

1st INTERNATIONAL KARATEKIN SCIENCE AND TECHNOLOGY CONFERENCE

1-3 SEPTEMBER 2022

ÇANKIRI, TURKEY



Abstract Proceedings Book



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1st International Karatekin Science and Technology Conference

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ABOUT THE CONFERENCE

CONFERENCE NAME

1st International Karatekin Science and Technology Conference

DATE AND PLACE

September 1-3, 2022 Çankırı – Turkiye

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English

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Conference Topics

Audiology
Biology
Chemical Engineering
Chemistry
Civil Engineering
Computer Engineering
Dentistry
Electrical and Electronic Engineering
Emergency Aid and Disaster Management
Food Engineering
Forest Engineering
Gerontology
Health Management
Landscape Architecture
Mathematics
Mechanical Engineering
Midwifery
Nursing
Nutrition and Dietetics
Orthotic-Prosthetic
Physics
Physiotherapy and Rehabilitation
Social Work
Statistics



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Dear Participant,

The total number of speakers at “1st International Karatekin Science and Technology Conference” was 214 together with the invited speakers.

A total of 15 invited speakers, 7 of whom are foreign and 8 of whom are Turkish nationals, made presentations at the conference.

In addition to the invited speakers, 105 foreign speakers from various countries made presentations at the conference. 52% of the 199 speakers in total were foreigners.

Thank you to all the participants who gave generously of their time, especially the speakers who shared their studies and experiences and the institutions who assisted in.

1st International Karatekin Science
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THE HISTORY OF THE THERMODYNAMICS

**Honorable Invited
Speaker**

Sadık Kakaç

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Sadık Kakaç was born in 1932 in Çorum, graduated from Istanbul Technical University, Faculty of Machinery in 1955; He received his MSc degrees in Mechanical Engineering from Massachusetts Institute of Technology in 1959, in Nuclear Energy in 1960, and his PhD from University of Manchester in 1965; He was promoted to Associate Professorship at Istanbul Technical University in 1967 and to Professorship at Middle East Technical University in 1971. Sadık Kakaç, who worked at Middle East Technical University between 1960-1982 and 1998-1999, was a visiting professor at Munich Technical University in 1990-1991, and retired from Middle East Technical University in 1999. Sadık Kakaç, who played an important role in the establishment of ITU Nuclear Energy Institute in 1960, was a member of the Atomic Energy Commission between 1970-1978, was elected as a member of the TÜBİTAK Science Board in 1971 and held this position for two terms. Sadık Kakaç also served as the Deputy Secretary General of TÜBİTAK for a while between 1975-1976. Representing our country in the NATO Science Committee between 1978-1980, Kakaç served as the Secretary General of the Turkish Atomic Energy Commission on the same dates Sadık Kakaç, Honorary Professor of Shang-hai Electric Energy Institute in China, Honorary Consultant of Xian Jiatong University, foreign member of the Russian Federation Academy of Sciences, Principal Member of the Turkish Academy of Sciences “International Journal of Hydrogen Energy”, “International Journal of Heat and Mass Transfer” He is the editor of the scientific journals “International Communications in Heat and Mass Transfer”, "International Journal Experimental Heat Transfer, Thermodynamics and Fluid Mechanics” and “International Journal of Thermal Sciences”. 1989 Alexander von Humboldt Award (Germany), 1994 Turkish-American Association of Scientists Science Award, 1997 American Society of Mechanical Engineers (ASME) Heat Transfer Award, 1997 International Heat and Mass Transfer Center (ICHMT) Service Award, 1999 METU Prof. Dr. Sadık Kakaç, the winner of the Mustafa N. Parlar Education and Research Foundation Service Award, was awarded an Honorary Doctorate by Ovidius University (Romania) in 1998 and by Reims University (France) in 1999. Sadık Kakaç is the recipient of the TÜBİTAK Service Award in 2000. Working at the University of Miami between 1982-2008, Prof. Dr. Sadık Kakaç has been working at TOBB University of Economics and Technology since June 22, 2007.



**NANOGRAVIMETRIC AND VISCOELASTIC
MEASUREMENTS ON ELECTROACTIVE FILMS
USING THE EQCM**

Invited Speaker

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ABSTRACT

Coulometric and gravimetric measurements provide absolute assays. Their combination in the electrochemical quartz crystal microbalance (EQCM) technique yields a powerful analytical methodology, particularly in conjunction with selectivity provided electrochemically (*via* potential) or chemically (*via* surface functionalization). This presentation reviews the EQCM principles and the manner in which electrolytes and surface films influence the quartz resonator acoustic response. Diagnostics are presented for distinguishing gravimetric and viscoelastic responses, reflecting film mass and mechanical properties, respectively. The power of the EQCM to monitor deposition and surface-exchange processes *in situ* is illustrated for electroactive materials, at equilibrium or under kinetic control, and at the nanoscale.

The EQCM can quantify transfers of uncharged and electroinactive species (notably solvent) between a surface-bound film and solution. Correlation of surface mass change with electrochemical charge as a function of time, enables distinction of solvent, anion and cation (especially proton) transfers. Deposition of metal ions (Ni, Co, Cu) onto surface-attached carboxylate ligands can be nanogravimetrically assayed and parameterized by an isotherm to permit determination of metal ion concentrations at levels relevant to environmental issues. Availability of safe drinking water is a global challenge, in which fluoride ions play a significant role. Dependent on local circumstances, one may wish to fluoridate the water (benefiting dental health) or remove excess fluoride (avoiding serious health conditions). The latter may be accomplished by fluoride ion-exchange into electroactive films; the extent and dynamics of this process may be monitored using the EQCM.

Extension of these concepts will be briefly explored. Integration of the EQCM with additional techniques, such as probe beam deflection [5], allows interfacial and solution processes to be characterized in a single experiment. Analysis of the QCM acoustic spectrum as a function of frequency and temperature provides novel insights into nanomechanical dynamics of polymeric materials.

Keywords: EQCM, Conducting polymer, Electroactive film, Ion-exchange, Viscoelasticity



**TARGETING CANCER METABOLISM ENZYMES
FOR CANCER TREATMENT**

Invited Speaker

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ABSTRACT

The development of cancer-specific therapeutics has been limited because most of healthy cells and cancer cells depend on common pathways. The recent evidence suggests that targeting the cancer specific metabolic and mitochondrial remodeling may offer selectivity in cancer treatment. Tumor metabolism enzymes, Pyruvate Kinase M2 (PKM2), Malic Enzyme 2 (ME2), G6PD and 6PGD are predominantly overexpressed in a number of tumor types and inhibition of these enzymes results in decreased tumor growth. Reversing the mitochondrial suppression and the increased glucose consumption in cancer cells is an important step and has great potential for therapeutic drug developments. Therefore, we performed small molecule library screen to discover small molecule inhibitors of these enzymes for cancer treatment. Here, progress regarding screening for Tumor metabolism enzymes inhibitors will be reported.

Keywords: Tumor metabolism enzymes, Pyruvate Kinase M2 (PKM2), Malic Enzyme 2 (ME2), G6PD and 6PGD



**A LIKELIHOOD RATIO TEST FOR HIGH-DIMENSIONAL
MANOVA ABLE TO OUTPERFORM EXISTING TESTS**

Invited Speaker

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ABSTRACT

A Likelihood Ratio Test is developed for the one-way high-dimensional MANOVA. This test is able to outperform in terms of power most existing tests in most situations, displaying an extraordinary behavior even for extremely skewed distributions as well as heavy tailed distributions, including those with no expected value, in which case it becomes a test for location. Still, it shows a better Type I error control than existing tests and non-inflated power values. Furthermore, the test presented is able to work with samples of size just 1, for all samples, except one of them, and its statistic has a very nice and simple asymptotic Normal distribution, which does not require any restrictions on sample sizes in order to hold. Extended simulation results are presented.

Keywords: Asymptotic Normal distribution, exact distribution, Generalized Integer Gamma distribution, Generalized Near-Integer Gamma distribution, product of Beta random variables.



**THE MOST COMMONLY USED DATA MINING TOOLS
ON MEDICAL DATA**

Invited Speaker

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ABSTRACT

Data mining and artificial intelligence applications in the field of healthcare have a critical importance. Because the smallest mistake in this field can cause irreversible damage. Researchers studying in this field have always aimed to diagnose the disease or segment lesions with the highest accuracy. In many studies, the use of data mining tools have been proposed for medical data. There are many data mining tools used in the literature. Some of them are open-source and free of charge, while others are available for a fee. In this study, the advantages and disadvantages of the most popular open-source data mining tools used in the healthcare field are presented.

Keywords: Data mining, Data mining tools, Medical data analysis



**THE ROLE OF THE NITRIC OXIDE PATHWAY
IN THE ANTICONVULSANT EFFECTS OF
VITAMIN D ON EPILEPTIC SEIZURES IN RATS**

Invited Speaker

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ABSTRACT

Epilepsy is one of the most common neurological diseases affecting more than 0.5% of the world's population [1, 2]. The disease is characterized by recurrent seizures that occur spontaneously. Cholecalciferol (vitamin D3) is produced on the skin from 7-dehydrocholesterol under the influence of ultraviolet radiation with a wavelength of 290-315 nm, which is the main source of endogenous vitamin D production [3-5].

In this study, despite the great breakthroughs in the field of epilepsy studies, the present drugs are ineffective in one-third of the patients, as well as without providing a definite treatment. There is accumulating evidence suggesting the role of vitamin D in epilepsy. The aim of this study was to investigate the effect of vitamin D on seizure formation, post-seizure cognitive functions, and the possible role of nitric oxide and oxidative stress in this effect, in the PTZ-induced seizure rat model. Sixty male Wistar albino rats were used in this study. The rats were randomly divided into 11 groups each containing 6 animals: Group 1: Control; Group 2: Saline+PTZ (45 mg/kg); Group 3: Vitamin D (1.5 mg/kg)+PTZ; Group 4: L-Arginine (500 mg/kg)+PTZ; Group 5: L-NAME (60 mg/kg)+PTZ; Group 6: 7-Nitroindazole (40 mg/kg); Group 7: Aminoguanidine (100 mg/kg)+PTZ; Group 8: Vitamin D+L- Arginine+PTZ; Group 9: Vitamin D+L-NAME+PTZ; Group 10: Vitamin D+7-Nitroindazole+PTZ; Group 11: Vitamin D+Aminoguanidine+PTZ. Animal behavior was evaluated with open field and passive avoidance tests. Nitric oxide (NO), total oxidative status (TOS), and total antioxidant status (TAS) levels in the cortex and hippocampus brain regions were determined by ELISA method. The treatment of vitamin D in combination with NO inhibitors has a positive effect on the PTZ-induced seizures and ameliorate post-seizure learning deficits. Moreover, the combination of vitamin D with NO inhibitors reduced oxidative stress and NO levels after seizures in the cortex and hippocampus. Vitamin D supplementation could be effective as a supportive treatment drug in epileptic patients, according to the findings.

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Keywords: Epilepsy, Nitric oxide, Pentylenetetrazole, Rat, Vitamin D



**FIGHTING AGAINST COVID-19: A COMPUTATIONAL
BIOPHYSICS APPROACH**

Invited Speaker

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ABSTRACT

Previously it was reported that cell-surface Glucose Regulated Protein 78 (CS-GRP78), also termed heat shock protein A5 (HSPA5), could be a possible route for SARS-CoV-2 internalization. The binding site on the spike protein of SARS-CoV-2, which can recognize CS-GRP78, was predicted in a previous study. The spike glycoprotein of the SARS-CoV-2 bear many conserved motifs to the previously determined human coronavirus strains such as HKU1, 229E, NL63, OC43, MERS-CoV, and SARS-CoV. 2 However, we would like to emphasize that using a simple bioinformatics approach can suggest a possible role of the GRP78 in cross immunization against COVID-19. Additionally, different antiviral drugs have the potential to be SARS-CoV-2 inhibitors, thus can be used against COVID-19. These drugs are tested *in silico* at the beginning of the pandemic, and currently, some are approved against COVID-19.

Keywords: COVID-19, SARS-CoV-2, Spike, GRP78, Virus-host cell recognition



GLYCOSAMINOGLYCANS: BIOMIMETIC MATERIALS

Invited Speaker

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ABSTRACT

Numerous vital physiological processes are carried out by the broad family of complex, unbranched polysaccharides known as glycosaminoglycans (GAGs). Understanding the biological functions of GAGs and structure-property correlations is challenging due to the structural complexity of GAGs, which severely restricts their availability. Our comprehension of the biological functions of GAGs and the control of their biosynthesis will be aided by a technique that can access GAGs and their analogues with defined structure at reasonably large sizes. Controlling the surface modification at the micro- and nanoscale can affect the characteristics of a material. The study of biomaterials has a lot of potential when glycosaminoglycans (GAG) are used to structure material surfaces. A special group of bioactive polysaccharides known as GAG may precisely engage a wide range of different natural binding partners, including growth factors and sticky proteins. As a result, behaviors like cell adhesion, proliferation, and differentiation can be managed. For the intended use of each specific biomaterial, the biocompatibility and stability of the material reflect essential characteristics. In my researches, in order to create unsulfated and sulfated GAG analogs, chitosan and its derivatives are chemically modified.

Keywords: Chemical modification, Chitosan, Glycosaminoglycans, Heparin, Medical application.



**WOODY VEGETATION DEVELOPMENT IN THE AFRICAN
SAHEL - EVIDENCE FROM LOCAL KNOWLEDGE. A CASE
STUDY FROM ELGENEINA AREA IN WESTERN DARFUR
STATE, SUDAN**

Invited Speaker

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ABSTRACT

In the Sahel, woody vegetation represents the major natural resources upon which the livelihood of local people depends. This resource has always been under great anthropogenic pressure as well as environmental stresses, the last was the great Sahelian drought in 1960s through 1980s. All these make the Sahel one of the most attractive zones for botanical studies. However, most of these studies were based on large scale climatological or remotely sensed observations. The importance of this study originates from the fact that this important resource has been under both anthropogenic and climatic pressures that threaten its existence, thus scientific investigations are needed to evaluate its dynamic. The aim of this study was to assess the local perceptions of the woody vegetation changes in Elgeneina Area in Western Darfur State, Sudan. Semi-structured interviews were performed with 25 groups of informants from 8 villages. The results showed drastic change in the abundance of the woody plant species in the area. According to the locals, more than 77 per cent of the 56 listed species were declining, with over 30 per cent identified as threatened, including numerous plants of great economic value. Increasing species were mostly drought-tolerant plants mainly of Acacia type. A few species were listed as locally extinct. The major causes of species decline were identified to be agriculture, deforestation and bushfires. Data derived from local ecological knowledge were consistent with that of many ecological studies, suggesting the reliability of people's knowledge for obtaining ecological data. Information from this study can be used as baseline for conservation of species identified as threatened.

Keywords: African Sahel, Woody vegetation, Western Darfur, Local perception, Declining



**THE PURSUIT OF NOVEL DHODH INHIBITORS:
DEVELOPMENT OF IMIDAZO-FUSED HETEROCYCLES
AND HERO MD ANALYSIS – A TOOL FOR ANALYSING
GROMACS BASED MD SIMULATIONS**

Invited Speaker

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ABSTRACT

Dihydroorotate (DHODH) is an essential enzyme of *de novo* pyrimidine biosynthesis, catalysing the ubiquinone-mediated oxidation of dihydroorotate to orotate. DHODH is considered a druggable target. Recently, academics and industry researchers have been directing efforts in investigating DHODH inhibition to manage autoimmune diseases, cancer, malaria, and other diseases. Our group initiated this research project with the aim to study the molecular mechanism of *Pf*DHODH inhibition using MD simulation in order to design novel inhibitors. A program named, HeroMDAnalysis was developed to assist in the analysis of MD simulation. Importantly, this GUI tool can be very helpful to biochemists, synthetic chemists, and pharmacologists involved in the area of MD simulation. Progressively, in the context of identifying novel inhibitors to target *Pf*DHODH, various computer-aided drug design approaches were utilized. The pursuit resulted in 3 different series of imidazo-fused heterocycles namely: 1) Aminomethylated-imidazo[1,2-a]pyridines, 2) *N*-arylated-imidazo[2,1-b][1,3,4]thiadiazoles, and 3) 1H-benzo[*d*]imidazole-alkyl-acetamides. Progressively, the imidazo-fused heterocycles were synthesized using novel chemical methodologies. The advantages of methodologies used in this project includes atom economy, operational simplicity, reduced waste, and moderate to good yields. A total of 38 compounds were synthesized, and structure elucidation was carried out using advanced spectroscopic techniques including ¹H and ¹³C NMR, ESI-MS, FT-IR, CHNS elemental analysis. Finally, the synthesized compounds were investigated for *in vitro* anti-malarial activities against *Plasmodium falciparum* 3D7 (Drug sensitive), Dd2 (Chloroquine-resistant), and INDO (Chloroquine-resistant), and anti-cancer activities against MCF-7 (human breast adenocarcinoma) and A549 (NSC lung cancer) cell lines. The present study resulted in identification of 3 compounds which have showed inhibitory potential of IC₅₀ values < 1 μM against *Pf*3D7 cell line. The compounds were also active against drug resistant cell lines of Plasmodium parasite (*Pf*Dd2 and *Pf*INDO). Further, the molecules could serve as lead for further optimization of potency and preclinical development.

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Keywords: Pyrimidine biosynthesis, HeroMDAnalysis, Imidazo-fused heterocycles, Plasmodium falciparum 3D7, Chemical methodologies



**WHAT IS THE ROLE OF THE CHEMISTS IN
TRADITIONAL MEDICINE**

Invited Speaker

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ABSTRACT

According to World Health Organization (WHO), Traditional Medicine (TM) is a comprehensive term used to refer both to TM systems such as Traditional Chinese Medicine (TCM), Indian Ayurveda and Unani (Greek) Medicine, and to various forms of indigenous medicine (home remedies). In developing countries, broad use of TM is often due to its accessibility and affordability. TM is sometimes the only affordable source of health care—especially for the world’s poorest patients. Approximately 80% of the world population rely on traditional medicine. Herbal medicine includes herbs, herbal materials, herbal preparations and admixed herbal products that contain active ingredient parts of plants, and other plant materials, or combinations. These active ingredients are known as natural products (NPs). NPs are chemical organic compounds produced by living organisms that exert a biological effect on other organisms.

Chemists do research on the medicinal plants to isolate compounds in a pure form and subject them to comprehensive spectroscopic techniques to identify and characterize them. Eventually, run biological assays to confirm their importance in medicinal use.

This paper tells a brief story on how chemists contribute to traditional medicine i.e. from selection of plant to get pure compound subjected to biological assay.

Keywords: Traditional Medicine, Herbal Medicine, Chemists, Natural product, Spectroscopy



WORLD BORON R&D ACTIVITIES AND BOREN

Invited Speaker

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ABSTRACT

R&D is one of the most important activities required for innovation in the world. In the first quarter of the current century, there are intense and well-fictionalized research and development studies behind the rapidly advancing technology, product development and innovative approaches. In parallel with these, the application areas of boron minerals and products used in a wide and various fields are increasing day by day. Since boron is used more or less in more than 250 areas, it is known as the “Salt of the Industry” and offers a wide range of uses in the sector. Boron is frequently used in chemistry, materials, automotive, construction, nuclear energy, defense industry, cleaning and detergent, glass, ceramics, health, agriculture, aerospace and aircraft, military vehicles, fuels, electronics and communications, polymeric materials, nanotechnologies and metallurgy and many chemicals and products are still developed. The World Academy publishes approximately 7,000 articles and 13,000 patents on boron every year and 30% of these studies are also encountered as boron materials. This is an indication that more boron-containing products and materials will be encountered in the upcoming period.

Keywords: Boron, Boron materials, R&D, TENMAK-BOREN.



**USE OF MOLECULAR IMPRINTING IN SOLID
PHASE EXTRACTION OF SOME
BIOANALYTICALLY IMPORTANT MOLECULES**

Invited Speaker

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ABSTRACT

Molecular imprinting technology is inspired by natural receptors found in the body. These receptors can recognize a single substance among a crowd inside a solution. Molecular imprinting polymers (MIPs) can be thought of as artificial receptors. They can be synthesized for specific/selective recognition of a molecule or a group of molecules. The syntheses of these special polymers are achieved by the polymerization of the monomer(s) and the crosslinking agent in the presence of the template molecule. Unlike conventional polymer synthesis, a monomer is only used to supply a covalent or a non-covalent attraction between template molecules, and the polymerization of a crosslinking agent is achieved around this bond. This special knitting by crosslinking agent around template-monomer complex supply high stability, activity during a wide range of conditions, and robustness. Specific/selective binding sites are obtained after removal of the template molecule from the resulting polymer. These properties presumably make the MIPs potential candidates for recognition of the analyte(s) even in harsh conditions, and also make them applicable in different analytical techniques like solid phase extraction, solid phase micro-extraction, and thin film micro-extraction. In this talk, recent studies in the authors' laboratory on the use of MIPs and MIP-composite materials for specific analytical applications will be discussed.

Keywords: Molecular imprinted polymers, Extraction



**LONG-TERM VIBRATION CONTROL BASED
STRUCTURAL HEALTH MONITORING OF CIVIL
ENGINEERING STRUCTURES**

Invited Speaker

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ABSTRACT

Civil engineering structures are designed for a certain service life and are exposed to different loading conditions in the process. In this sense, monitoring the changes in the structures and taking the necessary precautions in a timely will prevent undesirable situations in terms of both economic and loss of life. For this purpose, the Structural Health Monitoring Systems are widely used for structural health monitoring and damage detection of engineering structures. The Structural Health Monitoring System includes the determination of the current structural conditions of the engineering structures, which are in use or are under construction, the continuous or periodic monitoring of the structural behavior in order to determine the damage and the creation of the structural condition database. Vibration-based structural health monitoring has gained popularity as a continuous monitoring method because it is undamaged method and has uninterrupted nature. Dynamic parameters, which vary with damage and are specific to structures, are monitored in the assessment based on vibration data.

Also, advanced structural analysis tools are available for the evaluation of the behavior of structures, today. The finite element (FE) method is one of the obvious of these tools. The FE method is widely used in all kinds of engineering structures to obtain the static and dynamic behavior of structures. But FE models are insufficient to fully reflect the actual structural behavior due to the assumptions made for uncertain system parameters and a successful FE modeling is required for the reliable assessment. In this context, the actual dynamic parameters of the structures are determined by the Structural Health Monitoring and the accuracy of analytical studies can be increased.

The Structural Health Monitoring Systems provides the necessary precautions, the protection of the structures and the prolongation of their service life by evaluating the structural data of the engineering structures. It can also improve the guiding regulations used in the design phase and develop new strengthening methods. For this reason, the Structural Health Monitoring System is gaining importance for civil engineering structures.

Keywords: Damage detection, Dynamic characteristics, Finite element method, Structural health monitoring



**CURRENT TRENDS AND FUTURE OUTLOOK OF
HYDROGELS IN DRUG DELIVERY**

Invited Speaker

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ABSTRACT

Hydrogels are widely used in biomedical fields including drug delivery due to their unique properties such as biocompatibility, biodegradability, flexibility, and non-toxicity. Because of their advanced properties, the interest in hydrogels is increasing day by day. Although researchers have been working on developing new hydrogels and enhancing the properties of the existing ones, there are still many remaining unsolved challenges for improvement. This review paper handles the topic of hydrogels as drug delivery systems (DDS). Herein, we summarize the properties, advantages, classification, and preparation methods of hydrogels. We highlighted some recent progress of hydrogels as unique drug delivery vehicles. The future perspective of the use of them was eventually enlightened.

Keywords: Hydrogel, Controlled drug release, Biomedical, Absorption, Therapy.

**1st International Karatekin Science and
Technology Conference**

**IKSTC1st
2022**



September 1-3, 2022 – Çankırı, Türkiye

<https://www.ikstc.org/>

Invited Speaker

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Prof. Dr. S. M. Moustafa Kamal could not participate in our conference because of a serious health problem. So we appreciate his effort and support to our conference and we would like to declare his name in the conference abstract book as honorable invited speaker.



**CONVOLUTIONAL NEURAL NETWORK FOR POTHOLE DETECTION IN
DIFFERENT ROAD AND WEATHER CONDITIONS**

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ABSTRACT

Potholes are structural damage to the road which makes them the primary cause of accidents in many countries. In this study, a deep learning algorithm called Convolutional Neural Networks (CNNs) is proposed for pothole detection. In our model, we used three different datasets to justify the robustness of our model in detecting dry and wet potholes. Sigmoid and Softmax activation functions were separately used in the creation of the CNN algorithms. The CNN algorithm in the use of the Sigmoid function achieved 91%, 96%, and 83% accuracy scores over datasets 1, 2, and 3 respectively. In contrast to this, the CNN algorithm in the use of the Softmax function has 81%, 96%, and 85% accuracy scores over datasets 1, 2, and 3 respectively. This study revealed that the employed CNN algorithm in the use of the Sigmoid activation function can be considered more robust and effective in detecting the potholes images than the CNN algorithm in the use of the Softmax activation function.

Keywords: Potholes Detection, CNN, Robustness, Activation Function



**THYROID GLAND DISORDERS IN PATIENTS WITH LIVER DISEASE: A
CLINICAL STUDY**

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ABSTRACT

The liver plays a significant role in the metabolism of thyroid hormones, and the amount of thyroid hormones is also essential for appropriate hepatic function and bilirubin metabolism. Thyroid disorders are usually connected with liver damage or biochemical test abnormalities. This study was conducted to investigate the relationship between thyroid gland function with susceptibility to Liver disease in a sample of Iraqi patients. To find the association of the thyroid hormones with liver function test include, AST, ALT and bilirubin in blood serum of patients and healthy controls. To observe the effect of thyroid hormones abnormalities on liver function, in Iraqi patients with liver disease were used. A 50 samples of blood were collected from different age groups who attended to the Al- Hussein Educational Hospital in Thi-Qar governorate - Iraq . Another 25 blood samples were collected from normal healthy controls at different ages and genders. Present study included decreased of BMI in patients with liver disease more than controls. Age showed no significant differences.

Keywords: Thyroid Gland, Liver Disease, AST, ALT, TSH, T4, Bilirubin levels



**MOLECULAR IDENTIFICATION AND EVALUATION OF STREPTOKINASE
ACTIVITY AMONG STREPTOCOCCUS PYOGENES IN RELATION TO
STREPTOKINASE GENOTYPE ISOLATED FROM TONSILLITIS PATIENTS**

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ABSTRACT

About 100 throat swab samples were taken from a patient suffering from tonsillitis, and 60 were obtained through biochemical tests. Of these, 40 were identified as hemolytic, and 6 were identified as *S. pyogenicus*. The ability of these six strains to produce streptokinase was evaluated. Among the six strains, the one with the most variable production degrees was *S. pyogenicus* S30. Its activity was 0.35 U/mg. *S. pyogenicus* S30 was selected to determine the optimal conditions for streptokinase production. The maximum amount of the enzyme was achieved after the strain was given a base medium containing 0.5% glucose, a 1.5% yeast extract, and an inoculum with a size of 10. 4 The optimal conditions for streptokinase production were established by precipitation with a 45% saturation of ammonium sulfate. The resulting enzyme was then purified using a combination of ion exchange, gel filtration, and DEAE-Cellulose. After the last step, the enzyme's specific activity was increased to 54 U/mg. It was then analyzed using a PCR method to determine the presence of the *S.pyogenicus pyogenicus* specific primer. The results indicated that the six production strains exhibited 100% positive bands.

Keywords: PCR, Tonsillitis, Streptokinase, *S.pyogenicus*, Bacterial isolates



**CLASSIFICATION OF BREAST LESIONS ON MAMMOGRAM IMAGES USING
MONARCH BUTTERFLY OPTIMIZATION AND SUPPORT VECTOR MACHINE**

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ABSTRACT

Currently, breast cancer affects many women worldwide. In recent years, many Computer-aided diagnosis (CAD) model have been developed for early diagnosis of breast cancer. An efficient CAD model is suggested to identify mammogram images as benign versus malignant in this study. The suggested CAD model constitutes four stages which are image acquisition, segmentation, feature extraction, feature selection and classification process. Gray level run matrix (GLRM) approach is used for feature extraction, while monarch butterfly optimization (MBO) for feature selection process. Support vector machine (SVM) algorithm is preferred for classification process. The suggested model has been tested on a private mammographic dataset. The suggested model (GLRM+MBO+SVM) shows an 0.944 of accuracy for breast lesion classification. Compared with similar studies, our proposed model showed good classification results for the breast lesion classification process.

Keywords: Breast cancer, Gray level run matrix, Monarch Butterfly optimization, Support vector machine



**DESIGN MULTI INPUT SINGLE OUTPUT DC TO DC CONVERTER FOR MOBILE
DEVICES**

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ABSTRACT

In today's world. We have been able to find more than one way to generate energy. Also, humanity wants to store then use this energy. Based on this situation, we need to change our perspective on energy. Our electricity always falls short of consumption. So, we synthesize several generation methods. If we want to give an example, some plants have wind turbines and PV or PV and hydroelectric power plants. As you know turbines generate AC but PV systems generate DC. That can be a solution to energy shortage, but it can be not easy to transmit. On the other hand, this DC energy is using many areas but we haven't any good quality solution to store DC electricity. According to this, our work is about how to take different types of inputs and regulate energy for charging mobile devices. Regulating, methods are very different and they have also some methods. In this study, we are talking about multiple DC/DC converters. This study has Multiple input DC/DC converter topology. This type of converter has some production methods. Also, we are discussing some methods applications and their specification. In addition to this, we search about how to safely charge mobile devices.

Keywords: DC, AC, PV, Converter



**FINITE ELEMENT SOLUTION OF CONTACT PROBLEM FOR THE
FUNCTIONALLY GRADED ORTHOTROPIC LAYER RESTING ON A HALF
PLANE**

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ABSTRACT

In this study, the receding contact problem between a functionally graded orthotropic layer and a homogeneous half space is considered using finite element method. The functionally graded orthotropic layer pressed by two rectangular rigid stamps placed symmetrically. It is assumed that the contact surfaces are frictionless, only normal tractions can be transmitted through the contact areas. The finite element method of the problem is constituted using ANSYS software. The main objective of this paper is the study the effect of inhomogeneity parameters and orthotropic material properties of the of the functionally graded orthotropic layer mismatch on the contact pressure and the size of the contact regions.

Keywords: Finite element method, Functionally Graded Material, Receding Contact, Mechanic.



ON INTUITIONISTIC FUZZY SOFT MULTISETS

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ABSTRACT

An intuitionistic fuzzy set is characterized by membership and non-membership functions. The notions of the soft set and multiset are other useful instruments in the modeling of some problems. In this paper, the concept of intuitionistic fuzzy soft multisets (IFSMSs) and set-theoretical operations of IFSMSs are defined. Fundamental definitions and operations are supported with examples to make the concepts more understandable.

Keywords: Intuitionistic fuzzy set, Soft sets, Intuitionistic fuzzy soft set, Multiset, Intuitionistic fuzzy soft multisets



**AN EVALUATION OF SOCIAL WORKERS' USE OF TECHNOLOGY DURING
THE COVID 19 PANDEMIC PROCESS**

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ABSTRACT

Covid-19, which has spread rapidly in different geographies around the world and caused an epidemic, has become a global crisis in almost every country. Especially during the quarantine, isolation and physical-social distance Covid-19 epidemic; children, young, old, immigrant etc. has negatively affected the psycho-social well-being of many disadvantaged individuals. The Covid-19 outbreak affects many vulnerable groups differently, reinforcing their vulnerabilities and increasing their risk of exposure to abuse. The pandemic, which has become a major crisis, will not only affect individuals and families, but also communities. Necessitates intervention.

Emerging crises require response to disruptive effects at structural and institutional dimensions, not only to individuals and families, but also to the wider community. Social workers, who focus on the well-being of disadvantaged groups and the solution of their problems, need to follow technological developments in the provision of services and policy making, from the planning of the interventions to these problems, to the implementation and follow-up, in accordance with the information society we live in.

Especially during the pandemic, social workers need to be able to use many digital technologies such as electronic systems, applications for professionals and service users, websites, assistive robotic technologies, social media and sharing networks in their professional work. Also in their institutions digital technologies of social workers in subjects such as reporting of existing data, developing and monitoring services, online and technology-supported learning, care.

The fact that they can use them is effective in solving the problems that arise during the pandemic process. In this context, the process of using technology by social workers during the pandemic will be examined.

Keywords: Covid19, Social worker, Disadvantaged groups



**EFFECTIVE PARAMETERS ON MECHANICAL PERFORMANCE OF STEEL
FIBER-REINFORCED CONCRETE BEAMS**

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ABSTRACT

In this study, parameters affecting the mechanical performance of steel fiber-reinforced concrete beams were evaluated. The aim of the study is to see the effect of steel fibers used to change the failure mode in beam members that become embrittled with the increasing the concrete strength, on the behaviour of the members. For this reason, 271 beam test results with/without stirrup were compiled from the literature. The parameters considered in the compiled beams are fiber volumetric ratio (V_f), fiber aspect ratio (l_f/d_f), span-to-depth ratio (a/d), cylinder compressive strength (f_c'), and longitudinal reinforcement ratio (ρ). Fiber types used in beams are hooked-end, flat-end, crimped, and round steel fiber. V_f , l_f/d_f , a/d , f_c' , and ρ ranges are 0.3-2.0, 43.0- 127.7, 0.6-6.5, 19.6-232.1, and 0.4-8.0%, respectively. As a result of the study, the effects of these parameters on the shear stress of the beams and the limit values of these effects were determined.

Keywords: Steel fiber, Shear stress, Span-to-depth ratio, Failure mode



**PRODUCTION OF MEDIUM DENSITY FIBERBOARD (MDF) SANDWICH BOARD
AND EVALUATION OF USAGE POSSIBILITIES**

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ABSTRACT

In this study, the possibilities of using 20mm Polystyrene insulation boards in plate production by covering with 3mm MDF and 3mm Pine veneer were evaluated. Many studies have been done on insulation boards but similar study like this study has not been found in the literature about insulation board or the furniture industry [1-4]. With this study, it is aimed to reduce the amount of wood raw material usage and to create a new low-cost product that can be used in the production of light load bearing elements such as shelves for the furniture industry as well as its use as an insulation board. In the study, 3mm MDF boards were coated to 20mm polystyrene with PVA glue and 200gr glue per square meter. After bonding, the boards were compressed from the corners and middle parts by hand torture and kept for 24 hours. Modulus of rupture (MOR), modulus of elasticity (MOE) internal bond (IB), screw strength (SS) and density analyzes were performed by cutting the boards according to 25mm particle board test standards. According to the analysis results, the mechanical and density values of the MDF coated board gave better results. (MOR: 7.4 MPa, MOE: 1955 MPa, IB: 0.14 MPa, SS: 14.9 N/mm, Density: 250 kg/m³). Lower mechanical and density values were obtained from pine veneer covered boards compared to MDF (MOR: 6.08 MPa, MOE: 1608 MPa, IB: 0.07 MPa, SS: 12.53 N/mm, Density: 205 kg/m³). According to the analysis results, it has been evaluated that the MDF and wood coated polystyrene board can be used as insulation board and light load bearing board in furniture.

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Keywords: Foam board, Medium Density Fiberboard, Insulation, Furniture.



**THE RELATIONSHIP BETWEEN GROWTH DIFFERENTIATION FACTOR-15
AND TESTOSTERONE HORMONE LEVEL IN PROSTATE CANCER PATIENTS**

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ABSTRACT

Prostate cancer (PCa) is a common non-skin malignancy disease that frequently causes death males and the burden of this cancer continuously elevating in many countries and especially Asian. Hence the need to find prognostic markers to predict aggressiveness, patients' outcome, and efficacy of treatment are raising. Samples were recruited from the department of Oncology of AL-Ramadi teaching hospital and Haditha general hospital of Al_Anbar - IRAQ. A total of 100 male patients were recruited from December 2019 to November 2020. All patients received after clinically and laboratory diagnoses. Patients was 70 person while the control groups 30 subject. Serum growth differentiation factor 15 (GDF-15), prostate specific antigen (PSA), total serum testosterone, follicle-stimulating hormone (FSH) and C-reactive protein (CRP) were assayed by BioTek Elisa and Roche Cobas c 311. In Serum PCa patients with continuously disease progression were Levels of GDF-15 elevated. There was a significant increase PSA levels with prostate cancer patients with old injury but observed a trend to tiny depression in levels of serum total Testosterone and FSH. Concerning to the Pearson Scale there were positive significantly ($P < 0.0023$) correlated between serum GDF-15 with Prostate-specific antigen (PSA) levels. In addition, there were a positive significantly ($P < 0.002$) correlated to the duration of the disease with the level of C-reactive protein (CRP) in serum. In our conclusion, a strong correlation was observed between increasing (GDF-15), PSA and body mass index (BMI) with PCa risk. Also, Prostate cancer patients was related to depress FSH and total testosterone levels. The present thesis reinforce the use of GDF-15 and PSA examinations as prognostic biomarkers in PCa and in determining disease progression.

