

Conference Proceedings

Abstracts of poster presentations during 2nd International Conference on Applied Biosciences (ICAB2021) held in Mohammad Ali Jinnah University, Karachi, Pakistan during December 30-31, 2021.

Preface

Department of Biosciences, Mohammad Ali Jinnah University, Karachi, Pakistan organized 2nd International Conference on Applied Biosciences (ICAB2021) during December 30-31, 2021. Hundreds of scientists, post-doctoral fellows and graduate students from Pakistan and other countries attended this conference. In this conference, an array of topics related to applied biosciences including Biochemistry, Molecular Biology, Bioinformatics, Metabolomics, Biotechnology, Cancer Biology, Genomics, Metagenomics, Proteomics, Health Biotechnology, Immunology, Infectious Diseases, Microbiology, Genetic Engineering, Molecular Medicine, Neurosciences, Virology were discussed.

In this issue of PJBMB, we are publishing abstracts of selected posters presented during the conference. All abstracts submitted to ICAB2021 for presentations in technical sessions were peer reviewed. Editorial board of PJBMB is grateful to the organizing committee of ICAB2021 for providing abstracts of poster presentations for publication in PJBMB.

Editorial Board

Pakistan Journal of Biochemistry and Molecular Biology

SELECTED POSTER PRESENTATIONS IN ICAB2021

BIOREMOVAL OF MALACHITE GREEN BY IMMOBILIZED TRAMETES PUBESCENS

Uroosa Ejaz^{1,2}, Umm-E-Zehra¹, Yasir Hussain¹, Hamza Javed¹, Muhammad Sohail²

Shaheed Zulfikar Ali Bhutto Institute of Science and Technology - Karachi Campus
²Department of Microbiology, University of Karachi, Karachi, Pakistan

ABSTRACT

Dyes are colored substance that chemically binds to the substrate to which it is being applied used for creating attractive shades and different colors on fabrics. Each year millions, litres of dyes are released into environments from the effluents created by

man textile industries, dye producing industries and printing industries. These dyes are able to persist in environments longer due to their inherent properties of being chemically stable, resistant to fading, unaffected by light and microbial degradation. Most of the effluents produced by the following industries are carcinogenic, toxic and mutagenic. Dyeing and textile industries use various synthetic dyes which can pose threat to environmental and public safety. Textile effluent contains 5-10% of dye usually discharged into natural water which leads to concern due to their toxic and carcinogenic nature. Conventional biological system for bioremediation and decolorization of dye are not efficient enough. Fungi especially white rot fungi produces lignolytic enzymes such as laccase, lignin peroxidase and manganese peroxidase can be used to bioremediate various dyes present in water waste. Laccase may be utilized as alternative

biological system to decolorize and detoxify textile effluents in water originated from textile manufacturing industries. Fungi can be immobilized onto natural substrate such as coconut coir and immobilized fungi can be used for bioremoval of malachite green

Objectives: Immobilization of *Trametes pubescens* on coconut fibres. Mycoremediation of malachite green by immobilized fungi. **Methodology:** *Trametes pubescens* was added to sabouraud dextrose agar which contained 0.5% coconut coir and incubated at 30 °C for 7 days. Immobilized coir was transferred to malachite green solution and incubated at 30 °C for 72 h. After incubation, sample was centrifuged for 15 mins at 7500 rpm and the absorbance was recorded at 616 nm. % decolorization was calculated. **Conclusion/results:** In this study for the treatment of malachite green, mycelia of *Trametes pubescens* was used to degrade malachite green dye with the production of laccase enzyme. Immobilized fungi removed 86.71% malachite green from the solution. Thus, bioremediation has proved to be an effective method to get rid of dyes from the textile effluent.

