# 3RD II SCIENCE AND 2ND DEPARTMENT OF CHEMISTRY GCWUF INTERNATIONAL CONFERENCE 2023

## Recent Advances in Photonics & Physical Sciences

March 07-09, 2023

# ABSTRACT BOOK

II SCIENCE

**2023**

Department of Chemistry
GC Women University Faisalabad

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**Welcome to GCWUF**

Government College Women University Faisalabad (GCWUF) started its journey as an intermediate college in 1934. It was promoted to Degree College in the year 1944 and postgraduate disciplines were introduced in 1985. The long journey that started with the humble beginning, reached its climax when the status of University was granted on 5th January 2013. University is catering to the needs of more than six million people of the city and of equal number from the surrounding districts. It is situated near Jaranwala Road that is not far away from historical Clock Tower. The University is a hub of educational, social and cultural activities having a close liaison with Business and Industrial Communities. University has two campuses: the main campus and the new campus. More than eight thousand students are currently enrolled at GCWUF main campus and this number is expected to increase exponentially. The university offers 31 Bachelor, one Associate Degree in ADE, B.Ed. (1.5 year), 17 Master, 10 M.Phil., and 05 PhD degree programmes in different faculties. The current faculty of GCWUF presents a blend of enthusiasm, sincerity and dedication. The faculty comprises highly qualified teachers with PhD, MS/MPhil and MSc. Degrees. Fresh PhD faculty is also engaged with the University under the Interim Placement of Fresh PhDs (IPFP). Under the Faculty Development Program, PhD scholarships with career opportunities are being offered through HEC programmes in various disciplines of studies. Moderately equipped laboratories and a commitment to remain intact with modern teaching and research techniques are the main academic distinctions of GCWUF.

**Vision**

Government College Women University Faisalabad aims to deliver quality education and services to explore multiple opportunities of success and building strong collaborations leading to a positive change in our students, our institutions, and communities around the world.

**Mission**

We aspire to equip our students with,

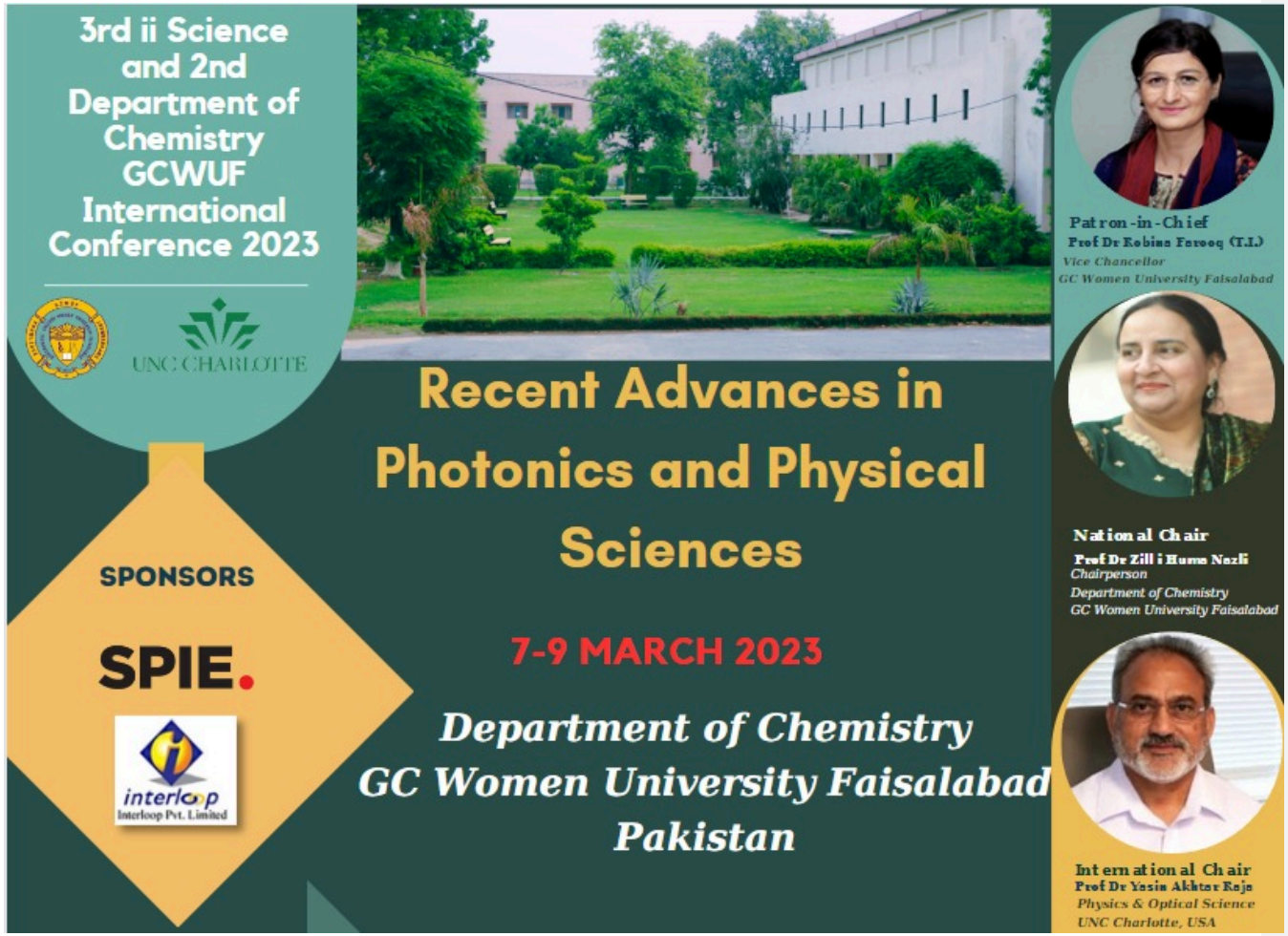
1. A strong base in quality research and stem education.
2. Industry-oriented and market-driven practical skills essential to address modern-day challenges in a befitting manner.

3. An entrepreneurial spirit to open up new horizons of employability and self-dependency.
4. An intellectual capacity to groom themselves personally and professionally.
5. A sound base of ethical standards to participate confidently and perform efficiently in various fields of life.

**Prof. Dr. Robina Farooq (T.I)**
**Vice Chancellor (Patron-in-Chief)**

Government College Women University Faisalabad (GCWUF), situated at the heart of the city Faisalabad, was established in 1934 and was upgraded to the current status in January 2013. Since its inception, it has been consistently striving to empower female students with educational skills by offering BS, M.A, MSc, MS/M.Phil and PhD Degree Programs in 25 disciplines.

The highly motivated faculty, determined to exploit all available resources, is contributing substantially to materialize the dream of women self-dependency and empowerment. Research is deemed to be a significant performance indicator which gives a distinguished status to an institution. Keeping this fact into consideration, GCWUF is focused to create an ideal intellectual environment where students and faculty can achieve research excellence in their respective fields.


3rd ii Science and 2nd Department of Chemistry GCWUF International Conference 2023
UNC CHARLOTTE
Recent Advances in Photonics and Physical Sciences
7-9 MARCH 2023
Department of Chemistry
GC Women University Faisalabad
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Patron-in-Chief
Prof Dr Robina Farooq (T.I.)
Vice Chancellor
GC Women University Faisalabad
National Chair
Prof Dr Zill i Huma Nazli
Chairperson
Department of Chemistry
GC Women University Faisalabad
International Chair
Prof Dr Yasin Akhtar Raja
Physics & Optical Science
UNC Charlotte, USA

**Department of Chemistry**

**National Chair**

**Prof. Dr. Zill-i-Huma Nazli**
**Chairperson,** Department of Chemistry
Ph.D.PU, Organic Chemistry
Tel#: +923347483791; Email: drzillihuma@gmail.com

Experience: 29-8-1994-current
Research interest: Soil chemistry, Nano-chemistyr
BOOKS / MONOGRAPHS / MANUALS = 04
**Projects:** Agrowaste mediated synthesis and Characterization of silver nanaoparticles: Antibacerial Activity and applications in Bioremediation

**Awards**

- **2nd POSITION IN M sc IN THE DEPARTMENT**
- **2nd Position in M Phil in the department**
- **AWARDED " XIII th STAR AWARD 2002 "**
- **IPSO FACTO DESIGNATED AS "STAR LAUREATE 2002" in the field of Science and Technology**
- **Best / Talented Teacher award2004**

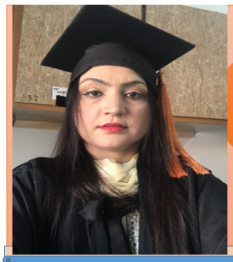
**DR SADIA ASIM**
**Associate Professor, Chemistry**
**Director Planning & Development**
**Planning & Development**
Doctorate Degree PhD (Physical Chemistry)
**Email:** dr.sadiaasim@gcwuf.edu.pk

# Dr. Sana Aslam

**Associate Professor**
**Department of Chemistry**
**Government College Women University Faisalabad**

**Area of Specialization**
**Medicinal Chemistry , Drug Designing , Synthesis of Heterocyclic Compounds**

- **Administrative Duties**
- 1. Departmental Associate Head
- 2. Incharge ORIC, GCWUF (Till June,2022)
- 3. Departmental controller of examinations and advisor of BS-8th (Session 2014-2018), BS (Session 2018-2022) and MSc. (Session 2018-2020).
- 4. Member of Tender Committee.
- 5. Member of Tender Technical Committee.
- 6. Focal Nominee for Mphil/PhD review committee HEC From QEC
- 7. Departmental Member of HEC Curriculum Designed Committee.
- 8. Convener of Campus Lab Developments



**Dr. Abida Kausar**
**(HEC Approved Supervisor)**
**Associate Professor (Analytical Chemistry)**
**Research Publications= 30 (IF=Total IF=143), h index (19)**
https://scholar.google.com/citations?user=ttTsVwUAAAAJ&hl=en

**Biomaterials Research Group**

## Work Experience

24-8-22-to present Associate Professor, GCWUF
6.4.2015-24-8-22 **Assistant Professor**, GCWUF
2006-2008 **SST** (GGHSS 46 SB. Sargodha)

## Research Interest

- Preparation and Characterization of novel adsorbents
- Adsorption process optimization for wastewater Treatment
- Theoretical description of Adsorption process

## Departmental Duties

- Member of curriculum committee
- Responsible for SOS and prospectus
- Focal person to DSA
- Incharge of Water Quality analysis Laboratory
- RO Plants quality maintenance and water analysis of GCWUF RO

## Awards

2021 Research productivity award by GCWUF for 2020
2020 Research productivity award by GCWUF for 2019
2019 Research Productivity award 2018

**Name:** Dr Farhat Jubeen
**Designation:** Assistant Professor
**Dept:** Chemistry
**https://orcid.org/0000-0001-8828-1051**

**1.Area of specialization / Research:**
**Food Chemistry,**
**Pharmaceutical synthesis**

**2.Future Plans**

- **To improve online teaching strategies**
- **To develop national and international collaborations**
- **To produce 4 international research papers**

**3.Tasks and Responsibilities:**

**Technical Manager Mycotoxins Testing Lab**
**Incharge Bioelectrochemistry Research Lab**
**Moderator of Organic Chemistry**
**Member of Postgraduate Advisory Committee**
**Seminar/Training Workshops/webinar/conference organizer**

**Name:** Dr. Umme Kalsoom
**Designation:** Assistant Professor
**Department:** Chemistry
**Faculty:** Science and Technology
**Email Address:** dr.ummekalsoom@gcwuf.edu.pk
**Contact No:** 03216634610
**Nature of Job:** Contract

**Area of Specialization / brief statement of research interest**:
**Area of Specialization :** Organic Chemistry
**Research interest**: Bioremediation of pollutants in wastewater
**Other administrative, advisory and community services:**

- Incharge organic Lab
- To maintain cleanliness in department
- Duty on admission of BS program

**Research Project**

NRPU Project final report submitted

## Dr. Maryam Aslam

| | |
|---|---|
| **Assigned Tasks/ Responsibilities** | **Advisor & Controller of MPhil PhD students of all semesters and all related tasks**<br>**Member MPhil PhD Review Committee**<br>**Member Post Graduate Review Committee to scrutinize MPhil/PhD synopsis**<br>**Member BOS of the department**<br>**GRE Examination convener**<br>**Incharge Green Chemistry Lab** |
| **Academic Progress** | • **PhD CHM-811 Analysis of Metals in Environmental Samples**<br>• **MPhil CHM-701 Important Topics in Analytical Chemistry**<br>• **BS MA CHM-601 Important Synthetic Products**<br>• **BS EA CHM-601 Important Synthetic Products** |
| **Research Progress** | **Supervision**<br>• **Produced 11+6 MPhil Scholars**<br>• **4 MPhil students in research process**<br>• **1 PhD Scholar in research process** |
| **Future Road Map** | • **Upcoming submission of NRPU**<br>• **Determination of physicochemical characterization of vegetable oils**<br>• **Application of natural dyes on cotton using plant extracts**<br>• **Submission and review process of research articles** |

Dr. Rehan Naseer : Assistant professor
Specialization in Analytical Chemistry (UAF)

- Impact Factor : 36.23
- Total publication: 14
- Research Interests
- Characterization and biological activities of oils and extracts
- Evaluation of mycotoxins in cereal and cereal products
- **Projects**
- NRPU project of 2.7 million
- Start up research grant project of 0.5 Million
- **Research students working under supervision.**
- 4 M.Phil + 1 PhD

Dr. Faiza Nazir
Assistant Professor
Department of Chemistry GCWUF

one PSF research project short listed "Extraction of natural dye and mordants from plant waste with improved colour fastness and yield optimization for industrial consumption" under Research Support Program of Rs 7.858 M

Research paper published as first author "Eco-friendly dyeing of cotton using waste-derived natural dyes and mordants" https://doi.org/10.1111/cote.12629 in Colouration Technology

Chapter 5 published as first author title "Natural plant extract treated bio-active textiles for wound healing" **https://doi.org/10.1016/B978-0-323-90479-7.00007-5** of Elsevier book entitled "Medical Textiles from Natural Resources"

Other administrative responsibilities: Time table incharge, staff secretary chemistry department, analytical chemistry moderator, lab incharge Micro and Nano health research lab.

## Dr. Sadia Nazir
## PhD. BZU/ University of York U.K
## Inorganic Chemistry

Assistant Prof. (Contract) 13-09-2013 to date

**Total Publications:** 13

**Total Impact Factor:** 48

**Research**

**Co-supervisor :** **1 PhD** student successfully completed her degree (UAF )

**Other Duties:**

- Moderator (Inorganic Chemistry) Secretary Board of Studies
- Secretary DARC meeting Focal person for library
- Incharge Inorganic Chemistry Laboratory
- Involve in arranging Seminars and workshops .

