جامعة الملك سعود
King Saud University
كلية العلوم
وكالة الدراسات العليا والبحث العلمي

SRFPS
Scientific Research Forum for Postgraduate Students
ملتقى البحث العلمي لطلاب وطالبات الدراسات العليا

ملتقى البحث العلمي

لطلاب وطالبات الدراسات العليا بكلية العلوم

الإثنين: ٩ فبراير ٢٠٢٦ م

تحت رعاية

سعادة الأستاذ الدكتور

يزيد بن عبدالملك آل الشيخ

نائب رئيس الجامعة للدرسات العليا والبحث العلمي

٢٠٢٦ م

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المحتوى

كلمة سعادة عميد الكلية

الأستاذ الدكتور / زيد بن عبدالله آل عثمان

يسعدني أن أرحب بكم في ملتقى البحث العلمي لطلاب وطالبات الدراسات العليا بكلية العلوم. إن هذا اليوم هو فرصة رائعة لكم لعرض أبحاثكم ونتائج دراساتكم, وللتبادل العلمي والثقافي مع زملائكم وأساتذتكم.

إن البحث العلمي هو أساس تقدم الأمم, وهو الطريق الوحيد لتحقيق التطور والتقدم في مختلف المجالات. وإننا في كلية العلوم, نعمل جاهدين على دعم وتشجيع البحث العلمي, وتوفير البيئة المناسبة لكم لتطوير مهاراتكم البحثية.

أود أن أشيد بجهودكم في إعداد أبحاثكم, وأتمنى لكم التوفيق في عرضها.

كما أود أن أشكر أساتذتكم على دعمهم وتوجيههم لكم خلال هذه الفترة.

يمثل ملتقى البحث العلمي فرصة لنا جميعاً لتعلم كل جديد, وللاستفادة من تجارب بعضنا البعض. فلنستفد من هذه الفرصة, ولنعمل جاهدين على تحقيق الأهداف التي نسعى إليها.

شكراً لكم, وأتمنى لكم يوماً علمياً ممتعاً ومثمراً.

كلمة سعادة وكيل الكلية للدراسات العليا والبحث العلمي

الدكتور / سعد بن عبدالعزيز آل داود

يمثل الملتقى العلمي لطلاب وطالبات الدراسات العليا بكلية العلوم حدثا هاما تلتقي فيه همم طلاب وطالبات الدراسات العليا لعرض أعمالهم ونتائجهم البحثية ومناقشتها.كما يمثل يوم هاما للاتقاء بأساتذتهم في التخصصات المختلفة ويعد منبرا هاما لتبادل الأفكار والآراء والاطلاع على كل ما هو جديد في مجال البحث العلمي في مجال العلوم الأساسية وتطبيقاتها المتنوعة.

أبنائي وبناتي طلاب الدراسات العليا بكلية العلوم أود أن أذكركم بأن العلوم هي أساس التقدم والتطور الذي تهدف له البشرية فما عليكم إلا أن تبذلوا قصارى جهدكم في البحث والتطوير ولا تبخلوا بوقتكم للاستفادة بما هو كل جديد في مجال الأبحاث العلمية.

نشكر لكم مشاركتكم في هذا اليوم المميز ونتمنى لكم مشاركة فعالة.

نبذة عن ملتقى البحث العلمي

هو ملتقى علمي متخصّص يهدف إلى دعم وتمكين طلبة الدراسات العليا من عرض أبحاثهم ومناقشتها في بيئة أكاديمية محفّزة، بما يسهم في تعزيز جودة البحث العلمي، وتنمية المهارات البحثية، وتشجيع التميّز والابتكار، وتعزيز التواصل العلمي بين الباحثين وأعضاء هيئة التدريس، بما يتوافق مع رسالة كلية العلوم وتوجهات الجامعة.

كما يسهم إقامة هذا الملتقى في تعزيز مكانة الكلية كمؤسسة أكاديمية رائدة تهتم بتطوير البحث العلمي وتنمية مهارات الطلبة. فهي تخلق بيئة علمية محفّزة تدعم الابتكار وتُشجع الطلبة على استكشاف القضايا البحثية ذات الصلة بتخصصاتهم والمجتمع من حولهم.

كما تسهم في بناء جيل من الباحثين المتمكنين، وهذا سوف يكون له أثرا إيجابيًا على جودة المخرجات التعليمية والبحثية، ويدعم توجه الكلية نحو التميز الأكاديمي والبحثي. إلى جانب تعزيز التكامل بين الأقسام الأكاديمية والإدارية في تنظيم فعالية علمية شاملة، وترفع من مستوى جاهزية الطلبة للمشاركة في المحافل العلمية الداخلية والخارجية، مما يساهم في إبراز إنجازات الكلية ورفع تصنيفها المؤسسي.

هذا بالإضافة إلى مساهمته في تحقيق الأهداف الاستراتيجية للجامعة من خلال دعم الابتكار والبحث العلمي في الجامعة لما يمثله طلاب وطالبات الدراسات العليا من قوى فعالة في إجراء الأبحاث العلمية. كما تساهم الفعالية في دعم البيئة التعليمية والبرامج الأكاديمية وتحسين مخرجات التعلم لبرامج الدراسات العليا من خلال إجراء بحوث علمية متطورة تواكب التطور البحثي المناظر في الجامعات العالمية. حيث ستمكن هذه المبادرة طلاب وطالبات الدراسات العليا من عرض أنشطتهم ونتائجهم البحثية ومناقشتها مع المتخصصين مما يساعد على تحفيز التفكير النقدي، وتعزيز مهارات التحليل والاستنتاج، ومهارات التواصل بما يتماشى مع تحقيق أهداف الجامعة الاستراتيجية . هذا بالإضافة إلى تعزيز دور الجامعة المجتمعي من خلال اجراء أبحاث تطبيقية تساهم في تحقيق التنمية المستدامة. كما تعد المبادرة فرصة لتفعيل الشراكات والتعاون مع القطاع الصناعي والعمل تقديم الاستشارات العلمية والحلول العملية لمشكلاتهم.

الرؤيــة

الريادة في دعم التميّز البحثي لطلبة الدراسات العليا, والمساهمة في بناء مجتمع علمي مبتكر يواكب مستهدفات رؤية المملكة ٢٠٣٠.

الرسالة

تمكين طلبة الدراسات العليا بكلية العلوم من عرض أبحاثهم وتطوير مهاراتهم البحثية والتواصلية, وتعزيز جودة البحث العلمي والابتكار, بما يدعم التنمية الوطنية والاقتصاد المعرفي.

أهداف ملتقى البحث العلمي

1. توفير منصة لطلاب وطالبات الدراسات العليا لعرض ومناقشة أبحاثهم العلمية بأسلوب مبسط.
2. تعزيز مهارات البحث العلمي و تحفيز الإبداع والابتكار لدى طلاب وطالبات الدراسات العليا.
3. مشاركة المعرفة والتعرف على أحدث التوجهات والاهتمامات البحثية
4. تعزيز التفاعل بين التخصصات المتنوعة وتشجيع التعاون والتبادل العلمي بين الباحثين.