**AUNPS PROMOTES
ACTIVATION OF P53 AND
INHIBITION OF NF-KB
SIMULTANEOUSLY IN SKBR3
CELLS**

**Muhammad Safdar*^{1,2}, Mehmet
Ozaslan²**

¹Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan and
²Department of Molecular Biology and Genetics, Gaziantep University, Turkey

ABSTRACT

Objective: The objective of this study was to synthesize novel gold nanoparticles (Au(0)NPs) that simultaneously activates p53 and inhibits NF-κB signaling in SKBR3 breast cancer cells. **Methods:** The tetracycline based Au(0)NPs were synthesized by chemical method. These Au(0)NPs were characterized by different authentic techniques. The first characterization technique was UV-Visible (UV-Vis) spectroscopy to monitor Plasmon absorption maxima at 529 nm. The second technique was X-ray powder diffraction (XRD) pattern to confirm the crystalline nature of the prepared the Au(0)NPs. Finally, the Fourier transformed infra-red (FT-IR) spectroscopy was used to study the bonding patterns of the prepared the prepared Au(0)NPs with a size range of 10–50 nm. These Au(0)NPs were used as a nanomedicine to treat SKBR3 breast cancer cells using relative gene and protein expression studies. **Results:** In response to Au(0)NPs, the level of caspases (3, 8 and 9) were changed, p53 was activated and NF-κB was inhibited simultaneously. The viability and proliferation of breast cancer cells (SKBR3) were downregulated as compared to the normal breast cells (CRL-4010). In addition, the gene and protein expressions of caspases supported the data. The inverse relationship between p53 and NFκB was found in AuNPs treated breast cancer cells. **Conclusions:** The study laid down a preliminary step to employ newly synthesized AuNPs as a chemotherapeutic agent that stimulated cell death via both intrinsic and extrinsic apoptosis and inhibited the cell survival via suppressing the NFκB and recommended to have better insight.

Keywords: Nanomedicine; Characterization; Breast cancer; p53; NFκB; Caspases

DETECTION AND CHARACTERIZATION OF LOCAL FMDV ISOLATES USING ONE STEP RT PCR

Darakshan Jabeen, Syeda Ghufrana Nadeem, M. Munir

Medical Mycology Research and Reference Laboratory, Department of Microbiology, Jinnah University For Women, Karachi, Pakistan.

ABSTRACT

Foot and Mouth Disease is known to infect animals which are cloven hooved and considered as a contagious disease. The Foot and mouth disease in Pakistan is endemic, is caused by the Virus Foot and Mouth Disease serotype A, O and Asia-1. It has been reported that this disease has an outbreak rate in a continuous manner annually despite of regular vaccination. For an effective strategic vaccination program, detection and characterization of the prevalent serotypes caused by Foot and Mouth Disease Virus is now a crucial need. The present study was designed to optimize a One-Step RT-PCR technique for the Genotyping of FMDV serotypes prevalent among cattle in Landhi Dairy Colony, Karachi for the selection of most appropriate vaccines to have an accurate knowledge of circulating virus serotypes in the country. Materials and Methods: One step RT-PCR was effectively established and optimized using the extracted RNA of reference Foot and Mouth Disease Virus for the genotyping of Foot and Mouth Disease Virus serotype O with different PCR conditions, Volume of the Master Mix and thermal cycling conditions. One step RT-

PCR was performed on 100 ELISA positive samples collected between the years of 2014 and 2015. Universal Primer Pairs IF/IR was used for the primary diagnosis of Foot and Mouth Disease Virus and serotype specific Primer Pairs were used for the Foot and Mouth Disease Virus serotype detection. Results: Of the 100 field samples, 85% were Foot and Mouth Disease Virus positive. Out of 100, 85 samples were confirmed for Serotype O in the Foot and Mouth Disease Virus infected samples of the year 2014 and 2015. Conclusion: It may be concluded that the one step RT-PCR optimized in this study could be used for field's samples for the isolation and characterization of Foot and Mouth Disease Virus isolates. For a reliable and an effective Foot and Mouth Disease control program in Landhi Dairy Colony, we suggest introducing Foot and Mouth Disease control vaccination program on large scale for all cattle and buffaloes in Landhi dairy Colony annually.

ISOLATION AND SOCIAL INTERACTION AFFECTS LONGEVITY IN DROSOPHILA MELANOGASTER MODEL

Bisma Yaseen Syeda Urooba Fatima, Madiha Sohail and Mushtaq Hussain*

Bioinformatics and Molecular Medicine Research Group, Dow Research Institute of Biotechnology and Biomedical Sciences, Dow College of Biotechnology, Dow University of Health Sciences, Karachi, Pakistan