Dr. Shagufta Parveen, Assistant Professor, PhD Applied (Organic) Chemistry, Beijing Institute of Technology, China
Tel # +923317703329
Email ID: dr.shaguftaparveen@gcwuf.edu.pk, shagufta_organic@yahoo.com

**Research Interest**

- Organic Synthesis
- Asymmetric Synthesis
- Synthesis of Catalyst
- Molecular Docking Study
- Drug design and synthesis
- Biological analysis
- Isolation, purification and characterization of Natural Products

**PUBLICATIONS**

| TOTAL PUBLICATIONS | TOTAL IMPACT | ARTICLES PUBLISHED SPRING 2022 |
|---|---|---|
| 29 | 98.2 | 03 |

**PROJECT AS CO-PI**

| TITLE | FUNDING AGENCY | AMOUNT | STATUS |
|---|---|---|---|
| Synthesis of important APIs (active pharmaceutical ingredients) with potential market demand : A step towards made in Pakistan Pharmaceutical products with goal of improvement in Pakistan Economy | TH-22 (PSF/CRPT/hetx-22 | 5.60 | Continue (at 1st. quarter stage) |
| Synthesis of potential multi-protein targeting pyrimidine scaffold against diabetes mellitus and their Artificial Intelligence driven hit to lead optimization: Integrative computer aided drug designing approach | CIF | 70.563 | Submitted |
| A Neutraceutical Formulation based-on Pharmacopeia to treat Vitiligo: A Cutaneous Disorder due to Dysfunctionality of Melanocytes | HEC/TDF | 13.90 | Submitted |

# DR FAIZA AMIN

Assistant Professor, Chemistry
Doctorate Degree Ph.D Chemistry (Physical Chemistry)

| Sr. No | Title of Research Project | Funding Agency | Funding Amount | Designation in Project (PI/Co-PI) | |
|---|---|---|---|---|---|
| | | | | PI | Co-PI |
| 1. | Antioxidant, anticancer potential and phytonutrients study of some Pakistani fruit juices treated with native and immobilized Exo-Polygalacturonase of fungal origin | HEC-NRPU | Rs. 179288/- | PI | - |

- Currently Supervising 2-M.Phil. Students, in spring 2022 4-M.Phil. chemistry students completed their research under my supervision.
- Working as Advisor/Controller of BS Chemistry 5th Semester (Session: 2020-2024).
- Organized a training workshop in February 2022 on "Art of Scientific writing & data Analysis"

**Dr. Nazia Yaqoob**
Assistant Professor
PhD Analytical Chemistry, University of Agriculture Faisalabad, Pakistan
Tel # +923332090567
Email ID: dr.naziayaqoob@gcwuf.edu.pk, nazia_yqb@yahoo.com

**Research Interest:**

- Analytical analysis (Isolation, Purification, Structure Analysis )
- Study of Lipid chemistry and Oleogells.
- Food preservation by gamma UV- irradiation and Food packaging films

**Publications:**

- **Project:** Feasibility of UV and Gamma irradiation for the preservation of selected mushrooms. Effect on physicochemical and nutritional composition" .
- 0.4 million Completed

**Name: Dr Maryam**
**Position:** Assistant Professor
**Department**: Chemistry
**Higher qualification:** Ph.D Northwest A&F University, China
**Phone:** +92-311-5860980
**Email:** *maryam@gcwuf.edu.pk; smilejust9@yahoo.com*

**Research Interests:** Extraction and Isolation of Natural products.
Synthesis of biologically active small molecules and experience in conducting antioxidant activity.
Drug designing using different computational techniques like Molecular docking, Discovery studio, QSAR of drug molecules, Autodock vina, Molegro Virtual Docker, Flare Spark ™ etc.
Chemistry software's and internet tools (End Note, Chembio draw, & Chem. Sketch)
Spectroscopic Techniques (UV, IR, NMR, Mass spectroscopy)
Chromatographic Techniques ( Thin layer chromatography, Column Chromatography)

**Publications:**

- Coordinator Chinese language Course

| Published Articles | Total Impact Factor | Submitted Articles |
|---|---|---|
| 18 | 40 | 03 |

**Project:**

| Title | Funding Agency | Amount (Millions) | Status |
|---|---|---|---|
| Synthesis of biologically active hydroxytriazines | HEC/SRGP/21-394 | 0.3 | Completed |
| A Neutraceutical Formulation based-on Pharmacopeia to treat Vitiligo: A Cutaneous Disorder due to Dysfunctionality of Melanocytes. | HEC/TDF | 13.90 | Submitted |

# Dr. Huma Munir

PhD Analytical Chemistry
Assistant Professor
Department of Chemistry
GC Women University Faisalabad

Dr. Nusrat Shafiq, Assistant Professor, Synthetic and Natural Product Discovery Laboratory, Department of Chemsitry, Government College Women University Faisalababd, Pakistan, # +923037295919
Email ID: dr.nusratshafiq@gcwuf.edu.pk, ggumarin@gmail.com , ORCID ID: orcid.org/0000-0002-3270-4227, Author ID: 14032182200 Experience= 07-04-2015 to Present

Research Interest: Synthetic Organic Chemistry, Natural Product Chemistry of Plants and endophytic fungi (Isolation, Purification, Structure Analysis, Biological Evaluation and Total Synthesis, Molecular Docking study, QSAR, Pharmacokinetics study, DFT study, New Drug Designing, APIs synthesis

**RESEARCG GRANTS:**

| Title | Funding Agency | Amount (Million) | Status |
|---|---|---|---|
| "Synthesis and biological evaluation of novel pyrimidine derivatives" | HEC/SRGP/1142 | 0.47523 | Completed |
| In vitro Macro and Micro propagation of Allantoin (from shrub) for Commercialization to Cosmetic Industry | HEC/TDF03-172 | 11.032 | Continue |
| Synthesis of important APIs (active pharmaceutical ingredients) with potential market demand : A step towards made in Pakistan Pharmaceutical products with goal of improvement in Pakistan Economy | TH-22 (PSF/CRPT/helx-22) | 5.60 | Continue (at 1st quarter stage) |
| Synthesis of potential multi-protein targeting pyrimidine scaffold against diabetes mellitus and their Artificial Intelligence driven hit to lead optimization: Integrative computer aided drug designing approach | CIF | 70.563 | Shortlisted |

Total Publications= 34 Impact Factor=133



# Dr. Nadia Noor

**Area of specialization / Research:**

Analytical Chemistry

**DAY 1**

**7th March 2023**

Plenary Lecture
Jinnah Auditorium, GCWUF
09:45-11:20 am PST

**Frontiers of Nano-Photonic deep-UV Irradiation Technology**

**Prof Dr Khizar Bhutta**

Sr. Engineering & Manager, Whirlpool Corporation, Benton Harbor MI, USA

**Abstract:** Deep-UV is an emerging form of germicidal UV (GUV) irradiation, a highly recognized and well-established disinfection technology and growing resource in the battle against the virus SARS-CoV-2 and other pathogens that can spread easily through the air in enclosed spaces. While UV photonics, photoreaction and photoreactor systems are the key elements of emerging high tech manufacturing industry, the new generation of UV photonics offers highly efficient, reliable and customizable UV LEDs for the B2B market. These devices can be used, among others, for water purification, disinfection, food preservation, automotive and aviation interior sterilization, medical diagnostics, phototherapy, UV curing, and sensing. Latest product portfolio covers single chips and fully packaged UV LEDs in the UV-B and UV-C wavelength ranges of 280 to 245nm regimes. The profound technological expertise of the UV photonics especially within the area of advanced packaging made it possible that these challenging wavelength light sources are tailored to meet some critical specification needs in terms of high power densities, emission wavelengths, emission characteristics, power ranges or chip layouts, thermal stabilities, and longer lifetimes. Briefly, recent advances in a new deep-UV light source (UV LED), create the opportunity for the development of novel UV-based technologies and devices to cater the COVID-19 pandemic sanitization and disinfection needs for polluted air, fluids, surfaces, articles and system. Technically, emerging UV LEDs photonic has potentially transform this technology by not only advancing the design and application of current UV modules, but also enabling the creation of entirely new products and markets. We will present possible future developments on group III-nitride nano-UV LEDs, which are based on current achievements in this rapidly arising research-technological field. First, the challenges facing their fabrication, their characteristics and

packaging will be presented. Some critical high tech manufacturing industrial applications such as in water purification, surfaces disinfection, food preservation, automotive and aviation interior sterilization, medical diagnostics, phototherapy, UV curing, smart sensing, optical lithography, Non-line-of-sight (NLOS) communication, and optical computing will be summarized. We will discuss unconventional device applications and prospects for emerging photon source-based technologies, and current achievements in UV Photonics packaging devices. It is believed that besides today's environmentally friendly terrestrial industrial and information technologies, an enormous potential of nano-UV LED technology for AL & ML based automation transformation technology applications is envisaged.

## Near-Infrared Spectroscopy and AI for Non-Invasive Pervasive Glucose Monitoring

**Prof. Dr. Maria Valero de Clemente**.

College of Computing and Software Engineering, Department of Information Technology at Kennesaw State University (KSU).

**Abstract:** The United States is facing diabetes and metabolic disease epidemic, with more than 11.33% of the population suffering from diabetes, and 30\% of metabolic syndrome. The lead indicator of these diseases is the Blood Glucose (BG) concentration. Measuring BG involves either painful blood extraction multiple times per day, insertion of needles inside the body, or using non-invasive devices that lack accuracy. While the development of non-invasive methods is progressing, the current approaches do not present high accuracy.

Session-I: Nano-Chemistry & Nano-Technology Applications
Jinnah Auditorium, GCWUF
11:50 am-01:30 pm PST

**Invited Talk:**

## Quality food production in changing climate scenario through collaborative approaches

Commented [DNS1]: Not given Lecture

Hassan Munir, Fahd Rasul and Abdul Khaliq

Department of Agronomy, University of Agriculture Faislabad

**Abstract:** Food production is critical requirement for survival of humanity since its very beginning. Rising Climate change phenomenon is making such fulfillment of food production difficult day by day. Food assurances are, therefore, much concerned with the practices and choices of cropping across the globe. Resilient cropping options in the form of salt lovers, drought lovers as well as heat, low nutrition and frost resilients all are getting popular with respect to climatic adversities, variability and shocks. Rising CO2 and heat are leading to melting of cap and glacial ice very quickly leading to abrupt floods and sea level rise and such changes are leading to huge risks to humanity in variety of regions of the world. Coping such challenges in subcontinent is similarly at stake when considered in respect of conventional crop husbandry and lack of digitized interventions as well as connectivity among the stakeholders. Applied and basic scientific communities are siloed and a number of factors right from social to cultural as well as ethnic to professional, are hurdling ultimate progress to combat such deleterious impacts of climate change. Harnessing the climate change is again crucial when those are dealt on spacial basis. Looking forward for physicists, chemists, biochemists and pure biologists collaborating with the applied agrarian, microbiologists, physiologists, medical professionals, sociologists, anthropologists etc. for clustered efforts is endeavored to practically hook up for mitigation of climate change and assurance of food to the mankind, a every desired goal of all scientific community.

**Invited Talk:**

**Microalgae-based CO2 capture and biotransformation of biomass to bioproducts in a circular bioeconomy paradigm" and it would fit into the theme."**

**Prof. Dr Aamer Mehmood.,**

Director Training & Development,

GC University Faisalabad

**Abstract:**

**Invited Talk:**

## The Emerging Role of Polymeric Nanofibers in Medical & Healthcare Applications

Dr. Ahsan Nazir, National Textile University, Faisalabad

**Abstract**

Polymeric nanofibers find a range of medical and healthcare applications due to their unique physical, chemical, and mechanical properties. Some of the most important applications of electrospun nanofibers in these fields include Tissue Engineering, Drug Delivery, Wound Dressings, and Biosensors. They are used in tissue engineering to create scaffolds that mimic the extracellular matrix of natural tissues. These scaffolds provide a suitable environment for cells to grow and differentiate, which can be used to repair or regenerate damaged tissues. These fibres can also be used to deliver drugs and other therapeutic agents to specific target sites in the body. Their high surface area to volume ratio allows for a higher drug loading capacity and sustained release of drugs over a longer period. Electrospun nanofibers can also be used for wound dressings that promote faster healing and reduce the risk of infection. The high porosity and surface area of electrospun nanofibers allow for the efficient absorption of wound exudates and the delivery of drugs and other therapeutic agents to the wound site. Further to this, electrospun nanofibers can also be used as sensing elements in a variety of applications, including medical diagnostics. The high surface area and sensitivity of electrospun nanofibers allow for the efficient detection of various analytes. Commercialization of these nanofibers for above mentioned applications need rigorous validation and upscaling so that the projected benefits can be taken from them.

## Session II: Emerging Technologies in Environmental Sciences
## Video Conference Room, GCWUF

**Invited Talk**:

### Green synthesis of magnesium oxide nanoparticles using leaves of Iresine herbstii for remediation of Reactive Brown 9 dye

Dr Samina Iqbal.

National Institute of Genetic Engineering and Biotechnology.

**Abstract Missing**

### Rhizoremediation of emerging pollutants: a sustainable approach

Dr. Shumaila Kiran

GC University Faisalabad.

**Abstract Missing**

### Synthesis and Characterization of boron nitride (BN) thin film for magnetic and antibacterial applications via Sol-gel method"

Dr. Faiza Amin

GC Women University Faisalabad.

**Abstract:**

To ensure the best dimensional accuracy and greatest efficiency, novel technologies require innovative coatings. Recently, two precursors H3BO3 and B(NO3)3 were used to develop a boron nitride thin film via the sol-gel dip coating method. The molarity of H3BO3 increases with the thickness of thin films, however, the molarity of boron nitrate causes the thickness to decrease. The film-preferred (002) plane and the precursor molarity and crystallite size have a direct correlation. The band gap also widened with increasing molarity for both precursors. Films show ferromagnetic behavior at room temperature. BN has excellent antibacterial activity against four bacterial strains.

**Synthesis of Bis Schiff bases and their Evaluation as anticancer agents**

Sarosh Iqbal,[a,b,*], Khalid Mohammed Khan[a,c,] Muhammad Iqbal Choudhary[a]

Government College University Faisalababd
HEJ, research Instiute, Karachi

**Abstract:**

Currently, cancer is second leading causes of death in humans worldwide, accounting for roughly a quarter of all deaths. About 20 million cancer cases are expected to occur in the next two decades, so development of improved anticancer therapies is urgently needed in the field of medicine and Human Health. We have synthesized bis Schiff bases (**1-25**) by reaction between carbohydrazide and different aldehydes in the presence of acetic acid and ethanol. Synthesized compounds (**1-25**) have been purified and characterized by mass spectrometry and NMR spectroscopic techniques. In addition, all synthesized compounds have furnished good CHN analysis. All synthesized compounds have also been evaluated for their potential as anticancer agent and study have identified interesting lead molecules having potential for further study.

The talk will highlight synthesis and bioactivity study of bis Schiff bases.

**Development of an eco-friendly and fire-resistant natural fiber composite.**

Sumaira Zulfiqar

National Textile University Faisalabad

**Abstract**

**Effects of Polyphenol-Rich Hibiscus and Zingiber Teas on Obesity and Oxidative Stress in Rats Fed a High-Fat-Sugar Diet**

**Neelam Iftikhar* and Abdullah Ijaz Hussain**

Natural Product and Synthetic Chemistry Lab, Government College University Faisalabad, Pakistan.

**Abstract**

The present research work was planned to investigate the potential of polyphenol rich extracts of Hibiscus rosa-sinensis (HRS) and Zingiber officinalis (ZO) teas against the obesity and related biochemical parameters of high-fat-sugar diet-induced obesity rats. Three herbal teas were prepared from HRS flowers and ZO rhizomes and their mixture (HRS:ZO, 3:1). Extracts were prepared and total reduced capacity (TRC) and total flavonoid contents (TFC) of the extracts were estimated as gallic acid and catechin equivalents (GAE and CE), respectively. TRC of HRS and ZO extracts were found to be 5.82 and 1.45 mg/g of dry plant material, measured as GAE while TFC were 9.17 and 1.95 mg/g of dry plant material, as CE, respectively. Reverse Phase-HPLC analysis revealed the presence of 15 phenolic acids and 4 flavonoids in herbal extracts of both samples. Catechin, rutin, gallic acid, 4-hydroxy benzoic acid, chlorogenic acid, caffeic acid and salicylic acid were the major compounds detected. 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay was performed and both extracts showed > 50% DPPH radical scavenging capacity. Two levels (250 and 500 mg/kg BW) of each tea were selected to assess anti-obesity potential using high-fat-sugar-diet-induced obesity rat's model. Data showed that higher dose of HRS significantly reduced the rat's body weight and body mass index as compared to high-fat-sugar diet group. Total cholesterol, high and low density lipoproteins, triglycerides, kidney, liver and atherogenic indexes, bilirubin total, aspartate aminotransferase, alanine aminotransferase, alkaline phosphate and serum cretanine of rats showed that HRS extract showed significant anti-obesity potential. Moreover, HRS extract also prevent the alterations in malondialdehyde, superoxide dismutase and reduced glutathione levels of experimental rats, thus also showed potential against oxidative stress. It is evident from the results that higher dose of HRS exhibited best protective effects against obesity and oxidative stress while ZO showed fewer protective effects.