اللجنة المنظمة

رئيس الملتقي

د. سعد بن عبدالعزيز آل داود

وكيل الكلية للدراسات العليا والبحث العلمي

مقرر الملتقي

أ.د. محمد حسن النويهى

رئيس وحدة البحث والنشر العلمي

أعضاء اللجنة

أ.د. أسماء بنت عبدالله العثمان مساعد وكيلة الكلية للدراسات العليا والبحث العلمي	**أ. مرام بنت سفر آل سالم** وكالة الكلية للدراسات العليا والبحث العلمي
د. أريج بنت على الزهرانى رئيسة وحدة العلاقات العامة والاعلام	**أ. هاجر بنت محمد الطرياق** وكالة الكلية للدراسات العليا والبحث العلمي
أ.د. أمل بنت محمد المحيميد قسم الكيمياء	**أ. محمد بن عبدالله بن شويل** وكالة الكلية للشؤون التعليمية والأكاديمية
د. إيمان بنت عبدالله الغامدى قسم الفيزياء والفلك	**أ. عبير بنت على صولان** وحدة العلاقات العامة والاعلام
أ. فواز بن مشارى المشرافى رئيس وحدة الدراسات العليا والابتعاث	**أ. أشجان بنت عبدالله السالم** وحدة العلاقات العامة والاعلام
أ. ماجدة بنت نايف الحمدان وكالة الكلية للدراسات العليا والبحث العلمي	**أ. عبدالهادى بن محمد القحطانى** وحدة العلاقات العامة والاعلام
أ. ممدوح بن عبدالعزيز المجيول وكالة الكلية للدراسات العليا والبحث العلمي	**أ. سمية بنت إبراهيم الفريح** وحدة تقنية المعلومات
أ. منى بنت عوض الشهرى وكالة الكلية للدراسات العليا والبحث العلمي	**أ. البندرى بنت أحمد الراجح** وحدة الشؤون الفنية والمقررات الخدمية
أ. تركية بنت بدر العتيبى وكالة الكلية للدراسات العليا والبحث العلمي	**أ. هند بنت ناصر المعجل** قسم الكيمياء الحيوية

First Track: Biological and Environmental Sciences

المسار الأول : أبحاث العلوم البيولوجية والبيئية

Poster Code:	PBE_2026_1
Student Name:	**Amani Riyadh Ahmad Alsharidah**
Supervisor:	Prof. Afrah Alkhuriji
Degree:	Ph.D.
Title:	Modulation of Phase-I Cytochrome P-450 2C9 Enzyme by Commiphora Myrrha Resins in Cultured Liver Carcinoma Cells (HepG2): In Vitro and In Silico Studies
Abstract:	Background The use of natural health products (NHP) is constantly increasing worldwide. Among the most NHP consumed in the Arabian Peninsula are the resins of Commiphora myrrha (C. myrrha) tree. Consumption of C. myrrha may result in herb-drug interactions mediated by drug-metabolizing cytochrome P-450 (CYP) enzymes in the liver, which could lead to serious health consequences for patients. This study aims to determine the herb-drug interactions based on the induction of predominant CYP 2C9 by a non-toxic boiled aqueous extract of C. myrrha and to unveil the potential involvement of xenobiotic-sensing nuclear receptors such as transcription factor Pregnane X Receptor (PXR) in CYP 2C9 induction, and to predict the molecular interactions of PXR with C. myrrha-derived metabolite(s). Methods Cytotoxic effect of boiled aqueous extract of C. myrrha resins in cultured liver carcinoma Hep G2 cells was assessed using MTT assay. CYP 2C9 gene and protein expression levels were evaluated using reverse transcription- quantitative polymerase chain reaction and Western blot. Nuclear receptor binding assays, chemical analysis and molecular docking prediction were performed using specific kits, liquid chromatography-mass spectrometry time-of-flight, and in silico software, respectively.

Poster Code:	PBE_2026_2
Student Name:	**Fai Mohammed Aldossari**
Supervisor:	Prof. Dr. Intisar Sulaiman Ali Al-Suhaibani
Degree:	Ph.D.
Title:	Quantification of Pro-caspases and Activated Caspases in ChemoResistant Cell Lines by Targeted Quantitative Proteomics
Abstract:	Background: Caspases are cysteine-aspartic proteases that play a key role in programmed cell death (apoptosis) and are critically involved in cancer development and therapeutic response. Accurate quantification of both pro-caspases and their activated forms remains challenging due to their low abundance, structural similarity, and limitations of conventional analytical methods. In this study, a sensitive and selective liquid chromatography–tandem mass spectrometry (LC-MS/MS) method was developed and validated for the targeted quantification of pro-caspases and activated caspases in breast cancer cells. Methods: Signature peptides specific to pro- and cleaved caspases were designed using bioinformatics tools and optimized for multiple reaction monitoring (MRM) analysis. The method was applied to MCF-7 breast cancer cells treated with doxorubicin to induce apoptosis. Method validation demonstrated excellent linearity, specificity, sensitivity, and reproducibility across a wide dynamic range. Results: The developed LC-MS/MS approach enabled simultaneous detection and quantification of multiple caspase forms in a single analytical run, allowing clear differentiation between inactive and activated states. Changes in caspase expression following treatment were consistent with apoptotic activation and supported by complementary biochemical analyses. Conclusion: This study presents a robust targeted proteomics strategy for quantitative caspase analysis in cancer cell models. The developed method provides a reliable tool for apoptosis research and has potential applications in cancer biomarker discovery and therapeutic evaluation.

Poster Code:	PBE_2026_3
Student Name:	**Nuwayyir Al-Shammari**
Supervisor:	Dr. Abdulwahed Al-Refaei
Degree:	Ph.D.
Title:	Bird Diversity, Seasonal Migration Pattern and Evaluate Threatened species in the King Abdulaziz Royal Reserve, Kingdom of Saudi Arabia
Abstract:	Ecosystems are dynamic systems shaped by interactions between biotic and abiotic components through continuous energy flow and nutrient cycling. Birds are essential for ecosystem stability, influencing seed dispersal, pollination, and pest control. Saudi Arabia lies along key migratory flyways connecting Eurasia and Africa, yet many protected areas, including the King Abdulaziz Royal Reserve (KARR), lack comprehensive avifaunal assessments. This study aimed to evaluate avian diversity, species composition, habitat associations, seasonal variation, and threats in KARR. Field surveys were conducted over four seasons at 208 sampling stations using fixed-radius point counts and opportunistic observations. Recorded species were classified by phenological status, trophic guilds, and international conservation frameworks (IUCN, CMS, CITES, AEWA). A total of 194 species were documented, including 146 landbirds and 48 waterbirds across 23 orders and 50 families. Passage migrants dominated the community, and insectivores were the most common trophic guild. Bird diversity peaked in spring, reflecting migration patterns and increased resource availability. Habitat heterogeneity, water availability, and vegetation cover were identified as key drivers of avian diversity, whereas grazing, hunting, habitat loss, and climate-related stressors were the main threats. The findings highlight KARR importance as a refuge for resident and migratory birds. To conserve this biodiversity, the study recommends long-term monitoring, enhanced protection of critical habitats, and integration of scientific findings into national strategies in line with Saudi Vision 2030. Overall, the study provides a baseline for future research and management of bird communities in arid ecosystems, supporting conservation planning and sustainable biodiversity management.

Poster Code:	PBE_2026_4
Student Name:	**Rawan Farhan bin Salem Al-Enezi**
Supervisor:	Dr. Bader Obaid Almutairi
Degree:	Ph.D.
Title:	Expression Profiling of MAGE Family Genes in Treated and Untreated Leukemic Cells Versus Normal Blood Samples
Abstract:	Leukemia is a major public health challenge worldwide and represents one of the most common hematological malignancies in Saudi Arabia. Despite advances in diagnosis and treatment, early detection remains a critical limitation, highlighting the need for reliable molecular biomarkers. Cancer-testis antigens (CTAs), particularly the melanoma antigen gene MAGE family, have gained attention due to their restricted expression in normal tissues and aberrant activation in various cancers, including leukemia.The main problem addressed in this study is the limited availability of specific biomarkers that can support early leukemia detection and disease monitoring. Therefore, this study aimed to evaluate the expression patterns of MAGE family genes as potential biomarkers for leukemia.This study investigated the expression of MAGE-A (A1–A12), MAGE-B (B1–B6), and MAGE-C (C1–C3) gene families in leukemic samples compared with normal blood samples. Gene expression analysis was performed using RT-PCR, followed by gel electrophoresis to visualize and compare expression profiles between treated leukemic samples, untreated leukemic samples, and normal controls.The results demonstrated differential expression of several MAGE family genes in leukemic samples compared to normal blood samples, with notable variation between treated and untreated leukemia groups. These findings support the potential role of MAGE genes as leukemia-associated molecular markers. In conclusion, the altered expression of MAGE family genes suggests their promise as diagnostic biomarkers for leukemia. Future studies are recommended to quantitatively validate these findings using qRT-PCR and to investigate the epigenetic regulation of MAGE genes through DNA methylation and histone modification analyses using leukemia cell lines and epigenetic drug treatments.