Keywords: Prostate Cancer, GDF-15, Total Testosterone, PSA, CRP, FSH, Roche Cobas c311



**COMPARATIVE STUDY BETWEEN HUMAN PLACENTAL LACTOGEN
HORMONE WITH SOME BIOCHEMICAL TESTS IN IRAQI PREGNANT WOMEN**

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ABSTRACT

Human placental lactogen: a peptide hormone, similar to the structure of prolactin than the pituitary gland, but much more active. It contributes to the maturity and preparation of the mammary glands to produce milk, affects the diaper levels on the levels of some hormones during pregnancy. The aim of the study is to assess the levels of human placental lactogen in pregnant women with insulin and some chemical parameters. Study the effects of placental lactogen on the mother and fetus metabolism and on the growth and development of the fetus. 130 people (65 pregnant women) are evaluated in varying degrees of pregnancy stages and the control group 65 healthy women (without pregnant). Weight results indicate that women are average weight, did not suffer from changes in the level of the hormone of lactogen, the HPL, unlike obese and very weak. There were no statistically important differences for T3 T4 TSH. The statistical analysis showed that the HPL, the human placenta, may change levels in women who have problems during pregnancy when compared to the control group. The study also showed that the levels of the HPL, the human placenta, were affected in women in the thirties of life. There was a slight change in hormone levels in women who had diabetes during pregnancy. The study concluded that weight and age had a direct impact on changing the levels of the HPL. On the contrary, the CRP T3 T4 TSH was not on the levels of the HPL. The levels of the HPL are higher in women who carry embryos suffer from growth rates and changes in diabetes levels during pregnancy when comparing controls. There is a need to study insulin resistance with the hormone of lactogen, human placenta.

Keywords: HPL, TSH, T3, T4, Insulin, Pregnant women



**SYNTHESIS, CHARACTERIZATION AND EVALUATION OF ANTIOXIDANT
CAPACITY OF SOME SCHIFF BASES CONTAINING THIOPHENE GROUP**

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ABSTRACT

Schiff bases exhibit various biological properties due to the presence of the imine group [1]. Heterocyclic compounds exhibit radical scavenging behavior and are good antioxidants involved in protecting from free radical damage. Due to the biological properties of thiophene, which is a heterocyclic compound, thiophene-based aldehydes were chosen for the synthesis of Schiff bases [2]. In this study, it was aimed to synthesize, characterize and investigate the antioxidant capacity of some Schiff bases containing thiophene group. Substances were obtained by synthesizing (E)-N,N-dimethyl-4-((thiophen-2-yl-methylene)amino)aniline (**3**) by the reduction reaction (**4**) of this compound and adding phosphate groups (**6**). After purification by crystallization, FT-IR, ¹H and ¹³C NMR analyzes were performed. As a result of the comparison of the EC₅₀ values of the synthesized compounds and the ascorbic acid used as a standard, it was seen that the % RSA results of the 3 and 4 compounds were higher than the ascorbic acid.

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Keywords: Thiophene, Schiff Base, Antioxidant Capacity



**IN SILICO INHIBITION MECHANISM OF GLUTATHIONE REDUCTASE BY
COUMARIN DERIVATIVES: A MOLECULAR DOCKING STUDY**

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ABSTRACT

Glutathione reductase (GR), which is a major antioxidant enzyme, is targeted in the treatment of many diseases due to the dual role of its product, reduced glutathione (GSH), in infected cells. This study's goal was to introduce new GR inhibitors to the literature. In this study, some additions were made on the basic coumarin structure and a docking study was performed against the enzyme. In this study, some additions were made to the basic coumarin structure and a docking study was performed against the enzyme by using the Molegro Virtual Docker program. Crystal Structure of human Glutathione Reductase was used for docking studies (PDB ID: 2GH5). Coumarin derivatives showed -158.567—109.516 Moldock Score affinity for glutathione reductase enzyme. Effective Glutathione Reductase enzyme inhibitors can be derived from coumarin derivatives if appropriate modifications are made as the results show us.

Keywords: Glutathione reductase (GR), Coumarin derivatives, Docking



**LUNG OPACITY CLASSIFICATION WITH CONVOLUTIONAL NEURAL
NETWORK**

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ABSTRACT

On chest radiographs, the term of lung opacity refers to one or more areas where the normally darker lung appears more opaque or hazy. Lung opacity is usually benign and resolves spontaneously without complications in patients with short-term disease. In this study, a prediction process is performed by classifying chest x-ray images obtained from a public dataset with deep learning methods in order to help physicians in the diagnosis of the disease and to enable physicians to pay more attention to these areas before the disease passes to the pneumonia stage. The classical Convolutional Neural Network (CNN) model is preferred for the classification process. The CNN model is able to classify the dataset categorised as Normal and Lung Opacity with an accuracy rate of 92.93%.

Keywords: Lung opacity, Deep learning, CNN, Disease classification



**INVESTIGATION OF THE EFFECTS OF SOME METALS ON GLUTATHIONE
REDUCTASE ACTIVITY PURIFIED OF FROM RAINBOW TROUT
(ONCORHYNCHUS MYKISS) ERYTHROCYTES**

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ABSTRACT

The enzyme glutathione reductase (GR; *E.C.1.6.4.2) was isolated from the erythrocytes of rainbow trout. There were four stages to the purification process: preparation of hemolysate, precipitation of ammonium sulfate, ion exchange using DEAE-Sephadex, and affinity chromatography using 2',5'-ADP Sepharose 4B. GR enzyme was produced with a yield of 13.36 percent and a purification efficiency of 7135.2 EU/mg protein specific activity. SDS-PAGE was used to purity-check the enzyme after it had been purified. One band was produced because of the procedure. At a wavelength of 340 nm, enzyme activity was assessed spectrophotometrically using the Carlberg and Mannervik technique. All kinetic investigations and purification processes followed this technique. On the activity of the isolated enzyme, it was examined how certain metal ions (Cu^{2+} , Zn^{2+} , Pb^{2+} , Fe^{2+} , Co^{2+} , Mg^{2+} , Cr^{2+} , and Al^{3+}) reacted *in vitro*. Metals that had an inhibitory impact have their IC_{50} values determined. To identify the kind of inhibition, Lineweaver-Burk plots were created, and the plot's K_i constants were extracted from it. The GR enzyme activity isolated from rainbow trout erythrocytes was found to be unaffected by Al^{3+} ion, whereas Cr^{2+} ion activates the enzyme.

Keywords: GR, Metal Ion, Inhibition, Erythrocyte



SERUM URIC ACID LEVEL IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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ABSTRACT

Serum uric acid is commonly elevated in subjects with chronic kidney disease (CKD), but was historically viewed as an issue of limited interest. Recently, uric acid has been resurrected as a potential contributory risk factor in the development and progression of CKD. Most studies documented that an elevated serum uric acid level independently predicts the development of CKD. Raising the uric acid level in rats can induce glomerular hypertension and renal disease as noted by the development of arteriosclerosis, glomerular injury and tubulointerstitial fibrosis. Pilot studies suggest that lowering plasma uric acid concentrations may slow the progression of renal disease in subjects with CKD. While further clinical trials are necessary, uric acid is emerging as a potentially modifiable risk factor for CKD. Since this seminal study, there has been a renewed interest in the potential role uric acid may have in both acute and CKD, We briefly review some of the major advances that have occurred in this field in the last 15 years. There are inconsistent findings on the role of hyperuricemia as an independent risk factor for chronic kidney disease (CKD). Hypertension has been implicated as a factor influencing the association between serum uric acid and CKD. In this study we investigated the association between serum uric acid and renal function and tested whether hypertension moderates this association.

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Keywords: Kidney failure, Kidney diseases, Uricacid



**CELL VIABILITY AND CYTOTOXICITY ANALYSIS OF VESPA CRABRO NEST
EXTRACTS ON SPODOPTERA FRUGIPERDA CELL CULTURE**

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ABSTRACT

In this study, cell viability and cytotoxicity analyzes were performed on Spodoptera frugiperda (Sf9) cell cultures of extracts obtained from Vespa crabro nests collected from the Black Sea region. The MTT method was applied to determine the effects of ethanol extracts prepared from wasp nest samples. Concentrations of 100, 25, 12.5, 6.25, 3.125, 1.562 and 0.781 µg/mL of extract were applied in MTT analysis. It was observed, the applied concentrations decreased cell viability depending on the dose, were highly toxic to the Sf9 cells and increased cytotoxicity depending on the dose increase.

This study was financially supported by Ordu University BAP unit (B-1817).

Keywords: Vespa crabro Nest, Sf9, MTT



**STUDY OF THE RELATIONSHIP BETWEEN CHANGES IN PHYTIC ACID
LEVELS AND THEIR EFFECT ON SEMEN PARAMETERS IN MEN**

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ABSTRACT

The aim was to find out the effect of phytic acid on the number and motility of sperm in men. The study was divided into three levels according to the number of sperms (level 1; azoospermia (n= 35), level 2; Oligospermia (n=35), Level 3; Normospermia (n=30)). The study concluded that there is a correlation between phytic acid and poor sperm motility, where the results indicate that there are significant differences with Clinical importance for changes in phytic acid levels in men who were in the first level of our study. There was a negatively correlation between phytic acid levels and sperm count, $r = -0.613^{**}$ at $P = 0.004$, as well as the negative correlation with sperm activity, $r = -0.501^{**}$ at $P = 0.019$, The study concluded that the high levels of phytic acid the men's body can increase infertility problems. Thus, it increases fertility problems and may be related to the sexual ability of men. Where it can affect the active form of the male hormone testosterone by its effect on the presence or absence of some minerals in the body, and thus associated with weak sexual desire in men and low sperm production.

Keywords: Infertility, Testosterone, Phytic acid, Lipid profile, Sperm



**ASSESSMENT OF THYROID FUNCTION, VITAMIN D AND SOME
BIOCHEMICAL VARIABLES IN HEMODIALYSIS PATIENTS**

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ABSTRACT

Vitamin D binds to the intracellular nuclear receptor VDR, which is expressed in macrophages, monocytes, dendritic cells, T and B lymphocytes, and others. These cells produce the enzymes needed to metabolise vitamin D. Vitamin D receptors interact with 1,25(OH)₂D₃, generated by 25(OH)D-1-hydroxylase. Vitamin D₃ has extensive impacts on numerous lines of defence cells, indicating its importance in immune-mediated changes and autoimmunity. It controls CD4⁺ T cell differentiation and activation. It suppresses the activation of TCD4⁺ Th1 cells, lowering the production of IFN- γ , IL-2, and TNF- α , resulting in enhanced CD4⁺ Th2 T cell proliferation and production of IL-4, IL-5, and IL-10. Multiple sclerosis symptoms worsen in winter and spring when vitamin D levels are low, according to research. Vitamin D pills reduce these symptoms in women, according to studies. Clinical investigations using vitamin D analogues in individuals with DM1 showed that the condition was managed, with a drop in glycosylated haemoglobin and an increase in plasma C-peptide levels, indicating the prospective relevance of this therapy. Further research is needed.

Keywords: Thyroid function, Vitamin D, Chronic haemodialysis (CDH), Hematology and inflammatory status



**PLANNING OPTIMAL FOREST ROAD NETWORK USING UNMANNED AERIAL
VEHICLE (ELDIVAN SAMPLE)**

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ABSTRACT

This study, using Unmanned Aerial Vehicle (UAV) for the existing forest road network on forest roads, which undertakes the basic infrastructure in the execution of various forestry activities, is used to determine and plan the forest road locations required for the optimal forest road network, such as drones, etc. This study was conducted to demonstrate the usability of featured technologies. In this study, a practical approach is presented in the use of databases that can be processed with the help of Geographic Information Systems (GIS) software to make evaluations about national forest road networks with the data obtained. Within the scope of the study, the current orthomosaic data was obtained by making flights from various heights with the drone (UAV) device of the forest assets within the borders of Çankırı Karatekin University Faculty of Forestry Eldivan Research and Application Forest (367 ha). With the advantageous analysis environment provided by better quality and sensitive data, a multi-database containing the data of the entire study area has been created. After the current state of the forest road network has been determined, the existing forest road network has been defined in the digital environment and the necessary locations to reach the optimal road network have been determined by the GIS software. By using the orthomosaic and high-resolution Digital Elevation (DEM) data produced within the scope of the study, the locations needed in accordance with the relevant communiqué of the General Directorate of Forestry (GDF) were included in the planning and alternative routes were revealed for the project design studies. By using the UAV device, practical and effective data can be obtained in a short time in practice and a suitable decision-making environment can be provided for decision makers. All the data produced as a result of this study are represented in a database that can be used by scientists and other interested participants.

Keywords: Unmanned aerial vehicle, Forest road, Planning, Alternative route



PREPARATION OF TEST STRIPS FOR NAKED EYE DETECTION OF PEROXIDE TYPE EXPLOSIVES

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ABSTRACT

Peroxide-based explosives are energetic materials that have the R-O-O-R functional group which contains O₂ required for a very rapid explosion. The explosion occurs very quickly thanks to the weak -O-O- bonds. Peroxide type explosives are preferred and used very frequently by terrorists because they can even be prepared from materials used at home easily. However, since they do not have chromogenic or fluorogenic group or any other functional group, it is not possible to detect them via classical analytical methods. TATP, the most important and common usage of the peroxide type explosives, does not leave any post-explosion residue like nitro aromatic class explosives frequently used in military activities. Detection of peroxide-type explosives has become even more important after the 2005 London Metro terrorist attack and the 2015 Paris suicide bomber attempts. Since the detection of TATP is difficult, methods have been developed for the detection of H₂O₂ which is the product of the degradation of TATP in an acidic medium. Different analysis methods such as spectrophotometric, chromatographic, electrochemical and fluorometric methods have been developed for H₂O₂ analysis [1,2]. Among these, colorimetric detection has been received great attention in recent years due to its simple usage, low cost, portability, that it can be applied in a short time without a trained person, and even allows analysis without a device with the naked eye [3]. In this study, we developed a polymer based colorimetric sensor for the naked eye detection of TATP. We synthesized 2-hydroxyethyl methacrylate (HEMA) based transparent polymeric film for quantitative and qualitative colorimetric analysis of TATP by using CUPRAC methods. The Cuprac method, is a method used in the total analysis of many reducing agents, was developed in the laboratories of İstanbul University Cerrahpaşa. The method is based on the spectrophotometric measurement of the colored complex of Cu(I)-Nc formed as a result of the interaction of copper(II)-neocuproin (Cu(II)-Nc) reagent and H₂O₂, at 454 nm[4,5]. In this study, Cibacron Brilliant Yellow 3G-P reactive dye containing negatively charged sulfanyl-SO₃H groups covalently bonded to the synthesized poly (HEMA) films in order to electrostatically attach the (Cu(II)-Nc) complex. The colored complex turning from light yellow to brown as a result of interaction was measured in UV spectrophotometer. As a result, polymer-based test strips were developed that allow rapid, inexpensive analysis of TATP with naked eye in non-laboratory environments [6].

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Keywords: Colorimetric sensor, Explosive dedection, Polymeric test strips, Triacetone triperoxide (TATP)



**OPTIMAL OUTPUT POWER OF PHOTOVOLTAIC (PV) ELECTRICAL SYSTEMS
USING ARTIFICIAL NEURAL NETWORK (ANN)**

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ABSTRACT

One of the biggest problems facing manufacturers and researchers after installing the solar energy systems is to increase their efficiency and meet the demand loads of consumers, Also when starting designing a project to produce energy by solar energy cells, the output energy to be produced from this project is first determined, accordingly the type of panels, their number, their output energy and the way of connecting them are determined series and in parallel, and the type, capacity and number are determined of Inverters required, Cable connections, chassis, etc...

All of the aforementioned causes a loss of part of the energy, and one of the biggest problems that designers and implementers of projects faces is the inability of them to calculate these losses with the required accuracy, here in this study presented one of the methods that contribute to increasing efficiency by verifying the selection of the correct data and inserting it correctly in its appropriate location to establish a solar energy network in a way It is true, and this was done by using two different computer programs and they were combined with each other, the first program which is (PVsyst 6.8.5), As for the second it is an artificial networks algorithms, that to find the best values that can be used to achieve the highest level of effectiveness and the highest output power values when applying the energy solar system. This controller is designed to produce the maximum power from the PV module.in this study it was found that using the PVsyst 6.8.5 in conjunction with Artificial Neural Network (ANN) gives better results at a high rate to estimate the prediction output power which helps engineers and designers to accurately evaluate the final external effort and reduces the time spent in finding out put power when calculating it with Other programs or manually calculated, therefore, combining program information PVsyst 6.8.5 with the Neural Networks algorithm (ANN), is recommended to use.

Keywords: Artificial Neural Networks (ANN), PVsyst 6.8.5, Solar cell, Renewable energy



**USE OF INFORMATION TECHNOLOGIES IN THE CONTEXT OF THE SOCIAL
SERVICES SECTOR**

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ABSTRACT

Recently, with the rapid development of technology, computers and information technology are frequently used in the field of social work. Computer technologies are highly needed today, including networking and using the Internet as an essential tool for professionals. Understanding, designing and implementing computer and internet applications in Social Work will enable individual human service professionals and institutions to better serve their clients and effectively manage human service institutions. It also provides information on collection, storage, processing and transmission of services.

Human Services Technology explains key technological terms and gives you a history of technology uses before exploring other areas of Information Technology. This essential guide will also improve your ability to find and understand the latest research and information on important topics. Technology used in social work allows professionals to broaden their know-how and better serve clients by providing proven methods and explanations. In this study, detailed evaluations will be made on the types of information technology used in the social work sector in general.

Keywords: Social service, Clients, Information technology



**STUDY OF THYROID HORMONE EFFECT ON BIOCHEMICAL PARAMETERS
OF LIVER FUNCTION IN IRAQI PATIENTS**

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ABSTRACT

This study aims to study the effect of thyroid hormones on some biochemical tests of liver function in Iraqi male patients and to study the relationship between them. A controlled study included 135 Samples from patients and controls, group B, 45 patients with liver disorder, group C: 45 patients with a thyroid disorder, and group A: 45 Healthy people (As Controls group). The study concluded that there were significant statistically significant differences for patients with liver disease, as well as for patients who suffer from abnormalities in the functions of the thyroid gland. For T3 and T4, there was a clear importance and a slight impact for patients with liver disease. Because of the defect in the liver enzymes, this led to an increase in the TSB percentage, which increased significantly. AKL and Alb levels indicate statistical significance within the results of our study. Serum protein levels had no significant changes in our study. We recommend conducting more studies on these topics.

Keywords: Thyroid, TSH, T4, Liver, Gpt



DRINKING WATER QUALITY ASSESSMENT OF ÇANKIRI TOWNS, TÜRKİYE

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ABSTRACT

The use of water due to the increasing population and industrialization on Earth is increasing every day, surface waters are preferred as a source of drinking water, it is necessary to supply water to the network after it has been determined by analyzes that it has undergone absolute healthy treatment. In this study, the physicochemical and microbiological character, and main pollutants of drinking water of Cankiri towns were examined for human health estimation. For this purpose, we performed the water quality index (WQI) assessment. The levels of As, Cd, Fe, Hg, Ni, Pb, Se and Vn were higher than their permissible limits of Turkish legislation and WHO. The WQI rating using physicochemical parameters determined the quality of the water to be good. When the heavy metals were used to calculate the WQI value, water quality was determined poor or very poor quality due to high heavy metal levels in samples. The health risk assessment indicated that the As, Pb, and Hg in drinking water can cause health problems. These results can be used by managers to determine the necessary drinking water treatment strategy to ensure the safety of consumers.

Keywords: Drinking water, Heavy metal, Water quality, Health



**STUDY THE RELATION OF SOME BIOCHEMICAL PARAMETERS WITH A
VITAMIN D DEFICIENCY IN CARDIOVASCULAR DISEASE PATIENTS IN
KIRKUK CITY**

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ABSTRACT

As in any research work, this work also identified some limitations. One of the limitations was the fact that the groups were not homogeneous in terms of the proportion of men and women. The results were not treated according to gender for all variables because, for most of them, we would be working with a very small sample. If we had more women, we could have treated all the data according to gender and verified whether the variables studied had different behaviours between men and women. This would have been interesting since in some variables, namely 25(OH)D₃, there seems to be an influence of gender. Another possible limitation was the fact that the patient group consisted of individuals who were diagnosed with coronary artery disease, who underwent catheterization approximately 2 or 3 years before recruitment. Possibly, if the recruitment had been carried out a few weeks or months after the cardiovascular event, the results would have been different. The differences between controls and patients could have been even greater. However, this is what has been done in most studies published to date. Perhaps this is a gap and studies should be developed in patients monitored over several years to, in a way, assess the role of vitamin D in the evolution and prognosis of these individuals. In the patient group, there were only 16 individuals with vitamin D sufficiency. If the sample had been larger, it is possible that we would have had a greater number of individuals with vitamin D sufficiency in this group and it would have been possible to make comparisons with a greater degree of reliability.

Keywords: Vitamin D deficiency, Cardiovascular disease, Biochemical parameters.



**ASSESSMENT OF URIDYL-DIPHOSPHATE GLUCURONOSYL TRANSFERASE
1A1 GLY71ARG GENE POLYMORPHISM AND SELECTIVE BIOCHEMICAL
PARAMETERS IN NEONATES WITH SEVERE HYPERBILIRUBINEMIA**

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ABSTRACT

The most common clinical health concern among newborns is jaundice. The development of pathological newborn jaundice is caused by a variety of etiological causes. There is no clear risk factor for about half of the cases, which points to the possibility of a genetic component. We wanted to see if there was a link between the Gly71Arg (G71R) polymorphism in the uridyl-diphosphateglucuronosyltransferase 1A1 gene as well as the prevalence of unexplained severe indirect hyperbilirubinemia in Iraqi neonates. In the population of controls, the genotype distribution frequency for (G71R) polymorphism, was in accordance with the Hardy–Weinberg equilibrium, but this was not the case in the population of patients. There was a statistically significant increase in G71R A/G 62 (62 percent), A/A is 7 patients (7 percent), and GG with 31 when contrasted with the controls (31 percent). We found significant relationships between G71R A/G, (UGT-1A1) gene, A/A genotypes, and A allele as well as risk of severe (UIHB) in Iraq neonates in the current study, to minimize the harmful implications of high-toxic bilirubin levels, larger prospective studies utilizing (UGT-1A1 gene G71R genotyping) urgently needed as a signal for predicting the severity of unexplained early newborn IHB.

Keywords: Type 2 diabetes, Genetic association, Glucuronosyl transferase (1A1 GLY71ARG), Polymorphism, Neonates



**PREPARATION, MORPHOLOGICAL AND ELECTROCHEMICAL
CHARACTERIZATIONS OF POLY(TOLUIDINE BLUE)-DEEP EUTECTIC
SOLVENT/GOLD NANOPARTICLE MODIFIED SCREEN-PRINTED CARBON
ELECTRODE**

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ABSTRACT

Toluidine blue (TB) is a redox polymer which has electrocatalytic and fast charge transfer properties. Despite these excellent properties, polymers synthesized electrochemically in aqueous solution can be unstable and, leave from the electrode surface, reducing the sensing performance of the sensor. Despite these excellent properties, polymers synthesized electrochemically in aqueous solution can be unstable and detach from the electrode surface, thus the sensing performance of the sensor is decreases. To overcome the limitations in aqueous solutions, anhydrous systems such as deep eutectic solvents (DES) have been used in recent years [1]. In this study, screen-printed carbon electrodes (SPCEs) were modified with poly (toluidine blue)-deep eutectic solvent (PTB_{DES}) and gold nanoparticles (AuNP) for use as disposable electrochemical sensors, followed by morphological and electrochemical characterizations. First, electropolymerization of TB was performed on the working electrode (WE) of SPCEs. TB was prepared in DES ethalin (ethylene glycol: choline chloride 1:2) solution in 50 mM pH 8.0 phosphate buffer (PBS) in 0.1 M KCl and 0.1 M KNO₃. Electropolymerization of 1 mM TB in 90% DES etalin solution and 10% PBS (-0.6 V to +1.0 V, 100 mV.s⁻¹, 30 cycles) was applied by the cyclic voltammetry (CV) method. Then, AuNP was deposited on the WE of SPCE/PTB_{DES} by CV method (-1.3 V to -0.2 V, 50 mV.s⁻¹, 10 cycles). The morphological characterizations of the modified SPCEs were carried out by scanning electron microscope (SEM), and electrochemical characterizations were applied by CV, differential puls voltammetry (DPV) and electrochemical impedans spectroscopy (EIS) techniques in 5 mM K₃Fe(CN)₆/K₄Fe(CN)₆ (1 M KCl) solution. It was concluded that PTB_{DES} and AuNP showed a synergistic effect and increased electronic conductivity. The SPCE/PTB_{DES}/AuNP electrode can be used sensors and biosensors as transducer.

Acknowledgements: This work was supported by the Scientific Research Projects Coordinator of Çankırı Karatekin University (BAP) (Grant No: EY0211221D07).

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Keywords: Screen printed electrode, Deep eutectic solvents, Poly(toluidine blue), Gold nanoparticles



**CONTRIBUTION OF CD38, SIRT1 AND VITAMIN D3 IN THE PROGRESSION OF
COVID-19**

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ABSTRACT

COVID-19 is the disease that has occupied the whole world for nearly three years, which began in China from the city of Wuhan at the end of December 2019 . It was declared an epidemic in 2020. The cause of this epidemic is SARS-CoV-2 virus, which is one of a large family that includes a group of coronaviruses. Research and studies were directed towards understanding the mechanism of COVID-19 in the body and knowing the people who are more exposed to risk factors. Nicotinamide adenine dinucleotide is a vital biomolecules in most disease so it has become a focus of research. It is a key coenzyme playing an important role in redox reactions. It is also a substrate for several NAD⁺ consuming enzymes such as Sirtuin (SIRT), poly- ADP ribose polymerase (PARP) and CD38. NAD⁺ plays an important role in activating the immune system and also has an effective role in controlling inflammatory states. The current study looked at levels of CD38 and SIRT1, in addition to Vitamin D₃ levels. This study included 110 specimens, 80 patients with SARS-CoV-2 and 30 healthy controls. All patients were diagnosed by specialized doctors. CD38 and SIRT1 levels were measured by Enzyme-Linked Immunosorbent Assay (ELISA), while Vitamin D₃ levels were detected by competitive fluorescent immunoassay technology. The results found an increase in CD38 levels and a decrease in SIRT1 levels in patients compared to the control group, as well as a decline in vitamin D₃ levels. These results lead to suggest that high CD38 levels and low SIRT1 and Vitamin D₃ levels may be associated with inflammatory response during infection with COVID-19 and might have their impact on the progression of the disease.

Keywords: COVID-19, NAD⁺ consuming enzymes, VitaminD, CD38, SIRT1



**EVALUATION PLASMA OSTEOPONTIN LEVELS AND SOME BIOCHEMICAL
MARKERS IN PATIENTS WITH CHRONIC KIDNEY DISEASE COMPLICATIONS**

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ABSTRACT

A cross-control study was carried out for the estimation of osteopontin levels and some biochemical markers in patients with chronic kidney disease complications. The number of patients under the study were 135 patients with chronic kidney disease and acute kidney disease control group with the same demographic properties. The study showed that the highest mean level of Osteopontin was in patients with chronic renal disease and acute kidney disease, while the averages were a low in the control group. The current study showed that the mean age the mean age of the experimental group is 20 years higher than the average age of the control group for the group II and about 15 years higher for the group II when compared with the control group. While the means value of weight was statistically insignificant when performing the statistical analysis. The average value of GFR was statistically significant when performing the statistical analysis for the experimental group consisting of two groups of patients diagnosed with acute chronic renal failure. Serum OPN concentrations correlated with GFR, blood urea, S. creatinine, TSB, triglyceride, HDL, LDL ($r=-0.9$, $P<0.0001$).

Keywords: CKD, Osteopontin, Biomarkers, AKI A, GFR



**BIOCHEMICAL ASSESSMENTS OF SERUM AND SEMINAL PLASMA ZINC
LEVELS AND THEIR CORRELATIONS WITH REPRODUCTIVE HORMONES IN
MALE INFERTILITY**

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ABSTRACT

Male infertility is a common condition, and we conducted this study to identify and discover the causes. Zinc levels in men's blood and seminal plasma will be examined in connection to reproductive hormones in order to see whether zinc shortage or excess, vitamin D, and a few chemical tests have any influence on male infertility after they are compared to controls. The study was divided into three groups (Normospermia 45), (Oligospermia 50) ve (Azospermia 50). The results show the importance of age for individuals with azospermia. Also, weight gain showed a strong association with male infertility, and body mass had an explanation indicating the same importance. Cholesterol was statistically significant in the two study groups representing patients, and more research is needed on this topic. FSH and LH showed statistical significance, indicating that their levels had changed. The azospermia group had lower levels of AMH. But further study is needed due to the large number of treatments.

Keywords: Seminal Plasma, Azospermia, Zinc, Oligospermia, Vitamin D



**INVESTIGATING THE EFFECT OF VITAMIN D LEVELS, AMH AND SOME
CHEMICAL TESTS IN SEMEN FOR INDIVIDUALS WITH AZOSPERMIA,
OLIGOSPERMIA, AND NORMOSPERMIA**

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ABSTRACT

The aim of our study was to investigate the effects of vitamin D level, AMH and some chemical tests in semen of individuals with azospermai, oligospermai and normal spermai and whether deficiency or excess of vitamin D and some chemical tests have any effect after comparing with controls. It was found that vitamin D could increase sperm motility. Vitamin D levels in serum and seminal plasma of patients were compared with sperm parameters. No significant relationship was found between serum vitamin D level and seminal plasma vitamin D level ($p=0.463$). However, serum vitamin D level was found to be significantly related to progressive sperm count ($p=0.037$) and percentage of morphology ($p=0.049$). In assessing the mechanisms of action of vitamin D, sperm intracellular calcium levels were measured as indicators of the increase in intracellular calcium and malondialdehyde (MDA) levels as indicators of oxidative stress. The results show that serum vitamin D level is not significantly related to intracellular calcium level ($p=0.878$) and MDA level ($p=0.791$). Moreover, no significant relationship was found between seminal plasma MDA level and sperm parameters. However, both total sperm motility ($r=0.241$) and progressive sperm motility ($r=0.217$) were found to be significantly correlated with intracellular calcium.

Keywords: Vit D3, AMH, Infertility, Lipid profile, Testosterone



**THE EFFECT OF *Moringa Oleifera L.* EXTRACT ON TEXTURAL
CHARACTERISTICS OF SET-YOGHURT**

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ABSTRACT

In this study, Moringa extract (ME) was obtained by drying Moringa leaves after water extraction. The obtained ME was added to milk in two different ratios, 0.4% and 0.8% on dry matter basis, and yoghurt was produced. In addition, Moringa extract was encapsulated with maltodextrin by freeze drying method. The obtained microencapsulated Moringa extract (MME) was used in the production of yoghurt in two different ratios containing 0.4% and 0.8% Moringa extract on dry matter basis. The hardness, consistency, cohesion and viscosity index values, which are the textural parameters, vary between 40.17 and 85.47 g, 1055 and 2228.04 g, -33.46 and -82.57 g, -82.96 and -180.24 g, respectively. The addition of ME significantly reduced the firmness, consistency, stickiness and viscosity index of the yoghurt compared to the control yoghurt ($P<0.05$). Again, the addition of MME significantly reduced the same parameters compared to ME yoghurts ($P<0.05$).

Keywords: Moringa oleifera L., Microencapsulation, Yoghurt, Textural characteristics



NUMERICAL STUDY OF FLOW AND HEAT TRANSFER OF NANOFLUIDS IN A RIBBED CHANNEL WITH WINGLETS

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ABSTRACT

Passive methods are often used to increase heat transfer without reducing the overall efficiency of thermal devices. These methods are applications such as baffles, winglets, vortex generators and ribbed/grooved surfaces in different configurations. These applications are preferred in many fields such as heating/cooling systems, heat exchangers, solar air heaters, chemical or food processing. This method is economical compared to other heat transfer enhancement techniques as it does not require external power [1-7]. This study numerically investigates the flow and heat transfer of CuO-water nanofluid in a ribbed channel with winglets at its center. Analyzes are performed with the Computational Fluid Dynamics (CFD) based ANSYS Fluent program. Governing equations are solved with the SIMPLE algorithm. The upper and lower surfaces of the channel consist of V-shaped ribs, and discrete V-shaped winglets are placed in the center of the channel. In the study, the nanoparticle volume fraction is kept constant at $\phi = 5\%$, and Reynolds number (Re) varied between 100 and 600. The upper and lower ribbed surfaces of the channel are protected at a constant temperature of $T_w = 360$ K. The study results are given in terms of Nusselt number (Nu), and relative friction factor (r). In addition, the solutions are compared to the ribbed channel without winglets for the base fluid. The flow and temperature distributions are obtained at different Re for the ribbed channel with/without winglets. The results show that the CuO-water nanofluid and winglets contribute significantly to the heat transfer, but the friction factor is slightly increased. Nusselt number increases with increasing Reynolds number. The heat transfer in the channel with winglets for nanofluid flow is found to be 1.32 times higher than the base fluid flow of the channel without winglets.

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Keywords: Ribbed channel, Winglets, Nanofluids, Heat transfer, Friction factor



ASSOCIATION OF VITAMIN D DEFICIENCY WITH OVERWEIGHT

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ABSTRACT

In our study, there was increasing epidemiological evidence linking vitamin D deficiency status to obesity events. In addition, the study showed that there is an association between weight and vitamin D deficiency on the one hand, and lipid and calcium levels on the other hand, which indicates the association between weight gain and vitamin D deficiency. We have noted that obesity may increase the risk of developing ADHD. However, there is not enough information to understand whether there is a causal relationship between the two, but according to our results we believe that vitamin D deficiency reduces fat metabolism and thus increases body weight. Vitamin D deficiency has also been linked to an increased risk of osteoporosis and other diseases. 25-hydroxyvitamin D (25(OH)D) (25D) concentrations are believed to be the most accurate predictor of total vitamin D stores in the body. The relationship between low circulating 25D concentrations and obesity is well established, but the mechanisms are not fully understood. Vitamin D deficiency is associated with a cardiac metabolic risk profile in obese subjects. Our study concluded that more research should be done on these topics

Keywords: Vitamin D Deficiency, 25-hydroxyvitamin D, Overweight.



**INVESTIGATING THE PREVALENCE OF THYROID DYSFUNCTION IN I OBESE
IRAQI PATIENTS**

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ABSTRACT

In this study the function of the thyroid gland was investigated in obese individuals. The study was included 100 individuals with central obesity who divided into 50 males and 50 females, while they were control with 50 healthy lean individual (25 male and 25 female). The serum of each individual was used to analyze thyroid stimulating hormone (TSH), triiodothyronine (T3), thyroxine (T4), thyroid peroxidase antibodies (antiTPO), fasting blood sugar (FBS), and lipid profile which included; triglycerides (TGs), cholesterol (Chol), high-, low-, and very low-density lipoproteins (HDL, LDL, and VLDL). The results have shown non-significant differences in the level of T3 between obese and lean people, significant reduction in the level of T4 in obese people compared to lean people, significant elevation in the level of TSH in obese people compared to lean people, and non-significant differences in the level of antiTPO between obese and lean people. Moreover, the level of FBS was significantly higher in obese people compared to lean people, and significant alterations were observed in the lipid profile in obese people in which the TGs, Chol, LDL, and VLDL were elevated significantly, while HDL was reduced significantly. In conclusion, central obesity can be considered as risk factor for the development of hypothyroidism in males and females.

Keywords: Obesity, Thyroid hormone, ATPO



CORRELATION BETWEEN G6PD ENZYME AND BREAST CANCER

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ABSTRACT

Breast cancer is a complex, heterogeneous disease and one of the most common female cancers worldwide. Although great progress has been achieved in early diagnosis and systemic therapy of breast cancer in recent years, metastasis remains a major obstacle in the effective treatment of breast cancer. In breast cancer. One of the most important metabolic pathways that participate in these processes is the pentose phosphate pathway (PPP), which synthesizes the nucleotide precursor ribose-5-phosphate and produces the reduced form of the nicotinamide adenine dinucleotide phosphate (NADPH), an essential cofactor required for the synthesis of lipids and the maintenance of the antioxidant systems, such as the reduced glutathione pool. Thus, it has been proposed that the activation of the PPP could be regarded as a hallmark of cell transformation. Glucose-6-phosphate dehydrogenase (G6PD), the rate-limiting enzyme of the PPP, The purpose of this study is to investigate the function of this enzyme in breast cancer cell metabolism and to explore this potential as therapeutic targets. In our study, we chose breast cancer cells because they heavily rely upon PPP to manage oxidative stress and survive.

Keywords: G6PD, Pentose Phosphate Pathway, Breast cancer



CREATINE KINASE ELEVATION IN COVID-19 PATIENTS ON STATIN

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ABSTRACT

Recent studies have related the safety of statin drugs in COVID-19 patients, and its anti-inflammatory effect could reduce the severity of the infection and accelerate the recovery; while some case reports refer to rhabdomyolysis occurrence in COVID-19 patients, it's interesting that some of them were on statin therapy, this serious symptom considered an advanced adverse effect of statin drugs, in this study, we investigate the statin effect on creatine kinase in 140 patients, our cohort divided to four groups; 35 infected with Coronavirus on-statin, 35 infected not on statin, 35 not infected on-statin and 35 healthy Individuals as control, abbreviated to (A, B, C, and D) respectively, to compare their outcomes with each other. As a result, we can imply that statin has a highly significant effect on the CK, the p-value at 0.002 and, in group A Rhabdomyolysis was reported in two patients versus one case in group B.