**Keywords:** Nutraceutical, Cholesterol, Kidney Index, Liver Index, High fat diet, Phenolic acids and flavonoids

**Green Synthesis and *In-Vitro* Anticancer Studies of New Binuclear Se-*N*-Heterocyclic Carbene Adducts**

Muhammad Atif[1], Maryam Aslam[3], Muhammad Adnan Iqbal[2]

[1]University of Lahore, Sargodha Campus, Sargodha

[2]Organometallic & Coordination Chemistry Laboratory, Department of Chemistry, University of Agriculture, Faisalabad, Pakistan

[3]Government College Women University Faisalabad

**Abstract**

A series of binuclear selenium adducts were designed using molecular docking approach while finding their promising interaction to four angiogenic factor-proteins including COX-1 (Cyclooxygenase-1), VEGF-A (vascular endothelial growth factor A), HIF (Hypoxia-inducible factor) and EGF (human epidermal growth factor). They were synthesized as per *In-situ* coordination approach, wherein green synthetic approach was employed. The synthesized adducts as well as their respective bis-benzimidazolium salts were confirmed by $^{1}H$ and $^{13}C$-NMR along with FT-IR spectroscopy. The both were, then, subjected to *In-vitro* anticancer activities against breast adenocarcinoma cell line (MCF-7), cervical cancer cell line (Hela), mouse melanoma cell line (B16F10) and retinal ganglion cell line (RGC-5) using MTT assay while comparing their activities with a commercially established standard-drug including 5-Fluorouracil and Sunitinib. The increase in cytotoxicity of the adducts and bis-benzimidazolium salts was observed with increase in stability of aromaticity of N-Heterocyclic carbene cores.

## Bio-Statistical Optimization of Lipase via Microbial Fermentation and Its Applications on Plastic Degradation

**Sidra Jabeen, Faiza Amin**

GC Women University Faisalabad.

**Abstract:**

Lipases (triacylglycerol acyl hydrolases, EC 3.1.1.3) subclass of esterase enzyme that catalyzes the fat (lipids) hydrolysis. These are representatives of class serine hydrolases which have various commercial applications. Lipases play important roles in digestion, transport and processing of dietary lipids (e.g., fats, oils) in numerous living beings. Lipase is also used as biocatalysts for poly-degradation. Lipase can be synthesized by fermentation i.e., solid state fermentation and

submerged fermentation. In the first part of research, lipase production optimization by solid state fermentation had been carried out using optimization protocol through a fungal strain. Different parameters influencing the biosynthesis of lipase were identified to obtain minimal titers of enzyme. In next step, all identified parameters were used in statistical design to optimize the synthesis of lipase titers. Then ammonium precipitation technique was used to partially purified the enzyme and after this characterization in terms of temperature (T), pH, Change in entropy (ΔS), Activation energy (Ea), Micheali's Constant (Km) and Maximum velocity (Vm) etc. have been found. In last step, industrial significance of lipase had been assessed in detail. Finally, data points had been plotted in graphical form via MS excel and data had been analyzed using a proper statistical tool and the results had been presented in the form of mean standard deviation.

## Cultivation of Exotic Safflower Accessions under Municipal Wastewater and Ground Water

[1]Muhammad Usama Shabbir, [1]Muhammad Alamgeer, [2]Rabia Safeer, [2]Sadia Waris, [2]Uzma Nasrullah, [1]Muhammad Sajid, [1]Muhammad Zain Shahzad, [2]Ayesha Yousaf, [2]Ayesha Sharif and *[1]Hassan Munir

University of Agriculture Faisalabad

**Abstract**

Climate change, poor agricultural management and rapid population expansion are the main causes of Pakistan's water crisis. Loaming wastewater from urban sewer and from industrial effluents critically affecting the crops in the peri-urban environments. Safflower is a xerophytic plant that can conserve subsoil moisture using robust vigorous tap-root system. Therefore, this study was targeted to assess the growth, phenology and yield of exotic safflower accessions under different water sources. The study was executed under completely randomized design with factorial arrangements at net-house of the Agronomy Research Farm, University of Agriculture Faisalabad during last week of December 2021. Two sources of irrigation water and their combination mix were employed in two non-spiny exotic safflower accessions with three treatments (I 1 -Ground water, I 2 -Waste water and I 3 -Ground water +Wastewater with 50:50 ratio). The influence of wastewater on safflower's growth, yield and phenology was studied. Safflower irrigated with the wastewater and ground water mixture produced the same yield of seed, plant height and number

of branches with the same fresh and dry weights as of safflower produced from pumped water from ground alone. Days to stem elongation showed significant response of wastewater as compared to groundwater and mixer of ground and wastewater application. The protein and oil contents in safflower seed, irrigated with the wastewater and groundwater mixture were lower than those grown with groundwater. Conclusively, safflower was found mitigating the harmful effects of wastewater and its combination with groundwater based on its root extraction phenomenon.
**Keywords:** Wastewater, Ground and wastewater, Safflower, growth

**Session III : Rational Drug Designing and Discovery**
**Video Conference Room, GCWUF**

**Invited Talk:**

# Chemical Composition and Pharmaceutical Applications of Lamiaceae Essential Oils: A Comprehensive Study.

Prof Dr Abdullah Ijaz

Department of Chemistry. GC University Faisalabad

**Abstract**

The aim of the present study was to examine the effect of different environmental and agricultural parameters on the quality and biological activities of essential oils of Lamiaceae species. The essential oils contents from material collected from colder regions and at full bloom were higher than from temperate regions. The GC-MS analysis revealed that mostly quantitative, rather than qualitative variations were observed in the oil composition of each species with respect to harvest seasons. The principal chemical constituent determined in M. arvensis, M. piperita, M. longifolia, M. spicata essential oils from both the seasons were menthol, menthone, piperitenone oxide and carvone, respectively. The major chemical constituent of O. sanctum, O. gratissimum and O. basilicum essential oils were eugenol, β-caryophyllene, β-elemene and linalool. The antiproliferative activity has been tested on breast cancer MCF-7 and prostate cancer LNCaP cell lines by the MTT assay. The antimicrobial and antioxidant activities were determined by using broth micro dilution, DPPH radical-scavenging and inhibition of linoleic acid oxidation assays. All the tested essential oils exhibited excellent antimicrobial, antioxidant, cytotoxic potentials. The significant ($p < 0.05$) variations in the contents of most of the chemical components and biological activities of seasonally collected samples were documented.

**Invited Talk.**

Application of hybrid Biopolymers as green matrix for drug delivery.

Dr Muhammad Shahid

University of Agriculture Faisalabad

**Abstract:**

**Statistical evaluation of selected metals and metalloids in the serum of gastrointestinal cancer patients.**

Dr. Hafiz Muhammad Abdul Qayyum

University of Education Faisalabad Campus.

**Abstract**

**Structural, Morphological and Magnetic properties of Fe and Al doped Titania**

Hareer Sarmad

**Affiliation???**

**Abstract:**

In the current research ferromagnetic semiconductors with a narrow band gap are developed by doping of Fe and Al at variable molar ratios. The resulting material was characterized by X-Ray Diffraction (XRD), Scanning Electron microscope (SEM) and Vibrating Sample Magnetometer (VSM) to determine the structural, morphological and magnetic properties respectively. XRD technique determines the single-phase Anatase structure. Surface study reveals the agglomeration of nanoparticles. Magnetic properties showed interesting magnetic behaviors such as diamagnetic for TiO2, ferromagnetic for Fe, weak ferromagnetic for Al and strong ferromagnetic for Fe, Al doped Titania. Overall Fe and Al doped Titania has shown to be an effective materials which to be used in spintronics devices.

**Strengthening Salinity Effect in Canola Cultivars through Bio-Fabricated Zinc Oxide Nanoparticles (ZNONPs)**

[1]Maryam Hina, [2]Faiza Mubarak, [3]Maryam Aslam and [1]Imran Khan

University of Agriculture Faisalabad

**ABSTRACT**

Salt stress is a severe problem that inhibits plant growth and development and disturbs soil efficiency globally. Applying ZnO nanoparticles improves the quality and increases yield in many crops. This study was conducted to evaluate three different factors, which include Factor A: salinity levels (control, 6 dS $m^{-1}$, 12 dS $m^{-1}$), Factor B: different levels of ZnO nanoparticles (control, 20 mg/L and 40 mg/L), and Factor C: cultivars of Canola (super Canola and Faisal Canola). The research project was conducted at the Wire House of the Department of Agronomy at the University of Agriculture in Faisalabad. All treatments were kept in Completely Randomized Design (CRD) under a three-factor factorial arrangement with three replications. The morphological, physiological, and biochemical aspects of canola cultivars were recorded by following standard procedures. Salinity significantly reduced the growth of both canola cultivars, and all agronomic traits exhibited negative behavior towards different saline stresses (6 $dSm^{-1}$ and 12 $dSm^{-1}$). However, the condition became more adverse when the plant was exposed to 12 $dSm^{-1}$ levels of NaCl. Our findings showed that Super Canola is a more resilient cultivar and might be an excellent alternative for cultivation in salt-affected areas. Both canola cultivars observed significant degradation in chlorophyll contents (Chlorophyll a, b, and carotenoid contents) while total phenolic and sodium content increased gradually with increasing salt stress. Foliar application with two different (20 mg/L and 40 mg/L) concentrations of ZnONPs stimulated a substantial reduction in sodium and total phenolic content of both canola cultivars. Moreover, it showed a remarkable increase in individual growth components and final crop yield under saline and non-saline conditions. Most parameters showed their best response when treated with 40 mg/L. While other parameters (potassium content, No. of pod per plant, harvest index) gave maximum results at 20 mg/L concentration. The contribution of ZnONPs, in minimizing the adverse effects of salinity on canola cultivars may be related to the management of total phenolic content and ionic control.

**Keywords;** Salt stress, plant growth, ZnO nanoparticles, Canola

**Design of Wound Dressing Containing Natural Antibacterial Agent Through Electrospinning Technique**

Anum Javaid[1], Ahsan Nazir[1], Zubair Khaliq*[1], Muhammad Bilal Qadir*[1]

[1]School of Engineering & Technology, National Textile University, Faisalabad-Pakistan

Corresponding Authors: zubair.khaliq@ntu.edu.pk; bilal_ntu81@hotmail.com

**Abstract**

In the last decades, the rapid growth of the global population and the rise in bacterial infections caused an increase in the use of antibiotics. While antibiotics can be an effective treatment for bacterial infections, synthetic antibiotics have several side effects and can lead to drug-resistant bacteria. Consequently, researchers have turned to nature-based alternatives such as traditional medicine, essential oils, herbs, and spices which are biocompatible, biodegradable, and eco-friendly options. This research aimed to synthesize and investigate novel antibacterial nanofibers containing the natural antibacterial agent ginger extract. Ginger (Zingiber officinale Roscoe) is a widely used spice member of medicinal plants with several health benefits. Studies have shown that ginger possesses anti-inflammatory, analgesic, anti-tumor, antioxidant, and antimicrobial properties and is good for overall digestive and cardiovascular health. This study first involved ginger extract (GE) filtration, to remove the heavier particles. The GE was then used in Polyethylene oxide (PEO) and water solution at different concentrations. The electrospinning technique was employed to turn PEO/GE solution into nanofibers. The incorporation of GE in the nanofibers was confirmed through Fourier transform infrared spectroscopy (FTIR), which revealed peaks for phenolic and aromatic groups. The viscoelastic properties of the PEO/GE solutions were also analyzed, PEO/GE solutions displayed higher viscosity with increasing PEO and GE concentrations. Scanning Electron Micrographs indicated an increase in nanofiber diameter with increasing PEO concentration and uniform morphology. Furthermore, the PEO/GE nanofibers were found to exhibit antibacterial properties as they inhibit the growth of Staphylococcus aureus, evidenced by the agar test technique. These results suggest the potential application of GE/PEO nanofibers as a wound dressing.

**Keywords:** Polyethylene oxide, Ginger, Electrospinning, Antibacterial, Wound Dressing

**Isolation and molecular characterization of Xanthomonas oryzae pv. oryzae for prediction of Effective R Genes for Rice**

Khansa Ejaz[1], Ali Faiq,[2] M. Asif [1], M. Asif,[2] Abha zaka,[2] M. Hanna Nguyen,[4] C. M. Vera Cruz,[4] Ricardo Oliva,[4] M. Arif[2] and Sumera Yasmin[1]*

National Institute for Biotechnology & Genetic Engineering.

**Abstract**:

Bacterial leaf blight (BLB) is a rice foiler disease caused by Xanthomonas oryzae pv. oryzae (Xoo), occurs in almost all major rice-growing regions worldwide and is considered as a serious yield-limiting factor in rice production. Xoo is a vascular pathogen that enters the host through hydathodes and wounds The pathogen is highly dynamic and quickly evolves itself when encountered with new resistant genes, hence, the knowledge about existing virulence range within pathogen population and availability of corresponding resistance gene source is of immense importance. Therefore, the present study focused on molecular dissection and evaluating the effectiveness of different resistance gene combinations against Xoo strains collected from 10 major rice growing districts of Punjab Pakistan. Phenotypic characterization of 41 collected Xoo isolates has shown that all of them were rod shaped gram negative bacteria. However, oryzae species and oryzae pathovar was confirmed in only 22 strains using multiplex PCR. Analysis of loop-mediated isothermal amplification (LAMP) validated the lineage and close relatedness of Pakistani Xoo strains with already reported Asian Xoo population. Furthermore, pathogenicity test have shown that out of 22 tested Xoo strains, four strains KS1, KS2, KS3, NM1 and SL4 fell into the most virulent category with an average lesion length of $\geq$15cm. Pathotyping of selected rice lines (having different combination of Xa4, xa5, Xa7, xa13, Xa21, and Xa23) against five, highly virulent Xoo strains revealed that combination of Xa4+xa13 and Xa4+xa5+Xa21 was found to be the most effective one against Xoo population prevalent in major rice growing regions of Punjab. The use of these well-characterized Pakistani Xoo isolates to evaluate the most effective, region-specific resistance gene combination may enhance the efficiency and durability of future breeding programs not only in Pakistan but also worldwide.

**Isolation and characterization of protease inhibitor peptide from Momordica charantia L. as an effective remedy for liver disorder**

Shagufta Kamal, Naheed Akhter, Sadia Zafar, Saima Rehman, Ismat Bibi, Kanwal Rehman
GC University Faisalabad

**ABSTRACT**

Present study was planned to isolate serine protease inhibitor from locally available Momordica charantia (Bitter gourd). Isolation procedure was involved ammonium sulfate precipitation, ion exchange chromatography on O-diethylaminoethyl (DEAE) Sepharose and gel filtration on spehadex G-25 column. The newly isolated peptides showed potent alkaline protease inhibitory

activity in the range of $K_i$ = 0.13 ± 0.05 µM to 1.89±0.25 µM, $IC_{50}$ = 0.048±0.85 to 0.68±0.15 µM than interferons (0.08±0.005 µM) as peptides having carboxylate as strong electron-withdrawing group was recorded as a most potent inhibitor of alkaline protease inhibitor while (%) inhibition against trypsin was ranging between 62.65±2.45 to 94.24±2.61. The kinetic study predicted that isolated peptides followed the un-competitive and mixed type of inhibition against serine protease. In silico molecular docking of the most potent peptide (COP) was performed at the active site of the alkaline protease co-crystal structure (PDB ID:1NEN). The results of molecular docking approved the experimental findings.

**Keywords:** Electron withdrawing group, trypsin, molecular docking, un-competitive and mixed inhibition

## Session IV: Frontiers in Nutrition: Food Chemistry
## Jinnah Auditorium, GCWUF

**Invited Talk:**

**Role of functional foods in healthy lifestyle**

Prof. Dr Shehzad Basra

University of Agriculture Faisalabad

**Abstract**

Most of the modern diseases are due to poor lifestyle. These can be managed by adopting a healthy lifestyle. Incorporation of functional foods is an important part of healthy living. Functional foods have the potential to cure many diseases of metabolic syndrome. Clinical trials have supported treating diseases by proper use of functional foods in diet. These foods include moringa, quinoa, chia, aloevera, stevia, buckwheat, olive oil, honey etc.

**Invited Talk**:

**Advance Trends in the Extraction of Selected Functional Compounds**

Prof. Dr Farooq Anwar.

University of Sargodha.

**Abstract:**

**Fly ash: Challenges and opportunities for value addition.**

Shahzad Ali Shahid Chatha

GC University Faisalabad

**Abstract**

Fly ash as a particulate and leachate pollutant has been recognized as human carcinogen. It is a key player of smog and climate change. Its dumping can be detrimental for soil fertility and ground water as well as financial liability. The most attractive and sustainable mitigation of fly ash waste is its recycling for value addition materials. Synthesis of fly ash-based zeolites as value-added material is an economical and sustainable approach. In this work a variety of fly ashes from boiler

plants of different industries were used for the synthesis of fly ash based active zeolites. Different fly ash based zeolites and zeolite synergized photo-catalysts prepared by conventional and advanced curing techniques were characterized by state-of-the-art analytical techniques like; XRD, SEM, FTIR, ICP-OES and CEC and investigated for their wastewater treatment potential, Keeping in vie the findings of this study, it is very reasonable to conclude that recycling of fly ash waste for wastewater treatment is a positive move towards achieving a healthy environment and green technology.