Poster Code:	PBE_2026_5
Student Name:	**Manar Hussein Almutairi**
Supervisor:	Prof. Dr. Mikhlid Almutairi
Degree:	Ph.D.
Title:	Examining the Expression of Human Cancer Germline Genes and Their Epigenetic Regulation in Leukemia Patients
Abstract:	Leukemia remains a major public health burden in Saudi Arabia, where diagnosis often occurs at a younger age than the global average and is frequently delayed due to nonspecific early symptoms. This highlights the need for sensitive molecular biomarkers to support early detection and monitoring. Cancer-germline (CG) genes, which are normally restricted to germline tissues but aberrantly expressed in malignancies, represent promising biomarker candidates. However, their expression patterns in Saudi leukemia patients are not well characterized. This study aimed to evaluate and compare the mRNA expression profiles of selected CG genes (BAGE, PRAME, ODF4, SPA17, and TEX19) in treated leukemia (TL), untreated leukemia (UTL), and normal blood (NB) samples. Peripheral blood samples were collected from 36 individuals (14 TL, 10 UTL, and 12 NB). Total RNA was extracted, reverse-transcribed into cDNA, and analyzed using RT-PCR for qualitative assessment and SYBR Green qRT-PCR for quantitative evaluation. Gene expression levels were normalized to ACTB, and statistical significance was defined at $P < 0.05$. RT-PCR analysis demonstrated expression of all investigated genes across the studied groups, with stronger band intensity observed in UTL samples and weaker intensity in TL samples relative to control. qRT-PCR confirmed significant upregulation of BAGE and PRAME in UTL samples and downregulation in TL samples compared with NB, indicating an association with disease status and treatment response. These finding suggests that BAGE and PRAME may have potential utility as leukemia-specific biomarkers for early detection and monitoring in Saudi leukemia patients. Further large-scale studies are recommended to validate their clinical utility.

Poster Code:	PBE_2026_6
Student Name:	**Waad Mohammed Al-Dosari**
Supervisor:	Dr. Mukhlid Hamed Al-Mutairi
Degree:	Ph.D.
Title:	Influence of Tobacco Smoking on Innate Immune Gene Variations and Expressions in Saudi Women
Abstract:	Background and Objectives: Human beta-defensins (HBDs) are antimicrobial peptides encoded by the DEFB gene cluster, expressed in epithelial cells at mucosal barriers, where they play a role in innate immunity. Tobacco smoking reduces HBD-1 expression, impairing mucosal defense, and HBD-1 genetic variants, such as DEFB1 Ile38, are more common in smokers and linked to increased risk of smoking-related diseases. This study aimed to investigate the association between the HBD-1 single-nucleotide polymorphism (SNP) rs2738047 (C/T) and tobacco smoking in Saudi women. Materials and Methods: A total of 264 blood samples (114 smokers and 150 non-smokers) were genotyped and analyzed according to age (≥29 vs <29 years), smoking duration (≥5 vs <5 years), and weekly tobacco consumption (>19 vs ≤19 hours/week). Results: Significant associations were observed only among long-term smokers. Among women who had smoked >5 years, the CT genotype was associated with a ~6-fold increased risk of smoking (OR = 5.87, P = 0.005), CT+TT genotypes with a ~4-fold increased risk (OR = 4.19, P = 0.014), and the T allele with a ~3-fold increased risk (OR = 2.99, P = 0.037). No significant association was detected for the TT genotype alone. In women who had smoked ≤5 years, across age groups, by weekly consumption levels, and in the overall comparison with controls, no significant associations were observed, although slight trends were noted for the CT and CT+TT genotypes. Conclusions: These findings suggest that the rs2738047 polymorphism may increase susceptibility to long-term tobacco exposure, indicating a gene–environment interaction in HBD-1.

Poster Code:	PBE_2026_7
Student Name:	**Wadha Khalid Al-Julaigham Al-Qahtani**
Supervisor:	Prof. Afrah Fahd Al-Khuraiji
Degree:	Ph.D.
Title:	Genetic Polymorphisms of Vascular Endothelial Growth Factor and Their Impact on Recurrent Spontaneous Miscarriage in Saudi Women
Abstract:	Recurrent spontaneous miscarriage (RSM) is the loss of three or more clinically recognized pregnancies before 20 weeks of gestation. Angiogenesis is regulated by vascular endothelial growth factor (VEGF), a protein that plays a role in successful pregnancy. Disruptions in the VEGF gene expression potentially lead to infertility and pregnancy complications. Therefore, this study investigated the impact of VEGF gene polymorphisms on RSM among Saudi women. Blood samples were collected from 200 Saudi women (100 with RSM and 100 controls). DNA was extracted and analyzed for VEGF polymorphisms (rs10434, rs3025053, rs699947, rs2010963, rs833061, and rs25648) using TaqMan Real-Time PCR. Plasma VEGF levels were measured using the Human VEGF ELISA Kit. We found rs2010963, rs3025053, and rs699947 were significantly associated with an increased risk of miscarriage ($p < 0.05$). Furthermore, VEGF concentrations were lower in the RSM case group compared to the control group ($p < 0.05$).

Poster Code:	PBE_2026_8
Student Name:	**Tahani Hassan Ahmed Albinhassan**
Supervisor:	Prof. Intisar Al-Suhaibani
Degree:	Ph.D.
Title:	Quantitative Analysis of Gene Expression Induced by Heat Stress in Human Neuronal Cell Line
Abstract:	Proteotoxic stress plays a central role in hyperthermia related condition, specially heat stroke that is a life-threatening condition often accompanied by acute and long-lasting brain injury. Protein quality control inside the cell disrupts via extreme heat leading to protein folding, promotes aggregation, and compromises cellular recovery. Small heat shock proteins (sHSPs) function as ATP-independent chaperones that limit aggregation; however, α B-crystallin (HSPB5) role during heat stress response is not fully defined. In this study, HSPB5 expression and function in human medulloblastoma (DAOY) cells exposed to heat stress condition 44 °C for 1 h or 2 h, followed by recovery at 37 °C for up to 48 h analyzed. HSPB5 gene expression showed a stress duration dependent response, peaking earlier after 44 °C–1 h exposure and later at 44 °C–2 h. Further, protein levels reached maximal expression at 24h recovery. Co-immunoprecipitation at 24 h recovery revealed interactions of HSPB5 with vimentin, and HSPB1, suggesting the formation of chaperone and cytoskeletal complexes response. To evaluate functional relevance of HSPB5, shRNA knocked down was used under at 44°C–2 h conditions. While HSPB5 (KD) did not markedly affect early cell proliferation, it led to modest reduction during late recovery. Importantly, the KD resulted in early and sustained protein aggregation. As for the Apoptosis and Autophagy marker, reduced p53 induction, increased cleaved PARP, and decreased LC3B-II levels, indicating altered responses. Together, these findings highlight HSPB5 as an important regulator of proteostasis and cellular recovery following heat stress in neuronal cells.