Keywords: Covid-19, Rhabdomyolysis, Statin, Creatine kinase.



**STUDY OF THE CHANGES THAT OCCUR IN SOME BIOCHEMICAL
VARIABLES AFTER CHOLECYSTECTOMY FOR PATIENTS IN AL-ANBAR
GOVERNORATE/ IRAQ**

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ABSTRACT

The study included (90) Iraqi persons with age ranged from (20 - 70), that divided for two groups, group (1) control group consist of 30 healthy persons (males and females) and group (2) consist of 60 patient had a cholecystectomy, samples were obtained from Al-Ramadi teaching hospital and Haditha general hospital during the duration of October 2020 to March 2021, and measuring concentrations of TSB, ALT, AST, ALP, cholesterol, TG, LDL, HDL, VLDL, LDL, S. amylase, S. lipase, and CCK. Regarding the age of all participant the Mean \pm SE of patient group was (45.47 ± 1.57) that is lower than the control group (50.53 ± 1.73) with p-value 0.05 indicate a difference of statistical significant between the two group. The TSB mean level of patient group was 0.81 ± 0.02 that is statically different from mean level in control group (0.74 ± 0.01) , with p-value 0.04. TG and VLDL result showed a statistical difference between patient and control group, p-value was 0.01 for both markers. Measuring CCK for both group indicate a statistical significant difference in between as p-value 0.008.

Keywords: Cholecystectomy, Liver function test, Lipid profile, Amylase, Lipase, Cholecystokinin



HYPOTHYROIDISM AND ITS RELATIONSHIP TO WEIGHT GAIN

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ABSTRACT

The research was originally designed for studying the relationship between weight gain and hypothyroidism to get a better clarification on their association. We have found a significant higher values of BMI, waist circumference and waist/hip ratio in overweight subjects compared to lean control. Furthermore, overweight subjects with hypothyroidism have shown comparable BMI values with those without hypothyroidism, but significant higher waist circumference and waist/hip ratio. This indicates that abdominal body fats are linked with the pathophysiology of hypothyroidism. Verma et al. have reported a link between BMI and thyroid dysfunction, in which obese individuals are at more risk of hypothyroidism (Verma et al., 2008). Kelderman-Bolk et al. have reported that hypothyroidism patients exhibited a reduced life quality and reduces the effect of thyroxin treatment. The authors have suggested a weight loss management during the therapy of hypothyroidism to get the most beneficial effects of the treatment (Kelderman-Bolk et al., 2015). Mousa et al. have reported that hypothyroidism patients who showed high body fats tend to have more risks of developing metabolic syndrome (Mousa et al., 2018). Nevertheless, Witte et al. have revealed that visceral fats did not link the metabolic abnormalities with hypothyroidism, and they have attributed the reason to leptin instead of body fats (Witte et al., 2017).

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Keywords: Thyriod, Hypothyroidisms, Overweight, Thyroxin



**CIRCULARLY POLARIZED PATCH ANTENNA USING METAMATERIAL FOR
5G APPLICATIONS**

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ABSTRACT

In this paper, a new circularly polarized microstrip patch antenna operating at 3.5 GHz in the n78 frequency band of the 5G frequency spectrum below 6 GHz has been presented. AMC (Artificial Magnetic Conductor), a subclass of metamaterials, has been used to increase the performance of the antenna. AMC structure designed as a 4x4 array has been placed on the microstrip antenna without using air gap. HFSS (High Frequency Structural Simulator) has been used for simulation process. According to the obtained results, the designed AMC structure increases the performance of the antenna and reduces the size of the antenna. In addition, the effects of substrate and metamaterial thickness on the antenna performance have been examined. The results are also compared with the results given in literature.

Keywords: 5G, Patch Antenna, Metamaterial, Artificial Magnetic Conductor, HFSS



**ASSESSMENT OF LEPTIN LEVELS AND LIPID PROFILE AMONG TYPE 2
DIABETIC PATIENTS IN COMPARISON TO NON TYPE 2 DIABETICS**

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ABSTRACT

The current research aims to assessment in vitro the leptin levels and lipid profile among type 2 diabetic patients in comparison to non diabetics and the changes in leptin, lipid profile, Glucose and some biochemical tests with type 2 diabetic patients in comparison to non diabetics men. 110 Patients with T2DM and healthy persons (Controls group) were evaluated with looking into account age and weight, Group A (Control Group 55 without T2DM), Group B (55 With T2DM). The levels were studied Leptin, FBS, HbA1c, total cholesterol levels, HDL, LDL, VLDL, and TG in all blood serum samples of patients and controls for all cases. The results indicate the importance of leptin and the effect of its levels in patients with diabetes mellitus, which indicates the clinical importance of diagnosing leptin levels with age and triglycerides when directly treating these patients. The relationship between leptin levels and HOMA-IR was more pronounced and significant among obese T2DM subjects. All in all, it can be recommended that more studies should be conducted in more groups in order to fully reveal the relationship between leptin and other chemical tests in patients with diabetes mellitus. In addition, some tests must be added, especially the hormone insulin, in order to conduct a more important study.

Keywords: Leptin, Lipid profile, 2DM, FBS, HDL



**MENOPAUSAL HORMONES DISTURBANCE IN YOUNG AND ELDER BREAST
CANCER PATIENTS IN IRAQ**

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ABSTRACT

Breast cancer (BC) is a disease that breast cells grow out of control. Therefore, the early detection of breast cancer disease was the main aim of this study. In this study, several significant chemical tests have been done according to the aim of study. The study included 130 women at the age range between 26 - 66 years old. These women were divided into two groups known as patient group and control group. The control group included 65 healthy women (group A), while group B included 65 patients suffering from breast cancer disease. Anthropometric tests were performed as a function of some parameters such as; age, BMI, and weight. In addition, some other significant chemical tests were also performed such as; FSH, E2, Testosterone, Progesterone, Blood Urea, and S. Creatinine. In our results, there was a statistical significance for the FSH, Testosterone, Progesterone, ALP, Hb tests. The results of statistical analysis refer to significant differences and can be used as chemical markers to early diagnoses for women suffering from the breast cancer disease. While there were no significant differences for some other tests such as; Got, Gpt, Blood urea, and creatinine.

Keywords: Breast cancer, Women, Anthropometric



**FABRICATION AND CHARACTERIZATION OF MOLYBDENUM DOPED ZNO
NANORODS VIA ULTRASONIC SPRAY PYROLYSIS**

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ABSTRACT

Molybdenum metal doped ZnO nanorods were fabricated on a glass substrate via ultrasonic spray pyrolysis technique. The doping concentrations were in the range of 1 and 10 mol %. The crystallographic properties of the resulting ZnO samples were analyzed by the x-ray diffraction (XRD) method. According to the XRD analysis, it was determined that the lattice structure of the samples belonged to the hexagonal (wurtzite) unit cell. According to the XRD peaks it was understood that the crystals grow in the c-axis (002) direction. The morphological characteristics of the obtained thin films were analyzed by scanning electron microscopy (SEM). The presence of Mo ions in the samples was confirmed via energy dispersive x-ray spectroscopy (EDX) analysis. The optical transmittances of the samples were measured by ultraviolet / visible spectrophotometer (UV/VIS) at a wavelength of 300-1000 nm. It was observed that the produced films had high optical transparency.

Keywords: 1D nanostructure, ZnO, Metal doping, Ultrasonic spray pyrolysis method



**ANALYSIS OF METEOROLOGICAL AND HYDROLOGICAL DATA OF
NEVSEHIR PROVINCE, CAPPADOCIA, TÜRKİYE**

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ABSTRACT

Nevşehir is located in the Central Anatolia region of Cappadocia, Türkiye. A large percentage provincial area of Nevşehir is a part of the Middle Kızılırmak Basin. Besides Kızılırmak Basin, Nevşehir also contains drainage areas into Konya and Develi closed Basins. In this study, considering a 5 year interval data obtained from meteorology observation stations in Nevşehir, the climatic parameters such as, the annual and monthly total precipitation of the region, the number of monthly rainy, snowy and frosty days, precipitation and evaporation height, humidity, maximum and minimum temperatures, monthly and annual average minimum and maximum temperatures, soil temperature, wind direction and velocities are analyzed. By examining the change in meteorological data over a period of 5 years, the increasing and decreasing trends of climatic parameters in the region are determined. When the data are examined, it is observed that the annual average precipitation tends to decrease, while the annual average temperatures tend to increase. The average of the last 10 years' total precipitation values of Nevşehir province is calculated as 412.64 mm. The minimum precipitation value was observed as 281 mm in 2013 and the maximum value as 523.9 mm in 2012. Among the last 10 years, lowest annual average temperature was recorded as 10°C in 2011, and the highest as 13°C in 2018. The hydrological characteristics of the drainage basins of Derinöz, Karaağaç, Kızılöz and Damsa streams, which flow into Kızılırmak are examined and the effects of the long-term changes observed in the meteorological data on these drainage areas are discussed.

Keywords: Meteorological Data, Hydrological Data, Precipitation, Temperature, Evaporation



**ENHANCING CHONDROGENIC DIFFERENTIATION OF MOUSE
MESENCHYMAL STEM CELLS IN THREE-DIMENSIONAL IN VITRO MODELS
WITH GAG MIMICKING PEPTIDE NANOFIBERS**

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ABSTRACT

Constant, recurrent compression stresses on articular cartilage reduce its ability to mend itself after injury. Thus, it is vital to discover novel therapy options for the successful regeneration of the cartilage tissue. Current cellular therapy treatment alternatives are microfracture and autologous chondrocyte implantation; however, both therapies stimulate the production of fibrous cartilage, which degenerates over time, rather than functioning hyaline cartilage tissue. Tissue engineering experiments employing biodegradable scaffolds and autologous cells are crucial for creating a viable long-term therapy solution. Synthetic, bioactive, biocompatible, and biodegradable three-dimensional scaffolds made of glycosaminoglycan-like peptide nanofibers induce cell-cell interactions that promote chondrogenic differentiation of cells without the need of growth factors. We exhibited differentiation of mesenchymal stem cells into chondrocytes in both 2-dimensional and 3-dimensional culture, which produce a viable cartilage extracellular matrix, exploiting bioactive cues embedded into the peptide nanofiber scaffold without adding external growth factors.

Keywords: Peptide amphiphile nanofibers, In vitro chondrogenic differentiation,
Mesenchymal stem cells, Three-dimensional cell culture



**STUDY THE EFFECT OF OBESITY ON LEVELS OF PLASMINOGEN
ACTIVATOR INHIBITOR-1 AND ADIPONECTIN AS A PRE-DIAGNOSIS FOR
CARDIOVASCULAR DISEASE**

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ABSTRACT

Obesity is associated with an increased risk of developing cardiovascular disease (CVD), particularly heart failure and coronary heart disease (CHD). It directly contributes to cardiovascular risk factors, including obesity, dyslipidemia, type 2 diabetes, hypertension, and sleep disorders. In this study, it was aimed to investigate the effect of obesity on plasminogen activator-inhibitor-1 and adiponectin levels as a preliminary diagnosis of cardiovascular disease. The study was carried out in Imam Hussain Training Hospital in Zi-kar city, Iraq, by forming a patient and control group, and 50 patients in each group, aged between 35-45, with a total of 100 people. Blood samples were taken from all individuals for serum research. Serum cholesterol, serum triglyceride, serum low-density lipoprotein (LDL), serum high-density lipoprotein (HDL), serum very low-density lipoprotein (VLDL), serum triglyceride, serum plasminogen activator inhibitor-1 and serum adiponectin levels were measured in blood serum samples. When the first and second groups are compared, the differences between the two groups are statistically significant. The results showed that plasminogen activator inhibitor-1 levels were significantly higher in patients with obesity compared to the control group. Mean serum adiponectin values were significantly lower in the obese patient group compared to controls. On the basis of all results, it was concluded that overweight and obesity have strong risk factors for the development of cardiovascular disease, such as heart failure and coronary heart disease.

Keywords: Obesity, Cardiovascular Disease, Plasminogen Activator Inhibitor-1, Adiponectin, Lipid Profile



LIFESTYLE BEHAVIORS IN METABOLICALLY HEALTHY OBESE WOMEN

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ABSTRACT

Lifestyle behaviors have been reported different in metabolically healthy obese persons [1, 2]. Determining these behaviors and, if necessary, correcting them can be considered in order to reduce the risks of obesity [3]. With this assumption, the present study was conducted to determine the lifestyle behaviors of metabolically healthy obese women in Ardabil city, north-west of Iran. In this cross-sectional study, 250 obese or overweight women who were referred to the nutrition clinic were selected between September 2020 and September 2021. Participants were apparently healthy and without metabolic syndrome criteria in the age range of 18-50 years and body mass index of 25-50 kg/m². Data collection was performed using questionnaire which contains questions in individual lifestyle behaviors. Descriptive statistics was used to analyze data. In this study, 64% of metabolically healthy obese women referred to the nutrition clinic had class II and III obesity. The weight gain of 6 and 8 percent was reported at 6 and 12 months before the survey, respectively ($p < 0.001$). Expected weight loss was about 23% of body weight. Almost 79% of metabolically healthy obese women had a light physical activity. Nearly one-third of the studied population suffered from constipation. Omitting of meals and consumption of various snacks during the day was seen in 24.4% and 16.4% of the population, respectively. The range of sleeping duration was reported 3 to 12 hours/day. According to the results, adjustment of expectations of weight loss, increased physical activity, correcting of dietary habits and sleep management can be suggested as interventions to reduce the risks of obesity in metabolically healthy obese women.

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Keywords: Lifestyle behaviors, Obesity, Metabolically healthy obese, Women



**THE ROLE OF ASPROSIN AND SPEXIN IN DIAGNOSTIC OF THYROID DISEASE
IN AL-ANBAR GOVERNORATE**

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ABSTRACT

Structural and functional diseases of the thyroid may be divided into two major categories: hypothyroidism and hyperthyroidism (goiter, nodules and cancer). For proper functioning, thyroid hormones must be present at suitable amounts. White adipose tissue secretes a novel protein hormone, asprosin, which was discovered in 2016. It induces the release of hepatic glucose and is elevated in insulin resistance, obesity, and diabetes mellitus pathologically. Spexin is a new peptide that may have a role in the diagnosis of insulin resistance, diabetes or weight gain. An asprosin and spexin level in the sera of individuals with diverse thyroid disorders was the focus of this investigation (hyperthyroidism, hypothyroidism and thyroid cancer). The findings of cytokine studies have also been correlated with abnormal clinic markers in various disorders. In Al Anbar Governorate, researchers used a case-control study design to examine 140 Iraqi people. 110 individuals with thyroid illness (40 hypothyroidism, 40 hyperthyroidism, and 30 thyroid cancer patients) were compared to 30 healthy persons, ages 25-60 years old, as a control group. Collection was placed between November 2021 and May 2022 at the Anbar Governorate's Al Qimma Specialized Laboratory for Advanced Pathological Analyses.

Keywords: Asprosin hormone, Spexin hormone, Hyperthyroidism, Hypothyroidism, Thyroid cancer



**THE INVESTIGATION OF OVEN AND VACUUM OVEN DRYING KINETICS AND
MATHEMATICAL MODELLING OF GOLDEN BERRIES**

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ABSTRACT

Golden berry (*Physalis peruviana*), is a fruit that is natively cultivated in the Andean region. Due to its significant nutritional and functional properties, golden berry has been gradually attracting worldwide attention. It's characterized by a high content of vitamins, minerals, carotenoids and polyphenols. Due to its significant antioxidant properties, it's widely used for the treatment of various diseases and nutritional support. Nevertheless, golden berry is a rapidly perishable fruit, a property of which hinders its desired commercialization. The requirement for extensive preservation highlights drying: one of the most widely preferred preservation techniques. Although there are numerous studies regarding the antioxidant properties of golden berries, investigation on their drying characteristics is still scarce. Hence, in this study, oven and vacuum oven drying of golden berries were performed at 60, 70 and 80°C. Throughout the experiments, the drying kinetic parameters of effective moisture diffusivity (D_{eff}) and activation energy (E_a) were investigated. Moreover, mathematical modelling of the drying data was established with the most known modelling equations presented in literature. The experimental studies revealed that the drying times decreased with increasing drying temperature and with vacuum addition. The highest and lowest drying times were encountered as 480 minutes in oven drying at 60°C, and 195 min in vacuum oven drying at 80°C, respectively. D_{eff} values were calculated between 1.95×10^{-10} - 3.80×10^{-10} m²/s and 2.20×10^{-10} - 5.45×10^{-10} m²/s for oven and vacuum oven drying, respectively. E_a values, on the other hand, were found as 32.81 kJ/mol for oven drying and 44.30 kJ/mol for vacuum oven drying. Fourteen mathematical models were applied to the drying curve data and most of them were seen to yield satisfactory results. However, Midilli & Kucuk model was seen to provide the best fit for both oven and vacuum oven drying, with R^2 values between 0.999799-0.999957 and 0.999648-0.999998, respectively

Keywords: Drying Kinetics, Golden Berry, Mathematical Modelling, Oven Drying, Vacuum Oven Drying



COLLOCATION METHOD FOR NONLINEAR VIBRATION OF BEAM

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ABSTRACT

The collocation method is the method for the numerical solution of integral equations and partial and ordinary differential equations. The main idea of this method is to choose a number of points in the domain and a finite-dimensional space of candidate solutions. So, that solution satisfies the governing equation at the collocation points. An overview of the formulation, analysis and implementation of orthogonal spline collocation is provided for numerical solution of differential equations in two space variables by Bialecki and Fairweather [1]. The sextic B-spline function for numerical solution of a system of second-order boundary value problems is presented by Rashidinia et al. [2]. On the other hand, the quartic B-spline collocation method is applied for numerical solution of Burgers' equation by Saka and Dağ [3]. Quintic nonpolynomial B-spline collocation for a fourth-order boundary value problem is investigated by Ramadan et al. [4]. The results are shown that the quintic nonpolynomial B-spline collocation method presents better approximations. On the other hand, the presented method generalized all existing polynomial B-spline methods up to fourth-order. The current paper involves developing, and a comprehensive, step-by step procedure for applying the collocation method to the numerical solution of nonlinear vibration of beam. The simplicity of this approximation method makes it an ideal candidate for computer implementation. Finally, the numerical examples are introduced to show efficiency and applicability of quintic B-spline collocation method. Numerical results are demonstrated that quintic B-spline collocation method is very competitive for numerical solution of frequency analysis of beam.

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Keywords: Collocation Method, Quintic B-spline, Nonlinear vibration, Beam



**INVESTIGATION OF THE EFFECT OF THE FLY ASH USAGE ON THE
COMPRESSIVE STRENGTH OF CONCRETE**

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ABSTRACT

Fly ash can turn into a valuable and useful product when used correctly and as a component material of concrete. Fly ash provides significant benefits to concrete when used in concrete structures due to its pozzolanic properties. The aim of this study is to examine the effect of the chemical composition of fly ash on the compressive strength of concrete. The results obtained from the compressive strength tests of 12 concrete samples using partial cement replacement with fly ash were used as data to construct multiple linear regression models. These models were compared with a reference model consisting of 6 samples of pure concrete to estimate the compressive strength of concrete as a function of the apparent composition of fly ash. Both statistical and experimental methods were used for verification. In this study, concrete samples were formed using the same proportions of cement, sand and water. Concrete samples containing fly ash were created by adding fly ash at different rates 30 kg, 60 kg to 1 of concrete, but for the test samples we made 0.69 kg; 1.38 kg it was 0.023 of concrete.

Keywords: Fly ash, Concrete, Compressive strength



USING TRANSDERMAL PATCHES ON CONTROLLED DRUG RELEASE

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ABSTRACT

The aim of the given study is the formation as well as the development of patches of Donepezil HCl, which is used in the treatment of Alzheimer's disease (AD). AD is a progressive brain disease and the leading cause of dementia in the elderly. Conventional treatments for the management of AD have all been given orally, thus Donepezil is commonly used as an oral tablet, although a transdermal patch may offer advantages as an alternate therapy. Donepezil's chemical features, such as its low molecular weight (less than 500 Daltons) and amphiphilic structure, allow it to readily pass through the skin, enter the circulation, and penetrate the bloodbrain barrier being suited for transdermal patch application. Donepezil medication has been found in studies to be useful in enhancing therapeutic efficacy and lowering behavioral alterations such as functional issues, depression, anxiety, and lack of emotion. Transdermal medication administration for Alzheimer's disease has been shown to enhance patient compliance through reduced dosage frequency, improve bioavailability, reduce undesirable side effects, and make it easier to attain optimal levels. Furthermore, it promotes patient compliance in older patients since the patient does not have to remember to take their prescription or bring tablets for further administration later in the day. The transdermal approach provides various advantages over the oral route, including the ability to maintain sustained therapeutic plasma concentrations, providing an alternate mode of administration for individuals who have swallowing difficulties, and reducing systemic adverse effects.

This study aims to contribute to the treatment of individuals with Alzheimer's disease with an easy-to-use and more effective system. In PVP (polyvinylpyrrolidone) and HEC (hydroxyethyl cellulose) polymer-based films, it has been desired to provide flexibility by using PEG 400 (polyethylene glycol 400), propylene glycol, glycerol and coconut oil plasticizer additives, and to facilitate drug release by increasing permeability. In this study, the effectiveness of the patches prepared using different plasticizer materials was investigated. Also the release efficiency, bond structure, particle size and stability of patches were characterized by using UV/Vis (Ultraviolet/Visible) spectroscopy, SEM (Scanning Electron Microscope), FT-IR (Fourier Transform Infrared Spectroscopy) and Zetasizer. Release profiles were determined using the zero order, first order, Higuchi and Korsmeyer-Peppas kinetic models. In addition, the release kinetic values were found for the Korsmeyer-Peppas model, which was chosen as the most suitable model among the models. The characterization results confirmed that the films had a homogeneous structure. It has been observed that all additives, except for plant-based coconut oil, do not affect the stability negatively and the release rate increases as the amount of plasticizer increases. The film, in which 12% propylene glycol was used by weight, gave a better result than other films with 70.3% release rate.

Keywords: Transdermal patch, Plasticizer, Donepezil HCl, Kinetic model, Stability.



INVESTIGATION OF PHYTOCHEMICAL AND BIOACTIVITY OF WATER-BASED TURKISH PROPOLIS

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ABSTRACT

Propolis is the general name of the resin material collected by honey bees from various natural plant sources. Propolis is a sticky gum with a resin structure that varies in color from dark brown to green and yellow related to the origins and age of the bee [1]. People's widespread use and preference of propolis in folk medicine have a long history, and these are antioxidant, hepatoprotective, antimicrobial, antiprotozoal, antitumor, antibacterial, antifungal, antiviral, anti-inflammatory, and anticancer [2]. This study aimed to evaluate the antioxidant, antibacterial, anti-enzymatic, and DNA protective activities of propolis aqueous extracts stored (+4, -80, -196) and pulverized propolis (PP) extracts in different cold environments [3]. They were analyzed by HPLC MS/MS and NMR to evaluate their total phenolic (TPC) and flavonoid (TFC) content. The extraction rate of PP-196 was the highest (38.86%), and the extraction rate of PP+4 was the lowest (34.95%). The maximum TPC, TFC, total antioxidants, reducing power and superoxide anion scavenging activity measured by PP-80 were 13.99 ± 0.03 mg GAE/g, 3.38 ± 0.01 mg GAE/g, 174.31 ± 1.60 μ g/mL, 153.6 ± 0.06 μ g/mL and 25.83 ± 0.55 μ g/mL, respectively. The inhibitory activities of extracts against acetylcholinesterase, butyrylcholinesterase, alpha-glucosidase, lipase, and tyrosinase were found to be more effective than standard drugs. PP-196 exhibits potential antibacterial activity against gram-positive and gram-negative bacteria. The tested extracts found significant DNA protection capacities. Analysis of photochemical components by HPLC-MS/MS was performed that the extracts mainly contained rutin, morin, tamarind, kaempferol and chrysin, shikimic acid, caffeic acid, *p*-coumaric acid, and *o*-coumaric acid. ¹H-NMR analysis of the phenolic region showed high signal intensities for galangin, chrysin, ramnocitrin, genkwanin, tectochrysin, and 3-methoxycampherol obtained from PP+4 and PP-80 extracts. The results proved that propolis cold pulverized (PP-80 and PP-196) and extracted in water could be a powerful natural dietary supplement, non-toxic, and effective for human health.

Acknowledgments: This work has been supported by Ondokuz Mayıs University (BAP) under Project No: PYO.FEN.1901.20.001

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Keywords: Water-Based Turkish Propolis, Phenolics, Flavonoids, Bioactivity



**CLASSIFICATION OF NETWORK ATTACKS WITH LSTM ARCHITECTURE
METHOD**

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ABSTRACT

Detection of unknown attacks in network traffic is an extremely important issue due to the increasing dependency of systems on the internet today. Until recently, traditional machine learning models were generally preferred for network security detection. Nowadays, it is not being preferred as much as before. Even though machine learning models can acquire a wide variety of features, they require the manual design of network traffic, obtaining a low-rate accuracy. On the other hand, an attack detection system is a very critical situation for protecting information from malicious treatment. Attack detection systems are a system mechanism that can classify data as normal or attacked. The LSTM model is proposed for systems that can operate with higher accuracy as an alternative to classical machine learning models. The proposed LSTM model can automatically learn the basic features of the hierarchy and does not require manual design principles. This model has been tested with the publicly available NSL-KDD dataset acquiring 80% accuracy. Experimental results show that the model can be used as an alternative to other methods.

Keywords: Network Attacks, LSTM architecture, NSL-KDD data set, Network Attack classification



**SEPARATION OF RHODIUM FROM SIMULATED RHODIUM PLATING
SOLUTIONS WITH IMIDAZOLIUM DERIVATIVE IONIC LIQUIDS**

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ABSTRACT

Separation of rhodium Rh(III) ions from an acidic solution containing HCl by solvent extraction method was optimized by using 1-octyl-3-methyl imidazolium bromide (MOIMBr) and 1-decyl-3-methyl imidazolium bromide (MDIMBr) salts as extractants. In addition, parameters such as HCl concentration, ionic liquid concentration, extraction time and phase ratio, which affect the recovery of Rh(III), were optimized experimentally. At the end of the experimental process, the parameters of the extraction steps of Rh(III) were tested under optimum conditions and the selectivity of the process was tested in the presence of metal ions (Pt, Au, Cu, Ni, Fe) that can be found together with rhodium in the ore or industry, and the selectivity was found to be quite high.

Keywords: Rhodium, Metal ions, Ionic liquid, Extraction method, Imidazolium bromide



**INTERLEUKIN-6 AND SOME BIOCHEMICAL PARAMETERS IN CORONARY
ARTERY DISEASE IN BAGHDAD CITY**

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ABSTRACT

Interleukins (IL) are a type of cytokine first thought to be expressed by leukocytes alone but have later been found to be produced by many other body cells, they play essential roles in the activation and differentiation of immune cells, as well as proliferation, maturation, migration, and adhesion. The primary function of interleukins is, therefore, to modulate growth, differentiation, and activation during inflammatory and immune responses. Interleukins consist of a large group of proteins that can elicit many reactions in cells and tissues by binding to high-affinity receptors on cell surfaces. The current study aims to investigate the relationship of the Interleukin-6 level with coronary artery disease, a trial evaluating the relevance of inflammation as a new modifiable cardiovascular a risk factor. Where it can be said that coronary artery patients suffer from increasing levels of Interleukin6 and an increase in oxidative stress (ROS) and a decrease in the levels of antioxidants which leads to the enhancement of coronary artery disease. The patients in the current study will be randomly taken from coronary artery patients who come to the Iraqi ministry of health hospitals in Baghdad, there are two main groups; group A refers to collected 80 patients with patients artery compare with B group; while group B refers to 60 people healthy as control group

Keywords: Interleukin-6, Coronary artery disease, Antioxidants, ROS



**ESTIMATION OF HEXANOYL LYSIN, LACTOFERRINE AND SOME
DIAGNOSTIC MARKERS IN RENAL FAILURE**

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ABSTRACT

Moderate quantities of endogenous reactive oxygen species (ROS) are demanded for many cellular processes, while large levels are harmful and are linked to a variety of illnesses. Recent studies have related to published evidences indicate that reactive oxygen species (ROS) can induce lipid peroxidation, which plays important role in the pathophysiology of numerous diseases including atherosclerosis, diabetes, cancer, and kidney disease. Checking for oxidative modification or oxidative damage in biomolecules could be crucial to understanding and treating age-related illnesses. Hexanoyl-lysine (HEL) is a new lipid peroxidation biomarker produced from omega-6 unsaturated fatty acid oxidation. Lactoferrin (LF) also plays a role in antioxidant defense and other defensive systems, helping to protect kidneys from various damage. Current study includes 60 patients with renal failure from both gender (female and male), with age ranging from (15 - 25) years. The samples were select from patients who visit renal failure hospitals / Baghdad-Iraq. The control group consisted of 30 volunteers. The samples are evaluate in terms of Lactoferrin, Hexanoyl-lysine adduct HEL using enzyme linked immune sorbent assay kits (Elisa) and some biomarkers of renal failure using spectrophotometric methods. As result, present work can imply that the biochemical assessments revealed significant elevation (p -value =0.0001for HEL and LF) in patients renal failure.

Keywords: Keywords: Hexanoyl-lysine, Lactoferrin, Iron, Lipid profile, Glucose, Kidney functions.



**MODIFIED MONITORING ENERGY SYSTEM FOR TELECOMMUNICATION
POWER BASE STATION BASED ON PHOTOVOLTAIC ENERGY**

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ABSTRACT

Renewable energy and energy efficiencies are the primary foundations of sustainability and environmental compatibility. This paper provides a monitoring system for an overview of environmentally friendly and energy-efficient cellular base stations (BSs), which use the most energy in cellular networks. Reduced network operating costs and continued profitability are crucial concerns for cellular network operators. Monitoring cellular base stations in off-grid locations is the topic of this research. Because of this, this study creates and puts into use a modern system for monitoring solar systems, which will make use of GSM technologies to transport data spanning great distances for the least expensive possible cost. To monitor PV systems that are situated in remote locations, this research article displays a resilient, authoritative, and secure control strategy that makes use of sensor networks and IoT technologies. Defining and archiving defects, collecting generation, and performing data for the study are made easier with this technology. In this paper, by using the PZEM-00T multimeter and Arduino UNO, the voltage and current coming out of the solar inverter are monitored, and data is transmitted through the GSM network using the SIM900 module to the ThingSpeak Cloud so that the data is monitored from long distances.

Keywords: PV, monitoring system, PZEM-004T multimeter, SIM900 module, ThingSpeak Cloud, Arduino UNO



IN VIVO ANTIDIABETIC AND ANTIOXIDANT ACTIVITY OF TURKISH WATER-BASED PROPOLIS EXTRACT

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ABSTRACT

Diabetes is an ancient disease caused by insulin and/or relative deficiency. It is also one of the leading obesity-related diseases of our time, rapidly increasing in global dominance over the following decades [1]. Diabetic patients increasingly seek elective treatments with anti-hyperglycaemic properties for blood sugar control [2]. Propolis is a healthy drink to prevent chronic diseases such as heart disease, and numerous studies indicate that propolis has also been used as an anti-diabetic[3-4]. For preparing water-based Turkish propolis (WBTP), pulverized propolis (PP) at -80 °C and pulverized propolis (PP-196) at -196 °C were extracted with pure water and then lyophilized at -50 °C. This research was performed on the antihyperglycemic effect of PP-80 and PP-196 extracts on a high-fat diet and streptozotocin-induced type 2 diabetes in rats and administered orally daily for 35 days. Body weight and blood glucose levels were followed by completing blood count, HbA1C, *in vivo* serum biochemistry, and tissue antioxidant enzymes [5]. The diabetic group treated with the WBTP extracts showed significant improvement in body weight, lower blood sugar levels, and decreased HbA1c in the diabetic group. In contrast, white blood cell counts and their types increased slightly. In Diabetic Mellitus (DM) rats treated with WBTP extracts, reductions in hemoglobin, red blood cells, and their types were observed significantly, while hematological parameters increased and reached near-typical values ($P > 0.05$). At the same time, the serum levels of TC, TG, and LDL in the diabetes treatment group were lower than those in the DM group, and the HDL level was higher than that in the DM group. Serum biomarkers (urea and creatinine), enzymatic activities (AST, ALT, and ALP), and antioxidant enzymes increased in diabetic rats compared with the control group. This consideration suggests that PP-80 extract is a new supplement for people with diabetes.

Acknowledgments: This work has been supported by Ondokuz Mayıs University (BAP) under Project No: PYO.FEN.1901.20.001

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Keywords: Water-based Turkish propolis, Type 2 diabetes, Antidiabetic, In vivo antioxidant.



**CARDIAC ARREST INDUCED BY ANTI-HYPERTENSIVE AND NSAIDS DRUG
ABUSE USES DUE TO THEIR ROLE EFFECT ON ELECTROLYTES AND
ALDOSTERONE LEVELS IN HYPERTENSIVE PATIENTS WITH RENAL
INSUFFICIENCY**

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ABSTRACT

The present study aims to investigate the role of the drugs like angiotensin converting enzyme inhibitors (ACE), non-steroidal anti-inflammatory drugs NSAIDs and their effects in the contributions of electrolyte fluctuation levels, as well as in an abuse uses. Forty four cardiac arrest subjects cases of hypertensive with renal failure (renal insufficiency) were taken, and forty participants as a healthy control without any heart and kidney problems with same of mean age (58+5). Done in Hilla city/Iraq were enrolled in this study. Results that collected from the present study were a significant in reduction of serum aldosterone levels, with very clear raises in plasma potassium and urinary sodium levels due to the action of hypertension drugs. Also results shown a significant decreases in the urinary potassium, otherwise plasma sodium levels within the normal elevated malady in patients, when compared with healthy control. There were significance results with moderately increases levels of the patient serums urea and creatinine, as when correlated with healthy control investigations. The current study found that BMI does not differ in patient groups (with cardiac arrest) when compared with the normal healthy control group and each were within the BMI range for normal weight of a person both in males and females. It was concluded that uses of antihypertensive drugs and NSAIDs lead to lowering aldosterone levels that relates hypertension treatments and inflammatory diseases.

Keywords: ACEI, Aldosterone, NSAIDs, Potassium, Sodium



**THE RELATIONSHIP OF COGNITIVE CONTROL LEVELS, DEMOGRAPHIC
CHARACTERISTICS, DEPRESSION LEVELS AND PHYSICAL ACTIVITY
LEVELS IN HEALTHY ADULTS**

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ABSTRACT

Cognitive control and cognitive flexibility are defined as the ability to adapt to constantly changing situations and environments, with various goal-oriented behaviors such as creativity, reasoning, decision making, and problem solving (1, 2). The aim of this study is to examine the relationship of cognitive control levels with demographic characteristics, depression levels and physical activity levels in healthy adults. Forty-eight healthy adults were included in the study via the online platform. After the demographic information of the participants was obtained, the Cognitive Control and Flexibility Questionnaire (CCFQ) (3), Beck Depression Inventory (BDI) (4) and International Physical Activity Questionnaire (IPAQ) (5) were administered to the participants. Pearson Correlation Analysis was used to determine the relationship between the cognitive control level of the participants and other variables. First of all, the demographic characteristics of participants (28 Female, 20 Male) in the 18-65 age range included in the study were determined (42.6 ± 10.1 years and 25.2 ± 4.2 kg/m²). According to the correlation analysis data, there was a moderate negative correlation between the cognitive control level of the participants and the time spent in sitting activities ($r = -.415$, $p = .003$). However, there was no relationship between the demographic characteristics and depression levels of the participants and their cognitive control levels ($p > 0.05$). According to the results of the study, it was seen that the cognitive control levels of the patients were only associated with prolonged sitting activity. In the light of this information, it was thought that individuals who do sitting activities more than necessary during the day have a decrease in their ability to control their negative emotions and thoughts that may occur in stressful conditions.

Keywords: Age, Cognitive control, Depression, Physical activity



**INVESTIGATION OF STRUCTURAL, MORPHOLOGICAL AND ELECTRICAL
PROPERTIES OF SnO₂ THIN FILM GROWN BY SILAR METHOD**

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ABSTRACT

Due to its wide band gap value and large applications, tin dioxide (SnO₂) is useful multifunctional material. In this study, SnO₂ thin film was grown by the Successive Ionic Layer Adsorption and Reaction (SILAR) method for 40 cycles on the silver interdigital contact. Structural and morphological properties, SEM and UV analysis were investigated. For electrical characterization, I-V and resistivity measurements were also taken. Electrical measurements were taken depending on temperature. The results showed that SnO₂ thin film exhibits promising electrical applications for future work

Keywords: SnO₂, SILAR, Electrical Characterization



**THE RELATIONSHIP OF IL 17A, VIT-D LEVELS AND SOME BIOCHEMICAL
MARKERS WITH PSORIASIS AND THE EFFECT OF ORAL VITAMIN D
SUPPLEMENTATION ON CLINICAL AMELIORATION OF THE DISEASE**

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ABSTRACT

The aim of the study was to measure vitamin D levels before and after giving specific doses of it. Patients with psoriasis have an imbalance in vitamin D levels, as vitamin D levels have been correlated with the level of disease progression. The rates of developing psoriasis after giving vitamin D at a dose of the first month every day 2000 IU, then second and third month every week 10000 IU period 3 month indicated that the size of the affected area did not expand or stopped expanding. Also in our study, the levels of interleukin-17 and lipid profile showed some changes, which indicates that high levels of vitamin D may reduce inflammation or inflammatory diseases by contributing to the activation of the immune system. Affected by lipid levels. The reason for the effect is likely to be changes in vitamin D levels, which plays an important role in lipid metabolism. There was also an increase in calcium levels.