**Keywords:** flu ash, Smog, Synthesis, Zeolites, Water treatment

**Selection of resilient rice through analysis of morpho-physiological responses under osmotic stress conditions**

Naima Mahreen[1], Sumera Yasmin[1*], M Asif[2], Mahreen Yahya[1], Khansa Ejaz[1] and M Arif[2]

National Institute for Biotechnology & Genetic Engineering.

**Abstract**

Water scarcity accompanied by decreased precipitation is one of the key obstacles to agricultural throughput globally and is expected to increase further hence, posing a major threat to future food security. To sustain crop production under water deficit condition the need of the hour is to select drought tolerant rice variety. Therefore, in the present study morpho-physiological responses of rice genotypes were evaluated for polyethylene glycol (20%) induced osmotic stress under hydroponic system. The experiment was carried out in a growth room and to decipher the variation in genotypes for drought tolerance, 8 DPT (days post transplantation) rice seedlings were then subjected to the drought stress. Drought stress was imposed by elevating the osmotic potential (PEG-simulated drought) from 5%-20% PEG gradually. NIBGE-DT-02 genotype showed tolerance to 20% PEG-induced osmotic stress as indicated by minimum reduction in seedling length and biomass. Increased leaf proline content (20 $\mu molg^{-1}$ fresh weight) was observed in NIBGE-DT-02 as compared to susceptible variety. While, higher chlorophyll content with less percent reduction was observed in tolerant check variety (IR-55419-04) followed by NIBGE-DT-02 under osmotic stress. Significant percent decrease in chlorophyll a (CHL a) was observed in SB (78.7%) followed by NIBE-DT-11 (76.9%). All these responses collectively validated the adaptive response of selected genotype under osmotic stress. The results obtained from the present

study will be employed for the improvement of the rice crop in future breeding programs to address the food security issues in this alarming situation of climate change.

**Keywords:** Proline, Chlorophyll, Water scarcity, Osmotic stress tolerance, Rice genotypes.

**Synergistic Biostimulants for Sustainable Production of Wheat**

**Mahreen Yahya[1], Maria Rasul[1], Naima Mahreen[1], Sayed Zajif Hussain[2] and Sumera Yasmin[1*]**

National Institute for Biotechnology & Genetic Engineering

**Abstract**

Global agriculture is facing a major challenge of phosphorous deficiency. Applying phosphate solubilizing bacteria (PSB) as bio-fertilizers has enormous potential for sustainable agriculture. Despite this, there is still a lack of information regarding efficient formulation strategies. In the present study, well-characterized PSB, Ochrobactrum sp. SSR (DSM 109610), Enterobacter spp. DSM 109592 and DSM 109593 along with four organic amendments, biochar, compost, filter mud and humic acid were used to design bioformulations. All four carrier materials maintained adequate survival and inoculum shelf life of the bacterium, indicated by field emission scanning electron microscopy analysis. Filter mud (FM) based bio-formulation was most efficacious and enhanced not only wheat grain yield (4-9%) but also seed P (9%). Moreover, FM based bio-formulation enhanced soil available P (8.5-11%) and phosphatase activity (4-5%). The present study provides a valuable groundwork to design field scale formulations that can maintain inoculum dynamics and increase its shelf life. This work provides an environment and economy-friendly bacterial resource that potentially promotes sustainable agricultural development in the long term.

**Use of urease inhibitor for rice production and improved Nitrogen Use Efficiency under climate change scenario**

**Ahmad Faraz**[1,2], Asma Imran[1]*, Hammad Raza[2], M Iqbal[2]

[1]National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.
[2]Government College University Faisalabad, Pakistan

* Corresponding author E-mail: asmaaslam2001@yahoo.com

**Abstract**

Urea is widely used fertilizer in agriculture but most of the nitrogen (N) is lost through volatilization and leaching which not only contaminates the environment but decreases the

nitrogen use efficiency (NUE). Urease inhibitors (UI) are being recommended to minimize N-losses and enhance NUE because UI delay the hydrolysis of urea. This study was carried out to understand the impact of different UI on the morpho-physiological, biochemical and yield traits of rice. Rice plants were grown in pots till maturity and fertilized with different doses of UI i.e. 2-Mercaptoethanol (2-ME), thiourea (TU). UI was obtained from a commercial company and applied at different levels (0.5%, 1%, and 1.5%) with 80 kg N $ha^{-}1$ urea split application (40% at transplanting, 30% at tillering and 30% at the panicle stages). Each treatment was replicated three times. Control pots with full Urea (120 kg N $ha^{-1}$) were also cultivated. The differences in nitrogen (N) accumulation, translocation, dry matter and yield formation with different N fertilizer doses were analyzed. Results show that urease enzyme activity is much lower in all UI-treated plants as compared control that delay the urea hydrolysis which decreases the loss of ammonia. The N recovery efficiency and N agronomic efficiency were significantly higher in UI than control. TU expressed maximum 100-seed weight and seed yield per plant as compared to others. TU showed higher flag leaf SPAD and photosynthetic rate, as well as higher ROS, enzymatic activity and N uptake during grain filling followed by others.

**Keywords**: urease inhibitor; nitrogen use efficiency; 2-Mercaptoethanol; thiourea; rice

**Session V: "Workshop on " Simulations and Remote Access" (Hybrid)**
***Web-based Simulations and Remote Access Visualization Tools for Science & Engineering Programs***
***Video Conference Room, GCWUF***

Resource Person: **Prof. Ahmed S Khan, Ph.D.** Fulbright Specialist Scholar, World Learning Inc. U.S. Dept. of State's Bureau of Educational & Cultural Affairs (ECA), USA,

Resource Person**: Prof. Salahuddin Qazi**, Professor Emeritus, SUNY Polytechnic Institute, Utica, NY, USA

Resource Person**: Atilla Ozgur Cakmak,** Teaching Assistant Professor, Pennsylvania State University, USA

**Abstract**

Teaching, Learning and Research in new and emerging technologies require state of the art laboratories equipped with expensive equipment and associated support facilities. However, such facilities also require large financial resources and time restraints to implement the requirements. Use of Web-based Simulation and Remote Access Visualization Tools enhance students' learning and teaching of new and complex concepts without physically using required expensive equipment. In addition to cost savings, web-based simulation and remote access/online visualization approach offer several advantages: (1) Allowing the user to modify system parameters and observe the outcomes without any harmful side effects (2) Eliminating component or equipment faults that affect outcomes (3) Supporting users progress at their own pace in discovering and understanding of concepts, outcomes and issues, and (4) Enhancing the presentation and understanding of 'the dry and abstract' concepts by integrating theory and practice. The workshop will discuss application of online simulation tools and remote access visualization for teaching, research, and collaboration in the areas of nanotechnology, material science, environmental science, electrical engineering, biological sciences, physics, chemistry, photonics and much more. These tools include 26 RAIN (Remote Access Instruments in Nanotechnology) nodes for accessing visualization instruments; 500+ simulation tools at nanoHuB to simulate nanotechnology processes; interactive simulations at Phet Interactive Simulations for Physical Sciences and Math; modeling; simulation of PV systems — like PVsyst, SolarGIS, PVGIS, PVWatts and RETScreen; and CompuCell3D & Physicell flexible modeling platforms that allow simulations for biology, tissue engineering, and viruses including COVID19. Best Practices and Simulation Experiences at GVSU with X-Ray characterization using XPS and XRD will also be discussed.

**DAY 2**

**8th March 2023**

**Plenary Lecture**
**Jinnah Auditorium, GCWUF**

**Recent Advances in Photonics & Physical Sciences easy to tell, Difficult to own, what to Do?**

**Dr. Mohammed Ilyas Khan, Dr. Syeda Rabia Ejaz, Dr. Lubna Abidi**

Mama Care Foundation Breast Health Specialist

Govt. Sadiq College Women's University. Bahwalpur

Jinnah University for Women's Karachi

**Abstract:** Photonics denotes the science of generation, detection, and manipulation of light waves. Photonic-based methods have contributed significantly to public health in terms of developing rapid, cost-effective, personalized interventions. These methods have many advantages due to the high-speed movement of optical photons and the ability of light waves to penetrate various biological barriers without causing unwanted interactions Over the last two decades, photonics technologies have been used to rapidly, sensitively, and selectively detect disease-specific biomarkers, metabolites and metabolic biomarkers, pathogens, and disease-specific changes in the composition of cells and tissues, and body fluids With recent advancements in the field of bio photonics and Physical Sciences, it is now possible to differentiate malignant tissues from normal tissues and stages of cancer by combining artificial intelligence with photonic technologies. Cancer detection in its early stage can improve the survival rate and reduce mortality. The rapid developments in deep learning-based techniques in medical image analysis algorithms along with the availability of large datasets and computational resources made it possible to improve breast cancer detection, diagnosis, prognosis, and treatment What to do we have to adopt Strategies and Practices which are Affordable, Acceptable, and Practical and according to the need of Pakistan must be Innovative Integrated and Multidisciplinary Approach having measureable Indicator.

**Use of Functional Materials in Chemical Analysis of Drug Molecules**

**Prof Dr Halil Ibrahim Ulusoy.**

Department of Pharmacy, Sivas Cuhuriyet University, SIVAS/Türkiye.

**Abstract:**

**Session-I：Natural & Synthetic Medicinal and Pharmaceutical Sciences (Hybrid Mode)**

**Video Conference Room, GCWUF**

**10:45am-01:00 pm PST**

**Invited Talk**

# Natural Products and Synthetic Organic Chemistry Roads to Pharmaceutical Industry: Hopes and Disappointments

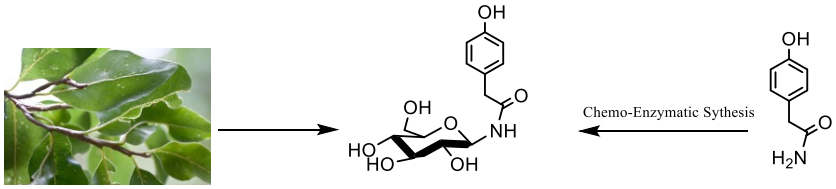
**Athar Ata**

Department of Chemistry, College for the Environmental and Science Complex, The University of Winnipeg, 599 Portage Ave. Winnipeg, MB, Canada R3B 2G3. Ph. (204) 786-9389; E-mail: a.ata@uwinnipeg.ca; Fax: (204) 774-2401

**Abstract:** Pharmaceutical industry relies on synthetic organic chemistry and natural products for discovering novel biomedical agents. Among both of these sources, natural products have provided 50% of the prescribed drugs to cure various diseases. The Mother Nature provides structural diversity with potent bioactivities against various biological targets that is obtained from different natural sources including plants and marine organisms. This structural diversity is incredible in its range of multiplicity. The molecules found in nature have resisted challenges of natural selections and overcame them during the molecular evolution. Due to this reason, natural product chemistry is one of the major contributors of lead compounds to the drug discovery process compared to combinatorial and genomic approaches as they have failed to provide sufficient chemical diversity.

Malfunctioning of enzymes often leads to disease that can be caused either by their dysfunction, overexpression, or hyper-activation. For instance, □-glucosidase (EC 3.2.1.20), a membrane bound enzyme, lies at intestinal cells which catalyzes the final step of carbohydrates digestion by hydrolyzing the glycosidic bonds in carbohydrates to liberate free glucose and causing type 2 diabetes. This affects approximately 2.1 billion people worldwide. The potent □-glucosidase inhibitors can be used to cure type 2 diabetes. Due to the catalytic role of □-glucosidase in carbohydrate digestion, these inhibitors may also be used as therapeutic target for other carbohydrate mediated diseases including viral infections, cancer, HIV, obesity and hepatitis.

We are involved in discovering new lead bioactive compounds exhibiting potent health related enzyme inhibitory activities using natural products and synthetic organic chemistry. In this presentation, discovery of novel bioactive compounds from natural sources and synthetic organic chemistry as well as their structure-activity relationships will be discussed. Additionally, our recently developed chemo-enzymatic approach to produce natural products on large scale will be also presented.



**Invited Talk**

**Nutraceuticals/Functional Foods a promising future for Health and New Drugs: Recent development and challenges**

**Prof. Dr. Tahir Mehmood.**

"Center for Applied Molecular Biology, University of the Punjab, Lahore, Pakistan.

**Abstract:**

**Invited Talk:**

**Measuring the influence of rol gene on plant metabolism in Lactuca sativa with metabolomic and bioactivity tools**

**Dr Hammad Ismail.**

University of Gujrat.

**Abstract:**

**Impact of Rare-earth doping in nickel spinel ferrites to improve the structural and electrochemical performance for supercapacitor Application(online)**

Tafruj Ilyas.

University of North Carolina, Charlotte, USA.

Lanthanum substituted nickel ferrites with the general formula NiLaxFe2-xO4 (where; x = 0, 0.3, 0.5) electrodes prepared by powder metallurgy technique have been investigated. Structural and surface morphological have been studied through X-ray diffractometer (XRD) and Scanning Electron Microscopy (SEM), respectively. The XRD data confirmed the spinel phase of La+3 substituted NiFe2O4 ferrites and determined the structural changes in term of lattice imperfection. Formation of well-defined spherical grains as uniform clusters and large agglomeration were observed by SEM. The electrochemical investigation of NiLaxFe2-xO4 (where; x = 0, 0.3, 0.5) electrodes were also carried out by Cyclic Voltammetry (CV) and Galvanostatic Charging Discharging in 1 M KOH electrolyte. The maximum specific capacitance of ~ 1050 Fg-1 was achieved at the scan rate of 10 mV/s. Hence, the fabricated electrodes NiLaxFe2-xO4 are known as a prospective material for energy storage applications.

**Phytochemicals screening and Neuroprotective activity of Verbascum thapsus Extract against Alzheimer Disease induced Rat Mode**

**Naheed Akhter**

Government College University, Faisalabad-Pakistan

**Abstract**

Back ground: Traditionally, Verbascum thapsus have been used as a medicine due to its potential bioactive compounds and pharmacological properties against various diseases.

Objective: The study was aimed to determine the potential effect of V.thapsus extract against Alzheimer disease induced rats.

Method: Preliminary physiochemical, phytochemical studies of plant were carried out along with FTIR and HPLC characterization. Acute toxic potential (OECD 425) was designed for safety evaluation. To determine the anti Alzheimer effect of plant, rats were orally given the aqueous extract of V.thapsus at doses of 50, 150, 300 mg/kg for 21 days and behavioral test were observed on 22$^{nd}$ day of study. Biochemical and histological studies were performed to validate the results of behavioral test.

Results: Phytochemical results revealed the presence of alkaloids, flavonoids, phenols and glycosaponins. HPLC analysis indicated the presence of quercetin, gallic acid, caffeic acid, vanillic acid, benzoic acid, chlorogenic acid, ferulic acid and cinamic acid. No mortality was detected in acute toxicity study. V.thapsus extract significantly improved the cognitive impairment related to behavioral studies. Histopathological studies revealed that neurofibrillary tangles and neuroinflammation was significantly improved in V.thapsus treated group. Biochemical studies suggested that V.thapsus has neuroprotective potential against Alzheimer's disease. By the molecular docking and interaction analysis, three potential phytochemicals were screened; Quercetin, Chlorogenic acid, and Ferulic acid, and have presented the best and stable conformation within active site of target AChE protein, furthermore ADMET results supported the computational experiments by presenting significant results, further molecular dynamic analysis also confirm the wonderfull interaction of target AChE protein with Quercetin, Chlorogenic acid, therefore these three phytochemicals could be recommended for clinical testing for the treatment of Alzheimer's disease.

**Keywords:** Verbascum Thapsus; Alzheimer's disease; HPLC; rats; histopathology; molecular docking

**Cyclo(L-Leu-L-Pro), a bioprotectant of food against aflatoxigenic Aspergillus flavus**

**Mahwish Salman**

Government College University, Faisalabad-Pakistan.