ABSTRACT

Consistent social isolation and interaction are paradoxical in intrinsic terms. Conditions and/or habitat of such forms impact on the wellbeing of humans both as physical and

mental health. However, to date their impact on the life span has not been addressed in pure quantitative terms. In this study *Drosophila melanogaster* has been employed as a model organism to explore the effects of social isolation and interaction on the longevity. Briefly total of 100 virgin males and female flies were housed in standard corn meal medium in a complete isolation till the termination of their natural life. In another set, flies were paired as male-male, female-female and male-female in total of 100 replicates in standard corn meal medium. All flies were placed at 22±2 °C for 8-10 hours of day night cycle. Flies were monitored daily for the mortality and confirmed it on the next day to rule out the confounding factor of sleep. The data has been statistically assessed by plotting Kaplan-Meier Survival Curve and showed that social isolation adversely affect the longevity of the flies. Moreover, variations were observed in terms of gender in isolation and in different pairing permutations. Additionally, it has also been shown that different pairing combination may lead to the homosexuality amongst both genders. Given 60% genomic similarity between humans and flies and presence of 75% of the human disease orthologous genes, the findings here in could provide interesting insights of the effect of social isolation on human longevity and sexual behaviour. The findings could then further be exploited for strategizing intervention for variety of psychological, psychiatric illness and inmates mental health problems.

INVESTIGATING THE IMPROVED THERAPEUTIC EFFICIENCY OF PRECONDITIONED MESENCHYMAL STEM CELLS

FOR THE REGENERATION OF INJURED RAT KIDNEY TISSUE.

**Rabia Farhat¹ , Dr. Rakhshinda Habib² ,
Dr. Mohsin Wahid¹**

Dow University of Health Sciences¹, Dow Research Institute of Bio-Technology and Bio-Sciences 2, DUHS, Karachi, Pakistan.

ABSTRACT

Acute kidney injury (AKI) is a leading kidney problem as it can lead to chronic kidney failure if not treated early. AKI is a disorder associated with loss of excretory functions of kidneys and is common in critically ill patients. The regenerative and proliferative potential of stem cell therapeutics have emerged as one of the potential future therapies for renal diseases. Stem cells are the unique type of cells in the body that can self-renew themselves and have the ability to differentiate into multiple lineages. Due to this differentiation ability and immunoregulatory properties MSCs are widely being used in tissue repair and in the treatment of many diseases. Because of non-invasive method of isolation, less ethical concerns, fast self-renewal property, and higher proliferation, umbilical cord derived MSCs are considered as a promising source for cell-based therapies and in regenerative medicine. Stem cells preconditioning by using chemokines or growth factors has been shown to improve their regenerative potential. In this study, mesenchymal stem cells derived from umbilical cord will be used to treat acute kidney injury. Preconditioning of these cells will result in targeted therapy of kidneys. In present study, we aimed to determine preconditioning of mesenchymal stem cells could exert improved therapeutic effects on rat model of AKI. The therapeutic

potential of stem cells derived from umbilical cord will be analyzed both histological and functional analysis. The study would give insight towards improvement in the cellular therapy approach for acute kidney diseases.

STUDY OF RELATIONSHIP OF POLYCYSTIC OVARIAN SYNDROME WITH INFERTILITY AMONG FEMALE PATIENTS AT LADY READING HOSPITAL PESHAWAR

Ayesha Hidayat¹, Rabea Ejaz¹, Irum Maqsood¹, Asma Azhar¹, Saira Saleem¹, Amber Shaheen¹, Noor Jahan Begum¹

¹Department of Zoology, Shaheed Benazir Bhutto Women University, Charsada Road, Peshawar, Pakistan

ABSTRACT

Polycystic ovarian syndrome (PCOS) is a heterogeneous endocrine disorder affecting about 5-20% females of child bearing age. PCOS is characterized by Hyperandrogenemia, Oligoamenorrhoea, Substantial number of immature follicles, inadequate LH:FSH ratio, hirsutism, fibroids etc. The target of the present study is to ascertain the relationship of PCOS with infertility. For this purpose 100 respondents were studied in Lady Reading Hospital Peshawar. Data was collected through well fabricated questionnaire. The result revealed that women with PCOS had higher percentages of hirsutism(92%), acne(88%), fibroids(60%), depression(63%), imbalanced hormone(85%), irregular menstrual cycle(85%), heavy bleeding(73%), and (68 %) of women were facing difficulty to conceive a baby. It was collected that hirsutism, acne, depression, fibroids, hormonal imbalance, irregular menstrual

cycle, and infertility are positively associated with PCOS. It was concluded that PCOS is the leading cause of Anovulatory infertility among the females of child bearing age.