Keywords: 1- Psoriasis, Total cholestrol, Vit-D, RBS, IL17, C-RP



**INVESTIGATION OF THE RELATIONSHIP BETWEEN AMH, IL18 AND IL-6
WITH OBESITY AND POLYCYSTIC OVARY SYNDROME IN IRAQI WOMEN
INFERTILITY**

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ABSTRACT

In women of reproductive age, polycystic ovarian syndrome (PCOs) is a hormonal disorder that affects a considerable percentage of the population. Women who suffer from PCOs may have irregular or prolonged menstrual periods, as well as high levels of the male hormone testosterone (androgen) [1,2]. Several studies have shown that PCOs is associated with a pro-inflammatory state, and persistent low-grade inflammation is thought to be a significant factor to the pathogenesis of PCOs [3]. This study aims to study the study of AMH hormone and some immunological tests such as IL18 and IL-6 with obesity and its relationship to the occurrence of PCOS and infertility in Iraqi women and study the relationship between them. The study included 130 participants, and it was divided into three groups: group A and group B, which represent patients, and group C, which represent controls. The study indicated the importance of age for women with polycystic ovary disease. In the same study, weight had a strong direct effect on the development of the disease in women. AMH levels were not significantly affected, and it may be because women are taking too much treatment. Immunological markers had an effective role, as the levels of ILn-6 were significantly affected when the results were compared with the control group. When Pearson's test was performed, there was a correlation between the hormone anti-morin, weight, calcium, white blood cells, and blood platelets.

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Keywords: AMH, IL6, IL18, PCOs, Infertility



**A STUDY ON ELECTROSTATIC SENSOR FRONT-END FOR PARTICLE
MEASUREMENT AT THE FEMTOAMPERE LEVEL**

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ABSTRACT

Over nearly fifty years, electrostatic sensors (ES) have been employed for pneumatic-flow measuring particulate emissions, measuring fluidized beds and flame detection, online particle size, speed and radial vibration measurement of mechanical systems, and condition detection of power transmission belts, mechanical wear, especially for aero-motors, and some human activities. ES is constructed in main parts: the sensor electrode (The Flow Noise Antenna) and the signal condition circuit (SC). The electrode is a conductive metal that can detect the electrostatic flow noise from a moving charged particle. The charge induced to the electrode should be collected and amplified to an acceptable level using a suitable signal condition circuit. SC is related to a random and ultra-low level of electric charge fluctuations. Owing to the very high level of amplification, the sensor is very susceptible to sensing the noise which stems from external electromagnetic sources. The geometric structures of the probe considerably influence the output signal amplitude and its frequency [1-3]. In this study, SCs, developed at the level of femtoamperes (10⁻¹⁵), employed in the aforementioned fields have been investigated, simulated, and designed with some circuits suitable for relatively high frequency and noisy environments realized. Approximately ten topologies which consist of active and passive feedback, charge and instrumentation amplifiers, and its hybrid circuits have been evaluated in terms of noise, dynamic performance, and dc analysis using real components and realized active guarding techniques [4-7]. First, for low-noise circuit design, it is necessary to prevent noise and keep the signal-to-noise ratio at the highest level if noise cannot be avoided. The triaxial cable and connector from active guard have been used to protect noise. Especially particle measurement applications in turbine engines have importance due to the necessity of using a wider frequency band due to high speed.

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Keywords: Electrostatic sensor, Electrostatic monitoring technology, Particulate signal conditioning, Low noise amplifier, Charge amplifier



**EVALUATION OF ENZYMATIC ANTIOXIDANTS IN LEUKEMIA PATIENTS IN
AL-ANBAR GOVERNORATE**

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ABSTRACT

Background: Leukemia patients have excessively high WBC counts in their bone marrow and blood. Symptoms of aberrant cells caused by bone marrow loss (i.e.: anaemia, neutropenia and thrombocytopenia). Infiltration (b) (e.g. liver, spleen, lymph nodes, brain, skin or testes). Aerobic organisms have a well-known antioxidant defence system. Oxidative stress causes several biochemical changes and is linked to many chronic diseases such as atherosclerosis, cardiovascular disease, mutagenesis, and cancer. In mammalian cells. Recently, free radicals, particularly oxygen radicals, have been linked to the multistep carcinogenesis process. Several antioxidants have been found to prevent neoplastic.

Aim of thesis: In this project will be to investigate the activity of antioxidant enzymes including: superoxide dismutase (SOD), and catalase (CAT) in leukemic patients, in Iraqi patients.

Material and methods: Our research participants through the utilization of study participants at the National Center for Hematology, Ramadi- Teaching Hospital. Patients between the ages of 13 and 72 with acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML) were enrolled in the study: there are three main divisions

Group A (GA): acute Lymphoblastic Leukemia (ALL) 50

Group B (GB): acute myeloid leukemia (AML) 50

Group C (GC): healthy control groups 50 (Controls group)

The control group consisted of thirty-four adults ranging in age from 19 to 59, all of whom looked to be volunteers. They were divided into two groups: the experimental group and the control group. No one had any clinical or laboratory evidence that could have an impact on the parameters that were going to be evaluated.

Results: The study included the determination of the antioxidants levels and relationship between enzymatic correlations with leukemia patients. Patients had higher SOD activity than healthy controls (p 0.001) for ALL and AML. The total serum catalase activity of AML and ALL patients was considerably lower than that of healthy controls (P<0.01). The AML and ALL mean levels have grown considerably (p<0.001) for both ALL and AML had high amounts of ceruloplasmin.

Conclusions: Serum SOD activity rises significantly in both types of acute leukemia. Oxidative stress may be a contributing factor. On the other hand, differences between AML and ALL may be related to the severity of the disease. Probably around 65 years of age.

Keywords: Acute leukemia, Superoxide dismutase (SOD), Antioxidant



**OPTIMIZATION APPROACH TO THE DESIGN OF DUAL BAND SLOTTED
CIRCULAR MICROSTRIP ANTENNA**

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ABSTRACT

In this paper, a circular microstrip antenna with circular slots has been designed via optimization approach. Aim of the optimization is to design an antenna operating on dual WLAN bands with desired gains. Circular slots have been added to antenna patch in order to obtain desired resonance frequencies and gain. Optimization tool of ANSYS High Frequency Structural Simulator (HFSS) has been used for design process. Genetic Algorithm has been chosen as optimizer in HFSS optimization tool. HFSS optimization and simulation results have been given.

Keywords: Circular Microstrip Antenna, Dual Band Antenna, Optimization, Slotted Antenna, WLAN



**EVALUATION OF THE RELATIONSHIP BETWEEN INFILTRATION RATE AND
SOME SOIL PROPERTIES IN DIFFERENT LAND USE**

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ABSTRACT

Soil infiltration rate (IR) is an important parameter and a good indicator of soil quality and fertility. The most influential factors for all conditions where the best performance in infiltration surveys are achieved are soil properties and land use type. Therefore, a detailed understanding of infiltration is required for different land use complexes. In this study, the effect of soil properties under different land uses on infiltration was investigated. Soil samples were taken from 30 points determined by GPS from 3 different regions (grassland, fallow and orchard) within the border of the Çubuk district of Ankara province in Türkiye. IR (with Minidisc infiltrometer) and bulk density were measured in undisturbed soil samples and hydraulic conductivity and sorptivity values were obtained from infiltration measurements. Basic parametric soil analyses and morphological descriptions were made in disturbed soil samples. In order to digitize the morphological properties, the coding system was created with the help of soil identification cards. The highest IR values were recorded from orchard and the lowest were recorded from grassland samples. Correlation analysis, one-way ANOVA and factor analyses were used to evaluate the relationships between soil variables and IR. IR showed the highest correlation with sorptivity (0.72), sand (0.69), and hydraulic conductivity (0.86) in grassland, fallow and orchard, respectively. IR in different land uses were loaded on the same factors with different soil variables. Due to different land management practices, such additional measurements need to be made for accurately assess the potential impact of land use and management changes on agricultural activities.

Keywords: Infiltration rate, Land conditions, Morphology, Factor analysis



**BODY COMPOSITION ANALYSIS, BLOOD PRESSURE, VIT D3, FERRITIN,
IRON, TSH AND CBC IN SERA OF PATIENTS WITH HAIR LOSS**

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ABSTRACT

This study was carried out to investigate some biochemical aspects in Iraq patients with hair loss compared to non-hair loss individuals. Recent studies on hair loss are one of the pathological and therapeutic challenges in the world. In the past 10 years, the chemical parameters of vitamin D3, ferritin and blood viscosity in hair loss have played a large role in new research, including in dermatology and especially hair loss. Vitamin D3, serum ferritin, TSH, and blood viscosity in hair loss. A prospective case study includes 50 male patients with hair loss and 50 male person with non-hair loss individuals causes. aged from 20-40 years old in Iraq / Baghdad. The results showed that the levels of hair loss patients significantly decreased when compared with non-hair loss individuals ($P < 0.05$). in each of the following parameters. Vitamin D3, serum ferritin, and basal metabolic rate. The blood pressure of the hair loss patients also decreased according to the chi-square test, while the levels below increased significantly when compared with those of the non-hair loss individuals ($p < 0.05$). body fat mass and the HCT level in plasma. While HB level in plasma, TSH and serum iron level non significant change occurred when compared with non-hair loss individuals ($P < 0.05$).

Keywords: Hair loss, Vit D3 with hair loss, Iron defetionsy, Diffused hair loss.



**A PHOTOVOLTAIC MPPT ALGORITHM BASED ON ASYMMETRIC FUZZY
LOGIC CONTROLLER**

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ABSTRACT

Uses Maximum Power Point Tracking (MPPT) Tracking Algorithm to discover and maintain the best operating point. Many other MPPT algorithms have been devised and studied, but most have efficiency, accuracy, and adaptability issues. Conventional controllers can't provide the ideal response due to the non-linearity of the current-voltage characteristics of the PV module and DC-DC converters. This is especially true regarding large-scale parameter changes or line transients. This paper compares two ways to optimize photovoltaic (PV) energy extraction. The maximum power that a PV module can collect varies with load, temperature, and solar radiation. To enhance the efficacy of a photovoltaic (PV) system, a maximum power point tracker (MPPT) gathers the most electricity a solar panel can provide and sends it to the load. The MPPT system contains a controller and a DC-DC converter. This project aims to use fuzzy logic control to create a maximum tracking power point. This is the result of the endeavour. Fuzzy logic controllers are well suited to nonlinear situations. This technique employs artificial intelligence (AI) to better model nonlinear systems. Buck, Boost, and Buck-Boost converter properties are examined to determine the optimal design for the PV system. The fuzzy logic controller design may be improved by running MATLAB models of PV module, transformer, and battery. According to the simulation findings, the fuzzy logic controller can achieve the desired results. Therefore, it may be used. In this work, two MPPT methods based on controllers are compared. PV systems and the DC-DC architecture are identical in both MPPTs. Thus, they are all equally effective.

Keywords: PV, MPPT, Fuzzy logic, DC-DC, PI



**IMAGE CAPTIONING WITH ENGLISH AND TURKISH DATA SETS WITH DEEP
LEARNING**

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ABSTRACT

In recent years, the increase in image data has led to the need to make sense of images. Therefore, the work on image captioning is gain importance. Image captioning means generating a description of an image. In this study, Flickr 8k data set [1] was used as the data set to make image captioning. Long Short-Term Memory (LSTM) from Iterative Neural Network (RNN-Recurrent Neural Network) algorithms was used on this data set. First, the pictures were categorized using a Convolutional Neural Network (CNN). As a result of the experiments, it was observed that the highest success was in the VGG16 and Inception V3 architectures, and work was carried out on both of these architectures. The best results were obtained in the VGG16 architecture. The extracted images and the two caption descriptions found for each image were given to the LSTM algorithm and an English description was generated for a new image. In this application, the BLEU (Bilingual Evaluation Understudy) score was used as the Evaluation metric. The BLEU score is a measure of the difference between automatic translation and human translation. The BLEU-1score was found to be 0.51%. The “TasvirEt” data set [2] was also used to obtain the same data set with Turkish subtitles. This data set is a data set consisting of subtitles of the Flickr8k data set translated into Turkish. The extracted images and this Turkish subtitle were given to the LSTM algorithm with the TasvirEt data set. The BLEU-1 score of the study with Turkish subtitles was found to be 0.31%. While the BLEU score was among the acceptable values for the English data set, it remained at a low value for the Turkish data set.

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Keywords: Image Captioning, CNN, LSTM, Deep Learning



**DETERMINATION OF D-DIMER, IRON, CALCIUM, PROTHROMBIN TIME,
FERRITIN AND VITAMIN D3 IN PATIENTS WITH COVID-19 IN IRAQI PEOPLES**

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ABSTRACT

The primary purpose of this study is to determine the prevalence and effectiveness of covid19 through biochemical testing of ferritin, D3, and iron levels in the presence of risk factors such as age and gender and clinical-pathological testing. Comorbidities showed a slightly significant difference between severe and non-severe cases compared to diabetes. Still, they were highly influential in the case of asthma and non-significant in the case of smoking and heart disease. In extreme cases, hypertension has a slightly significant effect compared to other groups. The most prevalent signs and symptoms of sars-covid19 were fever and dry cough (55 percent and 78 percent, respectively). The relationship between SARS-CoV-19 infection and white blood cell count was highly significant, with the highest percentage of severe cases showing a reduction in white blood cell count. This was equally true for patients who were not in critical condition. Our findings revealed a highly significant association between CRP and Ferritin in severe instances and vitamin D deficiency with calcium in severe cases when compared to healthy subjects. However, there was no correlation between Iron in both groups.

Keywords: COVID-19, D-Dimer, Vitamin D3, Prothrombin time, Blood clotting.



**PREVALENCE OF DIARRHEA DUE TO CLOSTRIDIUM DIFFICILE A-B TOXINS
IN A UNIVERSITY HOSPITAL IN NORTHERN CYPRUS**

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ABSTRACT

The high increase in diarrhea cases draws the attention of microbiologists to take the necessary precautions against the epidemic that occurs in some regions. It has been found each year that the mortality and morbidity rate of this infection explains about 500,000 cases in the United States. This retrospective study focuses on the investigation of the rate of *C. difficile* in a university hospital. Clostridium difficile toxin A / B results of patients admitted to the North Cyprus Near East University hospital between 2015-2018 were retrospectively extracted from the hospital registry system. A total of 230 patient data were used in the study. Data variables used included demographic information, department, inpatient or outpatient treatment. No significant difference was found in the age category in terms of Clostridium difficile toxin A / B positivity ($p = 0.822$). The highest positive *C. difficile* toxin A / B ratio was found in 18.2% in the 20-44 age group, while it was 15.5% in the age group 45 and over. However, there was no statistically significant difference in the age group as the chi-square result gave p -value = 0.721. The distribution of this infection showed statistical significance between inpatients and outpatients with a p -value of 0.018. While 9.70% of positivity was detected in inpatients, it was 21.30% in outpatients. The high rate of *C. difficile* infection among outpatients is due to the unregulated guidelines in the use of antibiotics obtained from pharmaceutical stores. This study shows the inadequacy of rational use of antibiotics in practice, although the sale of antibiotics without prescription is prohibited in Northern Cyprus.

Keywords: Prevalence, Clostridium difficile, Northern Cyprus, A-B Toxins



**ESTIMATION OF SERUM PROCALCITONIN, FERRITIN, D-DIMER AND OTHER
PARAMETER IN PATIENT WITH COVID-19**

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ABSTRACT

The present study has intended to discover the role of procalcitonin as a biomarker for coronavirus infectious disease 2019 (COVID-19) infection, and to predict its activity in differentiating the severity of the COVID-19 disease by taking mild, severe, and critical conditions of the COVID-19 patients. Eighty patients with COVID-19 were included in the study, which were on different clinical grades of the disease (mild, severe, and critical). Additionally, the study was controlled with 55 healthy people. The results have shown significant increase in the procalcitonin level in COVID-19 patients compared to the control. Moreover, significant increase of procalcitonin level was observed from mild passing by moderate to the critical cases of COVID-19 patients. Also, ferritin, D. dimer, and creatinine levels were significantly higher in COVID-19 patients compared to control. Nevertheless, the level of urea was not changed significantly in COVID-19 patients compared to control. In conclusion, procalcitonin can be used as excellent biomarker in the prognosis of COVID-19 with good percentages of sensitivity and specificity.

Keywords: Procalcitonin (PCT), Ferritin, D-dimer, and Covid-19



**ESTIMATION OF CYSTATIN-C(CYS-C),GALECTIN-3(GAL-3), MYONECTIN
LEVELS AND NUMBER OF BIOCHEMICAL PARAMETERS IN ANGINA
PECTORIS PATIENTS**

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ABSTRACT

Recent studies have related Angina is chest pain due to transient myocardial ischaemia, which usually occurs with physical activity or emotional stress, and is relieved by rest or sublingual nitroglycerin. Angina is common, affecting 3.8% of people in New Zealand. About half of patients with ischaemic heart disease initially present with symptoms consistent with a pattern of stable angina. The results of this study included the first of patients with angina pectoris by performing the analysis of troponin and the second of the healthy, and it was divided into four tables, each table compared between the control group and patients, and the first table includes four groups: CYC_C, GAL_3, Myonectin, INS and The second table also includes four groups Cholesterol, Triglycerid, HDL, LDL, VLDL and the third table includes three groups GOT, GPT, ALP and the fourth and last table is between Age (year) and Weight (kg).

Keywords: Keywords: Laminin, Prolipin levels, Number of biochemical, Inengina Pectoris



**THE POTENTIAL USE OF SALIVARY CYTOKINES IN DIAGNOSIS OF
PERIODONTAL DISEASES**

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ABSTRACT

The aim of this review is to highlight the potential of saliva as a diagnostic tool for periodontal diseases. Periodontitis is a major public health problem due to its high prevalence and it significantly decreases the quality of life. It has been shown that a massive number of cytokines play a crucial part in the pathogenesis of periodontitis, which causes the destruction of soft tissue and the resorption of bone. The release of inflammatory mediators and cytokines into the periodontal tissues, caused by periodontal bacteria, leads to periodontal tissue breakdown. To avoid consequences that could have a negative impact on a patient's quality of life, early diagnosis of diseases is essential. Salivary biomarkers have the potential to detect periodontal disease and determine the disease stage. Salivary diagnostics provide a higher level of care and lessen the need for unnecessarily intrusive treatments by serving as an easily accessible and non-invasive primary test for diseases.

Keywords: Saliva, Diagnostics, Periodontal disease, Cytokines



**CORRELATION BETWEEN SOME OF THE RENAL FAILURE PARAMETERS
AND THE ABNORMALITIES OF IRON LEVELS IN THE BLOOD OF PATIENTS
WITH RENAL FAILURE**

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ABSTRACT

Renal failure (RF) is a medical condition in which the kidneys are failed to operate correctly. This study aimed to investigate the relationship between RF and anemia through measuring the levels of transferrin, hepcidin, ferritin, iron, and total iron binding capacity in RF patients. The study has included 100 patients with RF disease and controlled with 50 healthy people with matched ages compared to the patients. Urea and creatinine levels were extremely elevated in RF patients compared to control. The levels of ferritin and hepcidin were increased significantly in RF patients compared to the control. Transferrin level on the other hand was not changed significantly in RF patients compared to control. The levels of iron and total iron binding capacity were reduced significantly in RF patients compared to control. Moreover, hemoglobin level was reduced significantly in RF patients compared to control. In conclusion, RF can lead to the incidence of anemia in patients and should be monitored carefully to avoid the health consequences. Also, the high level of hepcidin indicated serious inflammatory events in RF patients.

Keywords: ;Urea, Creatinine, Renalfailure, Ferritin, Fe



**LUNG CANCER DETECTION USING MACHINE LEARNING AND DATA
ANALYSIS TECHNIQUES**

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ABSTRACT

Lung cancer is the leading cause of cancer-related death in the world [1]. Although the early stages of lung cancer are critical for saving patients' lives, patients in these phases appear asymptomatic, resulting in difficulty detecting this type of cancer [2]. While the number of lung cancer cases increases annually, the need to identify the disease in its initial stages and implement preventative measures becomes vital [2, 3]. The advancement of technology has brought forth efficient ways of detecting diseases such as cancer [4]. Gender, age, smoking, yellow fingers, anxiety, peer pressure, chronic disease, fatigue, allergy, wheezing, alcohol, coughing, shortness of breath, swallowing difficulty, and chest pain were used as the input data for diagnosing lung cancer [5]. The dataset is publicly available at Kaggle. In this study, SVM (Support Vector Machines), k-nn (Nearest Neighbors), Naive Bayes and Neural Network methods were used for the detection of lung cancer. A multi-layer perceptron (MLP) algorithm with backpropagation was used for the Neural Network model. The hyperbolic tan function (tanh) was adjusted as an activation function. The number of neurons in hidden layers was determined as 100. The solver for weight optimization was chosen as "adam" (stochastic gradient-based optimizer). The linear kernel was chosen for SVM model for the detection of lung cancer. Euclidean distance was chosen in k-nn method and the neighborhood value was determined as 7. As a result of the analysis for the detection of lung cancer, it was observed that the best results were obtained as a result of Neural Network and SVM methods. The experimental results show that Neural Network gives the best result with 94,2% accuracy for detecting the absence or presence of lung cancer. For the SVM model, the accuracy was obtained as 93,4%.



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Keywords: Machine Learning, Lung cancer, Neural Network, SVM (Support Vector Machines), k-nn (Nearest Neighbors), Naive Bayes.



**INVESTIGATION OF THE EFFECT OF THE SLAG USAGE ON THE
COMPRESSIVE STRENGTH OF CONCRETE**

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ABSTRACT

Alternative raw materials, including industrial by-products, are necessary for a sustainable cement industry. The use of natural resources and energy is reduced when clinker is replaced by industrial by-products. As a result, both cost-effective and environmentally friendly types of cement are created. Standard blended cement can be made from a variety of industrial by-products including fly ash, silica fume, and slag, which is one of the most widely used industrial by-products. Today, Portland cement is the most widely used material in the construction of many buildings. The objective of the study is to investigate the effects of blast furnace slag on the compressive strength of concrete. In this study the variabilities that can be encountered in the determination of the compressive strength. For this purpose, blast furnace slag (BFS) and natural pozzolan Portland cement are used. In this study, the compressive strength of samples prepared using 0%, 10% and 15% slag were determined according to the TS 12390-3 standard. Results were obtained for 3 days, 7 days and 28 days of curing conditions. The results showed, as expected, that the usage of slag at different percentages reached the maximum compressive strength in samples exposed to curing for 28 days. While the compressive strengths of the samples prepared using 0% and 10% slag in the three-day curing condition are almost the same, the compressive strengths of the samples prepared using 15% slag are 10% higher. In addition, a 15% increase in compressive strength was observed with the use of 15% slag in the samples that were cured for 7 days, while an increase in compressive strength of 26% was observed in the samples that were cured for 28 days.

Keywords: Slag, Compression Strength, Durability Properties



USING TOOTH-GRINDING PLATES WITH TOOTHPASTE

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ABSTRACT

Is the toothpaste making enough contact with our teeth? Undoubtedly, toothpaste is beneficial for our teeth and gums. How can we apply toothpaste to our teeth in addition to a toothbrush? The answer to this question is teeth grinding plaque. Using the grinding plate with toothpaste is a new, unknown practice. It is easy to apply for dentists, every dentist diploma holder can take the measure to prepare this squeezing plate. Every dental technician laboratory can prepare teeth grinding plaque, it is very practical, only need plaster model preparation and special device with heated vacuum. Toothpaste is very cheap compared to other special whitening agents and chemicals. An inexpensive treatment for the citizen would be a hygiene product. This use of the squeak plate is an idea that needs to be preserved. Cheap, easy and harmless from whitening plaques, even children can use it with children's toothpaste. It prevents caries, cleans, whitens, provides good hygiene. It will be more effective to apply after brushing teeth before going to sleep in the evening.

The aim of this project is to protect oral health and increase oral hygiene. Healthy teeth and gums are also necessary for maintaining the health of the whole body. It is a project that will increase the use of toothpaste and prevent mineral loss of teeth. Thanks to this project, dentists will introduce toothpaste types to people. They can recommend whitening toothpaste for those who want to whiten their teeth, and a desensitizing toothpaste for those with tooth sensitivity. They can learn about dental caries that affect the teeth without causing pain, with the help of a dentist. The level of development of countries is linked to the health of their people. Oral and dental health is also an indicator of progress and development. People at a young age should not lose their teeth due to caries. This project is open not only for our country but also for the whole world humanity. Its introduction will be beneficial to all humanity.

Keywords: Tooth-grinding plate, Tooth-paste



**RETROSPECTIVE ANALYSIS OF MEDICAL PATHOLOGY QUESTIONS ASKED
IN THE ENTRANCE EXAMINATION TO SPECIALTY EDUCATION IN
DENTISTRY**

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ABSTRACT

Those who graduated from or continue their education from Faculties of Dentistry, in case they want to receive specialization training, must take the Dentistry Specialization Education Entrance Exam (DUS). In DUS, questions arise from basic and clinical sciences. In the Basic Sciences test, candidates face medical pathology questions along with other basic sciences. Our study evaluated the total 52 pathology questions found in 13 dental specialty education entrance exams held from 2012-2021. While 31 (59.6%) questions related to general pathology were asked, 21 (40.4%) questions included oral pathology. As a result of the study, it was determined that the most frequently asked questions from oral pathology were diseases and tumors of the soft and bone tissue in the jaw (n: 13, 25%), while the general pathology was the acute and chronic inflammation (n:8, 15.3%).

In the distribution of subjects according to years, general pathology and oral pathology were found to be equally distributed. Some issues are common to both general and oral pathology. Oral pathology questions are given with clinical information. Some questions are also intertwined with other basic sciences. The fact that pathology is a bridge between basic and clinical sciences has made it difficult to clearly distinguish the questions. We think that the data obtained as a result of the study will be useful for candidates preparing for the specialty exam in dentistry.

Keywords: Dentistry, Pathology, Test, Examination, DUS



**THE INSECTICIDAL AND ACHE INHIBITORY ACTIVITIES OF DIPLLOTAXIS
TENUIFOLIA ESSENTIAL OILS AND THEIR DETERMINATION OF CHEMICAL
CONTENTS**

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ABSTRACT

In the scope of this study, Flowers and leaves of *Diplotaxis tenuifolia* plant collected from Çankırı province were separated from each other. Essential oils (EOs) were obtained from these parts separately by using the method of steam distillation with neo-clavenger apparatus. Firstly, we have investigated contact toxicity effects of EOs. Contact activity test of essential oils were conducted on *Sitophilus granarius* and *Rhyzopertha dominica* species. In contact activity studies with *S. granarius* and *R. dominica*, larvae of 3., 4. and 5. stages were used. Finally, the effects of essential oils, which are thought to be associated with insecticidal activities, on acetylcholine esterase enzyme were evaluated. The major constituent of the essential oils extracted leaf (DTL-EO) were identified as 1-Isothiocyanato-4-(methylthio) butane (% 27.21), Isophytol (%44.15) and Squalene (% 8.41) by comparison of mass spectra. The major constituent of the essential oils extracted flower (DTF-EO) were identified as 1-Isothiocyanato-4-(methylthio) butane (%84.03), 2-thianonane (% 4.81) and 2-pentadecanone, 6,10,14-trimethyl (% 2.08) by comparison of mass spectra. Experimental results showed that DTL and DTL oils activate the acetylcholine esterase enzyme by % 70-85. These results indicated that essential oil of *D. tenuifolia* have significant potential which merits to be studied further in possible applications as contact insecticide in the control of *S granarius* and *R. dominica*. The major constituent (91%) of the oil was identified as 5-methylthiopentanenitrile by comparison of its mass spectra.

Keywords: *Diplotaxis tenuifolia*, Essential Oil, Insecticidal activity, Enzyme activity, Chemical analysis



**THE INVESTIGATION OF THE INHIBITORY POTENTIALS OF SOME
POLYPHENOLS FOR ACETYLCHOLINESTERASE ACTIVITY**

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ABSTRACT

This investigation primarily focuses on the AChE enzyme. In many cholinergic pathways, acetylcholinesterase is used in the central and peripheral nervous systems to quickly hydrolyze the neurotransmitter acetylcholine to stop impulse transmission. Accumulation of acetylcholine, excessive stimulation of nicotinic and muscarinic receptors, and trouble with neurotransmission are all effects of enzyme inactivation. Acetylcholinesterase inhibitors are used as appropriate medications and toxins because they interact with the enzyme as their primary target. Therefore, investigating the potential of polyphenols to prevent AChE was the primary aim of this research. Molecular docking studies were performed and 3 compounds were tested to determine their inhibition potential against the cholinesterase (AChE) enzyme. Results from in vitro and in silico experiments suggested that the compounds could function as AChE inhibitors. "(2R,3S)-3,5,7-tris(benzyloxy)-2-(3,4-bis(benzyloxy)phenyl)" chromane compound showed adequate drug-like properties and potent inhibitory properties against the enzyme, with IC₅₀ values of 13.59 M, "(E)-3,5-bis(benzyloxy)-2-(3-(3,4,5-tris(benzyloxy)phenyl)allyl)phenol" compound exhibited inhibitory activity against the enzyme as well, with IC₅₀ values of 15.07 M and "(2R,3S)-5,7-bis(benzyloxy)-2-(3,4,5-tris(benzyloxy)phenyl)chroman-3-ol" compound with IC₅₀ values of 15.75 M, the substance exhibited inhibitory properties against the enzyme. Additionally, the Swissadem and pkCSM web servers scanned all compounds' predictive qualities for drug similarity using ADMET estimations, where the molecules' theoretically calculated properties and the absorption, distribution, metabolism, and elimination were all calculated. The three compounds mentioned above-demonstrated no-toxicity potential (AMES toxicity). The data metal complexes did not exhibit ADMET properties, which could cause serious adverse effects in humans.

Keywords: Acetylcholinesterase, Metal Complex, Molecular docking, ADMET, Alzheimer's disease



BIOCHEMICAL STUDIES IN PATIENTS WITH CHRONIC MYELOID LEUKEMIA

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ABSTRACT

The study was conducted on chronic myeloid leukemia (CML) patients to investigate hematological parameters including hemoglobin (Hb), packed cell volume (PCV), white blood cell (WBC) and platelet (PLT) counts. The study was involved the investigation of enzymes activities including alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), and lactate dehydrogenase (LDH), as well as the circulation level of hepcidin. For this aim, 110 patients with CML disease were collected and controlled with 40 healthy people. The results have shown significant reduction in the Hb and PCV percentage in CML patients with an increase in the WBC and PLT counts. Additionally, the activities of AST, ALP and LDH were increased significantly in CML patients compared to control, while the activity of ALT was not changed. The level of hepcidin was elevated significantly in the serum of CML patients compared to the serum of healthy control. Hepcidin, and LDH were shown excellent sensitivities in the diagnosis of CML disease. In conclusion, the elevated hepcidin level in CML patients can be assigned to anemia associated inflammation.

Keywords: Hepcidin, CML, LDH, WBC, Chronic myeloid leukemia, ALT, AST, ALP



NIObIUM DOPING EFFECT ON ZNO NANORODS

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ABSTRACT

Niobium metal doped ZnO nanorods were synthesized on a glass substrate by ultrasonic spray pyrolysis technique in two steps. The structural, morphological, and optical properties of the produced samples were investigated via x-ray diffractometer (XRD), a field emission scanning electron microscopy (FE-SEM) combined with energy dispersive x-ray spectroscopy (EDX), and an ultraviolet/visible spectrophotometer (UV/VIS). The XRD patterns were indexed in the hexagonal (wurtzite) unit cell for all the ZnO samples. Also, according to the XRD peaks it was understood that the crystals grow in the c-axis (002) direction. The morphological characteristics of the obtained thin films were analyzed by. From the SEM micrographs, it was observed that ZnO thin films doped with Nb had a nanorod structure in the c-axis direction. The presence of Nb ions in the samples was confirmed via EDX analysis. The optical transmittances of the samples were measured at a wavelength of 300-1000 nm. It was observed that the produced films had high optical transparency. The average optical transmittance value of the samples is 90 %.

Keywords: Zinc oxide, Nanorod structure, Doping process, Ultrasonic spray pyrolysis system



**FACTORS AFFECTING THE PHYSICAL ACTIVITY LEVEL AND STRESS
PERCEPTIONS OF UNIVERSITY STUDENTS DURING COVID-19 PANDEMIC**

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ABSTRACT

The COVID-19 pandemic was first identified from an outbreak in Wuhan, China, in December 2019 (1). A decrease in physical activity and an increase in psychological distress have been an observable fact in the COVID-19 pandemic (2). 18-25 years old university students are one of the groups that have become the focus of concerns with the sudden change in their active lifestyles (3). The aim of this study was to examine the factors affecting the physical activity level of university students during the COVID-19 pandemic and investigating the relationship between physical activity level and stress perceptions. Four hundred and forty-four college students has included in this study. Physical activity level (by IPAQ) and perceived stress level (by PSS) evaluated and barriers/motivators for physical activity were asked to participants during COVID-19 pandemic. Mean age of participants were 21±2.95 years, 81.3% were women and body mass index (BMI) of 21.93±3.5 kg/m². Results of our study showed that vigorous physical activity ($r=-0.160$, $p<0.01$), walking ($r=-0.130$, $p<0.05$) and total physical activity scores ($r=-0.157$, $p<0.01$) of IPAQ were negative relationship with perceived stress score. Participants mostly reported that insufficient time (before pandemic:42%, during pandemic:33.5%), insufficient equipment (before pandemic:26.5%, during pandemic:27%) and lack of motivation (before pandemic:50%, during pandemic:45%) were barriers for physical activity before and during COVID-19 pandemic. Participants mostly reported that weight control (before pandemic:53.2%, during pandemic:55.1%), increasing muscle strength (before pandemic:54.7%, during pandemic:57.7%) and reducing stress (before pandemic:52.8%, during pandemic:55.1%) were motivators for physical activity before and during COVID-19 pandemic. As a result of our study, it has been shown that during the pandemic the perceived stress level decreases with vigorous physical activity, walking or total physical activity level. Considering university students, increasing the level of physical activity for stress management will be an effective, accessible method without any adverse effects.

Keywords: COVID-19, Physical Activity, Stress



**INVESTIGATION OF THE EFFECTS OF SOME SCHIFF BASES AND SCHIFF
BASE METAL COMPLEXES ON ALPHA-GLUCOSIDASE ENZYME ACTIVITY**

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ABSTRACT

α -glucosidase is an important target enzyme in the fight against type 2 diabetes. With its inhibition, the conversion of monosaccharides to monosaccharides slows down and their rate and rate of mixing into the blood decreases. In this study, it was aimed to investigate the effects of some Schiff bases and Schiff base metal complexes on alpha-glucosidase enzyme activity in vitro and in silico. The α -glucosidase enzyme activity was measured spectrophotometrically at 408 nm. Docking studies were carried out using the Molegro Virtual Docker program. 2D interaction details were determined using the Discovery Studio 2021 Client program. In the study, no inhibition effect was detected on the enzyme activity of ligands. The copper complexes of the ligands exhibited a very strong inhibitory effect. Strong inhibition effects have been detected in palladium complexes. Docking studies have shown that hydrogen bonds, hydrophobic and van der Waals interactions are effective in the interaction of the molecular with the active site of the enzyme.

The result was : Antihyperglycemic drugs (AGIs) are safe and effective. As a consequence, there is no increased risk of hypoglycemia with acarbose, miglitol, or voglibose. Cardiovascular risk factors have been reduced and the evolution of prediabetes into full-blown T2DM has been delayed. In diabetes mellitus type 2, α -glucosidase inhibitors are used to better manage hyperglycemia, especially postprandial hyperglycemia. With a proper diabetic diet and exercise, they may be used as monotherapy or in combination with other anti-diabetic medications. Docking with Sesamin and its derivatives is made possible by the stable structure. Conserved amino acids in α -Glucosidase play a vital role in maintaining the enzyme's functional conformation and are closely linked to donor substrate binding, as shown by docking findings Studying the domain-inhibitor interaction provided valuable insight into the putative binding mechanism of the domain and inhibitor.