**Abstract**

Food decay by pathogenic fungi causes economic loss and affects human health due to production of mycotoxins. The synthetic antifungal drugs develop resistances and creates different types of side effects on health. Therefore, the metabolites produced by beneficial microbes are good alternative of synthetic drugs due to the production of various antifungal metabolites.

The current study aimed to detect new antifungal metabolite cyclo(L-Leu-L-Pro), a cyclic dipeptide (CDP) from Lactobacillus coryniformis BCH-4 (KX388387) to evaluate its antifungal effect against Aspergillus flavus (MH179066) by using in vitro and in silico approaches. After culturing of L. coryniformis to collect cell-free supernatant, the CDP was extracted by using ethyl acetate and concentrated by rotary evaporator and loaded onto the C18 reverse-phase column of HPLC having a mobile phase system of 67.0% water, 3.0% acetonitrile, and 30.0% methanol with 1.0 mL/min flow rate. Antifungal and bioprotection analysis of cyclo(L-Leu-L-Pro) was performed against various food samples and docked as a ligand against receptor proteins of A. flavus (FAD glucose dehydrogenase, dihydrofolate reductase, and urate oxidase).

The HPLC detected concentration (135 ± 7.07 mg/mL) of cyclo(L-Leu-L-Pro) exhibited in vitro antifungal activity of 5.66 ± 0.57 mm (inhibitory zone). Besides, the CDP depicted valuable results as bioprotectant for grapes, lemon, cashew nuts, and almonds against fungus, in comparison with control. In molecular docking analysis, FAD glucose dehydrogenase exerted strong interactions with cyclo(L-Leu-L-Pro) having S-score of – 8.21. The results evaluated that the CDP has strong interactions with selected proteins, causing excellent growth inhibition of food-borne pathogenic fungi.

**Keywords:** Cyclic dipeptide, Lactobacillus coryniformis, Antifungal potential, Bioprotectant, Molecular docking

**Session II :Smart & Sustainable Development in Materials Manufacturing and Energy**

**Jinnah Auditorium, GCWUF 10:4 5am-01:00 pm PST**

**Invited Talk.**

**History of Periodic Table**

**Prof. Dr Jamil Anwar.**

**Distinguished Professor. University of Management and Technology Lahore**

**Abstract**

**Synthesis, Spectroscopic and Morphological Studies on CdS Quantum Dots for Photonic Applications**

**Ahmad Ali**

Ghulam Ishaq Khan Institute of Engineering Sciences and Technology.

**Abstract**

**IoT and Visible Light Communication (VLC) Based Vehicle-to-Vehicle (V2V) Networks**

Ahmad Hassan Khokhar[1,*], Muhammad Hasnat[1], Talha Nasir[2], Ibrahim Khan[2], and Muhammad Hassan Sayyad[1]

Center of Photonics, Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan

[2]Faculty of Electrical Engineering, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan

[*]*Corresponding author e-mail*: 2019042@giki.edu.pk; Ahmad.khokhar0055@gmail.com;

**ABSTRACT**

We are coming to an age where there will be so many smart vehicles on the roads, a way to communicate with each other will be needed. In addition, the radio frequency spectrum is getting crowded and additional communication technologies are needed to keep up with the future demands. With the aim to fulfill these two future needs, this research is undertaken and VLC based systems are designed alternative to radio waves for vehicle-to-vehicle communication [1, 2]. To establish a wireless communication channel, low cost prototype photonic transmitter and receiver

circuits are designed and analyzed using various laser and LED lights including vehicle headlights under different environments. It is hoped that our work can help provide a foundation for such a system being used in vehicles in a connected network in future.

**Effect of vanadium doping on the structural and optical properties of $Bi_2O_4$ dip coated thin film**

**Aimen Maqbool.**

Lahore College for Women University, Lahore.

**Abstract**

In the current research study, the sol gel dip coating technique was preferred to deposited vanadium-doped $Bi_2O_4$ (3 wt. % of $NH_4VO_3$) films on a substrate. The lattice structure, surface morphology, functional groups, and optical parameters of vanadium-doped bismuth oxide-coated thin films were analyzed by different characterizations. The existence of the monoclinic $Bi_2O_4$ phase has been proved by an XRD analysis. A small shift in crystallite size was noticed after vanadium-doping in pure bismuth oxide $Bi_2O_4$ with the reduction in lattice parameter. Sol of vanadium-doped contained various functional groups, which were recognized by FTIR spectroscopy at various wavelengths. Scanning electron microscopy analysis for the thin film showed an almost spherical-like appearance. For V-doped coated films, band gap energy was identified to be 1.8eV by using UV–VIS–NIR spectrophotometry performed in the 300–900 nm wavelength range.

**Influence of Ce doping on the characteristics and properties of copper oxide thin film.**

Muqadas Ghulam Alia Zohra Nazir Kayania , Warda Chaudhrya , Saira Riaza

**ABSTRACT**

A copper oxide thin film doped with $Ce^{3+}$ ions was created via sol-gel dip coating. Copper oxide in a two-phase phase (CuO-$Cu_2O$). with Ce doping was discovered using an XRD pattern along with the diffraction plane (110) and showed the cubic structure of $Cu_2O$, the crystallite size was determined to be 44.3nm. The chemical composition was investigated using FTIR spectroscopy of Ce doped (CuO-$Cu_2O$). Film morphology transitioned from non-uniform grains to cuboids. The band gap of the thin film decreased as the Ce dopant concentration increased. The band gap value

was calculated to be 3.45eV. Some potential uses for copper oxide include lithium-ion batteries, solar cells, magnetic storage devices, supercapacitors, photocatalysts, and field emissions. Keywords: Ce, Copper oxide, monoclinic, redshift.

**Influence of Ce doping on the characteristics and properties of copper oxide thin film**

**Madia Sahar[a] Zohra Nazir Kayani[a], Warda Chaudhry[a], Saira Riaz[a]**

**[(a)]Department of Physics, Lahore College for Women University, Lahore 54000, Pakistan**

**Abstract**

A copper oxide thin film doped with Ce3+ ions was created via sol-gel dip coating. Copper oxide in a two-phase phase (CuO-Cu2O). with Ce doping was discovered using an XRD pattern along with the diffraction plane (110) and showed the cubic structure of Cu2O, the crystallite size was determined to be 44.3nm. The chemical composition was investigated using FTIR spectroscopy of Ce doped (CuO-Cu2O). Film morphology transitioned from non-uniform grains to cuboids. The band gap of the thin film decreased as the Ce dopant concentration increased. The band gap value was calculated to be 3.45eV. Some potential uses for copper oxide include lithium-ion batteries, solar cells, magnetic storage devices, supercapacitors, photocatalysts, and field emissions.

Keywords: Ce, Copper oxide, monoclinic, redshift.

**Tunning of Perovskite Precursor Amount for Obtaining Optimum Performance of $CsPbIBr_2/TiO_2$ Heterojunction Type Perovskite Solar Cell**

**Sajid Khan*,** Mujeeb ur Rahman, Nadia Anwar, Ahmad Ali, Zafar Ali and Muhammad Hassan Sayyad

Advanced Photovoltaic Research Labs (APRL), Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan

*Corresponding Author*:* sajid.khan@giki.edu.pk

**ABSTRACT**

Due to their exceptional thermal stability, all-inorganic perovskite semiconductors have recently attracted great interest [1]. When creating high-performance perovskite solar cells (PSCs) the perovskite film quality is crucial and is influenced by a variety of variables, including the perovskite's composition, growth strategy, amount, [2] etc. In this work, the impact of $CsPbIBr_2$ perovskite precursor on the photovoltaic performance and impedance spectra of hole transport material-free (HTM-free) glass/FTO/c-$TiO_2$/m-$TiO_2$/m-$ZrO_2$/Carbon electrode type PSCs is investigated by varying precursor amount from 3 to 21 µL in steps of 2 µL The photovoltaic and impedance spectra of the devices are observed to be highly dependent on the perovskite amount. The device loaded with 11 µL of precursor exhibited the highest performance. According to these findings, selecting the ideal amount of precursor solution for the fabrication of the device is essential for ensuring the creation of perovskite crystals, full perovskite surface coverage, higher light absorption, optimum film thickness, and successful charge extraction from the manufactured devices to achieve higher performance.

**Synthesis and Characterization of boron nitride (BN) thin film for magnetic and antibacterial applications via Sol-gel method"**

Zainab Bashir.

Lahore College for Women University, Lahore.

**Abstract:**

To ensure the best dimensional accuracy and greatest efficiency, novel technologies require innovative coatings. Recently, two precursors H3BO3 and B(NO3)3 were used to develop a boron nitride thin film via the sol-gel dip coating method. The molarity of H3BO3 increases with the thickness of thin films, however, the molarity of boron nitrate causes the thickness to decrease. The film-preferred (002) plane and the precursor molarity and crystallite size have a direct correlation. The band gap also widened with increasing molarity for both precursors. Films show ferromagnetic behavior at room temperature. BN has excellent antibacterial activity against four bacterial strains.

# Development of Sustainable Azadirachta indica-loaded PVA Nanomembranes for polymer film Applications

**Rizwan Tahir**[1], Ahsan Nazir[1], Tanzeela Khalid[2], Muhammad Bilal Qadir[1]*, Zubair Khaliq[3]*
National Textile University Faisalabad

**Abstract**

Electrospinning is an emerging and promising technique for producing polymer films with a wide range of applications, including tissue engineering, drug delivery, and filtration. Polymer films contribute towards sustainability by reducing waste, improving energy efficiency, and supporting circular economies. By designing films with sustainable materials, recyclable designs, and energy-efficient properties, polymer films can help address environmental challenges and support a more sustainable future. The sustainable hydrophilic Azadirachta indica (AI) loaded electrospun PVA nanomembranes prepared for polymer film applications is an important research topic in the field of materials science. The use of natural and eco-friendly materials such as AI gives antimicrobial, antifungal, and anti-inflammatory properties, and PVA as a matrix material imparts excellent mechanical properties, biocompatibility, and biodegradability to the polymer film. The characterization of Sustainable Hydrophilic AI loaded PVA Nanomembranes for polymer film applications typically involved a range of techniques to assess their properties and performance. They were characterized by scanning electron microscope, Ultraviolet-visible spectroscopy (UV-Vis) drug release, water absorption analysis, 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenging, and antibacterial activity (qualitative and quantitative) at different PVA and AI concentrations. The AI nanoparticles of different sizes with different adsorption rates and low contact angles were examined. The prepared membrane showed antibacterial and antimicrobial activity, excellent mechanical properties, breathability, and permeability, which proves the AI loaded PVA nanomembrane for polymer fiber applications.

**Keywords:** Electrospinning, Polyvinyl Alcohol, Azadirachta Indica, Antibacterial, Nanofibers

**Growth And Physiological Response of Rice to Exogenous Bio-Stimulant Application under Saline Environment**

[1]**Umme Aymen**, [1]Sobia Shahzad, [2]Noreen Zahra and [1]Asma Hanif

Islamia University Bahawalpur

**Abstract**

A pot experiment was conducted at Islamia University Bahawalpur, Bahawalnagar Campus in order to assess the effect of bio-stimulant and salinity on the growth and physiological components of Oryza sativa. The experiment was consisted of salinity solely, salinity along with soil & foliar application of biostimulant. There were five different levels of NaCl as salinity stress 0 mM, 50 mM, 100 mM, 150 mM & 200 mM while bio-stimulant 1000 ppm. The Experiment was laid out in CRD with three replicates. Soil application of bio-stimulant found best against salinity as all morphological parameters, root fresh weight, shoot fresh weight, plant fresh weight, number of roots, number of leaves, shoot length, root length, number of tillers, leaf length, leaf width, leaf area, shoot dry weight, and root dry weight had highest mean values in soil application of biostimulant. In physiological parameters the foliar application was found best as carotenoids, phenolics contents, proline content, Nitrate and sulphates contents had highest mean values. The shoot potassium, calcium and sodium contents were found highest in control. Overall soil application was best as all morphological (14 parameters) & 4 physiological parameters were best in soil application. The foliar application of bio-stimulant was also found effective against salinity as compared to control but less than soil application of bio-stimulant.

**Keywords**: Carotenoids, phenolics, proline

**Physiological response of Sudan-grass to Exotic Seaweed, Amino acids and Minerals**

[1]**Ali Akbar**, [1]*Sobia Shahzad, [2]Noreen Zahra, [1]Asma Hanif

Islamia University Bahawalpur

**Abstract**

A pot experiment was conducted at Islamia University Bahawalpur, Bahawalnagar Campus to investigate the ameliorating the impact of salinity by novel seaweed, amino acid and nutrient

solution on growth and physiological components of Sudan grass using CRD with three replicates. In this experiment application of commercially available product “Tipple Boost” containing seaweed, amino acid and nutrients as soil and foliar application against salinity stress and salinity independently observed on growth and physiological components of Sudan grass. Soil application of seaweed, amino acid and nutrient solution was found best ameliorating the impact of salinity as morphological parameters Root Length, Shoot Fresh Weight, Root Fresh Weight, Number of Leaves, Number of Roots, Number of Tillers, Leaf Area, Leaf Width, Leaf Length, Shoot Dry Weight and Root Dry Weight while physiological parameters Chlorophyll a, Chlorophyll b, Total Chlorophyll, Carotenoids, Proline, Phosphate and Sulphate contents as compared to control and foliar application of seaweed, amino acids and nutrient solution. Foliar application was also effective in ameliorating the impact of salinity but less than soil application of seaweed, amino acid and nutrient solution as Phenolics, flavonoids, nitrates, shoot potassium and calcium contents showed better results as compared to control and soil application of seaweed, amino acid and nutrient solution.

**Abstract**

**Session-III: Photonics & Optoelectronics Committee Room, GCWUF**

**Invited Talk**

**Synthesis and Characterization of Quantum Dots for Low-Cost Scalable Photonics Applications**

**Prof. Dr Hassan Sayyad**

Ghulam Ishaq Khan Institute of Engineering Sciences and Technology

Abstract:

**Preparation of Modified Au doped ZnO Thin Films for Optoelectronic Applications**

**Maryam Anwar**, Zohra Nazir Kayani*, Amna Hassan

Department of Physics, Lahore College for Women University, Lahore, Pakistan

**Abstract**

Gold (Au) doped ZnO thin film was synthesized on a glass slide through sol gel- dip coating method. Thin film was annealed at optimized temperature. The optical properties of goldZnO film were characterized by UV-VIS-NIR spectrophotometry. X-ray diffractometer (XRD) structural studies confirm the wurtzite hexagonal structure of Au doped ZnO thin film. Preferential growth occurs along the (101) plane. The size of the crystallite was measured to be 25.01nm.The doping of Au influenced surface morphology and roughness of the film. The inspection of optical properties of Au/ZnO thin films was took place by UVVIS-NIR spectrophotometry. Optical study exhibits transparency and optical band gap changes with an increase in Au doping percentage. To probe biological properties of Au/ZnO, antibacterial activity was done by using Agar well diffusion method.

**Effect of Neodymium Doping on Structural and Optical properties of ZnO Thin Films"**

*Ayesha Akram*

*Affiliation*

**Abstract**

Rare-Earth (RE) metals have gained the attention of researchers due to their photoluminescence properties. Due to its partially filled f-orbitals, rare earth metal doping attracts more attention than transition metal (TM) doped ZnO. On a glass substrate, a thin film of Nd doped ZnO was deposited by using the sol-gel dip coating technique. Nd doped ZnO thin film structural experiments with an X-ray diffractometer confirm wurtzite hexagonal structure. The (100) plane is where the growth is preferred. The estimated crystallite size was 29.84 nm. The band gap energy was determined to be 3.7e V by using UV-visible spectroscopy in the 300-900 nm wavelength range. The envelope approach was used to estimate the refractive index and extinction coefficient from the transmission spectrum. The estimated dielectric constant was 25.1. To investigate the chemical composition of Nd doped ZnO, Fourier Transform Infrared spectroscopy was used.