Poster Code:	PBE_2026_9
Student Name:	**Afnan Saleh Munis Al-Qurashi**
Supervisor:	Prof. Ashraf Mohamed Ahmed
Degree:	Ph.D.
Title:	Envenomation with Snake and Scorpion Venoms as a Cause of Death: A Forensic Investigation of Rabbit Carcasses Decomposition and Entomological Colonization
Abstract:	Background: Envenomation by poisonous creatures is a major global cause of mortality. Its concomitant impact on the postmortem corpse decomposition and associated insect succession pattern is still poorly understood. Purpose of the study: This study comparatively investigates the impact of envenomization with the venoms of the snake Walterinnesia aegyptia L. versus the scorpion, Androctonus crassicauda L., on rabbit corpse decomposition and beetle succession. Methods: Three groups of rabbits (five animals each) were injected with the snake venom, the scorpion venom, or 0.9% saline (control) prior to euthanasia with CO2. The corpse decomposition stages and beetle succession were monitored over 11 days. Results: Four stages of decomposition with venom-dependent duration variation were observed. The scorpion-envenomized corpses showed a longer decay stage and a delayed dry stage. A total of 1094 beetles belonging to 27 species of 14 families were reported. Histeridae, Dermestidae, Scarabaeidae, and Tenebrionidae were the most diversified and prevalent families. Chrysomelidae, Elateridae, Hybosoridae, and Ptinidae were incidentally attracted to control corpses, while Nitidulidae and Zopheridae were only found on control and snake-envenomized ones. Four species belonging to the families Anthicidae, Histeridae, Scarabaeidae, and Tenebrionidae were predominant on all corpses. Four species belonging to the families Chrysomelidae, Curculionidae, Elateridae, and Hybosoridae were distinctively associated with the control corpses. Conclusions: These findings provided evidence that envenomation impacted the decomposition process and beetle succession in a venom-dependent manner, which could be significant for forensic investigations.

Poster Code:	PBE_2026_10
Student Name:	**Afra Mofareh Ali Alharbi**
Supervisor:	Prof. Dr. Saleh Abdul Rahman Al Quraishy
Degree:	Ph.D.
Title:	Unraveling role of Juglans regia leaf extracts during murine cerebral malaria

Abstract:

Title of Abstract: Neuroprotective and antimalarial effects of Juglans regia leaf extracts in a murine model of cerebral malaria

Background: Malaria is a major public health problem caused by the apicomplexan Plasmodium parasite. Cerebral malaria (CM) is the most critical outcome of Plasmodium infection. It is becoming more difficult to manage, particularly in areas of multi-drug resistance. Scientists are focused on identifying alternative strategies to combat malaria infection. Therefore, this study was designed to evaluate the activity of Juglans regia leaf extract (JRLE) in Plasmodium berghei-infected C57BL/6 mice.

Methods: The J. regia leaf extract (JRLE) was prepared using methanol and characterized by Fourier-transform infrared spectroscopy (FT-IR). Female C57BL/6 mice were divided into six groups (5 mice/group(: Group 1: Non-infected and non-treated (negative control).Group 2: Non-infected and treated with the potentially effective JRLE dose with low parasitemia (%).Group 3: Infected and non-treated (positive control).Group 4: Infected and treated with JRLE at 250 mg/kg of body weight (B.W.).Group 5: Infected and treated with JRLE at 500 mg/kg of B.W. Group 6: Infected and treated with the antimalarial drug, chloroquine (CQ), at 10 mg/kg of B.W.. Groups (3–6) were infected intraperitoneally with P. berghei (1×10^5). Treatment (oral JRLE or chloroquine) was administered for 5 days starting on day 4. Parasitemia, survival, and body weight were assessed, and brains were collected on day 9 p.i. for histopathological analysis (H&E staining) and Glial fibrillary acidic protein)GFAP(immunohistochemistry. Gamma-aminobutyric acid (GABA), glutamate, neurotransmitters (epinephrine, norepinephrine, dopamine, serotonin), and mRNA expression of signaling genes (Chrnb2, Gabbr1, Gnai1, Gria2) were evaluated using ELISA and real-time PCR. Data are expressed as mean ± SD. Group differences were analyzed using one-way ANOVA in SPSS (version 18), with statistical significance set at $p \leq 0.05$.

Results: Phytochemical screening by FT-IR demonstrated the presence of 10 functional groups in the JRLE. By day 9 after infection with the P. berghei parasite, the parasitemia was significantly reduced after JRLE treatment with a dose of 500 mg/kg (6.33% ± 1.18%) compared to the infected group (23.84% ± 2.06%), with a positive correlation with body weight. Our data showed that JRLE prolonged the survival curve of the infected mice. JRLE ameliorates the reduction of the brain index caused by P. berghei infection. Furthermore, histological analysis showed that infection with P. berghei exacerbates brain damage as evidenced by degeneration of Purkinje cells, cerebral hemorrhage, intravascular sequestrations of parasitized red blood corpuscles (pRBCs), and infiltration of lymphocytes. At the same time, treatment with JRLE mitigates the brain injury induced by the infection. JRLE reduced the level of GFAP expression in the brain tissue of the infected mice. Additionally, treatment with JRLE ameliorates the brain neurotransmitter imbalance (i.e., epinephrine, norepinephrine, dopamine, and serotonin) after Plasmodium infection. Upon JRLE treatment, Chrnb2, Gnai1, and Gabbr1 mRNA expression were down-regulated in the brain tissues derived from infected female C57BL/6 mice. Meanwhile, mRNA expression of Gria2 was up-regulated after JRLE inoculation. Our study proved that JRLE significantly ameliorated the neurotransmitter markers by increasing GABA levels and decreasing the glutamate level in the brain of P. berghei-infected mice.

Conclusion: Taken together, the data reported here illustrate that J. regia leaf extracts possess potent antimalarial effects and may offer a potential drug lead for developing a safe, effective, and affordable antimalarial therapy. Further studies are recommended to include the broader organ-specific effects of plant extract.

Poster Code:	PBE_2026_11
Student Name:	**Raed Ammar Al-Sufyani**
Supervisor:	Prof. Mukhlid bin Hamid Al-Mutairi
Degree:	Ph.D.
Title:	Examining the Relationship between COVID-19 Severity and Missense Variants in Innate Immunity Genes in Saudi Patients
Abstract:	Coronavirus disease 2019 exhibits marked interindividual variability in clinical severity, indicating an important contribution of host genetic factors. The innate immune response, particularly signaling mediated by the Toll-like receptor pathway, plays a central role in early viral recognition and immune activation. Despite the critical role of the TLR signaling pathway in antiviral immunity, the contribution of genetic variation within this pathway to coronavirus disease severity in the Saudi population remains incompletely understood. This study employed a case–control design to investigate missense genetic variants in key TLR pathway genes, including IRAK1, IRAK2, IRAK4, TLR2, and TLR8, among Saudi patients. Genotype and allele frequencies were analyzed across stratified groups based on sex, age, and ABO blood type using odds ratios with 95% confidence intervals, and statistical significance was defined at $p < 0.05$. Three-dimensional protein structural modeling was performed to assess potential variant-associated conformational changes. Statistically significant associations were identified between several variants within the analyzed genes and coronavirus disease severity, with distinct patterns observed across demographic and clinical subgroups. Structural modeling supported the biological plausibility of these associations by revealing potential alterations in protein conformation linked to the identified missense variants. Overall, this study provides evidence that genetic variation within the TLR signaling pathway contributes to coronavirus disease severity in the Saudi population. Integrating population-specific genetic association analyses with functional characterization and extending analyses to additional SNPs within the same genes is recommended to further elucidate disease susceptibility mechanisms