Keywords: Type 2 diabetics, Alpha-glucosidase, Enzyme activity, Schiff base



**COMPARISON OF THE EFFECTS OF LATERAL EPICONDYLITIS BAND AND
STATIC WRIST ORTHOSES ON EXTENSOR MUSCLE ACTIVATION OBTAINED
BY EMG: A PILOT STUDY**

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ABSTRACT

It has been stated that orthotic approaches such as lateral epicondylitis (LE) band and static wrist orthosis (SWO) used in the rehabilitation of LE reduce the activity of the wrist extensor muscles [1,2]. However, studies comparing the effectiveness of both orthoses are insufficient. The aim of this study was to compare the effect of LE band and SWO on extensor muscle activation. The study was carried out on six healthy individuals with a mean age of 27.66±4.08 years and a right hand dominant. Muscle activation of the individuals' right extensor carpi radialis (ECR) and extensor digitorum communis (EDC) muscles was obtained with a surface electromyography device (Delsys Inc. USA) [3]. Measurements were taken three times for each participant during maximum isometric gripping motion for three seconds without the orthosis, using a SWO, and a LE band. Each measurement was performed with 30 seconds of rest between repetitions. The muscle activation obtained was recorded as the average of three repetitions and the percentage of maximum voluntary isometric contraction (MVIC) achieved without the orthosis. Muscle activations of individuals for SWO and LE band, respectively; 112.58±25.87% and 148.02%±41.32% MVIC for ECR; for EDC was found as 138.28±38.47% and 129.79±25.91%. In terms of maximum voluntary isometric muscle activation obtained with both orthoses, there was a difference between the groups for the ECR muscle (p<0.05); results for EDC were similar (p>0.05). Our pilot study, which was initiated with a small number of patients, revealed that ECR and EDC muscular activation were increased with both orthoses, but the SWO was more advantageous in terms of ECR than the LE band. Considering that there will be higher muscular activation at maximum grip in the orthotic condition, it is recommended to use orthoses appropriately for their intended purpose and to work with a higher number of cases.

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Keywords: Electromyography, Lateral epicondylitis, Muscle activation, Orthosis



BIOTRANSFORMATION OF SOME STEROIDS BY ASPERGILLUS GLAUCUS

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ABSTRACT

Fungal steroid biotransformations have been widely used for a long time in order to convert and synthesize steroids since they can be carried out by their remarkable regio- and stereoselectivities [1].

Aspergillus is an extremely important fungal genus concerning mycotoxins, pathogenicity, fundamental eukaryotic genetics and biotechnological exploration [2]. *Aspergillus* species are ubiquitous fungi found in soil, water, and decaying materials. A few *Aspergillus* species are considered pathogenic to humans and animals [3,4].

Aspergillus glaucus is known to be a cosmopolitan fungus due to its physiological hardiness under more extreme conditions. *A. glaucus* may be mildly pathogenic for humans [3,4].

In this work, three steroids, pregnenolone, progesterone, epiandrosterone, were incubated with *A. glaucus* MRC 200914 for 5 days. Incubation of these steroids with *A. glaucus* mainly afforded some hydroxylated metabolites. The metabolites were separated by column chromatography. Structure determinations of the metabolites were performed by comparing melting points, NMR and IR spectra of starting materials with those of metabolites.

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Keywords: Biotransformation, *Aspergillus*, Pregnenolone, Progesterone, Epiandrosterone



**EVALUATION THE ROLE OF INTERLEUKIN-17 AND INTERLEUKIN 37 IN
PATHOGENESIS OF TYPE-2 DIABETES**

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ABSTRACT

Diabetes is a serious non-communicable disease of two types of different pathophysiology. Since they cause a great impact on health, thus no effort is spared in investigating the risk factors of the disease. In this thesis was aimed to determine the correlations between diabetes and interleukins (17 and 37). 140 persons from Al-Jamhouriy general hospital in Kirkuk in Iraq were randomly selected, were 70 of them had the disease and another 70 were free of the disease, 35 of each group were females and 35 of them were males, after ethical approval. Each blood samples were investigated for vitamin D level, blood urea level, serum creatinine, lipid profile test (cholesterol, triglycerides, high-density lipoprotein ,and low-density lipoprotein) in addition to patients' glycemic status (fasting blood glucose and hemoglobin A1C) and interleukins 17 and 37. Results showed that interleukin 17 and 37 were found to be significantly higher in the patients' group and were correlated with fasting blood sugar and hemoglobin A1C with a negative correlation with both age and body mass index. It also determined the glycemic status to be negatively correlated with age, weight, vitamin D, blood urea ,and dyslipidemia.

Keywords: Interleukin-17, Interleukin-37, Diabetes, Lipid profile, Vitamin D



**THE INHIBITION EFFECTS INVESTIGATION OF METAL COMPLEXES WITH
COUMARIN SCHIFF BASE ON G6PD ACTIVITY**

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ABSTRACT

The G6PD enzyme is the primary focus of this investigation. Cancer cells cannot survive or spread without G6PD. A G6PD deficit of less than one percent has no influence on the onset or progression of cancer. Inhibition of G6PD, which regulates cell growth and division, has a negative impact on cell development. Glucometabolism definition of cancer In order to synthesize NADPH and DNA, cancer cells rely on G6PD. NADPH and DNA synthesis are both inhibited when SIRT2 is turned on. G6PD is activated by Ras, Src, and PI3K/AKT in cancer cells. Glioma, lung, and ovarian cancers are all known to have G6PD (ROS). G6PD has an impact on treatment outcomes. In bladder cancer, BCG expression is linked with a bad prognosis. G6PD may be used to predict glioma treatment sensitivity and risk. Cancer metabolism is characterized by increased glucose intake and poor lactate breakdown despite the presence of normal oxygen tension. There are a number of recent studies that have shown that the pentose phosphate pathway (PPP) plays an important part in the "Warburg effect" because of its function in recognizing both intracellular and extracellular signals. In light of this, the pathway's diverse roles and the dual-step nature of its response sequence are highlighted. In fact, the initial PPP oxidative phase is preferentially augmented under redox stress in order to increase NADPH equivalents for antioxidant responses. RNA and DNA are synthesized by bio-reductive syntheses, which result in high NADPH levels, when significant quantities of d-ribose-5-phosphate (R5P) are combined with high levels of bio-reductive syntheses and other coenzymes such as NADH, FADH₂, and NADPH (Senesi et al. 2010).

Keywords: Coumarin, Schiff base, Metal complexes, G6PD, Inhibition



**CLINICAL STUDY OF APELIN AND SOME BIOCHEMICAL PARAMICAL IN
KIDNEY FAILURE IN BAGHDAD CITY**

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ABSTRACT

The activation in the kidney, of the apelin system, increases renal blood flow and diuresis and reduces inflammation and fibrosis. The apelin system also has a central role in the regulation of fluid homeostasis: apelin inhibits hypothalamic vasopressin release and reduces water intake. Although widely expressed in the human kidney, studies of the role of apelin in human kidney physiology are lacking. Animal studies suggest that apelin has direct actions on the kidney that contribute to the regulation of renal hemodynamics and fluid homeostasis. The purpose of the current investigation is to study the relationship of Apelin level with kidney Failure. Where it can be said that kidney Failure suffer decreasing the levels of Apelin and an increase in oxidative stress (ROS) and a decrease in the levels of antioxidants as well as a decrease in the levels of some of the trace elements, which leads to an increase in the chances of Kidney failure, patients in the study will be randomly taken from Kidney failure patients that come to the Iraqi ministry of health hospitals in Baghdad, to arrive at the current goal, the studied groups will be as; group A, it refers the collected 80 patients with Kidney failure compare with group B; while group B refers to 60 person healthy as the control group, complete medical history will be taken from each patient and control. In general, during this study, the necessary parameters will be identified as good indicators to kidney failure.

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Keywords: Apelin, Kidney failure, Antioxidants, ROS



**EVALUATION OF CHEMERIN AND SALUSIN BETA IN PREDIABETIC AND
NEWLY DIAGNOSED T2DM**

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ABSTRACT

Diabetes is an inflammatory illness. Chemerin's chemoattractant function and recent discovery macrophages in chronic inflammation of adipose tissue in obesity. the role of salusin β in vascular inflammation and its link to diabetes through endothelial damage. research goals study the connection of chemerin and salusin β with external factors and several biochemical variables in newly diagnosed T2DM, pre-DM and control groups. In 2021-2022, 120 Iraqis were placed into three groups (40 with prediabetes 20 male 20 female, 40 newly T2DM, 20 male 20 female, 40 healthy subjects as control group 20 male 20 female). chemerin and salusin β via ELISA. the standard deviation of the mean of chemerin and salusin β for T2DM (669.52 \pm 354.30) and (567.30 \pm 265.84) was significantly higher than for control (300.25 \pm 97.94), $p < 0.001$, (161.97 \pm 30.99) $p < 0.001$ and our statistical analysis show the mean for chemerin and salusin β in T2DM significantly higher than for prediabetic (468.07 \pm 203.25), $p < 0.007$, (302.85 \pm 159.98), $p < 0.002$, respectively .chemerin and salusin β concentrations in serum might be employed as diagnostic indicators. is particularly beneficial in predicting and preventing complications in diabetic patients. chemerin and salusin β as early diagnostic markers of T2DM in obese people.

Keywords: Chemerin, Salusin beta, T2DM



**XANTHINE OXIDASE IS INHIBITED AND URIC ACID LEVELS ARE LOWERED
BY TRANSITION METAL COMPLEXES OF SCHIFF-BASE LIGANDS (Cu AND
Pd).**

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ABSTRACT

The product of purine metabolism is hypoxanthine, and by the action of the enzyme xanthine oxidase, it is transformed into a xanthine complex, which, in turn, produces uric acid with the same enzyme.

If uric acid exceeds the normal level, the kidneys are unable to excrete it outside the body, and therefore it is deposited in the kidneys and joints, especially the joint of the big toe, in the form of small stones, and this disease is called gout.

In this study, 12 metal compounds, namely copper and palladium complexes were formed to inhibit the enzyme xanthine oxidase to reduce uric acid production. The results were that the copper compound successfully inhibited the enzyme reaction rate enzyme activity by 50%.

Where five absorptions were taken for each compound that interacts with the enzyme by means of a spectrophotometer, as it was proven that the copper compound has a high inhibition efficiency, unlike the palladium compound, which had a weak effect on the enzyme inhibition process. This study aims to produce a new drug to treat high blood uric acid instead of allopurinol, which has many complications

Keywords: Xanthine oxidase Inhibitor, Allopurinol, Gout, Uric acid, Hyperuricemia



**IMPROVED SPEED AND TORQUE EFFICIENCY FOR DTC CONTROLLED
ASYNCHRONOUS MACHINE USING FUZZY SWITCHING ALGORITHM**

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ABSTRACT

A vector form of control called direct torque control is based on stator flux and torque. Takashi invented it in the middle of the 1980s. Control of the primary components of an asynchronous machine, particularly the stator flux and electromagnetic torque, is possible by direct selection of the inverter's output voltage vectors. These choices are done in a manner that keeps both values inside a hysteresis band. Through the use of two regulators, the PI controller and fuzzy logic, this study aims to reduce torque ripple while also accomplishing motor speed control. To determine which performs better, comparisons will be made [1, 2, 3, 4, 5]. The results will be shown by using Matlab/Simulink at the end of the article, and a discussion will be made by comparing those two regulator.

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Keywords: Asynchronous machine, Direct torque control, Fuzzy logic, PID regulator



**THE INHIBITION EFFECTS INVESTIGATION OF METAL COMPLEXES WITH
COUMARIN SCHIFF BASE ON 6PGD ACTIVITY**

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ABSTRACT

This work is focused on the 6PGD enzyme. Without 6PGD, cancer cells are unable to thrive or spread. The beginning or course of cancer is not affected by a 6PGD shortage of less than one percent. Delaying or stopping cell growth and division may have a detrimental effect on the development of cells. Definition of cancer based on glucometabolism Cancer cells depend on 6PGD to produce NADPH and DNA. When SIRT2 is activated, it reduces NADPH production as well as DNA synthesis. In this research, 10 different compounds were tested for their inhibitory effects on the 6PGD enzyme.. OPP enzymes are now being considered as prospective therapeutic targets because of their close ties to tumor metabolism. The importance of 6-Phosphogluconate dehydrogenase (6PGD), PPP's third oxidative decarboxylase, in carcinogenesis and redox homeostasis has been well shown in recent years. 6PGD upregulation enhances cancer cells' proliferative and metastatic capacity by providing them with a metabolic and defense edge. Mutations in DNA, epigenetic alterations, malfunctioning enzymes, and misaligned signaling pathways all contribute to the multifaceted hyperproliferative nature of cancer (Vander *et al.* 2017).With an average of 1,670 deaths per day in the United States in 2018, cancer has overtaken heart disease and stroke as the most prevalent cause of death in the country's health care system. The fatal weapon's weight illness is expected to rise in the next years (Siegel *et al.* 2018). Six basic physiological alterations that are often recognized as cancer hallmarks may be used to describe cancer biology (Hanahan *et al.* 2011). Refusing to be stimulated by angiogenesis and other apoptotic processes and resisting the spread of invasion and metastasis by anti-growth signals is a learned ability. Cancerous cell populations have certain properties (Sarfranz *et al.* 2018).

Keywords: Inhibition, Metal complexes, Coumarin, Schiff base, 6PGD



FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEM

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ABSTRACT

With the developing technology, most of the loads used in industrial applications consist of inductive loads. Due to their nature, inductive loads use inductive reactive energy. The reactive energy used degrades the system's quality and efficiency, as well as causing power factor issues. Flexible alternating current transmission systems (FACTS) are vital for increasing the power system's performance and quality. The FACTS system makes it faster and easier to regulate a power system. The most popular FACTS device used to enhance power quality is the Distribution Static Synchronous Compensator (D-STATCOM). According to apply FACTS applications, we are talking about FACTS devices their applications. After the comparing of the FACTS devices, discuss the differences and apply the simulation model using MATLAB/SIMULINK. After the preparing simulation, results will be discuss and researching about future applications.

Keywords: DC, AC, FACT, MW, VA, VAr.



**REMOVAL OF Zn(II) ION FROM AQUEOUS SOLUTIONS BY GELLAN GAM-
CHITOSAN COMPLEX ADSORBENT**

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ABSTRACT

In this study, the cross-linked gellan gum (GG) beads were kept in the chitosan (CS) solution for the formation of the polyelectrolyte complex, later the particles were purified and removed from the solution before second crosslinking [1]. The potential of these complex particles to remove Zn(II) ions from wastewater was investigated. The analysis of FT-IR and SEM/EDX was performed to characterize the obtained polyelectrolyte complex. In the adsorption studies performed with the polyelectrolyte complex, the most appropriate pH value was 6. When the experimental conditions were applied at temperature: 25°C, pH: 6, the initial concentration of the solution: 200 ppm, and the adsorption time: 10 hours, the adsorption capacity was found to be approximately 42.05 mg/g. Kinetic studies have shown that the experimental results are consistent with the pseudo-second-order kinetic model. The Langmuir isotherm model was also found to be compatible with the equilibrium adsorption results. It has also been determined that the complex adsorbent can be used at least five times without a significant reduction in the adsorption capacity. As a result, the prepared polyelectrolyte complex may be a proper adsorbent for adsorption of Zn(II) ions to treat wastewater containing a low metal concentration.

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Keywords: Chitosan, Gellan gum, Polyelectrolyte complex, Zn(II)



ANALYSIS AND BIOACTIVITY OF ESSENTIAL OILS OBTAINED FROM DIFFERENT PARTS OF PRANGOS ARICAKENSIS

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ABSTRACT

Plants produce volatile and lipophilic substances known as essential oils (EO), such as mono or sesqui-terpene metabolism-derived hydrocarbons, phenylpropanoids, amino acids, or fatty acids [1]. Essential oils have a complex composition, which includes a lot of components. Especially hydrocarbons and oxygenated compounds are characteristically responsible for odors and flavors [2]. *Prangos aricakensis* (PA) is a newly identified locally endemic plant that grows in the Arıcak region of Elazığ province in the Eastern Anatolia region of Türkiye [3]. In this work, EOs were obtained from the dried parts (leaf: L, stem: S) of PA by hydrodistillation method using a Clevenger-type device. The EOs of the leaf and stems of PA were analyzed by GC-MS/MS. As a result, fifty-eight and fifteen components were identified as 97.15% and 99.93% of the EO of the stem and leaf parts, respectively. The main components of PASEO and PALEO were methyl trans-cinnamate, cinnamic acid ethyl ester, bornyl acetate, and limonene. We noticed that methyl trans-cinnamate is the chemotype of both parts of the plant. In this work, antioxidant (free radical scavenging, ABTS⁺ scavenging, and total antioxidant capacity), enzyme inhibition (acetylcholinesterase, butyrylcholinesterase (BChE), and tyrosinase), antibacterial and antifungal activities were applied *in vitro* of PASEO and PALEO. The IC₅₀ value of PALEO (2.12±0.84) was better than TBHQ (2.40±0.16) in free radical scavenging activity, and PASEO (13.14±0.46) was better than BHA (13.45±0.40) in ABTS⁺ scavenging. In BChE inhibition, PALEO (6.69±0.00) is more effective than galantamine (9.88±2.42). In particular, their antioxidant and anti-BChE potentials can be used in the development of different formulations for radical scavenging and Alzheimer's disease. The most extensively studied effect of PAEO was tested *in vitro* and can be researched on the safety of medicinal and food usage.

Acknowledgment: This work was supported by TÜBİTAK under project number 221Z330.

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Keywords: *Prangos aricakensis*, Essential oil, GC-MS/MS, Antioxidant activity, Enzyme inhibitory



**EXAMINING THE RELATIONSHIP BETWEEN QUALITY OF LIFE AND
PHYSICAL ACTIVITY, EXERCISE PERCEPTION IN MIDDLE ADULTHOOD**

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ABSTRACT

Adulthood is examined as young, middle and advanced adulthood. Middle adulthood is a period in which the social roles, productivity and coping skills of individuals between the ages of 40-50 are high and their life habits are stereotyped [1, 2]. Examining the quality of life, physical activity levels and exercise perceptions of middle-aged individuals will provide important information in the creation of a healthy elderly population [3]. For this purpose, the relationship between middle-aged individuals' quality of life, physical activity levels and exercise perceptions was examined. This study was conducted as a pilot study of a comprehensive study with the participation of 20 people (10 women and 10 men) between the ages of 40-50. Data were collected using personal information form, World Health Organization Quality of Life Scale-Bref Form (WHOQOL-BREF), International Physical Activity Questionnaire short form (IPAQ-SF), Exercise Benefits/Barriers Scale. Spearman Correlation Analysis was used to examine the relationship between WHOQOL-BREF and Exercise Benefits/Barriers scales and IPAQ-SF in data that were not normally distributed. The Mann-Whitney U test was used to determine whether the investigated parameters differed between the genders. First, the general demographic characteristics of the participants included in the study were determined (43.2±10.3 years, 169.9±0.9cm and 69.3±11.9 kg). According to the correlation analysis, it was observed that there was no linear relationship between the physical activity levels of middle-aged individuals and their exercise perceptions and quality of life ($p>0.05$). Similarly, no difference was found between these parameters investigated between male and female individuals ($p>0.05$). The study was conducted with a low sample and individuals who take an active role in daily life and have moderate physical activity. Participants may be physically active due to their life roles, uncorrelated to their perceptions of exercise. Therefore, the results may also be uncorrelated to quality of life.

Acknowledgment: This study is the preliminary study of a comprehensive research comparing the processes of adulthood and old age. It does not receive any financial support.

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Keywords: Perception of Exercise, Physical Activity, Middle Adulthood, Quality of Life



BERTRAND PARTNER TRAJECTORIES RELATED TO PAFORS

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ABSTRACT

Bertrand defined the concept of a pair of curves, called as Bertrand partner curves, in 1850. Bertrand partner curves were studied widely in the literature. In this study, we consider the concept of Bertrand partner trajectories related to Positional Adapted Frame on Regular Surfaces (shortly PAFORS) for the particles moving on the different regular surfaces in Euclidean 3-space. The relations between the PAFORS elements of the aforesaid trajectories are given. Also, the relations between Darboux basis vectors of them are found. Furthermore, some characterizations are given for some special cases of these trajectories with the aid of their PAFORS elements.

Keywords: Kinematics of a particle, Bertrand curves, PAFORS, Regular surfaces



**ENGINEERING OF INTERLAYER EXCHANGE COUPLING WITH THE
INSERTION OF A HEAVY METAL LAYER IN PLANAR HALL SENSORS**

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ABSTRACT

Due to their low power consumption, thermal stability, high performance in the low magnetic field and high signal-to-noise ratio, planar Hall sensors (PHS) have always been in a prominent position among magnetoresistive sensors [1,2]. PHS have potential applications in technological devices such as producing biosensors, microcompasses, blood pressure detectors, and microcrack detectors [1,2]. A PHS structure can conventionally be formed by using a single ferromagnetic (FM) layer or a bilayer consisting of an FM and antiferromagnetic (AF) layer, or a trilayer consisting of an FM, non-magnetic (NM) and AF layers [1]. Recently, bilayers consisting of an FM and heavy metal (HM) thin layers without an AF are offered as magnetoresistive sensor in the literature [1,3]. For a promising PHS, it is important to improve properties such as stability, reproducibility, selectivity, lower detection limits, ease of fabrication, field linearity, and sensitivity [1,4]. In this study, inspired by the idea of FM/HM bilayers, a special trilayered PHS is produced by inserting a Pt HM layer as an NM layer between FM and AF layers to improve the some of the mentioned properties of PHS, especially its sensitivity.

This work was supported by the Research Fund of the Gebze Technical University through the project number: BAP 2022-A-105-33.

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Keywords: Magnetic sensors, Planar Hall effect, Exchange coupling, Heavy metal



**PRODUCTION OF DIATOMITE REINFORCED POLYESTER COMPOSITE AND
INVESTIGATION OF ITS THERMOPHYSICAL PROPERTIES**

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ABSTRACT

In this study, composite materials have been improved by reinforcing diatomite soil into unsaturated polyester. Diatomite in the particle size range of 297 to 149 microns is used as a filler after drying at 105 °C. Diatomite reinforced polyester composites at different ratios by mass (0 %, 1 %, 3 %, 5 %, and 7 %) are produced at room temperature under open conditions to the atmosphere. In the experimental studies, the homogeneity of unsaturated polyester (UP) and the filler is provided first. Then, after methyl ethyl ketone peroxide (MEKP) and cobalt octoate (Co Oc) catalysts are added to the mixture, mixing is done at 1000 rpm for 2 min [1-3]. After the polyester composite is cured for 24 hours under laboratory conditions, necessary tests and analyzes are performed. The chemical bond structure of the obtained polyester composite is determined by Fourier transform infrared (FTIR) spectroscopy. The surface morphology of the composite material is examined by scanning electron microscopy (SEM). As the mass ratio of diatomite soil in the mixture raises, the porosity of the obtained composite increases. In the results, it has been observed that the density of the polyester composite decreases as the ratio of diatomite in the mixture by mass increases. Diatomite reinforcement changes the thermal conductivity coefficient of the polyester composite between 0.056 W/m·K and 0.079 W/m·K. Besides, Shore D hardness of the polyester composite varies between 78.0 and 81.5. It is observed that diatomite reinforcement tends to increase both the thermal conductivity and Shore D hardness of the polyester composite. Also, thermal decomposition experiments are carried out in a PID-controlled system in an inert environment between 25 °C and 605 °C. In the thermal decomposition experiments of polyester composites, it has been determined that the filler reinforcement increases the activation energy. Activation energy values are calculated using Coats-Redfern method when the temperature rise is 10 °C/min and the conversion rate (α) is between 0.1 and 0.9. Therefore, increasing the activation energy improves the thermal stability of the composite [4-6].

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Keywords: Diatomite, Polyester Composite, Density, Hardness, Thermal Conductivity



SINGULAR PERTURBATIONS OF MULTIBROT SET POLYNOMIAL

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ABSTRACT

We will give a complete description of the dynamics of the rational map $N_{F_{M_c}}(z) = \frac{3z^4 - 2z^3 + c}{4z^3 - 3z^2 + c}$ where c is a complex parameter. These are rational maps $N_{F_{M_c}}$ arising from Newton's method. The polynomial of Newton iteration function is obtained from singularly perturbed of the Multibrot set polynomial.

A singular perturbation means that we have a complex analytic map which is the new map F_{M_c} obtained by multiplying Multibrot set polynomial $M_c(z) = z^n + c$ and a simple polynomial $P(z) = z - 1$ so that $F_{M_c} = (z^n + c)(z - 1)$ where c is a complex parameter and $n > 2$. In this study, specifically we consider the case when Newton's method is applied the polynomial family $F_{M_c} = (z^3 + c)(z - 1)$. The dynamics of such a perturbation are very exciting for these reasons:

- They are non-polynomial examples,
- Their dynamical behavior is changed dramatically when the parameter c is non-zero but quite small.

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Keywords: Julia set, Rational iteration, Newton's method



INVESTIGATION OF THE PHOTOVOLTAIC, STRUCTURAL, ELECTRONIC AND SPECTROSCOPIC PROPERTIES OF SOME MOLECULES CONTAINING DIMETHYLANILINE

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ABSTRACT

In the present work, conformational analysis, ground state structure, non-linear optical properties and photovoltaic parameters of some molecules containing dimethylaniline were calculated by Density Functional Theory (DFT) and time dependent DFT (TD-DFT) computations. First of all, conformational analysis was performed to determine the most stable structure. Conformational space was scanned using Merck Molecular Force Field (MMFF) method. The conformers obtained from the conformational space scanning were optimized by B3LYP/6-31G(d,p) level. Then, B3LYP/6-311++G(d,p) quantum calculations are performed to optimize geometries and electronic, structural, nonlinear optical and photovoltaic properties for the title molecules. The title molecules could be used as dye in dye-sensitized solar cells (DSSC) applications. Therefore, the theoretical results have shown that TDDFT calculations using the B3LYP with the polarized split-valence 6-311++G(d,p) basis sets and the polarizable continuum model (PCM) were reasonably capable of predicting the excitation energies, the absorption and the emission spectra of the molecules. The HOMO and LUMO energy levels of these dyes can ensure a positive effect on the process of electron injection and dye regeneration. Key parameters in close connection with including light-harvesting efficiency (LHE), injection driving force (ΔG_{inject}) and total reorganization energy (λ_{total}) were discussed.

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Keywords: DSSC, Dimethylaniline, DFT, Photovoltaic parameters, Electronic properties



**EXAMINING THE LEVELS OF ANXIETY AND DEPRESSION AMONG NURSES
WORKING AT AL- DIWANIYAH TEACHING HOSPITAL DURING COVID-19
PANDEMIC**

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ABSTRACT

This study investigated the anxiety and depression of nurses working at Al-Diwaniyah Hospital during the COVID-19 pandemic. The study also looked into the effect of demographic characteristics (age, gender, and marital status) on their anxiety and depression levels.

This descriptive study was conducted at Al-Diwaniyah Teaching Hospital in Iraq during the COVID-19 pandemic between December 27, 2020, and February 26, 2021. The sample consisted of 150 nurses. Participation was voluntary. Data were collected face-to-face using a personal information form and the Hospital Anxiety and Depression Scale (HADS). More than half the participants were women (65.3%). More than a quarter of the participants were younger than 26 (34%). More than half the participants were married (58.7%).

Less than half the participants had bachelor's or higher degrees (45.3%). Most participants were non-smokers (71.3%). More than half the participants had been working for less than five years (54.7%) and had no chronic disease (69.3%). One-third of the participants had mild anxiety (33.3%), while one in ten had severe anxiety (10%). Half the participants had normal depression (50%), while ten had severe depression (6.7%). Married participants had a significantly higher mean depression score than single participants. Participants with more than five years of work experience had a significantly higher mean depression score than those with less than five years of work experience. Age, education, income status, gender, place of residence, and smoking habits did not affect participants' HADS scores. Authorities should provide nurses with psychosocial services to support their mental health in times of crisis, such as pandemics.

Keywords: COVID-19, Anxiety, Depression, Nursing



**ROLE OF TRANSCRIPTION FACTOR 7 LIKE RS7903146 AND RS12255372 GENE
POLYMORPHISMS AND SELECTIVE BIOCHEMICAL TESTS IN TYPE II IRAQI
DIABETIC PATIENTS**

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ABSTRACT

Recent studies have related to see whether the TCF7L2 gene polymorphisms rs7903146 (C/T) and rs12255372 (G/T) are linked to the risk of developing T2DM in the Iraqi population. In this study, biochemical and genetic parameters. Real-time PCR was used to genotype the samples. In both patients and controls, the frequency of genotypes, alleles, anthropometric measurements, glycemia, and glycated hemoglobin (HbA1c) was measured. As result, The TCF7L2 SNPs rs7903146 and rs12255372 had genotyping success rates of 98.55 and 97.42 percent, respectively. For both SNPs, the allele and genotype frequencies were in Hardy-Weinberg equilibrium. Between patients and controls, the genotype and allele frequencies for (TCF7L2 SNP rs7903146) allele were not substantially different. The frequency of the (rs7903146 T) allele in the controls was 29 percent, whereas it was 28 percent in the patients ($P = 0.61$). The TCF7L2 SNP rs12255372 genotypic and allelic frequencies did not vary substantially between patients and controls. In controls, (rs12255372 T) allele frequency was 21%, but in patients, it was 27% ($P = 0.42$).

Keywords: Type 2 diabetes, Genetic association, Transcription factor 7-like 2 (TCF7L2), Polymorphism



**EVALUATION OF SOME BIOLOGICAL PARAMETERS AND TRACE ELEMENTS
IN PROSTATIC TUMORS AMONG IRAQI PATIENTS WITH DMII**

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ABSTRACT

Among the challenges facing doctors in advanced prostate, cancer management is that it is developing quickly, which requires research in rapid ways to predict its development. Our goal in this study is to define some liver tests (Alp), Chloea, PSA, and TPA tests, focus on some trace elements in men with prostate and type 2 diabetes and discover the linear relationship between the specified tracking elements that were estimated between cases. The kidney fears tests were not mentioned in this study, but the levels of uric acid were significantly affected. There was clear importance of liver enzymes, whose levels were clearly affected, and there was a link between them and PSA in prostate cancer patients. The vowed elements did not have great influence, especially magnesium and selenium, on the contrary, zinc had a great statistical and clinical importance in this study. In general, during this study, the necessary parameters will be identified as good indicators for prostate cancer patients and DMII in the same time.

Keywords: Prostatic tumors, Trace elements, DMII, PSA, TPA



**STUDY OF THE RELATIONSHIP BETWEEN VITAMIN D LEVELS WITH IL 17,
IL1A AND SOME BIOCHEMICAL TESTS IN SUBJECTS UNDERGOING A DIET**

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ABSTRACT

Diet is defined as a program dieting to lose weight or not increase it. The aim of the study was to accurately measure the levels of Vit. D with Interleukin 1 α , IL 17, hsCRP, and some biochemical markers. Will be investigated the possible relationship between Vit.D with Interleukin 1 α , IL 17, hsCRP, and some biochemical markers in undergoing Diyet. IL1 α , IL17, Vitamin D, Total cholesterol, Triglyceride, HDL, LDL and calcium levels were defined from the individuals with diets according to the level of weight and age. When all the biochemical parameters obtained were evaluated according to the adaptation of people to the diet; there is a highly significant relationship between age, weight, Vitamin D and total cholesterol with diet in patients pre-diet and post-diet. Also, obtained were When all the biochemical parameters were evaluated according to the adaptation of people to the diet; There is no significant relationship between IL1 α , IL17, Tg and HDL and diet in patients pre-diet and post-diet.

Keywords: Interleukin 1 α , IL 17, Diyet, Biochemical tests, hs-CRP



**DETERMINING THE PROFESSIONAL IMAGE LEVELS OF NURSES AND THEIR
IDEAS FOR STRENGTHENING THEIR PROFESSIONAL IMAGE DURING COVID
19 PANDEMIC**

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ABSTRACT

Introduction: Although nurses have made nursing a profession with a high level of evidence and knowledge-based today, it is stated in the literature that the recognition of the profession has not reached the desired level. During the Covid 19 pandemic, nurses have become more recognizably in the media, society, and healthcare teams in healthcare services.

Aim: This study was carried out to determine the professional image levels of nurses and their ideas for strengthening their professional image during the Covid 19 period.

Methods: Descriptive and cross-sectional study was conducted online. In the study, the snowball sampling method was used and a total of 305 nurses participated. To collect the data, Nurses Introductory Characteristics Form, Structured Questionnaire, and Scale for the Image of Nursing Profession were used.

Result: It was determined that the total score of the nurses' professional image was 167.9 ± 12.69 and 35.4% of the nurses chose the profession due to the abundant job opportunities, 44.9% were satisfied with their choice of the profession, 67.8% were not satisfied with the view of society on the current nursing image, and 76.3% were not satisfied with the current image. Suggestions to strengthen the image of nursing follow as; raising the education level (28.0%), the society, government, and administrators should value nursing (19%), and improving the salary and working conditions (17.8%). When the relationship between the ideas to strengthen nurses' professional image and their professional image education sub-dimension scores; it was observed that the scores of the people who suggested increasing the level of education of nurses were significantly higher than those who suggested improving the salary and working conditions ($p=0.016$).

Conclusion: In our study, it was concluded that the image levels of the nurses were good and they were not satisfied with the nursing image of society.

Keywords: Nursing, Professional image, Covid 19



**EXCISION OF RESIDUAL CYST SEEN WITH ODONTOMA FROM RAMUS OF
MANDIBLE: A CASE REPORT**

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ABSTRACT

Residual cyst is in the group of inflammatory odontogenic cysts. These cysts originate from periapical granuloma and radicular cyst residues left after tooth extraction. They develop asymptotically, grow too large and cause bone defects and swelling in the jaw. Odontomas are classified as mixed odontogenic tumors. There are two types, compound and complex odontoma. It is the most common odontogenic tumor of the jaws. In this case report, enucleation of residual cyst associated with odontoma was reported from a 58-year-old male patient. At the same time, the pathogenesis, clinical and radiological features and differential diagnosis of residual cyst and odontoma are discussed.

Keywords: Residual Cyst, Odontoma, Enucleation



**EVALUATION OF SERUM ANTI-MULLERIAN HORMONE LEVELS ON
OXIDATIVE STRESS MARKERS AND THE ENVIRONMENTAL LIFESTYLE IN
FEMALE CONTROL AND PATIENTS WITH POLYCYSTIC OVARY SYNDROME
GROUPS**

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ABSTRACT

Despite the fact that the most prevalent cause of infertility is polycystic ovary syndrome (pcos), infertility affects women around the world. It is known that PCOS is connected with oxidative stress, and this study was meant to explore the association between free radicals and AMH levels in the body; AMH is a good biomarker of PCOS. The study included 100 study participants, 50 of whom had pre-menstrual syndrome (PMS) and the other 50 were healthy controls. The participants were recruited from the Nineveh Health Center. There is a well-known relationship between PCOS and AMH elevation, A significant effect between MDA and AMH was observed in PCOS' blood samples, the PCOS samples with high Amh are significant associated with high GLU, The effect of high cholesterol levels on PCOS cases was not strong, a weak effect of low GSH concentration on AMH value was observed in PCOS' blood samples, there is a relative relationship between AMH and FSH, it depends on the age for PCOS cases.

Keywords: AMH Hormon, Polycystic Ovary Syndrome, Oxidative Stress Markers, Malondehyde, Glutathion, Vitamine D, Insulin resistance, Environmental Lifestyle



**STUDY OF RELATIONSHIP BETWEEN LEVELS OF HEPCIDINE HORMONE
AND GDF15 FOR PATIENTS WITH PROSTATIC CANCER AND THEIR
CLINICAL IMPORTANCE**

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ABSTRACT

Prostate cancer (PCa) is a considered of malignancy worldwide, particularly among the elderly. In Europe, about 417.000 men were diagnosed with PCa for the first time in 2012. Since PCa is so diverse, there is a growing The development of novel biomarkers capable of predicting prognosis, cancer incidence, therapy effectiveness, & patient outcomes is critical. Additionally, biomarkers are required in advanced PCa that has progressed to CRPC following first therapy, it is possible to anticipate tumor growth and aggressiveness in connection to a range of potentially life-extending drugs. Hepcidin and Growth Differentiation Factor 15 have been shown to be present in significant concentrations in a variety of cancers (GDF-15). The levels of serum hepcidin and GDF-15 have been proven to be prognostic markers in cancer patients in the past. To determine the significance of hepcidin, Growth Differentiation Factor 15, Prostate-Specific Antigen, & several other associated Harmons in the prediction or early detection of prostate cancer, the investigators conducted a research. As a result, this research will be regarded as significant in the area of Iraqi patients.. There were substantial disparities in our research. ($P \leq 0.05$) with Hepcidin Hormone (H. H.), C-Reactive Protein (C-RP), Growth Differentiation Factor 15 (Gdf15), & Follicle-Stimulating Hormone (FSH), Because of the high importance (correlation) shown by our study (H.H, C-RP, GDF15, & PSA) between the Patient Group and Control Group, it can be used these variables to precise prediction of prostate diseases. There are relationships of strength between Hepcidin Hormone variables and some biochemical variables such as Age, C - Reactive Protein (C-RP), Prostate-Specific Antigen (PSA), & Growth Differentiation Factor 15 (Gdf15).