**Structural, magnetic, optical and morphological properties of B doped ZnO thin film"**

*Riffat Sabir.*

*Lahore College for Women University, Lahore.*

**Abstract**

The properties of semiconductors can be modified by B doped ZnO thin film, which will be synthesized by the sol-gel dip coating method. X-ray diffractometer shows the wurtzite hexagonal structure for B-doped ZnO thin film. UV-Visible spectroscopy examines the band gap of B-doped ZnO decreased by the increase in B dopant percentage. Transparency is shown in the visible region by transmission spectrum. Rough surface confirmed by scanning electron microscopy. Magnetic properties show the ferromagnetic behavior

## Optimizing Carbon Electrode Thickness for Enhanced Performance of Hole Transport Material-Free Perovskite Solar Cells

**Mujeeb ur Rahman[*], Sajid khan, Nadia Anwar, Ahmad Ali , Zafar Ali and Muhammad Hassan Sayyad**

Advanced Photovoltaic Research Labs, Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan

[*]*Corresponding author e-mail*: mujeeb.phy@gmail.com

**ABSTRACT**

Perovskite solar cells (PSCs) have emerged as a promising technology for low-cost and high-efficiency photovoltaic devices [1, 2]. In this work, the latest results are presented on the optimization of PSCs through variations in the composition and architecture of the carbon electrode layer. Herein, hole transport material-free (HTM-free) perovskite solar cells (PSCs) with a glass/FTO/c-$TiO_2$/m-$TiO_2$/m-$ZrO_2$/carbon electrode structure were fabricated. The objective was to investigate the effect of carbon layer thickness on the photovoltaic performance and impedance spectra. The results revealed that the carbon layer thickness plays a crucial role in determining the fill factor and series resistance of the PSCs. The device made using three layers of carbon exhibited best performance, yielding a fill factor of 67 % and a series resistance of 29 Ω. This study highlights the importance of carbon electrode optimization in improving the performance of HTM-free PSCs.

**"Emerging Technologies and Challenges for Effective Teaching and Learning"**

**Dr. Ahmed S. Khan,**

**Prof and Fulbright Specialist Scholar**

World Learning Inc, USA

dr.a.s.khan@ieee.org

**Abstract**

Emerging Technologies of the 4 th Industrial Revolution (4IR) are quietly and dramatically changing society; the way we interact with others, live, work, and educate our students. Such changes are enabled by emerging technologies like Artificial Intelligence (AI), big data, Internet of Things (IoT), Augmented Reality, Blockchain, Robotics, Drones, Nanotechnologies, Genomics and Gene Editing, Quantum Computing, and Smart Manufacturing. The fusion of these technologies is impacting all sectors across the globe at unprecedented speed. In the era of the 4th Industrial Revolution, a knowledge- and innovation-based economy plays a pivotal role in the development of nations around the globe. For nations to acquire or to maintain a technological edge, the technical competency of graduates has become of paramount importance. This transition towards the new economic realities has also created a paradigm shift in the modes of teaching and learning. The education system has been transformed into a "lifelong learning" model. In the knowledge-based economy, the traditional role of a professor has also changed – from a primary mode of providing information to promoting an interactive dialogue with students. The most important factors in effective teaching, and enabling of learning, are the professor's technical/professional currency, application of effective pedagogy, and maintenance of a stress-free and friendly teaching environment. Faculty, students, and institutions must adapt to new demands and requirements— those who adapt will survive, and perhaps even thrive. This presentation will survey emerging technologies and discuss challenges for effective teaching and learning in the fast-changing world.

**What If We All Could be Innovative**

**Dr. M. Khizar Butta, Sr. Engineering Manager,**

Whirlpool Corporation, Benton Harbor MI, USA

Abstract: A highly tuned culture of innovation can be our most powerful competitive edge to stay agile, relevant, and evolving. Creativity and innovative mind-set are deeply rooted in all cultures, but its definition and attributes vary across the cultures. Metaphorically, a culture of innovation is a place where something new can happen frequently and with regularity. In an innovative culture, deeply held beliefs about what works and what does not enable innovation rather than impeding. People contemplate that creativity and innovation are only for select groups i.e., scientists who wear lab coats, design thinkers and billionaire inventors. But what if every single person became an innovator, and each team member use creative problem solving to tackle challenges and tapping inventive thinking for fueling the growth. Organizations that invite & encourage everyone into the innovative- process operate with greater agility, achieve their targets and outperform their competition results in 5.5 times the revenue growth of peers with a less inclusive approach to innovation.

**"The paradigm shifts of Teaching and Learning**
**-Adopting & implementing Rubrics based AI and ML Technologies for Online Education."**

**Dr. M. Manshad Satti,**

CEO, IT Butler e-Services Internet City UAE, and Smart Solutions & EduServe Australia.

In the wake of the COVID-19 pandemic situation and due to the lockdowns imposed, the conduction of online classes at Schools, college, and university levels became mandatory by the educational Authorities to Safeguard the career of the young generation. Covid-19 brought out a drastic change in the educational system not only in Pakistan but more so in the entire world. Although most of the world was not prepared for such a paradigm-shift in Teaching and Learning. The shifts in Teaching and Learning, while adopting and implementing Rubrics based Artificial Intelligence (AI) and machine learning (ML) Technologies for Online Education become a stipulation for handling such scale threats in the future. The increasing attention to Machine Learning (ML) at Schools levels and in Higher studies, especially in engineering and Medical Sciences exploring different aspects has necessitated the need to synthesize the legacy Teaching and existing Educational practices. This presentation systematically reviewed how research on ML teaching and learning has been managed, including the current area of focus, and the gaps that need to be addressed in the literature in future studies. The Popular interest in artificial intelligence (AI) has increased incredibly in recent times. Especially, ML, an essential subset of AI that has become the new engine that revolutionizes practices of knowledge discover. Adopting such a

technological system will greatly improve outcome-based learning, commonly called Rubrics in Education. A rubric is a type of scoring guide that assesses and articulates specific components and expectations for an assignment and Quizzes. Such outcome-based results can be used for a variety of assignments: research papers, group projects, portfolios, and presentations. The outcome can be measured in Analytic Rubrics, Developmental Rubrics, Holistic Rubrics, and Checklists for Assessing a variety of Courses and Student grades.

**Panel Discussion of Vice Chancellors: Role of Emerging Technologies & Skills in Higher Education**

**Plenary Lecture:**

Prof Dr Halil Ibrahim Ulusoy. Department of Pharmacy, Sivas Cuhuriyet University, SIVAS/Türkiye. Use of Functional Materials in Chemical Analysis of Drug Molecules.

Abstract:

**Session-I：Natural & Synthetic Medicinal and Pharmaceutical Sciences (Hybrid Mode) Video Conference Room, GCWUF**

**Invited talk:** Title: Perovskite Materials and Their Applications in Renewable Energy Harvesting and Storage

Prof.,M. A. Gondal

Dir Laser Research group

King Fahd University of Petroleum and Minerals (KFUPM)

Saudi Arabia

Abstract:

One of the most successful methods for supplying the whole globe with cheap, clean, and sustainable energy is irrefutably the solar energy. Recently the photovoltaic (PV) solar cells prices have dropped significantly as the number of installations of such systems have increased, which

makes PV Solar cells economically viable with traditional energy sources, such as coal, oil and natural gas-based power plants in many regions. In addition, their heavy operational cost for non-oil producing countries, injurious to the environment and climate change, fast depletion of fossil fuels, such power plants are not practicable for long term. Perovskites solar cells (PSC) are at the forefront of emerging photovoltaic technologies due to their attractive characteristics like high light absorption, tunable optical properties, long diffusion length, low cost, and easy fabrication. Such unique features coined the perovskite materials, very attractive for many optoelectronic applications for the development of improved light detectors, lasers, solar cells, and LEDs. Due to these attributes, their power conversion efficiencies (PCEs) is rising rapidly and constantly improving with time. It is true to say that Perovskites have the steepest rise of efficiency as a function of time of all the existing solar cell materials, which makes them a game-changers in a photovoltaic performance race in near future

**Invited Talk:**

Nutraceuticals/Functional Foods a promising future for Health and New Drugs: Recent development and challenges"

Prof. Dr. Tahir Mehmood.

Center for Applied Molecular Biology, University of the Punjab, Lahore, Pakistan

**Invited Talk:**

Measuring the influence of rol gene on plant metabolism in Lactuca sativa with metabolomic and bioactivity tools

Dr Hammad Ismail. University of Gujrat.

**Impact of Rare-earth doping in nickel spinel ferrites to improve the structural and electrochemical performance for supercapacitor Application.**

Tafruj Ilyas.

University of North Carolina, Charlotte, USA.

**Abstract:** Lanthanum substituted nickel ferrites with the general formula NiLaxFe2-xO4 (where; x = 0, 0.3, 0.5) electrodes prepared by powder metallurgy technique have been investigated. Structural and surface morphological have been studied through X-ray diffractometer (XRD) and Scanning Electron Microscopy (SEM), respectively. The XRD data confirmed the spinel phase of La+3 substituted NiFe2O4 ferrites and determined the structural changes in term of lattice imperfection. Formation of well-defined spherical grains as uniform clusters and large agglomeration were observed by SEM. The electrochemical investigation of NiLaxFe2-xO4 (where; x = 0, 0.3, 0.5) electrodes were also carried out by Cyclic Voltammetry (CV) and Galvanostatic Charging Discharging in 1 M KOH electrolyte. The maximum specific capacitance of ~ 1050 Fg-1 was achieved at the scan rate of 10 mV/s. Hence, the fabricated electrodes NiLaxFe2-xO4 are known as a prospective material for energy storage applications.

## Identification of the Causes of Floods and Assessment of Resulting Damage in the City of Kerala-INDIA-"

Aya Anmar Abdulrehman Al-Aini.

BUID, United Kingdom.

**Abstract**

Floods are one of the most dangerous environmental disasters that affect infrastructure and human life and water pollution, which leads to an increase in diseases in the entire world. And is a common natural disaster in India More than 17.8 million people died in 14 states in India in 2018, all of these high numbers come from the negligence of the government authorities and the slowness in taking decisions and developing solutions to reduce the risk of floods. Kerala has witnessed the threat of flooding since 1924 and it continues to this day without a solution to reduce it and protect human lives and not waste them. One million families were displaced in the Kerala flood in 2018. Kerala is highly vulnerable to natural disasters due to its location along the sea coast and with a steep slope, the Kerala disaster management plan outlines 39 of the risks that are normal and dangers caused by humans. And she's one too One of the most densely populated Indian states

(860 people per km. sq. Makes it more vulnerable to damage and loss due to disasters. Flooding is the most common natural hazard in the state. Approximately 14.5% of the state's land area is subject to flooding. Landslides pose a great danger along the Western Ghats in Wayanad, Kozhikode, Idukki and Kottayam districts. Seasonal drought-like conditions are also Common during the summer months. Kerala experienced 66 years of drought between 1881 and 2000. Dry rivers and low water levels in summer led to water being A rarity in both urban and rural areas. Other major natural hazards are lightning, Forest fires, soil tubes, coastal erosion, and high wind speed. And also, as it is located in a seismic zone. This study relied on determining the causes of floods, assessing their dangers, and knowing the damages resulting from them in Kerala, India. Some studies also clarified the proposed solutions used in their countries and touched on some literary studies that dealt with the danger of flooding and limiting the flood disaster for which the world must prepare. Floods take hours and days, and residents can expect to be vigilant and evacuate. Climate change could expose millions to floods by 2030, some new studies also show that the proportion of the world's population at risk has increased by nearly a quarter since 2000, this increase has been documented by satellite and floods are the most widespread disaster. Its basis goes back to demographic change and climate change, a disaster that affects humans more than any environmental disaster. Floods not only killed people but also destroyed and damaged roads, schools, hospitals, homes and sewage systems. During the Kerala floods, cases of leptospirosis, dengue fever, malaria and acute diarrhoea were already reported. Waterborne infectious diseases are common health risks that may have long-term recurrence. Recent systematic reviews of the literature have reported some evidence of elevated risks of infectious diseases, mental health, malnutrition, and poor obstetric outcomes after exposure to floods.

**□-Glucosidase Inhabiting Natural Products from Edible Herbs**

Simran Sandhu[1,2], and Athar Ata[1]*
[1]Department of Chemistry, and [2]Department of Biology, The University of Winnipeg, 515 Portage Avenue,
Winnipeg, MB R3B 2E9

**Abstract**

*a*-Glucosidase is a membrane-bound intestinal enzyme that helps to digest carbohydrates by hydrolyzing the glycosidic bonds to liberate free glucose. The glucose produced from this enzymatic reaction causes a significant rise in blood sugar level. This is known as postprandial hyperglycemia and causes type 2 diabetes mellitus affecting over 21 billion people worldwide. This ailment can be managed by potent □-glucosidase inhibitors as these inhibitors slow down the breakdown of carbohydrates during their digestion to manage the blood glucose level.

We are involved in identifying health-related natural products from medicinally important plants. During our screening program of crude extracts of medicinal plants, we have identified a few edible herbs, *Momordica charantia, Zingiber officinale, Salvia officinalis, Artemisia absinthium and Olea europaea,* exhibiting significant anti-□-glucosidase activity. This presentation will discuss the bioactivity data of these herbs and our results from phytochemical studies on them.

**Phytochemicals screening and* Neuroprotective activity of *Verbascum thapsus* Extract against Alzheimer Disease induced Rat Model**

Naheed Akhter*[1], Fozia Anjum[2], Shagufta Kamal[1], Fatima Shahbaz[2]

[1]Department of Biochemistry, Government College University, Faisalabad-Pakistan

[2]Department of Chemistry, Government College University, Faisalabad-Pakistan

*[1] Email ID; naheedakhter@gcuf.edu.pk

**Abstract**

***Background***: Traditionally, *Verbascum thapsus* have been used as a medicine due to its potential bioactive compounds and pharmacological properties against various diseases.

***Objective***: The study was aimed to determine the potential effect of *V.thapsus* extract against Alzheimer disease induced rats.

***Method***: Preliminary physiochemical and phytochemical studies of plant were carried out along with FTIR and HPLC characterization. Acute toxic potential (OECD 425) was designed for safety evaluation. To determine the anti-Alzheimer effect of plant, rats were orally given the aqueous extract of *V.thapsus* at doses of 50, 150, 300 mg/kg for 21 days and behavioral test were observed on 22$^{nd}$ day of study. Biochemical and histological studies were performed to validate the results of behavioral test.

***Results***: Phytochemical results revealed the presence of alkaloids, flavonoids, phenols and glycosaponins. HPLC analysis indicated the presence of quercetin, gallic acid, caffeic acid, vanillic acid, benzoic acid, chlorogenic acid, ferulic acid and cinamic acid. No mortality was detected in acute toxicity study. *V.thapsus* extract significantly improved the cognitive impairment related to behavioral studies. Histopathological studies revealed that neurofibrillary tangles and neuroinflammation was significantly improved in *V.thapsus* treated group. Biochemical studies suggested that *V.thapsus* has neuroprotective potential against Alzheimer's disease. By the molecular docking and interaction analysis, three potential phytochemicals were screened; Quercetin, Chlorogenic acid, and Ferulic acid, and have presented the best and stable conformation within active site of target AChE protein, furthermore ADMET results supported the computational experiments by presenting significant results, further molecular dynamic analysis also confirm the wonderfull interaction of target AChE protein with Quercetin, Chlorogenic acid, therefore these three phytochemicals could be recommended for clinical testing for the treatment of Alzheimer's disease.

**Keywords:** *Verbascum Thapsus*; Alzheimer's disease; HPLC; rats; histopathology; molecular docking

**Cyclo(L-Leu-L-Pro), a bioprotectant of food against aflatoxigenic Aspergillus flavus.**

Mahwish Salman[1]*

**Session II :Smart & Sustainable Development in Materials Manufacturing and Energy**
**Jinnah Auditorium, GCWUF**

**Invited Talk.**

History of Periodic Table

Prof. Dr Jamil Anwar.

Distinguished Professor. University of Management and Technology Lahore..

**Abstract:**

**Synthesis, Spectroscopic and Morphological Studies on CdS Quantum Dots for Photonic Applications**

Ahmad Ali, Zafar Ali, Nadia Anwar, Mujeeb ur Rahman, Sajid Khan and Muhammad Hassan Sayyad

Advanced Photovoltaic Research Labs, Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan

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**ABSTRACT**

Quantum dots (QDs) are nanoscale semiconductors that have unique optical and electrical properties, making them promising materials for various photonic applications. In this study, the synthesis and characterization of Ag-doped cadmium sulfide (CdS) quantum dots were carried out with the goal of producing cost-effective photonic devices [1]. The quantum dots were synthesized via a successive ionic layer adsorption reaction (SILAR) technique on a mesoporous $TiO_2$ deposited electrode, their surface morphology and roughness were analyzed using atomic force microscopy (AFM). The results of the analysis revealed that the Ag-doping in CdS quantum dots significantly influenced their surface properties. Additionally, UV-visible spectroscopy was employed to study the quantum confinement effects in the quantum dots, providing valuable insight into their optical behavior. The presence of silver can modify the electronic structure of the quantum dots and lead to improved conductivity, which can be beneficial for photovoltaic and electronic applications. However, the extent of improvement in the electrical properties depends on the doping concentration, preparation method, and other factors [2,3].