Poster Code:	PBE_2026_12
Student Name:	**Saber Nahdi**
Supervisor:	Prof. Abdul Halim Harath
Degree:	Ph.D.
Title:	Assessment of Histopathology Aspects and Molecular Characteristics Associated with Ovarian Endometriosis
Abstract:	Background: Ovarian endometriosis (OE) is a chronic inflammatory gynecological condition linked to infertility and increased ovarian cancer risk. The molecular mechanisms underlying OE, particularly the interactions between inflammation, autophagy, and epigenetic modifications, remain poorly understood, especially in ethnically diverse populations. Methods: This study investigated OE in 183Saudi Arabian women (88 patients, 95controls) through histopathological and molecular analyses. Lesions were examined for stromal fibrosis and inflammation. Gene expression of inflammatory markers (IL6, IL10), apoptosis and cell cycle regulators (TNFRSF10D, CDK4, CDKN1A), autophagy markers (LC3, Ubiquitin), and epigenetic modifiers (DNMT3B, H3.1) was assessed by real-time PCR, alongside quantification of key inflammatory proteins. Results: Histopathology confirmed significant fibrosis and chronic inflammation in endometriotic lesions. Gene profiling revealed a pro-proliferative, anti-apoptotic signature with PTTG1 upregulation and downregulation of TNFRSF10D, CDK4, and CDKN1A. A notable post-transcriptional paradox was identified: IL-6 mRNA was elevated while protein levels were reduced, indicating tight control of local inflammation. Autophagy was enhanced, shown by increased LC3 expression coupled with decreased Ubiquitin mRNA. Epigenetic dysregulation included DNMT3B upregulation and H3.1 downregulation. Conclusion: This study defines a unique molecular signature of OE in Saudi Arabian women, characterized by regulated inflammatory responses, increased autophagy, and epigenetic reprogramming. These findings elucidate novel pathogenic mechanisms and highlight the importance of ethnic variability in identifying population-specific biomarkers and therapeutic targets for endometriosis.

Poster Code:	PBE_2026_13
Student Name:	**Moudhi Shakheer Al-Anzi**
Supervisor:	Dr. Suad Khalaf Al-Daihan
Degree:	Ph.D.
Title:	Effect of Trigonella foenum-graecum L. (Fenugreek) Seeds Extract Against Dioxin-Induced Liver Toxicity in Rats
Abstract:	Background: Dioxins are environmental contaminants known to cause severe health risk. Fenugreek (Trigonella foenum-graecum L.) is herb use in traditional medicine which rich in bioactive compounds. Aims: investigate the anti-toxic and hepatoprotective effects of fenugreek seed extract on dioxin induced liver damage in vivo by evaluating its antioxidant properties via measuring oxidative stress markers and assessing hepatoprotective effects by measuring serum liver functions. Methods: Forty-eight adult male Sprague Dawley rats were divided into six groups (n=8). Group I: served as control and received corn oil. TCDD- exposed groups (group II & III): were administered daily at oral two doses concentrations of 2.5 µg/kg b.w. and 25 µg/kg b.w. TCDD. Treatment groups (group IV & V) : received TCDD (2.5 µg/kg b.w. and 25 µg/kg b.w.) followed by daily oral gavage of Fenugreek extract (200 mg/kg b.w.), and FGE-received group (group VI): received fenugreek seed extract. The treatment administrations of all groups were for 21 days. Biochemical analysis included measuring liver enzymes (ALT, AST, ALP) measured by spectrophotometer and hepatic oxidative stress markers (GSH, GST, LPO) were estimated by ELISA. Histopathological alterations in liver were examinated. Results:Treatment with Fenugreek extract reversed these biochemical changes induced by dioxin exposure leading to a reduction in elevated liver enzyme markers and a restoration of antioxidant levels in the liver. Histological analysis further supported these findings, showing fenugreek extract improved the pathological signs induced by dioxin. Conclusion: The results suggest that fenugreek seed extract is an effective hepatoprotective remedy against dioxin and its ability to improve both biochemical and histological profiles.

Poster Code:	PBE_2026_14
Student Name:	**Sara Nayef Alharbi**
Supervisor:	Dr. Ajamaluddin Malik
Degree:	Ph.D.
Title:	Biosensor development for in vivo protein folding studies
Abstract:	Protein misfolding plays a central role in numerous diseases, including neurodegenerative, metabolic, and oncological disorders. As protein function depends on correct folding, cells rely on a complex proteostasis network of molecular chaperones, proteases, and regulatory factors to maintain protein integrity. Disruptions in this network contribute to a wide range of pathologies. This study characterizes the development of a protein folding biosensor based on engineered variants of the Zeocin binding protein (ZBP). Antibiotic resistance markers were selected for this system due to their robustness across diverse hosts. ZBP, a small and soluble protein with a known 3D structure, provides an ideal scaffold for detecting folding defects in both prokaryotic and eukaryotic cells. A rationally designed library of 22 ZBP mutations was generated to identify destabilizing variants. These were expressed in E. coli using a leaky expression system, and their resistance to Zeocin was quantified by measuring the minimum inhibitory concentration (MIC). Several mutations significantly reduced Zeocin resistance, reflecting impaired folding and decreased solubility. Wild type ZBP displayed high resistance, representing positive control, whereas the empty vector, which remained fully susceptible, was represented as negative control. Two variants, ZBP P9E and ZBP R26F showed the most drastic loss of resistance. These destabilized variants serve as effective biosensors for studying proteostasis and identifying molecular or chemical chaperones that enhance folding. Such a system enables high throughput screening approaches and offers a versatile platform for evaluating protein stability modulators across multiple biological environments.

Poster Code:	PBE_2026_15
Student Name:	**Fatimah mutlaq alharbi**
Supervisor:	Md. Ashrafuzzaman
Degree:	Ph.D.
Title:	Discovery of Aptamer-Based Chemotherapy Drugs to Target the Anti-Apoptotic Protein Bcl-2 In Cancer Cells
Abstract:	Background: Overexpression of the anti-apoptotic protein Bcl-2 is a key driver of chemoresistance and metastasis in breast cancer. This study aimed to in vitro validate a DNA aptamer for its therapeutic potential against MCF-7 cells. Methods: In vitro cytotoxicity was evaluated using the MTT assay across a concentration range of 5 nM to 1500 nM. Target specificity was assessed using a non-specific (NS) scramble control. Additionally, a wound-healing (scratch) assay was performed at 200 nM to determine the aptamer's effect on cellular migratory capacity over 48 hours. Results: The Bcl-2 aptamer demonstrated dose-dependent cytotoxicity with an IC50 of approximately 200 nM. At 500 nM, cell viability was significantly reduced to 36.33% ± 1.5%, compared to 91.66% ± 1.5% in the NS-control ($p < 0.001$). A plateau effect observed beyond 750 nM suggested target saturation. Furthermore, the scratch assay revealed a marked reduction in wound closure in treated cells compared to the 85% closure observed in untreated controls, indicating potent anti-migratory activity. Conclusion: These results confirm that the DNA aptamer effectively triggers apoptosis and suppresses metastasis in Bcl-2-overexpressing MCF-7 cells. This dual-action mechanism highlights its potential as a highly specific therapeutic candidate for targeted breast cancer therapy.