Keywords: Prostate Cancer, Hepcidine, GDF15, PSA



MODELLING EARTHQUAKE DATA USING SOME LIFETIME DISTRIBUTIONS

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ABSTRACT

In this study, we provide statistical inferences about earthquake data by modelling some lifetime distributions. We consider five lifetime distributions (Weibull, exponentiated Exponential [1], exponentiated Weibull [2], generalized Lindley [3], and Power Lindley [4]) to model earthquake data. We consider two earthquake data set in this paper. The first data consist of 20 observations denoting magnitudes of earthquakes in the Kuşadası bay on 23 November 2020 while the second data set includes the magnitudes of earthquakes in the Kuşadası bay on 24 November 2020. The maximum likelihood method is used to estimate the unknown parameters of these distributions. We estimate average magnitude of earthquakes via the maximum likelihood estimates of the parameters of five lifetime distributions.

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Keywords: Weibull distribution, Exponentiated Exponential distribution, Maximum likelihood estimation, Real data analysis



**ANN-BASED SMART IRRIGATION IMPLEMENTATION USING AIFES AND
MICROCONTROLLER**

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ABSTRACT

The importance of smart irrigation cannot be emphasized enough in this century. Regions around the globe are facing periodic droughts due to the impact of climate change and inefficient irrigation methods, coupled with the excessive use of fertilizers. Governments are increasingly trying to implement smart irrigation strategies that can reduce water wastage with the optimal use of resources. The advancement in Internet of Things (IoT) domain is positively impacting the development of smart irrigation systems [1-3]. In this study, Artificial Intelligence for Embedded Systems (AIFES), which is an AI framework that can be efficiently used with embedded systems, was used [4-5]. The proposed ANN-based model was first simulated and then embedded in the microcontroller. The AI-model relies on two inputs, namely, temperature and soil moisture. The output, which determined whether there would be irrigation or not, was empirically determined. This data was used to train the Artificial Neural Network (ANN), and the trained model was capable of deciding whether there would be irrigation or not based on new input from the sensors, and the pre-defined threshold value. A supervised learning approach was used to adjust the weights in the neural network. The neural network consists of three layers and Sigmoid activation function was used. The weights were initialized randomly in a range of adjusted and determined values. It was observed that there was high accuracy with the trained model, and it was able to provide the information needed for the embedded system to optimize the irrigation process. The future scope consists of realizing a more complex model with a higher number and instances of inputs such as sunlight intensity, sunlight exposure time, type of plant, weather forecast, soil nutrient concentration, amongst others, which will help in optimizing the environment for the efficient growth of plants.



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Keywords: Smart Irrigation, Artificial Neural Network (ANN), Artificial Intelligence, Embedded System, Artificial Intelligence for Embedded Systems (AIfES)



**EFFECT OF THYROID HORMONE T3 AND T4 ON THE CENTRAL NERVOUS
SYSTEM IS ASSOCIATED WITH DIABETES MELLITUS**

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ABSTRACT

Thyroid hormones are critically involved in the development of the central nervous system (CNS). Fetal and/or neonatal hypothyroidism causes myelination defects, and neuronal migration and differentiation, which cause mental retardation, which can be profound, and in certain cases irreversible neurological alterations. It is accepted that most of the actions of the thyroid hormones are due to the interaction of the active thyroid hormone, triiodothyronine (T₃), with nuclear receptors. Thyroid hormone regulates the expression of a series of genes that encode proteins with very diverse physiological functions: myelin proteins, proteins involved in cell adhesion and migration, signaling proteins, cytoskeleton components, mitochondrial proteins, transcription factors, etc.. T₃ originates partially in the thyroid gland, but for the most part is generated locally in target tissues from thyroxine (T₄). The concentration of T₃ in the CNS is tightly regulated by type II and III 2 deiodinases. Type II deiodinase, which is expressed in tanycytes and astrocytes, produces up to 80% of the T₃ present in the CNS. Type III deiodinase, present in neurons, degrades T₄ and T₃ to inactive metabolites.

T₃ receptors are already present in the fetal rat brain, in mRNA, from day 11.5 after conception, and the protein can be detected as early as the 14-day fetus. In the human fetus, the T₃ receptor is present at least from the 10th week of gestation, indicating that thyroid hormone may have actions in the human fetal brain. Of course, in human fetal tissues, T₄ can be detected in most of them, and T₃ in the brain, which could be derived mostly from T₄. Thyroid hormones present in the fetus, especially T₄ they can be of maternal or fetal origin. In humans, maternally derived T₄ could account for more than 50% of fetal T₄ at term under normal circumstances.

Keywords: Hypothyroidism, Thyroid hormone T₃ and T₄, Central nervous system, Diabetes mellitus



**A LITTLE TOUCH FOR AESTHETIC SMILES: RESIN-CONTAINING ANTERIOR
LAMINA VENEERS**

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ABSTRACT

Lamina veneers, one of the restorative dentistry applications, play an important role in the formation of acceptable aesthetic results. It is frequently preferred by dentists, as minimally invasive procedures are sufficient for its application. With the advancement of adhesive technology, resin-containing restorative materials are also used in the application of anterior lamina veneers. Resin-containing anterior lamina veneers; It is formed in the mouth by direct method and outside the mouth by indirect methods. Indirect methods have been developed to prevent polymerization shrinkage that occurs in the direct method. In indirect methods; It is aimed to improve the physical properties of lamina veneers with the help of factors such as heat, light and pressure. With the advancement of technology day by day, the production of computer aided lamina veneers is possible. In these systems, resin-based blocks are used to combine the properties of porcelain and resin, creating wider usage areas. This study has been prepared to present up-to-date information about resin-containing anterior lamina veneers, which have an important place in restorative dentistry and are frequently used in the formation of aesthetic smiles.

Keywords: Aesthetic smile, Anterior lamina, Composite lamina, Lamina veneer



INVESTIGATION OF WASTE SLUDGE OBTAINED FROM TUZLUCA REGION ROCK SALT

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ABSTRACT

Iğdır province is a province where mineral resources are not very rich. The only mineral deposit here is known as the rock salt deposit in the Tuzluca area. A total of 840 million tons of rock salt reserves with 91.4% NaCl grade have been identified in this deposit and it is operated by the private sector [1]. This reserve amount constitutes 22% of Turkey's rock salt reserve, which is 3,826 billion tons [2]. It is also reported that this deposit has the capacity to meet Turkey's salt need for 100 years and has a daily salt production capacity of 60,000 kg [3]. In the study of Yılmaz (2007), "The closed enterprise was opened in the SW wing of Tuzluca syncline and consists of a 200 m long and 3–3.5 m wide main gallery and side galleries, which were opened horizontally in approximately N 30 E direction. Ceiling height varies between 6-8 m. Rock salt is mined by the room-heel method with a size of approximately 8–8.5 m. During this study, the Tuzluca formation was examined and red colored claystone-mudstone and gypsum-claystone alternations were observed in various regions, which respectively underlie massive salt (halite) formations [2]. Processing and using the clay in the enormous amount of waste sludge that will emerge while operating this high amount of rock salt reserves is an inert value that will contribute to Republic of Türkiye's economy.

In the removal of heavy metals such as Cu, Ni, Mn and Cr from wastewater [4-6], in the removal of boron mineral [7], it successfully fulfills the adsorbent task in the removal of organic molecules such as methylene blue [8]. In this study, the ability of clay obtained from waste sludge to be used as an absorbent was investigated.

Acknowledgement: The authors thank to Sürkit Refinery Salt Industry and Inc. for their support of this study.

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Keywords: NaCl, Rock salt, Waste sludge



**ESTIMATION OF INSULIN HORMONS AND INSULIN RESISTANCE IN
DIABETIC PATIENTS INFECTED WITH COVID-19**

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ABSTRACT

COVID-19 was for the last two years was the one of the biggest problems that the man kind face in this pass two decades, many studies was published in this matter that covers most sides of this infection which includes many factores like (age, sex, severe obesity and diabetes are well-established as risk factors that increase morbidity and mortality). Although, the hypothesis in which insulin resistance contributes to these associations is not well studied and kept in the dark and its may be substantial. That's why and for other personal reasons I want to sudies and search for the effect that caused by corona virus in insulin resistance, in the contrary of the most published artical and thises that all involved with how diabetic patients are more susceptible for infection and they will be in greater dengerous than the normal people, so my study based on the measuring of insulin directly by using ELISA not measuring C-peptides as most of prvious studies as an indication for insulin activity, because I want it my study to be more precise and more accurate and fasting blood sugar to evaluate the Insulin resistance for diabetic patiens during their period of infection. The relationship between Covid-19 and insulin resistance is found, consideration should be given to assessing therapeutic interventions to reduce insulin sensitivity and improve outcomes on diabetic patients.

Keywords: Insulin, Insuline resistance, Diabetic patients, Covid-19



**THE STUDY OF DEFICIENCY OF VITAMIN B12, MAGNESIUM AND SOME
BIOCHEMICAL MARKERS IN PATIENTS WITH DIABETES MELLITUS**

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ABSTRACT

The goal of the present study is to identify the link between the deficiency in B12, magnesium deficiency, and several biochemical markers in diabetes mellitus people, testosterone changes, B12, and glucose in men with testosterone disorders. According to the results of the present study, it has been found that age is of great importance, as age increased, the incidence of diabetes increases. As for magnesium, it is significantly affected and had a link with diabetes, as well as vitamin B12. At the same time, there was a correlation between the diabetes test and changes in the lipid profile, but the most correlation was with total lipids. Adjustment for BMI at 45 years of age and average BMI significantly reduced the association between having a high body mass index (BMI) at age 25 and an increased risk of developing diabetes.

Keywords: Diabetes mellitus, Vitamin B12, Some biochemical, Magnesium, Biochemical



SELF-ASSEMBLING PEPTIDES IN ORAL AND MAXILLOFACIAL SURGERY

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ABSTRACT

Long-term studies have shown that there is an important connection between ‘biomaterials’ and biological materials [1]. Recently, studies have been carried out on different materials that mimic the production mechanisms in nature [2]. As a result of research, self-assembled artificial systems (e.g Peptides, nucleic acids) have been developed. The self-assembly mechanism is a bottom-up system, producing stable biological constructions. Among the self-assembly molecules, peptides are the most easily modified and functionalized structures. Application areas of self-assembly peptides include drug release and tissue engineering [2]. Especially tissue engineering is a very important and complex issue in Oral and Maxillofacial surgery [3]. In the literature review, it has been determined that self-assembly peptides are used especially in the field of hard tissue regeneration together with stem cells [4]. In this context, it has also started to be used as dental implant coatings. Self-assembly peptides with antimicrobial properties have been investigated in cases such as osteomyelitis. Another usage area of peptides in Oral and Maxillofacial Surgery is Nerve injuries. Peptides are being investigated not only in oral and maxillofacial surgery but also in other areas of dentistry. Considering all these studies, peptides are thought to be promising and clinically useful in dentistry.

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Keywords: Self-Assembling Peptides, Tissue Engineering, Dental implant, Maxillofacial defects, bone graft



**A MODIFICATION IN THE DETAILED BALANCE MODEL FOR QUANTUM DOT
NANOCRYSTAL SOLAR CELLS**

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ABSTRACT

The detailed balance model, developed by Shockley and Queisser [1], has been an important model in order to calculate an upper limit for the conversion efficiency of silicon p-n junction solar cells. The model has provided an important motivation to scientists studying energy and related topics in improving the conversion efficiency of solar cells. Recently, the model is also used in the calculation of conversion efficiencies for new-generation nanocrystal solar cells [2-4]. The original model was developed depending only on the band gap energy (E_g) of the electroactive material of solar cells, and hence, even if the active materials are different, if they have the same E_g , the conversion efficiency values become the same [5]. In this study, the original recombination current density expression has been modified for more realistic conversion efficiency calculations [6]. In the modified model, the recombination current density includes not only the E_g , but also various parameters such as effective mass and dielectric constant in the calculations via oscillator strength. Thus, more realistic efficiency values are obtained for different materials, even if they have the same E_g . The obtained results were compared with the experimental data like open circuit voltage, and it was observed that the results are in better agreement with experiments than the results of the original model.

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Keywords: Quantum dot solar cells, Shockley and Queisser limit, Detailed balance model, 3rd generation solar cells



**WHAT IS OSTEOMYELITIS OF THE JAW BONES? ITS HISTORY AND
CLASSIFICATION.**

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ABSTRACT

Osteomyelitis is defined as an infection of the bone. The treatment is difficult and the success rate is very low. Many patients use too many antibiotics and undergo multiple surgeries. Accurate identification of osteomyelitis is very important in the treatment phase. Revealing the microbiological origin with various tests and choosing the appropriate antibiotic directly affect the success of the treatment. Therefore, in this article, what osteomyelitis is, its history, causative factors and classification will be emphasized.

Keywords: Classification, Dentistry, Osteomyelitis



**THE STUDY RELATION OF ENDOTHELIN-1 AND MALONDIALDEHYDE WITH
CHRONIC KIDNEY DISEASE**

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ABSTRACT

Chronic kidney disease is a worldwide public health problem with an increasing incidence and prevalence. A cross-control study was carried out for the estimation of endothelin-1 and MDA and some parameters in patients with chronic renal disease. The number of patients under the study were 40 patients with chronic renal disease (under hemodialysis) their ages were between 20-75 years old. The study included 40 healthy control group who haven't any disease, with the same demographic properties. The study showed that the highest mean level of endothelin-1 and MDA were found in patients with chronic renal disease as respectively (102.6±15.1 pg/ml) and (12.03±3.94 nmol/ml). The lowest mean of the two markers was in the control group as respectively (39.03±5.94 pg/ml) and (7.56±2.25nmol/ml). The current study showed that the mean age of patients enrolled in the study was 51.7 years, the highest mean of endothelin-1 in HD patients was recorded within the age group > 50 years with hypertension (P<0.05). The study showed that the highest means level of B. urea, S. creatinine and Cystatin were found in patients with chronic renal disease (156.3±22.4, 7.22±2.91 mg/dl and 12.88±2.16 mg/dl) respectively, and the lowest means of the tests above were noted in the control group with highly significant relation (P. value <0.01). The study showed a positive correlation of ET-1 and MDA with B.urea, S. creatinine and cystatin c. The study showed a significant positive correlation of MDA with ET-1 in CKD patients (r: 0.57, P<0.01).

Keywords: Chronic kidney disease, Endothelin-1, Malondialdehyde.



**A SUCCESSFUL FALCIPARUM MALARIA TREATMENT WITH
HEMODIAFILTRATION IN AN AFRICAN PATIENT**

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ABSTRACT

Malaria is a serious infectious illness that has existed since ancient times. Despite its prevalence in sub-Saharan Africa, it remains a global public health issue. However, Plasmodium falciparum causes the most severe and fatal form of malaria, accounting for almost 80% of global mortality. Malarial acute kidney injury (AKI) caused by malaria can progress rapidly. An early initiation to renal replacement therapy is advised because AKI induced by malaria may worsen fast. This paper reports a successful severe malaria therapy with hemodiafiltration in the ICU of an African student studying in Türkiye. The patient, whose blurring of consciousness increased and Glasgow coma scale (GCS) decreased GCS=8, was admitted to the anesthesiology and reanimation ICU. The patient was treated for 3 days with malaria medications and continuous renal replacement therapy (CRRT). Malaria persists everywhere, especially among nonimmunized people. AKI is common in malaria patients. Patients with severe malaria should be examined for renal involvement, including electrolyte abnormalities and fluid overload. Supportive treatment is recommended for oliguric AKI. If feasible, CRRT may help these patients.

Keywords: Malaria, Plasmodium falciparum, AKI, Hemodiafiltration



NOTIONS OF MATCHING, COVERING, AND PACKING IN GRAPH THEORY

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the second chapter, König (1931) and Hall's (1935) theorems for bipartite graphs, and in the second section, Tutte's (1947) theorem related to matching in general graphs are proved. In the third section, the theorem of Erdős and Posa (1965) is expressed. In the fourth section, packing and covering concepts are discussed in terms of edges, and tree-packing (Nash and Williams 1961; Tutte 1961) and tree-covering (Nash and Williams 1964) theorems are proved as a result of the packing-covering theorem (Bowler and Carmesin 2015). In the fifth and final section, Dilworth's (1950) duality theorem for partial orders is proved as a result of Gallai and Milligram's (1960) path cover theorem for directed graphs. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Matching, Covering, Packing



RAMSEY THEORY FOR GRAPHS AND ESSENTIALS OF GRAPH COLORING

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the first chapter, the original theorem of Ramsey (1930) is proved and the related definitions and results are given; in the second section, definitions and results related to the equivalent of Ramsey numbers in graph theory are presented; in the third section, the statement of the induced Ramsey theorem is contented with; in the fourth and last section, the relationship between Ramsey features and connectedness is examined. In the first section of the second chapter, the five-color theorem is proved; in the second and third sections, the basic definitions and theorems of vertex coloring and edge coloring are presented, respectively. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the first two chapters of the thesis.

Keywords: Ramsey numbers, Induced Ramsey theorems, Map coloring, Vertex coloring, Edge coloring



BIOTRANSFORMATION OF SOME ANDROGENS BY ASPERGILLUS GLAUCUS

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ABSTRACT

Fungal steroid biotransformation has been an important process of preparing new steroid derivatives with potential pharmacological activities due to their high regio- and stereoselectivity [1].

Aspergillus is a very well-known fungal genus in terms of mycotoxins, pathogenicity, fundamental eukaryotic genetics and biotechnological exploration [2]. *Aspergillus* species are ubiquitous fungi found in soil, water, and decaying materials. Some *Aspergillus* species are known pathogens for humans and animals [3,4].

Aspergillus glaucus is a cosmopolitan fungi due to its physiological endurance under more extreme conditions. This fungus can be mildly pathogenic for humans [3,4].

In this work, three androgens, androstenedione, testosterone and dehydroepiandrosterone, were incubated with *A. glaucus* MRC 200914 for 5 days. Incubation of these androgens with *A. glaucus* mainly gave some hydroxylated metabolites. The metabolites were separated by column chromatography. Structure determinations of the metabolites were performed by comparing melting points, NMR and IR spectra of starting materials with those of metabolites.

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Keywords: Biotransformation, *Aspergillus*, Androstenedione, Testosterone, Dehydroepiandrosterone



**STUDY OF THIN-LAYER PEPINO DRYING WITH INFRARED AND
MICROWAVE METHODS AND COLOR ANALYSIS**

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ABSTRACT

Pepino is an exotic fruit that contains high vitamin C and is known to have many beneficial effects on health. In this study, thin layer drying and color changes of Pepino fruit by infrared (IR) and microwave (MW) methods were investigated. Effective moisture diffusions, activation energy, and drying rates were calculated from the drying data. Uniformly sliced Pepino fruit was processed without peeling. While IR drying processes were performed at 60, 70, and 80°C temperatures in 210, 165, and 120 minutes, respectively, MW drying processes were completed in 25, 16, and 6 minutes at 140, 210, and 350 W energy levels. While the initial average moisture content was 18.5702 kg water/kg dry, the lowest moisture content was determined as 0.3250 at 80°C in IR and 0.1263 water/kg dry matter×min at 350 W at MW. Effective moisture diffusions (D_{eff}) for IR were calculated between 6.69×10^{-10} - 1.23×10^{-9} m²/s, while for MW it was found between 8.75×10^{-9} - 3.75×10^{-8} m²/s. The activation energy (E_a) was 29.80 kJ/mol for IR and 33.30 kW/kg for MW. In addition, it was determined that color preservation was better in the IR method, and local burns were observed in the samples in the microwave method.

Keywords: Drying Rate, Activation Energy, Effective Moisture Diffusivity, Exotic Fruit, Solanum maritatum



**THE RELATION OF SERUM URIC ACID WITH A RISK MARKERS OF
CARDIOVASCULAR DISEASE PATIENTS**

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ABSTRACT

Purine metabolism terminates with the formation of uric acid as the last byproduct. The frequency of cardiovascular diseases linked to high levels of blood uric acid has recently increased (SUA). People with cardiovascular disease were studied to discover whether there was an association between their blood uric acid levels and a variety of biochemical indicators. A total of 150 individuals with thrombosis, ischemic heart disease (IHD), and cardiovascular disease (CVD) participated in the study. IHD and CVD patients with elevated uric acid, triglycerides, urea, and creatinine levels as well as normal HDL cholesterol levels. Blood tests revealed increased uric acid, glucose, cholesterol, triglycerides, urea, and creatinine in individuals with thromboembolism, but HDL values were lower in these patients. Hyperuricemia was shown to be linked to an increased risk of ischemic heart disease by logistic regression analysis (IHD). Thromboembolism and ischemic heart disease, for example, have been linked to hyperuricemia, and our findings support this conclusion.

Keywords: Uric acid, Troponin, D-Dimer, Cardiovascular disease, Ischemic heart disease, thrombolisim



NOTION OF FLOWS AND FLOW-COLOURING DUALITY IN GRAPH THEORY

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, a short introduction to the importance of the thesis topic and its meaning in life is presented. In the second chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the third chapter, basic definitions related to circulations are given; in the second section, the flows in the networks are studied, and the “max-flow min-cut” theorem is proved. In the third section, group-valued flows are introduced; in the fourth section, k -flows are studied for $k=2, 3$, and 4 values. The next section studies the surprising connection between flow and coloring; in the last section, Tutte's flow conjectures are discussed. In the fourth chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Circulations, Flows in networks, Flow-coloring duality



BIBLIOMETRIC ANALYSIS OF JOB ENGAGEMENT CONCEPT

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ABSTRACT

Positive organizational behavior is a discipline that aims to improve the behavior of individuals who make up the organization in favor of the organization. In line with this purpose, the necessity of finding the best solutions for changing and developing situations for both employees and organizations [1, 2] day by day is one of the reasons for the dynamic nature of the organizational behavior discipline. New concepts used in defining new situations appear as indispensable elements of organizational behavior discipline. The concept of “job engagement” is one of these concepts that has come to the fore recently due to its relationship with employee well-being and performance [3]. Within the scope of the research, bibliometric analysis of published studies (10.252 studies) containing the concept of “job engagement” between the years 2000-2022 in the Web of Science database was performed using VOSviewer software [4]. When the studies with the phrase “job engagement” in the keywords section are examined, the most used concepts are; work engagement, job satisfaction, burnout, engagement, employee engagement, well-being, job crafting and job resources.

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Keywords: Job Engagement, Positive Organizational Behavior, Employee Engagement, Bibliometric Analysis, Engagement.



**IN VITRO EFFECTS OF CLINDAMYCIN ANTIBIOTIC ON GLUCOSE-6-
PHOSPHATE DEHYDROGENASE ENZYME PURIFIED FROM SHEEP SPLEEN
TISSUE**

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ABSTRACT

In our study, the in vitro effects of clindamycin antibiotic on glucose-6-phosphate dehydrogenase enzyme (G6PD; E.C. 1.1.1.49) purified from sheep spleen tissue were investigated. Firstly, G6PD enzyme was partially purified from sheep spleen tissue by ammonium sulfate precipitation. The enzyme sample obtained as a result of ammonium sulfate precipitation was purified by 2', 5' ADP-Sepharose 4B gel affinity chromatography and the purity of the enzyme was controlled by sodium dodecylsulfate polyacrylamide gel electrophoresis (SDS-PAGE). Then, the effects of clindamycin antibiotic on enzyme activity were investigated. The IC₅₀ value was calculated as 28.75 mM by plotting the % Activity-[I] graph for the clindamycin antibiotic, which showed an inhibitory effect on the enzyme activity. In addition, in order to determine the K_i constant and inhibition type, preliminary experiments were carried out to determine the most suitable five different substrate concentrations and Lineweaver-Burk graphs were drawn by making measurements for each substrate concentration with the three most appropriate inhibitor concentrations. With the help of graphic, the K_i constant of the clindamycin antibiotic was determined as 41.64±11.89 mM and the inhibition type was determined competitively.

Keywords: Glucose 6-phosphate dehydrogenase, Clindamycin, Inhibition



**A PROSPECTIVE SOLUTION TO VOLTAGE CONTROL OF MAGNETIZATION
IN A BILAYER SYSTEMS**

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ABSTRACT

Modern spintronics has become increasingly important because of its potential impact on memory technologies and magnetic sensors [1-3]. Traditionally, the function of these devices is based on the magnetic-field induced magnetization switching. In nanostructures, however, this physical mechanism is not efficient enough to control the magnetic bits due to the large current. The current-induced (or spin-transfer driven) switching mode is considered to be more efficient; however, two main facts still remain challenging for applications in information storage technologies. Firstly, all metal spintronic devices have low resistances; secondly, the critical current density to move domain walls is still too high for the reduction of the power consumption. In order to tackle these difficulties, electrical field control of the magnetization is a prospective solution [4].

Here, to overcome this problem we propose that sample system which consist of antiferromagnetic (AFM)/ferromagnetic (FM) bilayers grown onto single crystals ferroelectric substrate. After magnetic field-cooling (FC) along the in-plane directions of ferroelectric substrate and upon allowing the system to relax through consecutive hysteresis loops (training effect) [5], the exchange bias field (H_{EB}) [6] was examined under the action of voltage (out-of-plane poling). Depending on the applied voltage (magnitude and sign), H_{EB} can either increase or decrease with respect to its value at 0 V. The relative variations of H_{EB} were observed at different values after FC along the [01-1] and [100] directions, respectively. These results stem from strain-mediated magnetoelectric coupling [7]. The applied electric field causes changes in the coercivity and the squareness ratio of the films, suggesting a reorientation of the effective magnetic easy axis in FM layer. However, larger H_{EB} values are observed when the squareness ratio is lower. It is claimed that the effect of voltage is equivalent to an in-plane component of an applied magnetic field oriented perpendicular to the cooling field direction.

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Keywords: Voltage Control of Magnetism, Exchange Bias, AF/FM Bilayer, Ferroelectric Substrate, Training Effect



**THE EFFECT OF MATERIAL PREFERENCE ON ENGINE PERFORMANCE IN
OTTO CYCLE ENGINE**

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ABSTRACT

Internal combustion engines are used in the automotive industry, construction, agriculture and energy sectors. These internal combustion engines have been in development for over 150 years. However, the thermodynamic cycles of internal combustion engines are among the main topics of thermodynamics textbooks. In this study, Otto cycle, which is the thermodynamic equivalent of spark ignition engines, has been analyzed from a different perspective. For the Otto cycle, the performance evaluation was made by using the melting points of various materials as the maximum temperature value. Thus, the effect of material selection on specific net work and mean effective pressure for an Otto cycle engine was investigated. It has also been shown that the optimum compression ratio of the engine can be determined depending on the material selection. It is foreseen that the results obtained in this study are guiding especially for engine designers.

Keywords: Otto cycle engine, Engine material, Performance



**BIOCHEMICAL AND IMMUNOLOGICAL STUDY IN IRAQI PATIENTS WITH
BRAIN TUMOR**

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ABSTRACT

From November 2021 to February 2022, researchers at Al-Hussein Hospital in Karbala, Iraq, will investigate the prevalence of bacteremia and immunological markers in patients with brain tumors. 50 patients with brain tumors (27 males, 23 females) and 30 healthy people as controls. Both patients and controls had blood drawn. Blood urea, creatinine, alkaline phosphate, and CKBB were measured by Fujifilm, and interleukin-12 (IL-12) by ELISA. The findings indicated that the most vulnerable age group was 1-10 year olds, with a 26% infection rate compared to other age groups. The average urea level in patients was 29.74 mg/dl compared to 28.21 mg/dl in healthy controls, indicating no significant difference between the two groups, unlike creatinine, which was higher in patients 0.6 mg/dl compared to 0.4 mg/dl in their parents, with a p 0.01 significant difference. Also, the level of Alkaline Phosphatase (188.22 U/L) was not substantially different from the healthy (187.76 U/L), nor was the level of CK-BB (p>0.005). Interleukin-12 levels in patients are lower than in healthy controls

Keywords: Brain, Biochemical alterations, CK-BB, Alkaline phosphatase, IL-12



**EVALUATION OF SERUM OSTEOPONTIN (OPN) LEVELS IN PATIENTS WITH
ISCHEMIC HEART DISEASE**

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ABSTRACT

Ischemic heart disease affects the heart as a result of narrowing of the arteries, resulting in less oxygen and blood reaching the heart muscle. In this study, age was used and the reason is that there is a clear relationship between age and IHD, which is that the older a person gets, the higher the risk of IHD. There is also a close association between diabetes and cardiovascular disease, which is the most common cause of death, so glucose and HbA1C were tested in this study. An increase in the percentage of fats above the normal level (cholesterol, LDL, VLDL and triglycerides), and any abnormal increase in these percentages leads to an increased risk of developing IHD, and there is a role of HDL (which is less than the normal limit in these cases) in this morbidity. May lead to more serious health problems. Excess fat in the circulatory system leads to blockage of blood vessels, especially in the coronary arteries, high blood pressure, and ischemic heart disease, leading to a heart attack. The serum level of hs-CRP was measured in people with IHD by ELISA. High serum levels of hs-CRP correlate with the risk of IHD. We found an association of Osteopontin (OPN) with biochemical variables. Also, there was a positive correlation between OPN with age, height, BMI and FBS. OPN, FBS, BMI, and HbA1c all have a favorable connection.

Keywords: Osteopontin, Ischemic heart disease, Lipid profile.



**GREEN AND SUSTAINABLE CELLULAR STATION BASED ON MPPT FOR
PHOTOVOLTAIC ENERGY**

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ABSTRACT

The increasing prevalence of cellular networks around the world has brought two issues to the fore: the energy cost of operating these networks and the associated environmental impact. The goal of the analysis and simulation in this paper is to develop robust management strategies, and study, and simulate solar energy management systems. We can achieve the backup mode operations of two energy-providing sources since the power sources are hybrid. It is necessary to use a renewable energy source and convert this energy into electrical energy due to the scarcity, inadequacy, and availability of electrical power in some locations so that we can have energy continually with the fewest interruptions and failures. The goal of the project is to design and implement an optimal, effective, and robust control by maximizing the solar modules' maximum power point tracking (MPPT). This will allow us to get the most power out of the solar modules under a variety of load conditions despite variations in turbulence, temperature uncertainty, and other factors. We will make sure that the upgraded MPPT algorithm efficiently transfers the electricity to the solar cell's load

Keywords: PV System, MPPT, Fuzzy, Photocell



**PREPARATION, MORPHOLOGICAL AND ELECTROCHEMICAL
CHARACTERIZATIONS OF POLY(AZURE A)-DEEP EUTECTIC
SOLVENT/GOLD NANOPARTICLE MODIFIED SCREEN-PRINTED CARBON
ELECTRODE**

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ABSTRACT

Azur A (AA) has an aromatic ring structure and is functional π -conjugated organic material that can exhibit excellent electrochemical properties. Poly(Azur A) modified electrodes have an excellent catalytic effect, high stability and electronic conductivity. The use π -conjugated polymers and nanoparticles (AuNP etc.) together creates a synergistic effect and increases the performance criteria of sensors and biosensors [1]. In this study, screen-printed carbon electrodes (SPCEs) were modified with poly (azur A)-deep eutectic solvent (PAA_{DES}) and gold nanoparticles (AuNP) for use as disposable electrochemical sensors, followed by morphological and electrochemical characterizations. First, electropolymerization of AA was performed on the working electrode (WE) of SPCEs. AA was prepared in DES ethalin (ethylene glycol: choline chloride 1:2) solution in 50 mM pH 8.0 phosphate buffer (PBS) in 0.1 M KCl and 0.1 M KNO₃. Electropolymerization of 1 mM AA in 90% DES etalin solution and 10% PBS (-0.8 V to +1.0 V, 100 mV.s⁻¹, 30 cycles) was applied by the cyclic voltammetry (CV) method. Then, AuNP was deposited on the WE of SPCE/PAA_{DES} by CV method (-1.3 V to -0.2 V, 50 mV.s⁻¹, 10 cycles). The preparation steps of the electrode are shown in Figure 1. The morphological characterizations of the modified SPCEs were carried out by scanning electron microscope (SEM), and electrochemical characterizations were applied by CV, differential puls voltammetry (DPV) and electrochemical impedans spectroscopy (EIS) techniques in 5 mM K₃Fe(CN)₆/K₄Fe(CN)₆ (1 M KCl) solution. It was concluded that PAA_{DES} and AuNP showed a synergistic effect and increased electronic conductivity. The SPCE/PAA_{DES}/AuNP electrode can be used sensors and biosensors as transducer.

Acknowledgements: This work was supported by the Scientific Research Projects Coordinator of Çankırı Karatekin University (BAP) (Grant No: EY0211221D07).

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Keywords: Screen printed electrode, Deep eutectic solvents, Poly(azur A), Gold nanoparticles



**PATHOLOGICAL FRACTURE OF THE MANDIBLE DUE TO ACTINOMYCOSIS
OSTEOMYELITIS: CASE REPORT**

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ABSTRACT

Actinomycosis is a specific and chronic infection caused by gram-positive anaerobic bacteria. While the cervicofacial form has the highest prevalence, it can also be seen in thorax, abdominal and genital region. In this case we reported a pathological fracture caused by actinomyces osteomyelitis. 68 years-old male patient referred to our clinic with pain on left mandibular angle. Patient is with a diagnosis of a fracture due to actinomycosis infection after the clinical, radiologic and microbiologic examinations. Patient is treated with a diagnosis of a fracture due to actinomycosis infection after the clinical, radiologic and microbiologic examinations. After the treatment, patient recovered and new bone formation at the fracture line were observed.

Keywords: Actinomycosis, Osteomyelitis, Fracture, Mandible



**INVESTIGATION OF MG+2 ION BEHAVIOR IN COLEMANITE PROPIONIC
ACID SOLUTIONS**

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ABSTRACT

Colemanite ore, one of the most commercially important boron minerals, is used in industry to produce various boron compounds due to its rich B₂O₃ content. Türkiye's most important commercially extracted boron ores are colemanite, tincal and ulexite as the second ore. In our country, various boraxes are produced by dissolving boric acid from colemanite by the sulfuric acid process and tincalin is dissolved in hot water, and ulexite is concentrated and exported. The main problem in the production of boric acid by the sulfuric acid process is impurities. One of the impurities is Mg⁺² ions that pass into the solution and it is important to examine the kinetics of this ion in the solution. In this study, the dissolution of colemanite ore in propionic acid solution in an aqueous medium in a batch reactor under atmospheric pressure was investigated. As dissolution parameters; colemanite particle size (D) 100 150, 150-250, 250-400*, 400-600 µm and solid/liquid ratio (K/S) 20 40*-60-80 g/L. As a result of the experiments, the time-dependent variation of the Mg⁺² concentration in the solution was observed.

Keywords: Colemanite, Propionic acid, Mg+2 impurity, Dissolution



**EVALUATION OF THE PERFORMANCE OF REDUCED GRAPHENE OXIDE
SAMPLES SYNTHESIZED USING HUMMERS AND CHEMICAL REDUCTION
METHOD USING DIFFERENT PURITY GRAPHITE ON CEMENT MORTAR**

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ABSTRACT

In this study, 85% Nanokar, 99% Nanokar, and 99.9% Merck's different purity of graphite are used with the hummer's method and chemical reduction method to synthesize reduced graphene oxide. It is aimed to evaluate the performance of synthesized reduced graphene oxide samples by using them in cement mortar. To determine the performance of reduced graphene oxide samples on hardened concrete, 7- and 28-day Thermal Conductivity and Heat Capacity measurements and 28-day electrical resistance and compressive strength measurements are taken. A reference experiment which was reduced graphene oxide not used in this experiment was performed to determine the recovery rates in the measurements. The recovery rates for 7- and 28-day Thermal Conductivity measurements were obtained at 34,63% and 52,63%, respectively by using a reduced graphene oxide sample coded rGO3 synthesized with 99,99% Merck graphite. The recovery rates were found to be 57.10% and 47.59% for 7- and 28-day heat capacity measurements, respectively, and were obtained by using a reduced graphene oxide sample coded rGO3 synthesized with graphite 99.99% Merck. The electrical resistance and compressive strength recovery rates were found to be 15.58% and 35.03%, respectively, and were obtained by using a reduced graphene oxide sample coded rGO1 synthesized with 85% Nanokar graphite. The experimental results showed that the performance of the reduced graphene oxide sample synthesized with low-purity domestic origin graphite, especially on thermal conductivity and heat capacity, was close to the reduced graphene oxide sample synthesized using high-purity foreign origin graphite. When this is evaluated in terms of costs and production on a large scale, getting great importance.

Keywords: Thermal conductivity, Chemical reduction method, Heat Capacity, Reduced graphene oxide, Cement mortar



**THE CORRELATION OF FGF23 LEVEL WITH PARATHYROID HORMONE
LEVEL AT DIFFERENT STAGES OF CHRONIC KIDNEY DISEASE**

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ABSTRACT

The aim of current study was determining the levels of FGF-23 in patients at different stage of chronic kidney disease, and found the correlation between FGF23 level and some electrolytes and PTH hormone. The current study is a case (patient chronic renal failure) - control (healthy persons) study Chronic renal disease patients of both genders (65 males and 44 females) aged 20 to 71 years' old who visit Azadi Teaching Hospital and Al-jumhuri Hospital in Kirkuk, Iraq (from October to December 2020), are the target population. Per patient with end-stage renal disease received hemodialysis twice or three times a week for a total of four hours. The results of the current study demonstrated that the highest age group with renal failure was 51-60 years, where it was 26.2%. Then, the age group was 61-70, as it was 22.1%, while the lowest age group of patients of renal failure was 31-40, where it was 5.4%. The results of the current study showed that the percentage of healthy people in the current study was 40 (26.8%), while the number of patients with kidney failure was 83 (55.7%), while other stages of kidney disease were reported, the third stage included 9 (6%) patients while. The fourth stage included 17 (11.4%) patients. Calcium levels in CDK (male and female) patients showed significant ($P \leq 0.05$) decrease compare with control group. Phosphorus, FGF-23 and PTH levels in CDK (male and female) patients were showed significant ($P \leq 0.05$) increase compare with control group.