**Synthesis and Characterization of boron nitride (BN) thin film for magnetic and antibacterial applications via Sol-gel method"**

Zainab Bashir. Lahore College for Women University, Lahore.

**Abstract:**

To ensure the best dimensional accuracy and greatest efficiency, novel technologies require innovative coatings. Recently, two precursors H3BO3 and B(NO3)3 were used to develop a boron nitride thin film via the sol-gel dip coating method. The molarity of H3BO3 increases with the thickness of thin films, however, the molarity of boron nitrate causes the thickness to decrease. The film-preferred (002) plane and the precursor molarity and crystallite size have a direct correlation. The band gap also widened with increasing molarity for both precursors. Films show

ferromagnetic behavior at room temperature. BN has excellent antibacterial activity against four bacterial strains.

Salma Waseem. Lahore College for Women University. Green synthesis of ZnO nanoparticles

**Keywords:** Carotenoids, Proline, Phosphate and Sulphate

Session-III: Photonics & Optoelectronics
Committee Room, GCWUF
10:45pm-01:00 pm PST

**Invited Talk:**

Prof. Dr Hassan Sayyed. Ghulam Ishaq Khan Institute of Engineering Sciences and Technology.

**Structural, magnetic, optical and morphological properties of B doped ZnO thin film"**

*Riffat Sabir. Lahore College for Women University, Lahore.*

**Abstract**

The properties of semiconductors can be modified by B doped ZnO thin film, which will be synthesized by the sol-gel dip coating method. X-ray diffractometer shows the wurtzite hexagonal structure for B-doped ZnO thin film. UV-Visible spectroscopy examines the band gap of B-doped ZnO decreased by the increase in B dopant percentage. Transparency is shown in the visible region by transmission spectrum. Rough surface confirmed by scanning electron microscopy. Magnetic properties show the ferromagnetic behavior

**Study of structural, optical and morphological properties of Au doped TiO2 thin film.**

Hina Naqvia , Zohra Nazir Kayania , Amna Hassana and Maryam Anwara (a)Department of Physics, Lahore College for Women University, Lahore 54000, Pakistan

**ABSTRACT**

Au doped TiO2 thin film is prepared by sol gel dip coating method. Structural analysis is done by X-ray Diffractometer (XRD) which confirms the creation of anatase phase. Crystallite size of Au doped TiO2 is about 10.10nm. The highest intensity peak is detected at (101) plan. UV-VIS Spectrophotometry is used to study the transmittance spectra within the range of 300-900nm with direct band gap energy Eg= 3.38eV. Scanning electron microscope (SEM) was used to study the morphology of Au- doped TiO2 thin film with 5%wt Au as dopant.

Keywords: Sol-gel, Dip coating, UV-VIS Spectrophotometry, SEM, XRD

**"Portable Smartphone-Based Fundus Camera Using Single Lens"**

Muhammad Miqdad Khan

NED University of Engineering and Technology Pakistan.

**Abstract:**

Fundus imaging is a crucial aspect of ophthalmology, and the development of smartphone-based solutions has been a rapidly growing field for over a decade. Despite the known benefits of using smartphones for retinal imaging, such as ease and cost-effectiveness, there has been a lack of available devices in this domain as there are only two Asian devices and only eleven devices available commercially worldwide. The development of more devices also helps in reduction of cost and competition makes the quality better. This study addresses this gap by developing a local, inexpensive smartphone-based portable fundus camera using a single lens. The device was designed and simulated using Zemax OpticStudio and then physical model was developed and tested on a Heine Ophthalmoscope trainer eye model. The results obtained were comparable to those of the gold standard Topcon tabletop fundus camera, with a wide field of view of 46 degrees. Additionally, this device is 20 times cheaper and 3 times smaller than conventional tabletop cameras. The potential for this device to meet the requirements of retinal imaging in an outreach setting, particularly in middle or low-income countries, makes it a groundbreaking solution for accessible and affordable retinal imaging in under-served areas.

**Impact of SILAR Cycles on the Efficiency of PbS Quantum Dots Based Solar Cells**

Nadia Anwar*, Ahmad Ali, Zafar Ali, Mujeeb ur Rahman, Sajid Khan and Muhammad Hassan Sayyad

Advanced Photovoltaic research Labs, Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, District Swabi, Khyber Pakhtunkhwa 23640, Pakistan

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**ABSTRACT**

Lead sulfide (PbS) quantum dots (QDs) have gained significant attention as photosensitizers for quantum dots sensitized solar cells (QDSSCs) due to their adjustable and narrow band gaps, quantum confinement effect, and capability for multiple electron-hole pair generation [1, 2]. This research focuses on creating high-performance QDSSCs based on PbS QDs sensitized mesoporous titania electrodes. The PbS QDs were grown on mesoporous $TiO_2$ through the Successive Ionic Layer Absorption and Reaction (SILAR) method. The effect of SILAR cycles was investigated and was found that the photovoltaic performance of the device changes directly with the number of SILAR cycles. The highest conversion efficiency was achieved with 2 SILAR cycles, leading to an improved photocurrent. The optical properties were analyzed using UV-visible absorption spectroscopy, revealing that the SILAR cycles impacted the band gap of the PbS QDs.

## Iron Oxide Nano-particles Improved Growth Of Peanut by Increasing Roots Reducing Capacity under Iron Deficiency

[1]Hira Ali, [1]Shamim Akhtar, [1]Durr-e-Nayab and [2]Nazneen Bangash

University of Gujrat

**Abstract**

Iron deficiency is a widespread problem in plants, that leads to interveinal chlorosis. High pH and high bicarbonate ions in calcareous soils make iron physiologically unavailable to plants, despite its abundance in nature. Various methods are in practice to cope with the problem of iron deficiency in plants that are expensive and less effective. Nanotechnology has emerged as an innovative field with vast applications in different fields of life including agriculture, military and medicine. Green synthesized iron oxide nanoparticles have the potential to reduce iron from $Fe^{3+}$ to $Fe^{2+}$, hence making it available to plants. The present study demonstrated the effects of iron

oxide nanoparticles (3mg/L, 25mg/L and 50 mg/L) on the alleviation of iron deficiency induced chlorosis in the peanut (Arachis hypogaea L.). Iron oxide nanoparticles were synthesized from Eucalyptus globulus L. leaves by green synthesis. At 298 nm wavelength, UV-vis spectroscopy indicated the formation of iron oxide nanoparticles that were later confirmed by the FTIR analysis. Different concentration of nanoparticles in solution form improved the symptoms of iron deficiency as compared to control in hydroponics experiment. The root fresh and dry weight, shoot dry and fresh weight, root and shoot lengths enhanced with 50 mg/L concentration (p<0.05). Changes in the physiological i.e., chlorophyll a (96% with 50 mg/L conc.) and biochemical parameters such as CAT, POD, SOD, POD, chlorophyll content, ferric reductase and active iron significantly increased as compared to control. SOD and POD showed 67% enhanced activity with 50 mg/L Fe nanoparticles (p<0.05). Iron oxide nanoparticles with concentration 50mg/L proved most effective under the stressful environment. Genotype 15465 was resistant to Fe deficiency with highest roots reducing capacity at 4,8,10 and 14 days after iron deficiency.

**Key words:** Iron deficiency, Peanut, nanoparticles, roots reducing capacity.

**Developing Exotic Safflower (Carthamus tinctorius L.) For improved Quality Oil Content under Differential Irrigation Regimes**

[1]Muhammad Sajid, *Hassan Munir, [1]Abdul Khaliq, [1]Fahd Rasul, [3]Maryam Aslam, [2]Tayyaba Samreen and [4]Sobia Shahzad

University of Agriculture Faisalabad

**Abstract**

Water shortage problems have recently become widespread throughout the world. Nowadays, many regions across the globe are suffering from productivity related issue due to water scarcity leading ultimately to food insecurity. Safflower is a drought tolerant along with low nutritional requirements. Therefore, this study was opted to assess production potential of exotic safflower accessions under different irrigation sources. Experiment was arranged under randomized complete block design under factorial arrangements at Directorate of Farms, University of Agriculture, Faisalabad during November 2022. A total of 08 screened accessions were tested to assess their agronomic potential in response to different irrigation sources. Three different irrigation treatments i.e. Canal water, wastewater and wastewater+biochar (biochar @10 t $ha^{-1}$)

were used. Growth, yield and oil traits of safflower were recorded during course study. Data regarding days to emergence, plant height, number of heads per plant, number of flowers per plant, days to flowering, days to maturity, yield and oil were significantly affected by different irrigation treatments. It was concluded that wastewater+biochar had considerably contributed to yield, yield components and oil followed by wastewater grown safflower accessions. Hence, usage of wastewater is viable option that reduce the significant use of synthetic fertilizer as well as biochar application restrain the uptake of heavy metals.

**Keywords:** Safflower, Wastewater, Oil, Yield, Biochar

**Higher Education Symposium**
**Role of Emerging Technologies & Skills in Higher Education**
Jinnah Auditorium, GCWUF
02:00-03:40 pm PST
**Chief Guest: Prof Dr Muhammad Mukhtar. Vice chancellor, National Skill University Islamabad**
**Symposium: Role of Emerging Technologies and Skills in Higher Education**

**Symposium: Role of Emerging Technologies and Skills in Higher Education**

## Title: Transforming Digital Learning in Higher Education

**Dr. Ayesha Sadaf**
Assoc. Professor of Learning, Design & Technology,
Department of Educational Leadership, Cato College of Education 277
University of North Carolina at Charlotte

**Abstract:**
The convergence of emerging digital technologies and collaborative constructivist ideas are transforming higher education. The COVID-19 pandemic served as a catalyst for forcing educational institutions around the world to rapidly rethink teaching and learning. In this talk, I will share current practices of how digital technologies are being used in the service of transforming teaching and learning in higher education. I will situate the Community of Inquiry as a guiding framework for collaborative constructivist approaches to teaching and learning. I will elaborate three presences that are particularly important for online learning: (1) teaching presence, (2) social presence, (3) cognitive presence. Finally, I will discuss the strategic responses and structural changes that higher education institutions could implement to transform the quality of the digital teaching and learning experiences in higher education.

## Title: Emerging Technologies and Challenges for Effective Teaching and Learning

**Dr. Ahmed S. Khan**
Fulbright Specialist Scholar,
World Learning Inc.,

U.S. Dept. of State's Bureau of Educational & Cultural Affairs (ECA)

**Abstract:**

Especially focused for the Institutional Leaders, VCs, Provosts, Educators and Administrator's, Covering modern teaching techniques and theories.

# "What If We All Could be Innovative!"

**Dr. Khizar Bhutta**.,

leads Whirlpool Corporation, USA

**Abstarct**

A highly-tuned culture of innovation can be our most powerful competitive edge to stay agile, relevant, and evolving. Creativity and innovative mind-set is deeply rooted in all cultures, but its definition and attributes vary across cultures. Metaphorically, a culture of innovation is a place where something new can happen with regularity. In an innovative culture, deeply held beliefs about what works and what does not work enable innovation rather than impede it. People think that creativity and innovation are only for a select groups such as scientists wear lab coats, design thinkers and billionaire inventors. But what if every single person became an innovator, and each team member use creative problem solving to tackle challenges and tapping inventive thinking to fuel growth. It has been found that innovative organizations both from academia and industry outperform their competitors by winning the talent war and driving massive shareholder value. Organizations that invite every employee into the innovation process operate with greater agility, beat their targets and outperform their competition results in 5.5 times the revenue growth of peers with a less inclusive approach to innovation.

This talk will review current thinking about innovation and identify key innovative traits as initial steps in exploring the feasibility of innovative thinking for all, and at all levels. While education may not be able to create innovative traits in individuals, education may improve the ability of individuals to utilize the traits they already possess. Therefore, major emphasis should be on identifying the characteristics, traits, and thought processes of innovative individuals or groups of individuals and the environments that they exist in using the existing literature and personal experience. Briefly, innovation requires a lot of different components to succeed. In addition to

"skill combined with will", innovators need good ideas, discipline, the right timing, resources, and the support of the organization. People who want to innovate need to make it a priority, and they have to really be dedicated to the process. They have to have the time and headspace necessary for creativity, and have a vision they're working toward. They also have to have enough patience to get through what can ultimately be a long and difficult road. Teaching nebulous skills like innovation and leadership may seem impossible, but there are ways innovation can be taught, or at least encouraged. The process isn't at all like studying for a test rather its more about having the space to experiment and yes, fail. Mentors can encourage innovation in their teams by building in time for individual and team brainstorming, offering a safe space to fail, and giving ideas the consideration they deserve. In summary, with greater utilization of innovative traits, we could expect to increase the number of innovations that majority individuals or groups of individuals contribute to our society.

**Title: The paradigm shifts in Teaching and Learning, While Adopting & implementing Rubrics based AI and ML Technologies for Online Education**

**Dr. Muhammad Manshad Satti**

**CEO IT Butler, Smart Solutions & EduServ**

**Abstract:**

In the wake of the COVID-19 pandemic situation and due to the lockdowns imposed, the conduction of online classes at Schools, college, and university levels became mandatory by the educational Authorities to Safeguard the career of the young generation. Covid-19 brought out a drastic change in the educational system not only in Pakistan but more so in the entire world. Although most of the world was not prepared for such a paradigm-shift in Teaching and Learning. The shifts in Teaching and Learning, while adopting and implementing Rubrics based Artificial Intelligence (AI) and machine learning (ML) Technologies for Online Education become a stipulation for handling such scale threats in the future. The increasing attention to Machine Learning (ML) at Schools levels and in Higher studies, especially in engineering and Medical Sciences exploring different aspects has necessitated the need to synthesize the legacy Teaching and existing Educational practices. This presentation systematically reviewed how research on ML teaching and learning has been managed, including the current area of focus, and the gaps that

need to be addressed in the literature in future studies. The Popular interest in artificial intelligence (AI) has increased incredibly in recent times. Especially, ML, an essential subset of AI that has become the new engine that revolutionizes practices of knowledge discover.

Adopting such a technological system will greatly improve outcome-based learning, commonly called Rubrics in Education. A rubric is a type of scoring guide that assesses and articulates specific components and expectations for an assignment and Quizzes. Such outcome-based results can be used for a variety of assignments: research papers, group projects, portfolios, and presentations. The outcome can be measured in Analytic Rubrics, Developmental Rubrics, Holistic Rubrics, and Checklists for Assessing a variety of Courses and Student grades.

**DAY 3**

**Smart Sensing for eHealthcare Applications using IoT, AI and ML Technologies**
**Jinnah Auditorium, GCWUF**
**09:15-12:30 pm PST**

## Emerging Role of Artificial Intelligence in eHealthcare

**Mohammad Ilyas, Ph.D.**

**Professor**

**College of Engineering and Computer Science**

**Florida Atlantic University**

**Boca Raton, Florida 33431**

**ilyas@fau.edu**

Electrical Engineering & Computer Science, Former Dean of Electrical and Former Dean of College of Engineering and Computer Science, FAU, Boca Raton, FL, USA.

**Abstract:** Healthcare informatics is handled mainly in three tiers i.e. organizational, operational and technological realms, all largely depending on communication. The network communication between patients, medics, and management links all relevant data. The eHealthcare industry has great potential and opportunities nonetheless faces enormous challenges as well. In this regard and context AI and ML have potential to address the needs.

## Invited Talk: "IoT for e-Healthcare Applications"

**Engr. Shaftab Ahmed**,

Adj Prof. ECE UNC Charlotte, Former Assoc Prof & Chair ECE Bahria Univ, Islamabad.

**Abstract**: The advances in networks, communication technologies and web engineering play an important role in offering medical services and eHealthcare solutions. Sensor-networks exploit personal wearable devices used to measure various clinical parameters of a patient. Such an exercise is useful for diagnostics, post operation monitoring and rehabilitation in case of serious injuries, heart attacks or brain trauma triage. Physiological sensors are available for temperature, humidity, blood pressure, and heartbeat measurements and recording. The implementation of high-speed broad-band data 5G data transfer has provided the opportunity of limitless data streaming of

virtually all patients equipped with implantable and wearable devices that contain monitoring and sensing equipment.