Poster Code:	PBE_2026_16
Student Name:	**Hala Al Shamer Al Ajmi**
Supervisor:	Dr.AMANI AHMED ALI ALGHAMDI
Degree:	Ph.D.
Title:	Investigation of the Potential Effect of C myrrha Extract on Apoptosis and Chemoresistance in AML Stem Cell line KG1a
Abstract:	Acute myeloid leukemia (AML) is a challenging hematologic malignancy characterized by elevated relapse rates, highlighting the importance for the identification of natural therapeutic substances for tackling chemoresistance. Commiphora myrrha, a herbal resin abundant in bioactive phytochemicals, has been recognized for its various pharmacological properties, including antiproliferative effects. This study aimed to examine the molecular anticancer properties of C. myrrha extracts on the human promyelocytic leukemia HL60 cell line. The cytotoxicity was evaluated to determine the IC50 values at various time intervals. Expression of apoptosis-related proteins was assessed using Western blot, and cell cycle distribution was examined by flow cytometry. The activities of caspase-3/7 and mitochondrial permeability transition pore opening (mPTPO) were detected by Confocal Fluorescence Microscopy. The methanolic extract of C. myrrha significantly reduced HL60 cell viability in a dose- and time-dependent manner among the various solvents evaluated. C. myrrha prompted apoptosis in HL60 cells, as indicated by an observed increase in Annexin V-positive cells. At the molecular level, treatment with C. myrrha resulted in the overexpression of the pro-apoptotic protein Bax and the downregulation of the anti-apoptotic protein Bcl-2, leading to the cleavage of Caspase-9, Caspase-3, and PARP. Moreover, confocal microscopy showed increased caspase-3/7 activity and heightened mPTPO activity, demonstrating the participation of the intrinsic mitochondrial apoptotic pathway. C. myrrha inhibited cell proliferation by downregulating the expression of essential cell cycle regulators, such as Cyclin D1, Cyclin A1, and Cyclin B1. These findings illustrate the potential anticancer properties of C. myrrha methanolic extract in HL60 cells, promoted by mitochondrial malfunction and cell cycle arrest, which requires more preclinical investigations.

Poster Code:	PBE_2026_17
Student Name:	**Afnan Nabil Badr Ghalib**
Supervisor:	Prof. Omar Salem Abdullah Al-Attas
Degree:	Ph.D.
Title:	The Role of Physical Activity in Modulating of Fibroblast Growth Factors 19 21 23 1 2 levels and their Implications for Obesity and Metabolic Health among Adolescents Insights from a Follow Up Study
Abstract:	Background: Obesity is one of the most prevalent metabolic diseases and is closely linked to other metabolic disorders, such as metabolic syndrome, cardiovascular disease, and type 2 diabetes mellitus. In this century, the prevalence of obesity among children and adolescents has increased more than ever due to unhealthy lifestyles and dietary behaviors. Fibroblast growth factors 1 and 2 (FGF1 and FGF2) are mitogenic adipokines suggested to play a role in metabolic regulation. The aim of this study is to investigate the influence of physical activity (PA) on the improvement of metabolic health in adolescents. Subjects and Methods: A total of 360 boys and girls aged 12–18 years enrolled in an annual lifestyle intervention program (LSIP), which included PA and a reduction in caloric intake for one year. Samples were collected at two points: baseline and follow-up. Participants were classified into six groups: three based on obesity status measured by Body Mass Index (BMI), and three based on PA levels calculated by total Metabolic Equivalent of Task (MET-minutes per week). Serum FGF1 and FGF2 levels were assessed using ELISA kits. Results: n the BMI categories, FGF2 levels exhibited a significant increase in the overweight group [Δ Median (IQR: Q1–Q3) = 22.9 pg/mL, p = 0.012]. However, data did not show significant differences for the normal weight and obese groups regarding FGF2 or FGF1 levels (all p > 0.05). Regarding PA categories, a statistically significant increase in FGF1 levels was found in the Moderate PA group [Δ Median (IQR: Q1–Q3) = 27.2 pg/mL, p = 0.017], contributing to a significant group effect (p = 0.002), while no statistically significant changes were observed for the low and high PA groups (p = 0.14 and p = 0.08, respectively). For FGF2, results did not show a significant association across any of the PA levels (all p > 0.05). In the analysis of PA habits, a significant increase in FGF1 levels was observed in the group with decreased Δ total METs [Δ Median (IQR: Q1–Q3) = 13.9 pg/mL, p = 0.03]. Conversely, groups with increased or unchanged total METs did not show significant changes (all p > 0.05). Similarly, the analysis of FGF2 levels did not reach statistical significance; however, borderline significance was noted in the group with no change in Δ total MET (p = 0.052) compared to the group with increased Δ total MET (p = 0.51). Conclusion: This study suggests that PA may modulate FGF1 and FGF2 levels in healthy Saudi adolescents following participation in an LSIP. Further studies are required to elucidate the role of PA and the mechanisms of action by which it influences FGF1 and FGF2 among pediatric populations, particularly those with obesity. Keywords: Obesity, adolescents, physical activity, exercise, adipokines, FGF1 and FGF2.

Poster Code:	PBE_2026_18
Student Name:	**Latifa Aljebali**
Supervisor:	Dr.Abir Alamro
Degree:	Ph.D.
Title:	Protective effectiveness of Resveratrol on Methylparaben induced hepatotoxicity in rat
Abstract:	Abstract: Introduction/Problem: Methylparaben (MP), a ubiquitous synthetic preservative, is a critical environmental contaminant linked to the pathogenesis of Metabolic Dysfunction-Associated Steatotic Liver Disease. Despite its prevalence, effective interventions for MP-induced hepatic dysfunction remain under-researched. Methodology: This study investigated the restorative potential of Resveratrol (RES) using forty female Wistar rats. Systemic toxicity was induced via daily subcutaneous MP exposure, while the intervention cohort received intraperitoneal RES to evaluate its bio-rehabilitative capacity. Results: Multivariate analysis confirmed that MP triggers profound disruption of hepatic homeostasis (Wilks' Lambda = 0.01635, ⊠<0.001). MP exposure caused a surge in ALT and an increase in AST, alongside significant biosynthetic deficits in albumin and total protein. Histopathology confirmed microvesicular steatosis and inflammatory infiltration. Correlation modeling identified Malondialdehyde (MDA) as the primary oxidative driver (⊠≈0.61–0.70). Crucially, RES intervention neutralized xenobiotic insults, achieving a reduction in lipid peroxidation (⊠≤0.0001) and a restoration of Superoxide Dismutase (⊠≤0.001). Furthermore, RES suppressed the hepatic inflammatory cascade (TNF-α, IL-6) and obstructed pro-apoptotic signaling (Caspase-3, BAX/Bcl-2). Hierarchical clustering confirmed the RES+MP profile reached a near-physiological baseline. Recommendation: These findings establish RES as a potent prophylactic against paraben-induced hepatotoxicity. We recommend integrating biochemical oversight and RES-based toxicological mitigation strategies into environmental risk management frameworks within industrial and research sectors to combat xenobiotic-driven liver disease.

Poster Code:	PBE_2026_19
Student Name:	**Reem Ibrahim Al-Rashed**
Supervisor:	Dr. Abdul Aziz Al-Omari
Degree:	Ph.D.
Title:	Targeting Alpha-Synuclein amyloids with Chemical Chaperones: Unraveling Mechanisms and prevention Strategies
Abstract:	Amyloidosis are group of diseases characterized by the abnormal accumulation of proteins inside or outside the cell, leading to cellular dysfunction and damage. One of the main examples of these diseases is the accumulation of α synuclein protein in the cell cytoplasm, which results in what is known as Parkinson's disease (PD) the second most common neurodegenerative disorder worldwide. Parkinson's disease is marked by the loss of dopamine producing neurons and impaired movement, along with the formation of Lewy bodies, which are intracellular inclusions composed primarily of α synuclein aggregates. Under normal conditions, α synuclein exists as a soluble monomer in the cytoplasm, while during certain circumstances it can misfold and aggregate into insoluble amyloid fibrils causing cellular damage. This pathological process is influenced by multiple internal and external factors that are still under investigation. Understanding the accumulation of α synuclein is of great importance for clarifying the mechanisms of these diseases and for developing therapeutic strategies. Scientific research, using diverse techniques, aims to elucidate the molecular pathways that drive the transformation of the soluble monomer into amyloid fibrils. This study seeks to identify the main effects of α synuclein aggregation and to explore potential therapeutic interventions. The steps include producing and purifying the protein in the laboratory, then testing the impact of various available chemical chaperones using experimental techniques. These chaperones may either promote or inhibit α synuclein amyloid formation. A deeper understanding of the molecular mechanisms of these compounds could lead to the discovery of new therapeutic strategies to mitigate the toxicity of α synuclein.