Keywords: Fibroblast growth factor 23, Chronic kidney disease, Hyperphosphatemia.



**STUDY OF THE ASSOCIATION OF GENES AND PROTEINS OF RESISTANCE TO
MULTIPLE DRUGS WITH MOLECULAR MARKERS IN PATIENTS WITH
ACUTE LEUKAEMIA**

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ABSTRACT

The study of thesis the association of genes and proteins of resistance compilations of evidence obtained in this study are patients with AL (n=75) who did not go into remission (n=56/75) after induction chemotherapy had a higher median age than patients who went into remission (n=19/75); the median survival of patients with AML, B-ALL and T-ALL were three months, 25 months and five months, respectively; the median survival of APL patients (n=19) was greater than 60 months; FMS3-DIT (5.8%) and LACTATE DEHYDROGENASE3-D835 (8.4%) mutations were rare; the JAK2V617F mutation was not detected in any patient; only six subjects expressed survivin (9.4%); the expression profile of MDR genes and proteins in AL patients was heterogeneous. In cases of AL, ABCB1 expression and LDH activity were positively correlated, the presence of the CD34 marker was associated with the highest transcription of abcc1, and the highest transcription of lrp was associated with the absence of the marker CD56 and with the absence of survivin transcription, In AML carriers (n=28/75), abcc1 transcription and patient age were positively correlated, and the absence of survivin transcription was associated with higher lrp transcription and in patients diagnosed with APL (n=19/75), abcc1 and LRP expressions were positively correlated with the percentage of leukemic promyelocytes at diagnosis, and ABCC1 expression was positively correlated with LDH activity and in ALL-B cases (n=19/75), ABCB1 and abcc1 expressions correlated positively with LDH activity, ABCC1 expression was negatively correlated with leukocyte count at diagnosis, and LRP expression was positively correlated with the number of leukocytes at diagnosis and was associated with the presence of TL-2.2.

In T-ALL cases (n=7/75), abcb1 transcription and leukocyte count were positively correlated; higher LRP expression was associated with the diagnosis of AML, Patients diagnosed with AL and AML who did not go into remission after induction therapy expressed more abcb1 than those who showed complete remission after induction chemotherapy.

These results suggest that the expression of abcb1/ABCB1, abcc1/ABCC1 and lrp/LRP is related to prognostic factors, such as age, leukometry at diagnosis, percentage of neoplastic blasts, LDH, presence of CD34 marker and TL-2.2, in cases of AL and that the high expression of abcb1 and ABCC1 influences the response to induction therapy in patients diagnosed with AML. Furthermore, it could be seen that the analysis of the transcription of chemotherapy resistance genes provides different prognostic information than the analysis of chemotherapy resistance proteins. Therefore, the present study recommends that, at the time of diagnosis of patients with AL, a simultaneous assessment of the transcription of genes (abcb1, abcc1 and lrp) and proteins (ABCB1, ABCC1 and LRP) of resistance to chemotherapy be performed.

Keywords: Genes and proteins of resistance, Multiple drugs, Molecular markers, Acute leukaemia.



SYNTHESIS, CHARACTERIZATION AND ANTIOXIDANT ACTIVITY OF N1-(5-CHLORO-2-OXOINDOLINE-3-YLIDENE) THIOCARBOHYDRAZONE SCHIFF BASES

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ABSTRACT

In this study seven new Schiff bases were prepared from monothiocarbohydrazones and 5-chloro isatin. The monothiocarbohydrazones were synthesized in the presence of ethanol under reflux with the reaction thiocarbohydrazide and substituted aldehydes. The reaction of synthesized benzothiocarbohydrazone, 4-hydroxy benzothiocarbohydrazone, 3-ethoxy-4-hydroxyl benzothiocarbohydrazone, 3,5-dimethoxy-4-hydroxyl benzothiocarbohydrazone and 4-N, N, dimethyl benzothiocarbohydrazone with 5-chloro isatin in acidic medium under reflux with N1- (5-Chloro-2-oxoindolin-3-ylidene) Schiff bases were obtained. The chemical structures of the products were confirmed by ¹H-NMR, ¹³C-NMR, IR and elemental analysis. Physicochemical properties such as melting point, color and solubility were determined. In vitro antioxidant activity of all compounds was determined by 1,1-Diphenyl-2-Picryl Hydrazyl (DPPH) free radical scavenging method. Antioxidant activities of molecules and standard used Gallic Acid> 3,5-dimethoxy-4-hydroxyl benzothiocarbohydrazone> 3-ethoxy-4-hydroxyl benzothiocarbohydrazone> 4-hydroxy benzothiocarbohydrazone> Benzothiocarbohydrazone> N1- (5-Chloro-2-oxoindolin-3-ylidene)) 4-N, N, dimethyl benzothiocarbohydrazone> N1- (5-Chloro-2-oxoindolin-3-ylidene) 3, ethoxy-4-hydroxyl benzothiocarbohydrazone> 4-N, N, dimethyl benzothiocarbohydrazone> N1- (5-Chloro-) 2-oxoindolin-3-ylidene) 3,5-dimethoxy-4-hydroxyl benzothiocarbohydrazone> N1- (5-Chloro-2-oxoindolin-3-ylidene) 4, hydroxy benzothiocarbohydrazone> N1- (5-Chloro-2-oxoindoline- 3-ylidene) benzothiocarbohydrazone.

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Keywords: N1- (5-Chloro-2-Oxindolin-3-Ylidene) Thiocarbohydrazone, Antioxidant Activity, DPPH method, NMR spectroscopy.



**THE EFFECT OF THICKNESS ON THE MORPHOLOGICAL AND OPTICAL
PROPERTIES OF ZNSE THIN FILMS**

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ABSTRACT

With the expansion of electronics and digital industries and their penetration into all areas of our lives, the production and development of high-precision, reliable, integrated, low-noise and low-power electrical components has become a very important consideration. However, when the relationships between the structure, properties and processing of materials are fully understood and assimilated, we can make the raw materials that nature gives us more available, and as scientists develop them, we can transform them into superior technologies. Today, the rapid change that occurs with the acceleration of research and studies in thin film materials creates new opportunities for the development of new processes, materials, and technologies. Therefore, many experiments and model systems have been developed to improve the previously known properties of basic physical and chemical properties related to thin film performance and structure in various applications and to increase progress in this field. A prerequisite for the development of new thin-film systems is the combined results of experimental and theoretical investigations and shaping their structure and performance. In this sense, the characteristics of thin-film materials and their control and optimization are of great importance. One of the most important features affecting these features is the producing method. There are chemical solution-based methods such as sol-gel method, chemical bathing technique, hydrothermal method, SILAR method and spraying method. In this study, Cadmium Selenide (ZnSe) thin films were grown on glass substrate using succession ionic layer adsorption and reaction (SILAR) method. Morphological and optical properties of ZnSe thin films grown at different thicknesses (40 and 50 cycle) are given comparatively.

Keywords: SILAR method, Thin films, Zinc Selenide



**THE RELATIONSHIP BETWEEN LIPID PROFILE AND DIABETES MELLITUS
TYPE 2 IN THE CENTER OF BAGHDAD / AL-RUSAFA**

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ABSTRACT

Type 2 diabetes patients aged 35-60 years and healthy control subjects were compared in a biochemical investigation to determine the glucose, HbA1c, and total lipid levels (HDL-LDL-VLDL-TG-Chol.) in the afflicted group compared to the control group. According to the findings, the number of infected individuals had higher glucose and HbA1c levels than those in the control group, and their cholesterol and other bad fats (such as LDL) and low-density lipoprotein cholesterol (VLDL) levels were higher than those in the control group, all at a probability level of 0.05. They also found that HDL cholesterol (a good fat) decreased significantly at the probability level of 0.05 in those infected individuals.

Keywords: Diabetes mellitus, HbA1c, Lipid profile, Glucose, LDL



3D PRINTING IN DENTISTRY

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ABSTRACT

The association of science in engineering with medicine has opened new doors for modernist healthcare. Thanks to technological developments, 3-dimensional (3D) visualization and printing technology have been widely used in the field of health (3). First introduced by Charles Hull in 1983, 3D printing technology is an object manufacturing method made by combining or depositing materials such as plastic, metal, ceramic, powder, liquid and even living cells in layers. Basically, three different printing technologies are used in the medical field: Stereolithography (SLA), Selective Laser Sintering (SLS) and Fused Deposition Modeling (FDM) (1, 2). 3D printing technology is used in various fields of dentistry. In particular, 3D anatomical printing models are widely used in anatomy and surgery education. In addition to education in dentistry, 3D printed models are used in different areas such as oral and maxillofacial surgery, patient-specific implant and prosthesis design, medical modeling, fabrication of surgical guides, digital orthodontics, orthognathic surgery, restorative dentistry and endodontics (2, 3). 3D printing is becoming digital dentistry by widely penetrating facilities in diagnosis, treatment and education. The quickened researches in this industry would open more gates to aid revolutionize digital dentistry (1).

Keywords: 3D printing, Dentistry



**A COMPARISON STUDY ON FIVE ESTIMATION METHODS FOR POWER
SHANKER DISTRIBUTION**

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ABSTRACT

Power Shanker distribution is suggested by Shanker and Shukla [1]. Shanker and Shukla [1] discussed some distributional properties of the Power Shanker distribution. However, there is no comparison study regarding the another estimators of the parameter of the Power Shanker distribution in the literature. Therefore, we provide a new expansion for point estimation of the Power Shanker distribution in this study. This study presents five different methods of estimation, such as maximum likelihood, least-squares, weighted least-squares, Anderson-Darling, and Crámer–von-Mises methods to estimate the parameters of the Power Shanker distribution. It is compared the performances of these estimators via a extensive Monte Carlo simulation study. In the simulation study, 5000 repetitions have taken at different sample sizes and parameter settings. We compute average bias and mean square error (MSE) of the parameters of the Power Shanker distribution. It is seen that the average bias and MSE decrease when the sample sizes increase as expected according to the simulation results. Thus, it can be concluded that the estimators provide the procedures of the estimation.

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[1] Shanker, R., Shukla, K. K. (2017). Power Shanker distribution and its Application. Türkiye Klinikleri Biyoistatistik, 9(3), 175-187.

Keywords: Shanker distribution, Power Shanker distribution, Point Estimation, Monte Carlo simulation



**IDENTIFICATION OF NADPH OXIDASE, COX-2, AND SOME BIOMARKERS IN
RENAL FAULIR**

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ABSTRACT

Renal failure is increasingly being related to oxidative stress. For example, uremic patients have a lower antioxidant defense maximal range, which has been linked to oxidative stress (the generation of excessive reactive oxygen species (ROS)). The kidneys produce NADPH, a superoxide anion and a type of ROS. In renal failure patients, an increase in NADPH production adds to the development of renal damage. COX-2 is an enzyme that controls the flow of blood through the kidneys. When COX-2 inhibitors are used, kidney damage might occur, and renal blood flow can be negatively affected. This can then lead to the production of kidney failure. In this study, 60 samples of renal failure patients and 30 samples of healthy subjects of both genders, aged 15-25 years, were collected over four months. The assays were performed on NADPH Oxidase, COX-2, and other biomarkers (kidney functions, glucose, lipid profile, electrolyte (Na^+ , K^+ , Cl^- , Ca^{2+})). As a result, we can confirm that the chemical evaluations revealed that the concentration of Serum COX-2 and NADPH can predict renal impairment. The results show rapid rise in serum levels of COX-2, NADPH in outpatients and inpatients with renal failure compared to control ($p > 0.05$). This investigation found that the increase in concentrations of both COX-2 and NADPH in the patient group was indicative of renal failure.

Keywords: Renal failure, COX-2, NADPH OXIDASE, Kidney functions, Lipid profile, glucose, Trace elements



**EVALUATE ELECTROLYTE BALANCE AND RENAL FUNCTION IN END-STAGE
RENAL FAILURE PATIENTS WITH HEMODIALYSIS**

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ABSTRACT

Chronic kidney disease (CKD) has become a global epidemic with an estimated prevalence of 14% in the United States and 5-15% throughout the world. As the kidneys play a central role in the regulation of body fluids, electrolytes, and acid-base balance, CKD and ESRD predictably result in multiple derangements including hyperkalemia, metabolic acidosis, and hyperphosphatemia which, in turn, lead to serious complications including muscle wasting, bone-mineral disorder, vascular calcification, and mortality. The current study aims to evaluate some biochemistry parameters in hemodialysis patients, these parameters are selected to investigate the renal function in end-stage of renal failure via (urea, and creatinine). In addition, electrolyte balance in end-stage of renal failure via (Na, K, Cl, Mg, Phosphorus, Bicarbonate, and Ca). To arrive at the current goal, Bias control studies are performed on 50 subjects (25 Males and 25 Women) of Iraqi patients with CKD at the age range (of 20 - 68 years) in Baquba teaching hospital in Ibn Sina Center for Dialysis and 50 healthy subjects as control (25 Males and 25 Women). All in all, through this study, good indicators for detecting this disease will be determined.

Keywords: Electrolyte balance, Renal Failure, End-stage, Hemodialysis, Bicarb



**PREPARATION, MORPHOLOGIC AND ELECTROCHEMICAL
CHARACTERIZATION OF TiO₂NP-AU NP-POLY (NILE BLUE)/DEEP EUTECTIC
SOLVENT MODIFIED SPCE**

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ABSTRACT

In recent years, metal nanoparticles with extraordinary conductivity, large surface-to-volume ratio, and biocompatibility have been widely used to develop new electrochemical sensing platforms and improve their performance¹. The use of redox polymers such as poly(Nile blue) (PNB), and nanoparticles together create a synergistic effect and increase the performance of the sensor². In this study, screen-printed carbon electrodes (SPCEs) were modified with titanium (IV) oxide nanoparticles (TiO₂NP), gold nanoparticles (AuNP) and PNB-deep eutectic solvent (PNB_{DES}) and, for use as disposable electrochemical sensors, followed by morphological and electrochemical characterizations. A layer-by-layer method was applied for the modification of TiO₂NP on the working electrode (WE) of SPCE. AuNP was deposited on the WE of SPCE/ TiO₂NP by cyclic voltammetry (CV) method (-1.3 V to -0.2 V, 50 mV.s⁻¹, 10 cycles). 1 mM Nile blue was prepared in 50 mM pH 6 PBS and deep eutectic solvent DES (1:9 ratio). PNB films were electropolymerized on the SPCE/TiO₂NP/AuNP electrode by 15 cycling potential, in the potential range from -0.6 to +1.2 V at a scan rate of 50 mV s⁻¹. The preparation stage of the SPCE/TiO₂NP/AuNP/PNB_{DES} sensor is given in Figure 1. Morphological characterizations of the SPCE/TiO₂NP/AuNP sensor were performed with Scanning Electron Microscopy (SEM) and electrochemical characterizations were carried out with CV, differential pulse voltammetry (DPV) and electrochemical impedance spectroscopy (EIS) techniques in 5 mM K₃Fe(CN)₆/K₄Fe(CN)₆ (1 M KCl) solution. The charge transfer between TiO₂NP and AuNP, and the synergistic effect between PNB and nanoparticles were observed, therefore it was concluded that it increased electronic conductivity. The SPCE/TiO₂NP/AuNP/PNB_{DES} electrode can be used to detect electroactive substances.

Keywords: Titanium dioxide nanoparticles, Poly(Nile blue), Gold nanoparticles, Deep eutectic solvents, Screen-printed carbon electrode



**PREPARATION, MORPHOLOGIC AND ELECTROCHEMICAL
CHARACTERIZATION OF POLY (METHYLENE BLUE)-DEEP EUTECTIC
SOLVENT / ZnONR-AuNP MODIFIED SPCE**

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ABSTRACT

Methylene blue (MB) is a cationic phenazine dye that is also a good redox mediator. The presence of electron-rich sulfur and nitrogen atoms in the MB structure enables it to dissolve in water [1]. In this study, screen-printed carbon electrodes (SPCEs) were modified with zinc oxide nanorod (ZnONR), poly (methylene blue)-deep eutectic solvent (PMB_{DES}) and gold nanoparticles (AuNP) for use as disposable electrochemical sensors, followed by morphological and electrochemical characterizations. Firstly, zinc oxide nanorods (-1.0 V, 60°, 80 rpm, 2400 sec, closed system) were modified on the working electrode (WE) of SPCEs by the amperometric method. Electropolymerization of MB was performed on the SPCE/ZnONR electrode. To this firstly, the solution of DES ethalin (ethylene glycol: choline chloride 1:2) and 50 mM pH 8.0 phosphate buffer (PBS), in 0.1 M KCl and 0.1 M KNO₃, was prepared. Then, the solution of 1 mM MB was prepared blue in 90% DES ethalin and 10% PBS and, was electrochemically polymerized by the cyclic voltammetry (CV) method (-0.6 V to +1.0 V, 100 mV.s⁻¹, 30 cycles). Finally, AuNP was deposited on the WE of SPCE/ZnONR/PMB_{DES} by CV method (-1.3 V to -0.2 V, 50 mV.s⁻¹, 10 cycles). The morphological characterizations of the modified SPCEs were carried out by scanning electron microscope (SEM), and electrochemical characterizations were applied by CV, differential pulse voltammetry (DPV) and electrochemical impedance spectroscopy (EIS) techniques in 5 mM K₃Fe(CN)₆/K₄Fe(CN)₆ (1 M KCl) solution. It was concluded that ZnONR, PMB_{DES}, and AuNP showed a synergistic effect and increased electronic conductivity. The SPCE/ZnONR/PMB_{DES}/AuNP electrode can be used to detect electroactive substances such as serotonin, dopamine, ascorbic acid, nicotinamide adenine dinucleotide, and uric acid.

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Keywords: ZnO-nanorod, Deep eutectic solvents, Methylene blue, Gold nanoparticles, Screen-printed carbon electrode



REGENERATIVE LOAD GAIN WITH BRAKING SYSTEMS IN ELEVATORS

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ABSTRACT

The basic methods of measuring energy consumption and labeling efficiency in elevator systems are explained in ISO standards. With the guide published by the German Engineers Association in 2009, the annual energy consumption of existing and newly commissioned elevators can be calculated and compared. Thus, the elevator energy efficiency class and usage category can be determined. In addition, the ISO standard for measuring and evaluating the energy performance of elevators has been published. The VDI guide has been prepared in relation to the energy efficiency of elevators. The purpose of this guide is to evaluate and classify the energy consumption of elevators according to a standard criterion. This guide is mainly planned for the energy efficiency classification of newly installed passenger and freight elevators, and is also used for determining the energy efficiency of existing elevators, objectively examining the energy consumption values given by the manufacturers, and estimating their energy consumption. The "energy efficiency class of elevator systems", which is determined by the results obtained using the methods foreseen in the guide, is registered with a document by the notified body. Studies will be carried out within the scope of the standards specified in this master's thesis.

Keywords: Regenerative, ISO, Energy efficiency



**ISCHEMIA MODIFIED ALBUMIN A POTENT BIOCHEMICAL MARKERS AS
HIGH SENSITIVE TROPONIN IN ACUTE MYOCARDIAL INFARCTION**

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ABSTRACT

Acute myocardial infarction (AMI) is a common sign of coronary heart disease. AMI is a form of myocardial ischemia necrosis caused by coronary artery blockage. AMI can cause chronic post-sternal discomfort, shock, arrhythmia, and death. Cardiac troponin (cTn) is the preferred AMI biomarker. This is a case-control included 80 patients (52 men and 28 women) with AMI at the Cardiac Care Unit (CCU) in Al-hussein Medical City, 20 healthy volunteers (12 men and 8 women) without CHD. Data of IMA test value from AMI and control group was used to calculate the ROC curve with an Area Under the Curve:0.767 (95% of CI, 0.673--0.860). There was a big difference in the median serum concentration of Ischemic modified albumin Troponin high-sensitive among the control and patient groups. Accordingly, the selected diagnostic cut-off was > 60 ng/ml analyzed for their clinical sensitivity (76.45%), specificity (81.88%), positive predictive value (88.33 ng/ml), and negative predictive value (33.33 ng/ml), as well as there was a positive correlation between serum concentration of IMA and hs-cTn. In conclusion: IMA is considered a potent marker for early diagnosis of AMI and a distinguishable test between ischemic and non-ischemic chest pain, as well as having high sensitivity and specific cut-off value, making it able to compare with hs-cTn in the identification of AMI.

Keywords: Keywords: Acute myocardial infarction, Ischemia modified albumin, Troponin



**COMPARED HUMAN HEART-TYPE FATTY ACID-BINDING PROTEIN WITH
CTNI, CKMB, AND MYOGLOBIN AND ROLE THEM**

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ABSTRACT

A heart attack, also known as a myocardial infarction (MI), is one of the main causes of mortality and disability on a global scale. In the past, wealthier nations were the ones most likely to have the ailment known as myocardial infarction. However, this trend is changing, and now poorer nations are experiencing it more often. The current study aims to measure the levels of HFABP, Troponin T, CK, cTnI, CK-MB, and myoglobin and to evaluate the accuracy of H-FABP in a point-of-care setting for early detection of myocardial damage (or ruling out MI) in 100 subjects with varying degrees of disease activity and a control group consisting of 55 healthy individuals. The results demonstrated the clear importance of age, as the study showed injuries at early ages. The rest of the chemical parameters showed clinically significant and significant differences through which we concluded that patients with improved MI showed higher sensitivity and specificity for myoglobin and h-FABP but lower sensitivity and specificity for CK-MB and cTnI. All in all, it can be used myoglobin and h-FABP tests as good indicators for detecting MI.

Keywords: H-FABP, CK-MB, cTnI, AMI, Myocardial infarction



**SPATIAL VARIABILITY OF FERTILIZER RECOMMENDATION OF RAINFED
WHEAT-CULTIVATED SEMIARID SLOPING SOILS**

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ABSTRACT

Uniform application of phosphorus (P) fertilizers to spatially variable soils often results in under-fertilization of low P-localities and over-fertilization of high P-localities. This study aimed at evaluating the variable applicability of P fertilizers on a 300-ha sloping landscape under rainfed winter wheat cultivation for over 70 years. The soils in the study area were sampled intensively and plant available soil P content (PASPC) was measured in each soil sample. Spatial variability of PASPC was evaluated by geostatistical technique and the area was divided into three uniform fertilizer P application zones (low, medium and high application zones) based on the spatial pattern of PASPC. PASPC was moderately variable; its mean was 11.74 kg P ha⁻¹ with a standard deviation of 3.30 kg P ha⁻¹. The fertilizer recommended by the Ministry of Agriculture and Forestry (FRMAF) was calculated for five sub-regions in the study area. The results showed that P fertilizer rates calculated for all five sub-regions were identical (24 kg P ha⁻¹), suggesting that the FRMAF was insensitive to spatial variability of PASPC in the study area. Surface maps of soil properties indicated a strong spatial association between PASPC and each of clay content, sand content, wilting point (WP), and CaCO₃ content. A furthermore comprehensive study is needed for evaluating efficiency and cost: benefit economics of variable P application in study soils.

Keywords: Geostatistics, Management zone, Phosphorous fertilizers, Site-specific management, Variable P application



**IN VITRO EFFECTS OF SOME DRUGS ON GLUTATHIONE REDUCTASE
ENZYME PURIFIED FROM SHEEP SPLEEN TISSUE**

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ABSTRACT

In this study, the effects of arveles, melox, capral and buscopan drugs on the enzyme Glutathione reductase (EC 1.8.1.7; GR, Glutathione: NADP⁺ oxidoreductase), which is purified from sheep spleen tissue and which is the most important enzyme of antioxidant metabolism, was investigated. Firstly, GR enzyme was purified from sheep spleen tissue by ammonium sulfate precipitation between 20-70% and 2', 5' ADP-Sepharose 4B gel affinity chromatography with 44.61% yield and 1476,6 fold. The purity of the enzyme was checked by the SDS-PAGE method. In the next step, the effects of arveles, melox, capral and buscopan on the enzyme activity were investigated. The IC₅₀ value was calculated as 23.79 mM by plotting the % Activity-[I] graph of the buscopan drug, which has an inhibitory effect on the enzyme. In addition, the K_i constant of this drug was 60,17±44,02 mM and the inhibition type was determined non-competitive. It was determined that Arveles, melox and capral drugs did not have a significant activation or inhibition effect on the enzyme.

Keywords: Glutathione reductase, Buscopan, Inhibition



**THE STUDY OF DIETARY FAT AND THE DEVELOPMENT OF TYPE 2
DIABETES, IN PATIENTS WITH OBESITY IN BAGHDAD**

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ABSTRACT

In the present study shown no significance when we compared the age between the two main groups of study , The mean age of obese with DM was (27.840 ± 10.57) years. Whereas that of without DM was (28.025 ± 10.022) p value 0.887. But a highly significant study in BMI (Obese with DM 37.6798± 3.6), (Obese without DM 20.9328± 1.9), P VALUE P < 0.0001. In comparison of gender of study population these slightly significant change in Obese with DM (male =61%, female 39%), but non-significant that observed in Obese without DM group (male = 50% , female 50%). Moreover, the ROC-Curve of age and BMI illustrate in table 4.2 shown a sensitivity was 41.18, and a specificity 61.34 in comparison of age as shown in figure 4.3. In comparison between BMI in study cases the sensitivity 100, specificity 100, C-peptide levels in obese with DM and other groups obese without sign of DM, the result shown a significant relationship between groups of study (Obese with DM = 1.9353±0.645), (Obese without DM = 1.3303±0.316) , p-value <0.05 ROC-Curve of C-PEPTIDE illustrate in table 4.4 shown a sensitivity was 44.5, and specificity 100 . HBAIC% levels in obese with DM and other groups obese without sign of DM, the result shown a significant relationship between groups of study (Obese with DM = 7.4908± 2.06), (Obese without DM = 5.1529± 0.339), p-value <0.001, sensitivity was 81.5, and specificity 100. Triglycerides and cholesterol were observed to grow in the lipid profile.

Keywords: Animal fat, Animal protein, Diabetes, Insulin resistance, Insulin sensitivity



**MORPHOLOGY AND FUNCTIONS OF CUP CELLS IN THE EPITHELIUM OF
SMALL INTESTINE**

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ABSTRACT

The cup cells are located in the epithelium of the small intestine. They have a specific morphology and are mostly observed in the ileum. They are also most abundant in rabbits and guinea pigs. The brush border of the cup cells is shorter than the absorptive cells, and their cytoplasm has less electron density. In addition, there is a cup-like depression at the lumen margin of the brush border of the cup cells. It has been found that cup cells showed vimentin-positive immunoreactivity in the rabbit ileum. Besides, it has been observed that the mitochondria of cup cells are smaller and the alkaline phosphatase activity at the brush border is weaker than the absorptive cells. The functions of cup cells are unclear. But it has been shown that bacteria were attached to the area above the cup cells. Therefore, it is thought that they have functions associated with the immune response to bacteria. Also, cup cells bind distinctive lectins, lack secretory granules, and do not transport antigens such as M cells. As a result; in this study, the morphological features, distribution, and functions of cup cells were explained. Thus, detailed information about cup cells was presented to researchers working on the subject.

Keywords: Cup cell, small intestine, light microscopy, electron microscopy



**OBTAINING DIATOMITE REINFORCED EPOXY COMPOSITE AND
DETERMINATION OF ITS THERMOPHYSICAL PROPERTIES**

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ABSTRACT

In this research, composite materials are produced by adding diatomite soil to epoxy. Diatomite in the particle size range of 297 to 149 microns is prepared as filler after drying at 105 °C. Diatomite reinforced epoxy composites at different rates (0 wt.%, 1 wt.%, 2 wt.%, 4 wt.%, and 6 wt.%) are synthesized at room temperature under open conditions to the atmosphere. In experimental studies, first of all, Epoxy a component and diatomite are mixed to obtain a homogeneous structure. Then, a certain amount of Epoxy B (hardening resin) component is added to the mixture and mixed at 1200 rpm for 90 seconds. After the epoxy composite is cured for 1 day in the laboratory, necessary tests and analyzes are carried out [1, 2]. The chemical bond structure of the synthesized epoxy composite is analyzed by Fourier transform infrared (FTIR) spectroscopy. The surface morphology of the epoxy composite is examined by scanning electron microscopy (SEM). According to the results obtained, as the amount of diatomite filler in the composite raises, the porosity of the epoxy composite increases. Besides, the increase in the diatomite ratio in the mixture also reduces the density of the epoxy composite. With the addition of diatomite, the thermal conductivity coefficient of the epoxy composite varies between 0.110 W/m·K and 0.095 W/m·K. Shore D hardness of the epoxy composite also varies between 77 and 80. Although the diatomite reinforcement reduces the thermal conductivity coefficient of the epoxy composite, it increases Shore D hardness. Also, thermal decomposition experiments of composites are carried out in a PID-controlled system in a nitrogen (inert) environment between 300 K and 900 K. When the thermal decomposition behaviors of the composites have been examined, it is determined that the addition of diatomite tended to increase the activation energy. In other words, increasing the activation energy improves the thermal stability of the epoxy composite [3-5]. Activation energy values are calculated according to the one-dimensional diffusion function with the highest correlation coefficient (R²) according to Coats-Redfern method when the temperature rise is 10 K/min and the conversion rate (α) is between 0.15 and 0.85.

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Keywords: Diatomite, Epoxy composite, Shore D hardness, Thermal conductivity, Activation energy



**PRODUCTION AND CHARACTERIZATION OF DIATOMITE REINFORCED MDI
BASED COMPOSITES**

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ABSTRACT

In this study, new composite materials have been improved by commercial polyol and methylene diphenyl diisocyanate (MDI). Diatomite filler in the particle size range of 149 to 74 microns is prepared for composite production as a filler after drying at 105 °C. Diatomite reinforced composites at different ratios by mass (0%, 1%, 2%, 3%, 4%, and 5%) are produced at room temperature under open conditions to the atmosphere. After mixing commercial polyol and diatomite filler at 1000 rpm for 5 minutes, MDI is added to the mixture and chemical reactions take place at 1500 rpm for 90 seconds. After the mixture is poured into standard molds and allowed to cure for 24 hours, necessary tests and analyzes are carried out [1-3]. The chemical bond structure of the synthesized composite is determined by Fourier transform infrared (FTIR) spectroscopy. Besides, the surface morphology and pore structure of the composite are examined by scanning electron microscopy (SEM) [4]. According to the results, it is observed that as the amount of diatomite filler in the composite raises, the number of closed pores increases and the pore diameter decreases. Besides, the rise in the amount of diatomite in the mixture provides an increase in the density of the composite. With the addition of diatomite, the thermal conductivity coefficient of the composite varies between 0.026 W/m·K and 0.039 W/m·K. Diatomite reinforcement increases both Shore D hardness and the thermal conductivity coefficient of the produced composite. Also, thermal degradation experiments of the obtained composites have been carried out in a PID-controlled system in an inert environment between 25 °C and 575 °C. The filler increases the activation energy and thus the thermal stability of the produced composite [5].

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Keywords: Composite, Density, Shore D, Thermal conductivity, Activation energy



CERAMIC MATERIALS USED IN CAD/CAM SYSTEMS

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ABSTRACT

Today, with the increase in esthetic expectations of patients and the development of digital technologies, it has become possible to produce new generation materials that are superior to the previous ones and function better. CAD/CAM technology has advanced to a point where it provides dentist with a wide range of restorative options both chair-side and at a traditional dental laboratory. These systems which enable prosthesis making to be possible in a single chair-side time are getting increasingly common since they eliminate laboratory process and traditional measurement methods, save time, diminish the risk of cross contamination to minimum and help us make more aesthetical, biocompatible restorations. With the increasing prevalence of restorations produced using CAD/CAM systems, new materials have started to be introduced rapidly. Ceramics are the most commonly used materials in CAD/CAM systems because of the fact that they are the best materials that can imitate the natural tooth. The purpose of this article is to introduce the current materials used in CAD-CAM systems.

Keywords: CAD/CAM, dental materials, dental ceramics, prosthetic dentistry



**INVESTIGATION IN TERMS OF SOIL CHARACTERISTICS OF INANDIK
(CANKIRI, TURKIYE) SINKHOLES DUE TO GYPSUM KARSTIFICATION**

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ABSTRACT

Sinkholes are karstic landforms that are formed as a result of the collapse of the ceilings of underground cavities, which are formed as a result of the interaction of groundwater with soluble rocks. The sudden occurrence of collapse makes these formations dangerous. Many buildings can be damaged due to sinkhole formations, and they can become unusable on lands that are a source of livelihood for the local people [1].

In this study, we investigated the sinkhole formations around Inandik village of Çankırı. When these sinkhole formations are considered in terms of the geology of the area, it is understood that they occurred as a gypsum karst. Since gypsum dissolves faster in water than carbonate rocks, it poses a greater risk. The structural damages in the region were observed with the field investigations [1]. In addition, discontinuous gypsum units were observed in field studies and classified as extremely wide and void structures according to ISRM [2]. When the boreholes drilled in the study area were examined, it was understood that there were molten gypsum layers underground [1, 3]. Point loading test was carried out with the samples taken by opening research pits in the gypsum units and it was observed that the rock had very low resistance [1]. By considering the microtremor measurements made at 28 points in the study area, the dominant vibration period and ground amplification values were reached [3]. As a result, it was determined that the sinkholes formed around Inandik village were caused by the deformation and dissolution of the gypsum units.

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Keywords: Sinkhole, Gypsum karst, Soil characteristic, Cankiri



**THE EFFECT OF THE COVID 19 PANDEMIC ON METRO MAINTENANCE-
REHABILITATION AND ENERGY CONSUMPTION**

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ABSTRACT

The metro line is a type of rail system with a capacity of 30,000 – 70,000 passengers per hour in one direction with a maximum speed of 80 km/h, a maximum slope of 3.5 %, and a minimum curve radius of 300 m. In Ankara after declaring a Global Epidemic by World Health Organization, public transport passenger capacity was reduced to 50%. In 2021, a full-time curfew was imposed between April 29 and May 17. It was decided to start the gradual normalization process on March 01, 2021. Due to the Covid-19 epidemic, the situation in Ankara rail public transportation lines changed in passenger numbers; AŞTİ – DİKİMEVİ ANKARAY Rail System Line. The number of failures, energy consumption, and their effect on maintenance were reviewed in this study. This line consists of 11 stops with a length of 8.5 km with a maximum speed of 30 km/h and a passenger capacity of 925. In 2020 and 2021, the number of passengers decreased at the rate of 57% and 70%. Considering the number of failures, the decrease was 28% and 35%. Considering the first 3 months of the epidemic, while the number of passengers decreased by 95%; the number of failures was 61%. Despite the 57% and 70% decrease in the total number of passengers throughout the year, a reduction in energy consumption was observed at 16%. Accordingly, the maintenance and repair processes of urban rail public transportation systems should be continued with the same care, and maintenance and repair plans should not be based on the number of passengers and voyages in accordance with the periodic control processes of the equipment should be done.

Keywords: Covid-19 Pandemic, Maintenance, rehabilitation, energy consumption



**CONTRIBUTIONS OF GAME THEORY TO ECONOMIC AND POLITICAL
RATIONALITY IN FORESTRY**

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ABSTRACT

Political and economic results are output of the implementation and management characteristics. Political and economic decision-making processes take into account the rationality criteria of forests such as productivity, profitability, and economy. For this reason, while these criteria in advanced countries in forestry have positive values, such values of developing countries are fluctuating. For example, only wood-based and non-wood forest products of forests in Türkiye are included in national balance sheets. Therefore, it is thought that the real value of forests is not calculated. However, calculating the actual values will change all balances. Thus, the discussions on the capacity of forests are moved to a more mathematical ground. The fact that the capacity of the forests is not enough to meet all the needs causes the forest assets to be endangered and therefore requires rationality in using. The concept of rationality is based on rules and obtaining reasonable results, and it has been used frequently in recent studies of game theory modeling initiatives. The effective use of this approach in forest policy and economy will contribute to the development of forests, villagers and the country's economy by obtaining more rational results, and will also be beneficial to eliminate some problems between decision makers and the public. In the last 20 years, the 10-fold increase in forestry-based game theory modeling researches in the world indicates that the game theory approach has begun to be included in decision-making processes aimed at achieving sustainable forestry. As a consequence, the game theory approach seems a new and effective tool that will contribute to the economically and politically rational management of forestry.