**Invited Talk: "Challenges, Risks, and Benefits of Health Data Sharing "**

**Dr Ir. Robert Splinter**

PhD. Chief Operating Officer, Chief Technology Officer Advanced Bioinformatics Ltd. UK, Manchester UK; Assistant Professor (adj.) University of North Carolina at Charlotte, Charlotte, NC, USA;

Chief Technology Officer Splinter Consultants, Amsterdam, The Netherlands.

E-mail: rsplinter@gmail.com

**Abstract**: Intelligent techniques for IoT cloud enabled connected healthcare. Enabling IoT cloud convergence technologies for smart healthcare. Machine learning for medical sensorial big data analytics. Energy-efficient data offloading and computing for smart sensors in healthcare applications. Medical IoT and big data analytics. IoT cloud for human activity monitoring. Context-aware situation understanding for smart healthcare. Deep learning approaches for smart healthcare. Privacy and security issues in sensorial data management of smart healthcare. Dynamic resource provisioning for mobile healthcare. Techniques, algorithms, and methods of processing smart healthcare data over the IoT cloud.

**Invited Talk:** Breastfeeding Medicine Symbol of Health

**Prof Dr Muhammad Ilyas**

Mama Care Foundation Breast Health Specialist

Abstract:

**Challenges and Opportunities in Healthcare**

**Fostering Linkages Between Biomedical Science and Biomedical Engineering for Better Healthcare**

**Muhammad Aslam**

**Advisor Postgraduate Education and Research**

**Shifa Tameer-e-Millat University H-8/4 Islamabad, Pakistan.**

**Abstract**: In the middle of twentieth century, many new scientific fields have emerged to interlink multiple sciences with Medicine for an innovative, interventional and interesting healthcare

delivery to improve health for all. Thus, we need to develop an integration between Medical Sciences and Emerging Sciences in in-numerous fields. The inter-disciplinary and trans-disciplinary areas of Health and Engineering Sciences include (but not limited to) Biophysics, Bio-mathematics, Biomedical Engineering, Public Health Engineering, Hospital Architecting, Intensive Care Unit Fabrication, Operation Theatres Designing, Environmental Health & Engineering, Bio-material Sciences, Bio-material Manufacturing, Genetic Medicine & Engineering, Interventional Radiology, Cyber/ Gamma Knife Surgery, Robotic Surgeries, Development of Artificial Skin, Neuroscience, Development of Cardiac Stents, Development of Urinary Stents, Development of Gut Stents, Development of Artificial Fingers/ Toes and Joints, Optometry, Cochlear Implants, Radiation Oncology, Stem Cell Laboratory, Computational Science, Bio-Instrumentation, Clinical Imaging, Dental Implants, Mobile Health, Telemedicine, Microscopy Analysis, Prosthetics, Bionics in Health, Regenerative Cellular Devices, Neural Tissues Development, Conduction Studies, Genes Designs, Genes Therapy, Reconstructive Devices, Clinical Engineering Biomechanics, Models for Neurorehabilitation, Nanotechnology and Nano-biotechnology. Furthermore, devices to undo Biological Warfare, Development of Ventilators, Cardio-pulmonary Resuscitation Machines, Bioinformatics, Health Informatics, Drug Discovery, Drug Development, Electro Medical Equipment, Development of Vaccines, Formulation of Diagnostic Kits, Hospital Consumables and many others require integration of Healthcare Professionals and Multifarious Sciences. Therefore, combination of Medicine with Emerging Sciences may facilitate precision in diagnostics and Therapeutics to improve. healthcare delivery for all. Translation Medicine is an Interdisciplinary and Trans-disciplinary science. Doctors, Scientists and Engineers together can bring revolution in diagnostic and therapeutics for better healthcare.

**Invited Talk.**

**Dr Habib Aslam Gaba**, Cardiologist and Member of FCCI (Faisalabad Chamber of Commerce & Industry)

Title: TBA (waiting info from Prof Zill-i-Huma Nazli)

Poster Session Convener: Dr Maryam Aslam & Dr Abida Kausar

Poster Evaluation Committee: Prof Dr Khizar Butta

Prof Dr Saima Akram

Prof. Dr Aysha Sameen

Computational analysis of natural alkaloids as potent inhibitors for COVID-2 main protease

**Laiba Shahbaz**, Shagufta Parveen, Nusrat Shafiq, Maryam Rashid,

A major threat to humanity in the twenty-first century is the COVID-19 which is a pandemic disease instigated via SARS-CoV-2. It features a high transmission rate & spreads through small respiratory droplets. Numerous compounds have been used to treat this fatal disease; alkaloids are among the most important of these compounds. alkaloids found naturally in microorganisms, animals, marine organisms and plants. Alkaloids are secondary metabolites with numerous pharmaceutical properties. In this research, Alkaloids information will be gathered from the PubChem database. and alkaloids will be certified to be anti-SARS-COV-2 by means of virtual screening.

**Experimental and computational analysis of some hetero-cyclic derivatives**

**Fatima Rida**, Nusrat Shafiq, Shagufta Parveen, Maryam Rashid

Heterocyclic compounds and their derivatives have been used as antibacterial herbicides, and anti-inflammatory medicines, with potential applications in a wide range of common ailments. Density functional theory (DFT) approaches have sparked a revolution in many subfields of computational chemistry. To learn more about how their chemical composition relates to their bioactivity, a TD-DFT-based computational analysis was conducted. Gaussian and Gauss View were used along with PubChem as compounds database and ChemDraw for structural optimization for UV/Visible, IR, and NMR calculations to predict the synthetic feasibility and biological activity strength.

**Experimental and theoretical evaluation of stilbene and its analogues**

**Asna Jannat**, Zill-i-Huma Nazli, Nusrat Shafiq, Shagufta Parveen

This review is about a class of plant polyphenols known as Stilbenes. Resveratrol – first stilbene was extracted from White Hellebore in 1940, since then 400 plus stilbene derivatives have been discovered. Apart from biosynthesis, its novel derivatives are being synthesized in laboratories. This class of compounds has extensive clinical (including antioxidant, anticancer, anti-inflammatory activities etc.) and industrial applications such as optical dyes, laser dyes, scintillators etc.

**Repositioning of chronic-L-type $Ca^{+2}$ existing drugs as novel therapeutics for high-risk diabetes type II**

**Kiran Irshad**, Nusrat Shafiq, Shagufta Parveen, Zill-i-Huma Nazli

Diabetes type II has become more popular disease of these days. The beta-cells of liver fail in proper functioning and also catalysis of AR enzyme occurs therefore, to control the division of intracellular calcium channels in pancreatic beta-cells and to inhibit the AR enzyme activity, novel L-type calcium channel drugs will be synthesized. Although various drugs of LTCC have performed anti-diabetic activity but observations have proved some therapeutic conflicts. Therefore, for the effective medication of already existing drugs, analogous drugs of LTCCs will be prepared by repositioning of their structures. 3D-QSAR, molecular docking, DFT, toxicity and ADMET study will be performed. Comparison between in vitro and in silico study of LTCC will be made for the discovery of best active compounds for novel therapeutic drug of diabetes type II.

**In silico-design 3D-QSAR and Molecular docking studies of derivatives of paracetamol**

**Nimra Basharat,** Maryam Rashid, Nusrat Shafiq, Zill-i-Huma Nazli

Paracetamol or acetaminophen is a widely used antipyretic and analgesics drug. It is extremely cheap, easily available, non-toxic drug. Paracetamol and its derivatives show extensive scope of biological activities like anti-microbial, anti-tumor, anti-fungal and anti-arrhythmic. As Ethoxycarbonylmethylparacetamol (anti-bacterial) and Dicarboxylic acid bis (4-acetylaminophenyl) ester (analgesic, anti-pyretic and anti-inflammatory) derivatives of paracetamol locally available in market. Computational methods in drug discovery enable quick screening of a vast compound library and identification of potential binders through modeling, simulation and visualization techniques. In the present study, computational calculations will be done using software including 3D-QSAR and molecular docking to analyze and interpret its biological activity for further repurposing.

**Synthesis of 1,4-Dihydropyridines Derivatives And in vitro anti-diabetic evaluation**

**Wajeeha Maqsood,** Maryam Rashid, Nusrat Shafiq, Shagufta Parveen

Diabetes mellitus is chronic metabolic disorder which occurs when pancreas loss their control to maintain the glucose level in blood by producing enough amount of insulin. On other side Hypertension is death causing disease increasing gradually, cause insulin resistance which increase the glucose level. Huge time (12-15 years) and cost is required to manufacture new drugs for the treatment of diabetes. Hypertension and diabetes, both are interlinked. So, the 1, 4-dyhydropyridine drugs which are class of anti-hypertensive drugs would be repurposed for the treatment of diabetes to save money and time, because these drugs show anti-diabetic properties also. DHPs drugs undergoes the pharmacokinetics analysis and in future used to control the diabetes by repurposing. Different Computational tools are used for this purpose like 3D QSAR, ADMET (absorption, distribution, metabolism and excretion) and Molecular Docking for drugs which will be used for designing the potent drugs against diabetes.

**Therapeutic Switching of metronidazole as SARS-COV-2 and synthesis of its potential derivatives**

**Rabia Khalil**, Shagufta Parveen, Nusrat Shafiq, Zill-i-Huma Nazli

Metronidazole (3-methyl-5-nitroimidazole) is a synthetic, azomycin derivative having strong bactericidal and antiparasitic properties. Metronidazole (MTZ) derivatives are commercially broad

spectrum containing pertinent antibacterial activity and a reasonable safety profile. That's why repurposing of MTZ by computational study such as QSAR, molecular docking, ADMET and toxicity will help in the development of understanding for creating new of MTZ-derivatives use target drug discovery for SARS-COV-2. In this study, Metronidazole derivatives will be synthesized and characterization using Silica gel chromatography, FTIR, Mass Spectroscopy and NMR techniques, Structural optimization will also be carried out through virtual screening.

**Prediction of Terpyridines as SARS-COVID-2 inhibitors by using COMFA based QSAR, Molecular Docking and ADMET**

**Maham Arooj,** Maryam Rashid, Shagufta Parveen, Nusrat Shafiq

SARS-CoV-2 is causative factor for the epidemic sickness coronavirus 2019 all around the world which has the highest rate of modality. Several initiatives have been launched for potential inhibitors of COVID-19. Huge amount of time and cost are the major challenges for the discovery of new drug. So our main focus will be repurposing of terpyridine compound against COVID-19. However, there are few reports of coronavirus SARS-CoV-2 treatment using terpyridine. In present study, pharmacokinetic analysis will be carried out for terpyridine that show greater potential against variety of diseases, and have other biological activities like anti-cancerous, antiviral, antimicrobial, antioxidant and antimalarial. Molecular docking, DFT (density functional theory) & ADMET (absorption, distribution, metabolism, excretion and toxicity) will be carried out of all screened compounds which will be used for composing the effective drug against novel corona virus.

**Repurposing of FDA Approved blood Cancer Drugs to manage diabetes mellitus.**

**Areej Akbar**, Nadia Noor, Shagufta Parveen, Maryam Rashid

Diabetes mellitus is endocrine and metabolic irregularity that evolve from deficiency of insulin emission or insulin exertion that lead to chronic hyperglycaemia with disturbance of fats, carbohydrates and protein metabolism. For development of new drugs huge time (10-15) years and huge cost will be required. Blood cancer drugs would be repurposed and used for control of diabetes mellitus and save money and time. In present study, pharmacokinetic analysis will be carried out for blood cancer drugs which further use to control diabetes mellitus by repurposing. For this purpose different computational tool will be used like 3D-QSAR, Molecular docking, ADMET (absorption, distribution, metabolism and excretion) and DFT (density functional theory) will be carried out of all isolated drugs which will be used for designing the effective drugs against diabetes mellitus.

**In-silico screening of FDA approved brain cancer drugs for management of Naegleria fowleria**

**Amina sardar,** Nadia Noor, Shagufta Parveen, Zill-i-Huma Nazli

The bacterium *Naegleria fowleri* is the cause of encephalitis called Primary Amoebic Meningoencephalitis (PAM). *Naegleria fowleri* is also known as "Brain-eating amoeba" because it badly affects human Central Nervous System (CNS), when amoeba in water goes up into the

nose. *Naegleria fowleri* found in summer months since it can withstand temperatures of up to 45OC and mostly feed bacteria found in naturally occuring warm freshwater bodies. Development of new drugs in market take many years. Repurposing of drug is best strategy to reuse already existed FDA approved drugs for naegleria fowleri. Some FDA approved drugs that are active as anti-brain cancer and antiviral have potential against *Naegleria fowleri* thus they are repurposed. Brain cancer is the most common cancer that found in *Neagleria fowleri* patients. Brain cancer is classified into Primary or Secondary tumor, 70% brain cancer occurs due to Primary or 30% due to Secondary tumor. Anti-brain cancer FDA approved drugs may have potential against Naegleria fowleri. Currently used FDA approved drugs for the management of *Naegleria fowleri* are Amphotericin B, Curcumin and Azithromycin that are generally used in combination with some other drugs. These drugs act as inhibition of cancerous cells specifically brain cancer cell lines in humans. Different computational tools including 3D-QSAR, DFT, molecular docking, toxicity, and ADME will be used to carry out current proposed work. The results will be optimized and publish in renowned journals.

**Re-purposing of FDA approved lung cancer drugs as pandemic SAR-2-inhibitors**

**Sheema sadia,** Nadia noor, Shagufta Parveen, Nusrat Shafiq

COVID-19 is proclaimed as international epidemic by WHO (World Health Organization) in 2020 and cause major crises for health and economic environment. But there is no licensed vaccine and drugs to treat COVID-19 thus continue to infect the people. Development of new drugs agent in the market take almost 10-15 years. Repurposing of drugs is best strategy to reuse already present FDA approved drugs for the treatment of COVID-19. Some drugs that are active as antiviral and antitumor especially anti-lung cancer drugs have potential against SARS-CoV-2. Lung cancer patient are at higher risk toward getting infected with SARS-CoV-2. Lung cancer is the most common cancer that found in COVID-19 patient. Lung cancer has two major types (SCLC & NSCLC). Non-small cell lung cancer causes almost 85% of lung cancer in the world and remaining is cause by small cell lung cancer. Both SARS-CoV-2 and lung cancer are belonged to lungs, thus anti-lung cancer FDA approved drugs may have potential against COVID-19. Keeping in mind these facts, the present research is designed to screen almost 200 FDA approved anti-lung cancer drugs for analyzing SARS-COVID-2 inhibition. For this purpose, different computational tools will be used including 3D QSAR, Molecular Docking, DFT, toxicity, and ADMET study. The results will be published in renowned peer review Journal.

**Synthesis of glucose-modified silver nanoparticles in an aqueous suspension of graphene oxide sheet as a bactericidal agent against E. coli for water disinfection**

***Sana Ijaz,** Kausar Abida, Toba Nazir,

Department of Chemistry, Government College Women University Faisalabad

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**Abstract**

Bacteria in water pose a severe hazard to human health, so these microbes should indeed be eradicated from water sources. For such purpose, the adsorptive properties of composites have been revealed as a potential approach for treating water-related biological problems. Graphene oxide-silver based composites have piqued the interest of researchers due to their environmentally benign, less hazardous, and successful approach among all bacteria removal methods. Silver-Graphene oxide composite has been synthesized and used for the removal of Escherichia coli. The feasibility of antibacterial activity by disk diffusion method has been assessed which results in the removal of 99%. E. coli specie. Furthermore, optical density method was tested for antibacterial activity which indicated that graphene oxide containing silver nanomaterial could successfully suppress the growth of E. coli. The characterization of synthesized silver-graphene oxide composite was done by UV-visible spectrophotometer, Scanning Electron Microscope (SEM), Energy-dispersive X-ray spectroscopy, XRD, TGA and Fourier Transform Infrared spectroscopy (FTIR). It can be found that adhesion of AgNP's was done on graphene oxide and this composite exhibited antibacterial effect against E. coli. These results exhibited the incorporation of composite that has been modified to achieve maximum functional efficiency. These antibacterial effects of hybrid composite have envisioned the good potential for water disinfection.