Poster Code:	PBE_2026_20
Student Name:	**Nada Mohammed Al-Mutairi**
Supervisor:	Seema Zargar
Degree:	Ph.D.
Title:	Mechanisms underlying the therapeutic effect of Atorvastatin on LPS-induced breast cancer cells through NF-κB pathway.
Abstract:	Lipopolysaccharide (LPS) is commonly associated with pro-inflammatory effects while as the cholesterol-lowering drug atorvastatin (ATO) has been identified as a potential pleiotropic agent capable of inhibiting cancer cell proliferation. This study aimed to investigate the interplay between LPS and ATO in modulating cancer cell growth and inflammatory signaling associated. We found that LPS exposure led to increased growth of MCF-7 and MDA-MB231 breast cancer cells, while there was no growth induction in MCF-10 normal control. This pro-proliferative effect was attenuated by the dose dependent addition of ATO in both breast cancer cell lines. LPS significantly increased the mRNA levels of TNF-α, IL-1β, IL-17, and CXCL1, important regulators of systemic inflammation and carcinogenesis. ATO treatments 0-4 μM doses completely reversed these LPS-induced inflammations in MCF-7 cell line and partially in MDA-MB231 cell line where as the higher doses (4-8 μM) were synergistic with respect to inflammatory cytokine overexpression in both cell lines. LPS induction significantly decreased the mRNA abundance of IL-6 compared to the control MCF-10 cells. The findings indicated that ATO does not significantly alter IL-6 expression in LPS-stimulated breast cancer cells, while the rapid changes in TNF-α signaling suggest it as the primary target pathway. In silico analysis revealed the role of ATO through prostaglandin signaling pathway regulated by RELA/NF-κB. Western blotting in MDA-MB-231 cells showed strong induction of NF-κB and TNF-α by LPS compared with the DMSO baseline. ATO treatment reduced these inductions in a dose-dependent manner via TNF-α mediated NF-κB signaling. This study explores the link between cytokine expression and breast cancer proliferation to support the discovery of novel biomarkers, therapeutic targets, and interventions for improved patient outcomes.

Poster Code:	PBE_2026_21
Student Name:	**Ahmed Shafi Ma'ashi Al-Anzi**
Supervisor:	Dr. Nasser Al-Daghri
Degree:	Ph.D.
Title:	Effects of a 6-month Lifestyle Intervention Program in the DNAm PhenoAge, SOST, and GDF15 Markers of Biological Aging in Adults with Prediabetes
Abstract:	Introduction: Prediabetes is a highly prevalent metabolic condition that substantially increases the risk of type 2 diabetes and cardiovascular disease, particularly in Arab populations experiencing rapid lifestyle transitions. Emerging evidence suggests that biological aging markers may better capture early metabolic deterioration than chronological age alone. Lifestyle interventions encompassing dietary modification, physical activity, and behavioral support have demonstrated efficacy in improving glycemic control and cardiometabolic risk factors. However, their influence on biological age in prediabetic adults remains insufficiently explored. This study investigates the impact of a structured lifestyle program on biological age and metabolic health in Arab adults with prediabetes. Objectives. Biological age (BioAge) is increasingly used as a marker of health beyond chronological age. Lifestyle modification programs (LMPs) may influence BioAge and associated cardiometabolic and dietary parameters. The present clinical trial aims to evaluate the impact of a structured LMP on BioAge, anthropometrics, biochemical markers, and dietary intake compared with a control group (CG). Materials and Methods / Patients and Methods A total of 181 adults (130 males, 51 females; mean age 50.8 ± 10.9 years, BMI 30.0 ± 4.8 kg/m^2) were enrolled. Participants were allocated to LMP or CG and followed for 6 months. DNAm PhenoAge was calculated and assessed alongside anthropometrics, blood biomarkers (HbA1c, fasting glucose, albumin, creatinine, GDF15, SOST), and dietary parameters. Results. LMP participants showed a significant reduction in DNAm PhenoAge (−4.9 years vs. +1.3 years in CG, $p < 0.001$) and DNAm PhenoAge−Age gap (−6.8 vs. −0.1, $p < 0.001$). Improvements were observed in weight (−5.7 kg), BMI (−2.0 kg/m^2), waist circumference (−6.3 cm), and HbA1c (−0.4%, $p < 0.001$). Dietary intake showed decreased total calories, protein, carbohydrates, and sugar. Key biomarkers including albumin increased, while fasting glucose and GDF15 decreased. CG participants showed no significant favorable changes. Conclusions. A 6-month lifestyle modification program effectively reduced biological age and improved metabolic and dietary profiles, underscoring its potential as a preventive strategy for age-related diseases. ClinicalTrials.gov ID: NCT06440681

Poster Code:	PBE_2026_22
Student Name:	**Wafaa Wuqyan Munir Al-Shammari**
Supervisor:	Dr. Saad Aldawood
Degree:	Ph.D.
Title:	Development of Lightweight and Flexible High-Z Reinforced Polymer Shields for Ionizing Radiation Protection in Medical Environments: Monte Carlo Simulation and Experimental Validation
Abstract:	This study investigates the development of lightweight, flexible polymer-based composite materials as lead-free alternatives to conventional high-density radiation shields. A physics-guided approach combining Geant4 Monte Carlo simulations with experimental validation is employed to design and optimize high-performance composites reinforced with high-atomic-number metal oxides (TiO_2, $BaSO_4$, Bi_2O_3, and WO_3) to enhance gamma-ray attenuation. Shielding effectiveness is experimentally evaluated using Cs-137 and Co-60 gamma sources, complemented by comprehensive physical and mechanical characterization to assess practical applicability. The integration of simulation-driven design with experimental benchmarking provides insight into the relationship between filler composition, attenuation efficiency, and mechanical performance. The results support the development of safe, flexible, and effective radiation-shielding materials for medical and radiation-protection applications. An update on the ongoing progress of this project will be presented at this forum.

Poster Code:	PBE_2026_23
Student Name:	**Amal Abdullah Almutairi**
Supervisor:	Dr. Saad Al Dawood
Degree:	Ph.D.
Title:	Hybrid Melanin–Polymer Nanocomposite for Gamma-Ray Attenuation: A Novel Approach to Radiation Protection in Medical Physics
Abstract:	Ionizing radiation is extensively used in medical imaging and therapy; however, inappropriate exposure poses biological risks to patients and healthcare workers. Radiation shielding therefore plays a critical role in radiation protection. Conventional shielding materials, particularly lead, provide high attenuation efficiency but are limited by toxicity, excessive weight, and environmental concerns, motivating the development of lightweight and lead-free alternatives. This study investigates a novel hybrid melanin–polymer nanocomposite reinforced with high-atomic-number (high-Z) nanoparticles for radiation shielding applications. The proposed material aims to achieve effective gamma-ray attenuation while maintaining flexibility and reduced toxicity. Structural and compositional characterization was performed using X-ray diffraction (XRD), scanning electron microscopy (SEM), Fourier-transform infrared spectroscopy (FTIR), and energy-dispersive X-ray spectroscopy (EDS). Gamma-ray attenuation measurements were conducted using calibrated radioactive sources over a broad photon energy range. In addition, dosimetric performance under diagnostic X-ray conditions was evaluated using a PMMA phantom, ionization chamber, and optically stimulated luminescence (OSL) dosimeters. The results demonstrate that shielding effectiveness depends on photon energy and nanoparticle concentration, with enhanced attenuation observed at lower photon energies. A maximum dose reduction of approximately 11% at 120 kVp was achieved, confirming effective attenuation under clinically relevant imaging conditions. These findings indicate that melanin-based polymer nanocomposites are promising candidates for lightweight, lead-free radiation shielding. Further optimization of nanoparticle composition and shield thickness is recommended to enhance performance and support future medical physics applications.