Key Words: Polycystic ovarian syndrome, Infertility, Anovulation, Hormonal Imbalance, Leutinizing Hormone, Follicle Stimulating Hormone, Hyperandrogenemia, Oligoamenorrhoea.

GREEN SYNTHESIS, CHARACTERIZATION AND APPLICATION OF PROTEIN BASED SILVER NANOPARTICLES: A SIMULTANEOUS CHEMOSENSOR FOR ANION (I-) AND CATION (FE²⁺) IN REAL SAMPLES

Hafiza Sumaiyya Jamal, Rameez Raja, Syed Waseem Ahmed, Muhammad Raza Shah, Shakil Ahmed and Syed Abid Ali*

H.E.J. Research Institute of Chemistry, University of Karachi, Karachi-75270, Pakistan

ABSTRACT

Conjugation of proteins to nanoparticles is among the most promising interfaces of nanotechnology because these hybrid nanomaterials combine the distinctive electronic, catalytic and photonic properties of nanoparticles with the recognition and highly selective catalytic properties of biomaterials. Bovine fetuin-A (α 2-HS-glycoprotein) is the most abundant globular plasma glycoprotein having higher sugar moieties content as well as sialic acid residues. Fetuin is very efficient in forming and stabilizing protein mineral colloids known as calciprotein particles. Present study

described the rapid, one-pot synthesis of protein capped silver nanoparticles by chemical reduction method using sodium borohydride as reducing and fetuin-A as stabilizing agent. Protein capping provide excellent stability at variable temperature, pH, salt concentrations and storage period. Hemolysis assay proved that after ultrafiltration F-AgNPs would be safe and non-toxic in respect to human RBCs. F-AgNPs were extensively characterized by UV/vis spectroscopy, AFM, DLS, SEM/SEM-EDS, FTIR, CD and intrinsic fluorescence spectroscopic measurements. F-AgNPs were proved as highly sensitive and selective colorimetric dual sensor for iodide and ferrous ion over other cation or anions showing good linear response of 1-8 and 1-10 μM for iodide and ferrous ions, respectively. The LOD was found to be 0.5 (I-) and 0.47 (Fe²⁺) μM . The recovery studies demonstrated that colorimetric dual sensor was effectively working in real samples (i.e. tap water and human plasma and urine) with monitoring abilities up to 100%. Cumulatively, our findings suggested that the designed probe and protocol is promising for the simultaneous detection of anion (I-) and cation (Fe²⁺). Key Words: Silver nanoparticles, Fetuin-A, Nanomaterials, Colorimetric sensor.

EXPLORING THE FUNCTIONAL VENOMICS AND ANTIVENOMICS OF THE TWO VIPERID (DABOIA RUSSELLII AND ECHIS CARINATUS) SNAKES OF PAKISTAN§

Syeda Uroosa Hashmi and Syed Abid Ali*

H.E.J. Research Institute of Chemistry,
University of Karachi, Karachi-75270,
Pakistan

ABSTRACT

Russell's (*D. russelii*) and Saw-scaled (*E. carinatus*) vipers are the major viperid, along with two elapids Cobra (*N. naja*) and Krait (*B. caeruleus*) constitute the "Big-4 snakes" of Pakistan, and responsible for large number of mortality and morbidity cases in South Asia. So far, administration of antivenom is the only effective treatment available for snakebite envenomation, which is even not sufficiently produced within the country and thus imported from India and Saudi Arabia. In the present study, various venom enzymatic activities and their antivenom neutralization were investigated from *D. russelii* in comparison with *E. carinatus*, which revealed significant intraspecific venom variations across the Indian subcontinent. Established functional venomomics revealed, the presence of different enzymatic (i.e., proteases, PDEs, PLA2, hyaluronidase, LAAOs, AChEs, and DNases) activities of the venom and correlates well with the clinical manifestations of viperid snakes which includes; renal failure, intravascular hemolysis, coagulopathy and hemorrhage etc. Enzymatic activities were established by using the diverse enzymatic assays, while for neutralization studies Bharat polyvalent antivenom was used which exhibits the partial cross-reactivity and/or neutralization against two Pakistani viperid snakes. Thus, clearly suggest the impact of geographical and ontological changes in Pakistani snake's venom composition and demands local production of poly/monospecific antivenoms for saving the precious lives.