Keywords: Decision Making, Forest Management, Game Theory, Rationality, Sustainability



NOTION OF CONNECTIVITY AND ITS IMPORTANCE IN GRAPH THEORY

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first two sections of the second chapter, the structures of 2-connected and 3-connected graphs are studied, respectively, and related definitions and theorems are given. In the third section, three different proofs of Menger's (1927) theorem, which is one of the most important theorems of graph theory, are presented. In the fourth section, Mader's (1978) theorem, which is one of the most important and deep theorems of graph theory, which gives the number of independent paths that intersect an induced subgraph of a graph only at its endpoints, is expressed, and one of its corollaries is proved. In the fifth and last section, the problem of the existence of disjoint paths between two specified sets of vertices is briefly mentioned. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Connectivity, Menger's theorem, Mader's theorem



RAM PUMP APPLICATION FOR AGRICULTURAL IRRIGATION IN ÇANKIRI

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ABSTRACT

It is of great importance that water, which is the key to life, is transported from its source to another place and/or transferred to higher levels than it is. Many studies have been done and are still in progress to solve this problem. Conventional thinking is that these transfers will be made by various types of water pumps driven by electricity or an internal combustion engine. These pump systems operate at high efficiency but they get their energy from electricity or fossil fuels. Although the ability to transfer water with the help of the power of running water or the vacuum effect dates back to the VI centuries BC, it is still used especially in agricultural irrigation. In this study, necessary theoretical calculations and designs are presented for the transportation of water passing through the city center and flowing from Tatlıçay to the related lands with a ram pump in order to irrigate approximately 40000 m² of agricultural land in the central Karaköprü locality of Çankırı province. Two electric motor centrifugal pumps with 1000 l/s flow rate are used in the current irrigation system. The aim is to minimize the electricity consumption used in irrigation. The water will flow into a canal 9 meters high and 30 meters away from the source, and the agricultural lands associated with this channel will be irrigated. The amount of water required for irrigation is 2000 liters per hour. As a result of the theoretical calculations, it has been seen that carrying all the water needed with a ram pump will bring additional costs due to insufficient slope, but a ram pump can be used instead of an electric motor. In addition, alternative methods that can be used other than water coaches are also presented in the study.

Keywords: Irrigation, Pumps, Ram pump, Çankırı



**CARDIAC MARKER AND HEART DISEASE RISK IN TYPE 2 DIABETES
PATIENTS**

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ABSTRACT

T2D has been related to poor lipid and lipoprotein metabolism and is a recognized risk factor for cardiovascular disease. NT-proBNP and soluble interleukin 1 receptor-like 1 indicators for myocardial strain and clinical risk factors in patients with type 2 diabetes are to be studied. Iraq's ALYARMOUK teaching hospital, National diabetes center and Specialized endocrinology and diabetes center provided 70 participants. Sixty people had type 2 diabetes and thirty were healthy. Each subject's blood was drawn, and serum samples were tested for NT-proBNP, sST2, and lipid profile using an ELISA Test Kit. HbA1c was also tested. Diabetes patients had 2041.12 114.65 NT-pro levels compared to control groups (793.01 156.91). Also, individuals with type 2 diabetes had higher sSt2 levels (10.79 0.73 vs. 5.01 0.74). Also, individuals with type 2 diabetes had higher HbA1c values (8.110.19) than healthy people (5.420.06). cholesterol, triglycerides, LDL, and HDL readings did not differ between patients and controls. While VLDL readings showed a greater difference between patients and controls.

Keywords: Enzyme kinetic, Type 2 diabetes, Heart disease, sST2, NT-pro BNP



**ELECTROCHEMICAL DETECTION OF DOPAMINE USING A SIMPLE REDOX
CYCLING-BASED DEVICE**

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ABSTRACT

Here, a dual ITO microchip was fabricated for high sensitive detection of dopamine (DA) based on redox-cycling. The ITO electrodes with 3×3 mm working areas were made via photolithography and dry etching processes. The microchip was obtained by first aligning the working areas of two ITO electrodes to overlap and then fixing them in that position using a double-sided tape, which also formed a sealed microchannel between the ITO electrodes for test solution delivery. The ITO electrodes and microchips were electrochemically characterized using EIS, cyclic voltammetry and chronoamperometry. Compared to a single ITO electrode in a microchannel, the microchip had a significantly higher signal due to redox cycling. The microchip was lastly used for the detection of DA at varying concentrations. According to the results, the microchip had an LOD of 0.15 µM in a linear detection region of 0.1 to 50 µM. The microchip requires less than 1 µl of solution to complete the analysis and has great potential to be applied for immunosensing.

Keywords: Redox-cycling, dopamine, ITO microchip, Electrochemical measurement, Microfabrication



**THE IMPORTANCE OF SEDIMENTATION POOL IN SEDIMENT DYNAMISM:
EXAMPLE OF KIZILIRMAK BASIN (CANKIRI)– TIMARLI LOCATION**

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ABSTRACT

In consequence of the land characteristics of our country, intense amounts of sediment are transported due to erosion, landslides and the scouring effects of water in the stream beds. The amount of sediment are transported in a year in Türkiye are more than the amount of sediment are transported in a year from the all European Continent [1]. The sediments of transported by the stream accumulate in the reservoir areas of the water storage and raising structures. In this study, sedimentation pool were examined to catch the suspended sediment of transported from reservoir areas to the water delivery channel fed by the Tımarlı regulator water resource built on the Kızılırmak river in Cankiri basin. The sedimentation problems have been observed in the regulator reservoir areas in consequence of intense amounts of sediment transported in Kızılırmak river passing areas. In order to prevent the problems that may be caused by the suspended sediment in the transmission channels, the sediment are accumulated by the reduction of water velocity in sedimentation pool [2]. In order to sediment are caught the needed minimum particle diameters in sedimentation pool, the sedimentation pool design should be made appropriately. The length of sedimentation pool was determined with the help of the Hec-Ras program for catching efficiency using Sümer (1977) approximation formula, by taking into account the flow rate of stream and cross section [3]. As a result, needed minimum particle diameters of sediment precipitation (0.50 mm) are caught in designed sedimentation pool, that the calculated length of sedimentation pool (40 m) was concluded to be appropriate its size in the field area.

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Keywords: Cankiri, Kızılırmak Basin, Tımarlı, Sedimentation Pool, Sediment



**BIOCHEMICAL STUDY FOR THE ROLE OF SERUM URIC ACID AND
CATALASE IN MONITORING THE CONTROL OF GLYCEMIA IN TYPE 2
DIABETIC PATIENTS**

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ABSTRACT

This study has aimed for investigating the role of uric acid in different groups of glyceemic controlled patients with (T2DM).

The interest was involved zinc and catalase as antioxidant materials to declare their role in T2DM disease.

The study has included 75 patients with T2DM disease whom divided equally on three subgroups according to their glyceemic control, which named poor glyceemic control, fair glyceemic control, and good glyceemic control, and additional 25 people were healthy to control the study. According to the findings, persons with T2DM who have poor glyceemic control had significantly higher levels of uric acid, which accompanied with a decrease in the level of zinc and catalase compared to the healthy people.

Significant changes in the lipid profile characteristics have been seen in people with T2DM. Glyceemic control is not being properly maintained T2DM patients have showed a positive link between uric acid and cholesterol, whereas fair glyceemic control T2DM patients have demonstrated a positive correlation between uric acid and fasting glucose level. In conclusion, poor glyceemic control associates with increase in the uric acid level and decrease in the antioxidants.

Keywords: Diabetes mellitus, T2DM, SUA, Catalase, ROS, Lipid profile, Zinc, Glyceemic control



INFINITE GRAPHS AND RECURSIVE STRUCTURES

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the second chapter, the equivalent of the concept of infinity in graph theory, and the related basic concepts, techniques, and theorems related are studied. In the second section, starting from the fact that there are two fundamentally different aspects of infinity in the connected infinite graphs, paths, trees, and ends are introduced and the related results are studied. In the third section, answers are sought to the two following questions: whether there is a universal graph in the class of all countable graphs, and which countable graphs are homogeneous. In the fourth and last section, the issue of defining a family of graphs recursively, which makes it possible to use induction to prove theorems about infinite graphs, is discussed. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Homogeneous graphs, Universal graphs, Recursive structure



**BIOCHEMICAL STUDY TO EVALUATE THE ROLE OF HEAVY METALS AND
OXIDATIVE STRESS IN THE INCIDENCE OF KIDNEY DISEASE WITH IRAQI
PATIENTS**

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ABSTRACT

The kidneys are crucial for regulating the body's internal balance of water and minerals, in particular (sodium, potassium, chloride, calcium, phosphorus, magnesium, sulphate). The study was conducted on kidney patients (male & female (n=60), and healthy subjects control (n=60), Serum was used to assay antioxidant enzymes activities and to measure MDA to prove such lipid peroxidation occurring as MDA considered an indirect measurement for lipid peroxidation, GSH(μ M) in control group 11.65 ± 0.01 while increase in patient male and woman ($18.55 \pm 0.01^*$), ($30 \pm 0.01^*$), which MDA(M) in control group 0.227 ± 0.1 that increase in patient male and woman $0.384 \pm 0.02^*$, $0.138 \pm 0.01^*$ and GST(μ U/L) in control group 3.3 ± 0.01 while increase in both groups 3.8 ± 0.01 , $3.6 \pm 0.01^*$. The total antioxidant capacity TAC values for the control group with the mean \pm SD (4.00 ± 0.32). Also, the TAC values of the kidney patients with the mean \pm SD (2.38 ± 0.55) in mean, while in woman 2.16 ± 0.34 . The mean TAC in patients is significantly decrease from the control group ($P < 0.001$) The serum Chromium (Cr) values for the control group with the mean \pm SD (0.94 ± 0.11). Also, the serum Chromium (Cr) values of the kidney patients with the mean \pm SD (1.08 ± 0.14) mg/dl, then in woman with mean (1.5 ± 0.13).

In the present study the mean serum Chromium (Cr) level in kidney patients is significantly higher when compared with the control group (P value < 0.001) The serum Lead (Pb) values for the control group with the mean \pm SD (1.62 ± 0.22) mg/dl. Also, the serum Lead (Pb) values of the kidney patients with the mean \pm SD (0.94 ± 0.13) mg/dl. Conclusion :This critical balance in generation of free radicals and antioxidant defense system is used by the organisms to deactivate and protect themselves against free radical toxicity. Decrease in level in Cr, Pb, Hg compare with control group in kidney disorder.

Keywords: Kidney, oxidative stress, Cr, Pb, MDA and glutathione peroxidase (GSH-Px)



**RELATIONSHIP BETWEEN GROWTH HORMONE AND JUVENILE IDIOPATHIC
ARTHRITIS IN IRAQI PATIENTS**

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ABSTRACT

Children with juvenile idiopathic arthritis (JIA) often have impaired growth and short stature. There is evidence that the therapeutic use of growth hormone (GH) is useful and safe in these patients. To analyse the correlation between growth GH and JIA in children. A study was designed included two groups of children less than 18 years, 25 children of them were patients with JIA and other 25 Childs were healthy control. In this work, nine parameters include age, Hb, AST, ALT, Urea, Creatinine, ESR, WBC, and height were measured in both patient children with idiopathic juvenile arthritis and healthy control. Mean and standard deviation of age, Hb, AST, ALT, Urea, WBC in patients were more than in control group, but creatinine, ESR, and Height in patients were less than in control group. Also, the results of this study showed a negative relationship between JIA represented by ESR level in patients and growth hormone represented by Height with predictive equation of linear relationship as $(-0.0486x + 15.349)$. The study concluded that there is a relationship between GH and JIA in children.

Keywords: Inflammatory markers, Tumor necrosis factor- α , İnterleukin-6, Obesity



**ASPROSIN AS A BIOMARKER OF METABOLIC SYNDROME & DIABETES
MELLITUS IN IRAQI FEMALES.**

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ABSTRACT

In the present study, the role of asprosin was investigated in metabolic syndrome (MetS) and type 2 diabetes mellitus (T2DM). Fifty healthy people were used to control forty patients with T2DM and 40 patients with MetS in the investigation of serum asprosin level with lipid profile, insulin, glucose, high sensitive C-reactive protein (hs-CRP), and glycated hemoglobin. The levels of glucose and glycated hemoglobin were significantly higher in T2DM and MetS patients compared to control, whereas the most significant values were obtained from T2DM patients. Lipid profile parameters were significantly changed in patients compared to control, whereas the most significant change was observed in MetS patients. Insulin was significantly increased in MetS and T2DM patients, referring to a state of insulin resistance. Additionally, the levels of asprosin and hs-CRP were increased significantly in T2DM and MetS patients compared to control. Moreover, the levels of hs-CRP and asprosin were significantly higher in MetS patients compared to T2DM patients. In conclusion, asprosin has shown to play an important role in the pathophysiology of T2DM and MetS, and can be used to predict the risk of MetS development in T2DM patients.

Keywords: Asprosin, Type 2 Diabetes, Lipid profile, Metabolic Syndrome, Insulin resistance.



RANDOM GRAPHS AND THE PROBABILISTIC METHOD

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the second chapter, the concept of a random graph and related definitions and results are given. In the second section, the probabilistic method, of which Erdős (1959) is the architect, is introduced and the related Erdős (1959) theorem is proved. Random graphs have results that are random even in their expressions, and these are results that contain the phrase ‘almost all’. In the third section of the second chapter, the properties of ‘almost all graphs’ are studied, and the Erdős and Renyi (1963) theorem is proved. In the fourth and last section, the threshold functions and second moments are introduced and the threshold function of the graph property containing a given graph is determined (Erdős and Renyi 1960, Bollobas 1981). In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Random graphs, Threshold functions, Second moments



**CORRELATION BETWEEN VISFATIN AND HEMOGLOBIN A1C IN TYPE 2
DIABETIC PATIENTS**

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ABSTRACT

Hyperglycemia is the hallmark of type two diabetes mellitus (T2DM), a chronic metabolic disease. It could be because of a lack of insulin production or a resistance to insulin effects on the body. There's a direct correlation between visfatin levels and T2DM, where visfatin is a newly discovered adipocyte hormone. The study included 120 volunteers who attended some hospitals in Salah al-Din/IRAQ, divided into two groups. The first group included 60 patients diagnosed clinically and under periodic monitoring with type two diabetes for more than five years. The second group included 60 volunteers of an age group close to the patients. The descriptive analysis was conducted, and the mean and standard deviation of the parameters was obtained, where the age was (58.721±7.850 years) for the healthy and (59.345±8.150 years) for the patients, where there was no significant difference. Still, the concentration of visfatin in the serum was elevated in the patients versus healthy volunteers, with a significant difference where; the p-value was $\leq 0.001^{**}$. Concerning glycosylated hemoglobin was elevated in the patients versus healthy volunteers where there was a significant difference, and the p-value was $\leq 0.001^{**}$; finally, the fasting blood sugar level was elevated in the patients versus healthy volunteers, there was a significant difference, and the p-value was $\leq 0.001^{**}$. Visfatin was positively correlated with HbA1c, where the values of $r = 0.3510^{**}$ and $p = 0.0060$. In addition, there was no correlation between visfatin and fasting blood sugar, as the values of $r = 0.7710$ and $p = 0.0380$. Correlation is considered significant at the 0.01 level (2-tailed). In conclusion, visfatin was positively correlated with HbA1c and no correlation with fasting blood sugar in patients with T2DM as per the statistical analysis.

Keywords: T2DM, Visfatin, HbA1c, FBS, Correlation



HAMILTON CYCLES AND DEGREE SEQUENCES IN GRAPH THEORY

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the second chapter, some sufficient conditions that guarantee the existence of a Hamiltonian cycle in a graph are examined, theorems of Dirac (1952), Asratian and Khachatrian (1990) are proved; in the second subsection, Chvatal (1972) theorem, which is a sufficient condition covering all previous results, is proved. In the third and last section, the theorems of Fleischner (1974), which states that the square of a 2-connected graph contains a Hamiltonian cycle, and Georgakopoulos (2009), which states that a similar situation is true for 2-connected locally finite graphs, are expressed, and the chapter is completed with Seymour (1974) conjecture, which is a comprehensive generalization of Dirac's (1952) theorem. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Hamilton cycles, Degree sequences, Square of a graph



**STUDY OF SERUM INTERLEUKINS (IL 13, IL 9, TNF) IN ASTHMATIC
PATIENTS WITH MITE ALLERGY**

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ABSTRACT

Asthma is a problem of a genetic inflammatory disease of the respiratory tract-airways in which clinical disease progression is influenced by environmental factors. Chronic airway inflammation, usually with eosinophil infiltration, is one of the hallmarks of asthma. Most asthmatics can be successfully treated with conventional medicine according to their severity, but in certain extreme cases, even with prolonged treatment, asthma remains uncontrolled, which is known as refractory asthma. A new biologic-based therapy strategy for severe refractory asthma has been created based on knowledge of the molecular pathways of airway inflammation in asthma produced by enhanced Th2-type responses, eosinophil activation, and allergic reactions. The first biological preparation approved to treat asthma was humanized anti-human IgE antibody (anti-IgE; omalizumab). Treatment with anti-IgE (anti-IgE therapy) has been recognised as a new therapeutic option for severe allergic asthma in adults since 2009 and children since 2012, based on clinical evidence, and has been demonstrated to have a 60% effectiveness rate. The TH2 cytokine family's interleukin (IL)-9 and IL-13 have recently been suggested as a key component in determining mucosal immunity and susceptibility to atopic asthma. TNF- is a key player in the establishment of the Th2 cell response to allergens ingested.

Keywords: Asthma, Dust Mites, Interleukin-13, Interleukin-9, Tumor Necrosis Factor Alpha.



**STUDY CHANGE IN LIVER ENZYMES AND HEPCIDIN HORMONE AS A
POSSIBLE RISK FACTOR TO JUVENILE IDIOPATHIC ARTHRITIS**

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ABSTRACT

Hepcidin is known to be the main regulator of systemic iron metabolism in the organism. Age, weight, AST, ALT, Hepcidin, ALP, Hb, WBC, ESR, and RBS were measured in patients with idiopathic juvenile arthritis (JIA) and healthy controls to see if there was a link between arthritis and hepcidin. There were no discernible differences in age between JIA patients and healthy control. Significant differences were recorded between age in JIA patients and healthy control. No significant differences were recorded between AST in JIA patients and healthy control. No significant differences were recorded between AL in JIA patients and healthy control. High significant differences were recorded between ALP in JIA patients and healthy control. High significant differences were recorded between ALP in JIA patients and healthy control. High significant differences were recorded between ALP in JIA patients and healthy control. High significant differences were recorded between ALP in JIA patients and healthy control. High significant differences were recorded between RBS in JIA patients and healthy control. According to the results of this investigation, there is no link between serum hepcidin levels and RA activity. It appears that using the hepcidin level in clinical practice to assess disease activity in RA patients is premature.

Keywords: Juvenile idiopathic arthritis, Hepcidin hormone, AST, ALP, ALT



**THE ROLE OF VITAMIN D HYPERGLYCEMIA AND HYPOGLYCEMIA IN
WOMEN WITH HEART DISEASE**

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ABSTRACT

Patients with Gestational diabetes mellitus (GDM) are prone to pregnancy-induced hypertension, polyhydramnios, infections, ketoacidosis, and other complications; if the control of blood glucose levels remains unfavorable for a prolonged duration of time, it may result in chronic intrauterine fetal hypoxia, growth abnormalities, malformations, neonatal hyperbilirubinemia and hypoglycemia respiratory distress syndrome, amongst other. The current study aims to the assessment of serum Vitamin D Hyperglycemia and Hypoglycemia in women with Heart Disease and compared them with the control groups. Determine the vitamin D and lipid profile function used in women with Heart Disease patients and compared them with the control groups. Study the effect of gender on study parameters and the correlations between serum vitamin D and other study parameters in women with Heart Disease and control groups. In general, during this study, the necessary parameters will be identified as good indicators to GDM.

Keywords: T1DM, Vitamin D, Hyperglycemia, Hypoglycemia, Heart Disease



PLANAR GRAPHS AND ITS CONNECTION WITH TOPOLOGY

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the second chapter, the basic topological concepts and related theorems that we will need in the next sections are briefly mentioned. In the second section, the structural properties of plane graphs are studied, and the well-known Euler formula and some of its results are proved. In the third section, it is examined how two different plane drawings of a planar graph can differ from each other. In the next two sections, some classical planarity criteria about when an abstract graph is planar, and in particular the famous Kuratowski (1930) (and Wagner 1937) theorem, are stated and proofs of some of these criteria are given. The second chapter is completed with a section where the concept of plane duality, which has very interesting connections with the algebraic, coloring, and flow properties of graphs, is covered. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Plane graphs, Kuratowski's theorem, Plane duality



**HORMONAL AND BIOCHEMICAL STUDY OF THE EFFECT OF VITAMIN D ON
POLYCYSTIC OVARIES IN WOMEN**

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a shared reason of ovarian dysfunction in women with anovulation. The main symptoms are branded by chronic anovulation, hyperandrogenism and/or the presence of ovarian cysts on ultrasound examination. Low levels of vitamin d3 exacerbate PCOS symptoms, including insulin resistance, ovulation, menstrual irregularities, infertility, hyperandrogenism, and obesity, and increase the risk of cardiovascular disease. In this study, we will try to find a relationship between PCOS and vitamin D deficiency in affected women. The study included (120) samples distributed into two groups, the patients group consisted of (80) samples and the control group consisted of (40) samples. Some chemical and hormonal tests were done such as VIT D3, TT, PRL, FSH, LH, TG, CHO, HDL, LDL, VLDL. We found low levels in Vitamin D, Follicle-Stimulating hormone, Cholesterol level, High-density Lipoprotein (HDL) level and Low-density Lipoprotein (LDL) level. also, We found high levels in Testosterone level, Prolactin level, Luteinizing hormone level, Triglyceride level and Very Low-density Lipoprotein (VLDL) level.

Keywords: Polycystic ovary syndrome, Vitamin D, Testosterone hormone, Prolactin hormone, LH



**INVESTIGATION OF A GRID-CONNECTED SYSTEM DESIGN ON A ROOFTOP
IN ÇAKU**

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ABSTRACT

The energy need, which has increased with the rapidly rising demands after Covid19, has increased even more with the developing tension between Ukraine and Russia. In addition to this cost increase, the climate crisis also makes people look for ways to produce energy from new sources. The first thing that comes to mind is undoubtedly solar energy, when it comes to renewable energy. Electrical energy is possible by using photovoltaic cells in solar energy. These systems must be carefully designed and simulated before installing them. Simple mistakes can cause the systems not to work and even some components to be damaged. In this study, a grid-connected solar energy system was designed and simulated on the roof of Çankırı Karatekin University Engineering Faculty using the PVSyst program. In the designed solar energy systems, the data obtained by changing the distance between the arrays are given as a result. The distance between the panel arrays is varied between 2.2 and 6 m. As a result, it has been revealed that the design that will give the highest energy with the least components will transfer 208.5 MWh of energy annually. (This study was made from the thesis work of the first ranked student.)

Keywords: Photovoltaic, PVSyst, Grid-connected, On-Grid, Rooftop PV Model



ON ALPHA-ADMISSIBLE THETA-CONTRACTIONS ON QUASI METRIC SPACES

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ABSTRACT

In this presentation by considering the Jleli and Samet's technique for contractions on metric space, we give a new concept of alpha theha d-contraction for multivalued mappings on quasi metric spaces. Then we provide some new fixed point theorems for such type mappings on left K, left M and left Smyth-complete quasi metric spaces.

Keywords: Fixed point, multivalued mappings, θ -contraction, quasi metric space



EXTREMAL GRAPH THEORY AND APPLYING THE REGULARITY LEMMA

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the aforementioned Master of Science thesis. To summarize the thesis in outline: In the first chapter, fundamental definitions and theorems of graph theory are covered. In the first section of the second chapter, the question of what edge density is required to force a graph to contain a copy of a given graph is sought, and in the second section, the same problem is discussed in terms of inclusion as a minor. In the third section, Hadwiger's (1943) conjecture and related results, and in the fourth section, the Szemerédi lemma of regularity and its proof are studied. In the last section, a general method of applying the Szemerédi lemma is introduced and as an example of this method, the theorem of Erdős and Stone (1946) is proved. In the third chapter of the thesis, before the conclusion and recommendations chapter, a literature review on the subject of the thesis is presented. In this talk, we briefly summarize the main chapter of the thesis.

Keywords: Subgraphs, Minors, Regularity lemma



ELECTROCOATING OF POLYANILINE AND POLYPYRROLE FROM DEEP EUTECTIC SOLUTION

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ABSTRACT

The high conductivity, chemical stability and simple synthesis of polyaniline and polypyrrole have given these polymers a wide range of applications in energy storage devices, chemical sensors and biosensors [1,2]. Polyaniline and polypyrrole, which are the conducting polymers, have been produced by electrochemical and chemical methods in aqueous and non-aqueous media [3,4]. However, the synthesis of these polymers in an aqueous medium may result in loss of electroactive sites of the final polymer films [5]. On the other hand, using a non-aqueous medium during electrochemical synthesis can improve not only electrochemical properties but also physical properties of the final polymer films [6]. Therefore, this study focused on the synthesis of polyaniline and polypyrrole from deep eutectic solvents under optimal conditions, and the findings show that the use of a non-aqueous medium provides more homogeneous and better electroactive polymer film production than aqueous media.

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Keywords: Conducting polymers; Polynailine; Polypyrrole; Deep eutectic solvents



**THE EFFECT OF TOTAL MOLECULAR VALANCE CONNECTIVITY INDICES IN
FORMATION OF DEEP EUTECTIC SOLVENTS**

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ABSTRACT

In this study, the relationship between the physical properties of the formed deep eutectic solvents and total valance connectivity indices of individual constituent molecules were investigated. While partial effect was found between the viscosity increase with increment of polar surface area of constituent molecules, direct relation for viscosity increase with total valance connectivity indices of constituent molecules forming deep eutectic solvents was discovered. The previously reported theory by L.B. Kier and L. H. Hall were proven a correlation between molecular connectivity indices and total valance connectivity [1, 2]. Constituent molecules were analyzed in terms of their total molecular valance connectivity indices prior to form deep eutectic solvents, and it was found that the decrease in total valance connectivity was strongly correlate with increase in viscosity of formed deep eutectic solvents. Viscosity measurements were carried at 30 °C, and choline chloride (total valance connectivity indice: 0.113) was chosen as main constituent molecule of prepared deep eutectic solvents. Other constituent molecules mixed with choline chloride were ethylene glycol (total valance connectivity indice: 0.1), urea (total valance connectivity indice: 0.06), malonic acid (total valance connectivity indice: 0.005), and citric acid (total valance connectivity indice: 8×10^{-5}), and viscosity of the mixtures were measured as approximately 12 cP, 125 cP, 300 cP and $>10^6$ cP, respectively. The technique applied here can be useful for studies that viscosity crucially important, such as charge carrier systems, electrodeposition baths or extraction mediums before any attempt to prepare new deep eutectic solvents, and prevent the waste of time and resources.

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Keywords: Total valance connectivity, Viscosity, Deep eutectic solvents



**PRODUCTION AND CHARACTERIZATION OF NANO-SIZED CALCIUM
CARBONATE-ZINC OXIDE COMPOSITES**

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ABSTRACT

Zinc oxide has attracted significant attention due to its similar properties with titanium oxide. Zinc oxide is non-toxic, chemically stable, environmentally friendly, easy to manufacture, and less expensive than TiO₂ [1-3]. Since it has a wide band gap of about 3.2 eV (3.37 eV for wurzite), it has been proven by various studies to be an excellent photocatalyst for the degradation and energy storage of organic pollutants [4-6]. Creating a composite photocatalyst is also a successful approach. Composite photocatalysts such as ZnO/SnO₂, NiO/TiO₂, ZnO/In₂O₃, and p-ZnO/TiO₂ have been extensively investigated [7-9]. The results show that the activity of the composite photocatalyst is higher than that found alone [10-15]. In this study, the synthesis and characterization of CaCO₃/ZnO composite is carried out.

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Keywords: Composite, CaCO₃, Calcium carbonate, ZnO, Zinc oxide



**SEAMLESSLY IMPLEMENTABLE ML BASED AUTHENTICATION METHOD
FOR RESOURCE-SCARCE EMBEDDED SYSTEMS**

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ABSTRACT

Widespread adoption of the ubiquitous Internet of Things (IoT) depends on its security-integrated development. Ensuring the security of IoT devices and networks used in healthcare systems has emerged as a global priority. Authentication is one of the cornerstones for meeting CIA requirements and prevents malicious parties from accessing devices and the network. However, the scaled nature of IoT networks with many devices and the presence of resource-limited devices in the network make it impractical for traditional cryptographic solutions to address security as an authentication method. Despite these limitations, machine learning algorithms are used for the authentication protocol in IoT networks. But the heavy computational requirement of machine learning algorithms is a major challenge to implement these algorithms for authentication in resource-constrained embedded devices. Therefore, in this study, lightweight ML method was used so that a scalable ML-based authentication method can be applied in IoT.

Keywords: Internet of Things, Embedded device, Security, Authentication, Machine learning



**TRANSFORMATION OF ONE STEP TWO ELECTRON TRANSFER Ni
REDUCTION AND OXIDATION PROCESS TO TWO-STEP ONE ELECTRON
TRANSFER PROCESS**

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ABSTRACT

In this study, the electron transfer process of nickel cation in deep eutectic solvent formed by mixture of 1 molar choline chloride and 2 molar urea, commercially known as Reline, were altered from one step $2e^-$ transfer to two-step e^- transfer process at both reduction and oxidation zones. Nickel was already studied in Reline, and revealed clear single peaks in both reduction and oxidation zones at around -1.4V and 0.2V, respectively, at 20 °C in three electrode (Pt working electrode, Ag/AgCl reference electrode, Pt counter electrode at 20 $mV.s^{-1}$) cyclic voltammetry experiments [1]. When a three electrode configuration (Pt working electrode, Pt counter electrode, and pseudo Ag wire as reference electrode) was applied for cyclic voltammogram experiments at 50 °C in 0.1M ammonium chloride added 0.1M $NiCl_2$ dissolved Reline solution, the reduction and oxidation of nickel turned into two-step one electron process. When peaks in reduction and oxidation regions were analyzed, it was found that $Ni^{2+/+}$ reduction occurred at -0.6V, $Ni^{+/0}$ reduction occurred at -0.8V, $Ni^{0/+}$ oxidation occurred 0.15V, and $Ni^{+/2+}$ oxidation occurred at 0.4V. Performed study were confirmed by optical confocal microscopy by taking images of working electrode at each peak. While there was no nucleation observed on the surface of electrode taken out at exactly -0.6V, a clear nickel flakes were observable on the surface of electrode taken out at -0.8V. In the oxidation zone, the nickel deposited electrode was taken out at 0.15V for surface observation, and no nickel nucleates were observed. Providing a wider stable potential window for formation of solid nickel phase can allow sufficient time for species to diffuse into the double layer before final reduction takes place. Therefore, performed study can be particularly useful for nickel alloy formation with other transition metals or in synthesis of Ni^+ bonded nickel complexes.

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Keywords: Cyclic voltammetry, Deep eutectic Solvents



**BIOCHEMICAL STUDIES OF THYROID HORMONES, ANTI
THYROPEROXIDASE, AND SOME PARAMETERS IN BLOOD SERUM OF
PATIENTS OF BENIGN AND MALIGNANT BREAST TUMOR PATIENTS**

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ABSTRACT

This study was conducted at the Oncology Teaching Hospital in Baghdad - Iraq, and the study lasted for 7 months, from March 1, 2021, to September 1, 2021. The study included three groups, each group included 40 patients with benign tumors, 40 patients with malignant tumors, and 40 female control groups. Thyroid disease is a common disease that may lead to other diseases. Breast cancer is also a common and fatal disease, and the causes of the disease must be sought. Thyroid peroxidase (TPO) is required for the thyroid gland's physiological activity. The goal of this study is to see if there's a link between thyroid and lipid problems and benign breast disease and breast cancer. The high incidence of thyroid peroxidase antibodies (TPOAbs) in breast cancer patients, as well as their protective effect, have previously been shown, implying a relationship between breast cancer and thyroid autoimmunity. TPO was recently discovered in breast cancer tissue samples, however, its antigen was not examined. TPO and its antigenic activity may have favorable benefits on TPOAb-positive breast cancer patients by detecting thyroid pathophysiology early. However, further research is needed to establish TPOAbs' positive impact and to better understand the mechanism behind it.

Keywords: Thyroid hormones, Antithyroperoxidase, Benign tumors, Malignant tumors



EFFECT OF PARAMETERS ON CALCIUM SULFATE CRYSTALLIZATION

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ABSTRACT

Calcium sulfate, together with its hydrates, has a wide application area, especially in construction, medicine, cosmetics and ceramics [1]. CaSO_4 – the water system has six stages, with four phases at room temperature: calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), calcium sulfate hemihydrate ($\alpha\text{-CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ and $\beta\text{-CaSO}_4 \cdot 1/2\text{H}_2\text{O}$), $\gamma\text{-CaSO}_4$ and $\beta\text{-CaSO}_4$. $\alpha\text{-CaSO}_4$ exists only above 1180 °C and transforms into $\beta\text{-CaSO}_4$ at lower temperatures (40-1180 °C) [2]. CaSO_4 is used as a desiccant, pigment and paper filler in its anhydrous form [3]. Hemihydrate (bazanite) is used in gypsum board production [4], as a bone filler [5], and has been investigated as a drug delivery system [6]. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is also used in gypsum board production [7, 8], Portland cement [9], food production [10, 11], surgical and It is used as a setting retarder in the manufacture of dental molds and in the manufacture of toothpaste [12, 13]. Calcium sulfate crystals are obtained as a result of the reaction of calcium chloride and sodium sulfate solutions mixed by changing various parameters. The morphological and dimensional properties of the obtained calcium sulfate crystals are revealed by XRD, SEM and BET analyses.

Acknowledgement: We would like to thank Çankırı Karatekin University, Chemical Engineering Department for their support in laboratory studies.

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Keywords: CaSO₄, Calcium sulfate, Crystallization, PSSS



THE LEVELS OF LIPID PROFILE (CHOLESTEROL, TRIGLYCERIDE) IN IRAQI PATIENTS WITH THALASSEMIA AND DIABETES

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ABSTRACT

This study aimed to determine cholesterol and triglyceride levels in Iraqi thalassemia and diabetic patients. The research comprised 120 individuals with diabetic thalassemia and a similar control group. Both genders, 10 to 45 years old, attend ibn al baladi hospital and al-karama hospital in Baghdad. Study from June to August 2022. Hb, Ferritin, FBS, Cholesterol, and TG were examined in Thalassemia, Thalassemia with DM, and control participants. The findings demonstrated a significant difference in Hb between controls and Thalassemia patients at a 0.05 alpha level, as well as between controls and Thalassemia with DM. Thalassemia and Thalassemia with DM had higher ferritin levels than controls. Fasting blood glucose findings demonstrated a significant difference between Thalassemia and Thalassemia with DM compared to control. Both Thalassemia and Thalassemia with DM had lower cholesterol levels than controls. Both Thalassemia and Thalassemia with DM had lower triglyceride levels than controls. The correlation investigation found substantial associations between FBS, cholesterol, and TG. Using thalassemia patients as a paradigm, and Thalassemia with DM, the connection between FBS, Cholesterol, and TG.

Keywords: Lipid profile, Cholesterol, Triglyceride, Thalassemia, Diabetes



**INVESTIGATION OF EFFECT OF THE PARAMETERS ON CALCIUM
CARBONATE CRYSTALLIZATION**

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ABSTRACT

The properties of CaCO₃ are particularly important in industrial applications, particularly in crystal structure, whiteness, chemical purity, specific surface area, particle size distribution, and morphology. Therefore, it is important to understand and control the formation of different CaCO₃ crystal types formed during crystallization, which has attracted increasing research attention recently [1]. As far as is known, various physicochemical factors responsible for the process, such as temperature [2], solvent type [3], pH [4] and initial supersaturation [5] lead to the phase transformation of CaCO₃. In the presence of barium, strontium and magnesium ions [6,7], graphene oxide [8], bovine serum albumin and polydopamine [9], selenic acid, arsenic acid and silicic acid [10] and various amino acid species [11,12], CaCO₃ morphology has changed. In this study, CaCO₃ crystals are synthesized with the mixing calcium chloride and sodium sulfate solutions. It was observed that the morphological properties of the CaCO₃ crystals changed, which were analyzed by SEM, XRD and BET.

Acknowledgement: We would like to thank Çankırı Karatekin University, Chemical Engineering Department for their support in laboratory studies.

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Keywords: CaCO₃, Calcium carbonate, Crystallization, Additive



**SELECTIVE TRANSPORT OF CADMIUM FROM ACIDIC LEACH SOLUTIONS
BY EMULSION LIQUID MEMBRANE USING TIOA AS THE CARRIER**

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ABSTRACT

In the present study, the selective separation of cadmium from the hydrochloric acid media was investigated experimentally by emulsion liquid membranes (ELMs) [1–3] using tri-iso-octylamine (TIOA) [4,5] as extractant and applied to the leach solution prepared from the zinc plant purification cake (CINKUR Co., Kayseri, Turkey). The effective parameters on both membrane and aqueous phase properties, such as the nature of acid and concentration of the acidic leach solution, concentration of stripping solution, extractant and surfactant concentrations, mixing speed, phase ratio, and cadmium concentration of the acidic leach solution on extraction of cadmium was optimized using a solution of synthetic cadmium in HCl. The selectivity and the efficiency of the improved ELM process were examined to the leach solution under optimum conditions. The results showed that 95% of cadmium was extracted by the ELM from the acidic leach solutions, containing Cd^{2+} , Zn^{2+} , Co^{2+} and Ni^{2+} ions, within 10 min with higher selectivity coefficient.

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Keywords: Emulsion liquid membrane; tri-iso-octylamine; copper cake, acidic leach solution; cadmium extraction.



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