Poster Code:	PBE_2026_24
Student Name:	**Marwa Elfoly**
Supervisor:	Prof. Amal Abdul Aziz Al-Hazani
Degree:	Ph.D.
Title:	Evaluation of Fucoidan molecular effects in overcoming drug resistance induced by PD-L1 intrinsic signaling, MYC and IRDS in Triple Negative Breast Cancer
Abstract:	Accepted for publication at "Proceedings of the American Association for Cancer Research" Introduction: MYC is a well-known oncogene overexpressed in many cancers, with established roles in driving tumor progression through enhanced proliferation and immune evasion. Paradoxically, MYC has also been reported to exert tumor-suppressive effects by limiting metastasis, but the underlying mechanisms remain unclear and the evidence is mixed. Results: We examined how MYC activity affect epithelial–mesenchymal transition (EMT) and migration in triple-negative breast cancer (TNBC). MYC knockdown increased migration in MDA-MB-231 and BT-549 cells, both with and without paclitaxel. Analysis of public RNA-seq datasets (MYC knockdown in MDA-MB-231 and BT-549) using DEG-restricted GSEA (adj. $P < 0.05$; $\|log2FC\| \geq 0.5$) showed significant positive enrichment of the EMT hallmark in MYC-knockdown cells, supported by EMT hallmark heatmaps indicating coordinated upregulation of EMT-related genes versus controls. RT-qPCR validated increased expression of mesenchymal markers (CDH2, TGFB1, FN1) following MYC knockdown. Conversely, MYC overexpression reduced migration and was associated with significant negative enrichment of the EMT hallmark by GSEA. Extending to in vivo and patient data, MYC signature scores were inversely correlated with EMT hallmark activity in TNBC-PDX microarray data ($r = -0.60$, $P = 2.91 \times 10^{-21}$) and the METABRIC TNBC cohort ($r = -0.58$, $P = 2.21 \times 10^{-20}$). Conclusion: These results suggest that MYC suppression activates EMT-associated programs and promotes TNBC cell migration, emphasizing the importance of MYC's context-dependent functions when designing MYC-targeted therapies.

Poster Code:	PBE_2026_25
Student Name:	**Safaa Abdulrahman Abdullah Al-Qurzi**
Supervisor:	Dr. Suliman yousef Al Omar
Degree:	Ph.D.
Title:	Genetic Variants in the IL-17 and IL-37 Pathway and Their Potential Role in Sjögren's Syndrome
Abstract:	Introduction: Sjögren's syndrome (SS) is a chronic autoimmune disease affecting exocrine glands and (Sicca). Pro-inflammatory cytokines, including IL-17, and anti-inflammatory cytokines such as IL-37, have been implicated in SS pathophysiology. Genetic data on Saudi SS patients remain limited. Objectives: Evaluation of IL-17 pathway polymorphisms (IL-17A, IL-17RA rs879577, IL-17RC rs76999397) and their association with SS. Assessment of IL-37 polymorphisms (rs3811046, rs3811042) in relation to SS susceptibility. Analysis using multiple genetic models (codominant, dominant, recessive, over-dominant, additive). Conclusion: Significant associations between IL-17RA rs879577 (OR=3.82) and IL-17RC rs76999397 (OR=12.45) polymorphisms and SS highlight the importance of the IL-17 pathway in disease susceptibility. Population-specific genetic studies are essential for understanding autoimmune disease etiology. Further studies are required to validate these findings and explore the therapeutic potential of targeting IL-17 pathways in Sjögren's syndrome.

Poster Code:	PBE_2026_26
Student Name:	**Maha Khalid Al-Askari**
Supervisor:	Dr. Mona Al-Anzi
Degree:	Ph.D.
Title:	Maternal Immune Activation Induced by Lipopolysaccharide as a Prenatal Risk Factor for Autism Spectrum Disorders: The Neuroprotective Effect of Artichoke (Cynara Cardunculus L.) in Rodent Model.
Abstract:	Objectives: Maternal health during pregnancy is a leading factor influencing offspring risk. This study investigated whether postnatal dietary supplements could reduce oxidative stress and gut leakiness in a rat model of ASD. Male rat pups were prenatally exposed to either valproic acid (VPA) or lipopolysaccharide (LPS) to induce ASD-like conditions Methods: A total of 54 offspring were divided into nine groups to evaluate various postnatal treatments, including an artichoke-based prebiotic (AR), probiotics (Pro), and omega-3 fatty acids (ω3). The experimental design also included control groups (saline, VPA-only, and LPS-only), as well as a protective regimen in which AR was administered both prenatally and postnatally. Oxidative stress and gut permeability "leakiness" were assessed using ELISA assays. Results: Prenatal exposure to VPA and LPS was associated with increased oxidative stress levels in brain homogenates, accompanied by a significant decrease in glutathione (GSH). Additionally, elevated plasma levels of gut permeability biomarkers were observed. In the VPA model, treatment with artichoke-derived prebiotics—administered either pre- or postnatally, or in combination with probiotics—effectively improved oxidative stress markers, evidenced by a significant increase in GSH levels. Conversely, similar interventions in the LPS-induced maternal immune activation model did not significantly ameliorate oxidative stress, although a modest increase in GSH levels was noted. Plasma levels of gut permeability biomarkers did not show significant improvement in either model following treatment with artichoke alone or in combination with probiotics and omega-3 fatty acids. However, intestinal fatty acid-binding protein levels were significantly reduced in all treatment groups across both models. In contrast, lipopolysaccharide-binding protein (LBP) levels were not significantly reduced by artichoke monotherapy in either model, though combination therapy with probiotics and/or omega-3s led to significant reductions in LBP. Conclusions: The results supported the use of both VPA and LPS as complementary models for studying ASD. The VPA model, characterized by direct and predictable neurotoxic effects, appeared more suitable for evaluating preventive interventions. In contrast, the LPS model more accurately captures the complex immune-inflammatory mechanisms implicated in ASD, highlighting the need for broader, more individualized treatment strategies. The differing responses to artichoke-based interventions in these models underscore the importance of considering ASD etiology when designing dietary and microbiome-targeted therapies.

Poster Code:	PBE_2026_27
Student Name:	**Altaf Nayil Alabdali**
Supervisor:	Prof. Abir Ghannouchi Ben Bacha
Degree:	Ph.D.
Title:	Comparative Clinical and Experimental Study on Novel Biomarkers Related to the Effectiveness of GABA Supplementation as Intervention Strategy in Autism
Abstract:	Background:Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by social communication deficits and repetitive behaviours. Excitatory-inhibitory (E/I) imbalance and oxidative stress are central to the pathophysiology of ASD. GABAergic deficits and glutamate excitotoxicity are two essential signalling pathways that could be addressed for therapeutic interventions. Objectives:Theobjectiveoftheclinicalstudywastoidentifydiagnosticandtherapeutic biomarkers associated with GABAergic and glutamatergic signalling in autistic individuals compared to healthy controls. While the experimental study aimed to evaluate the effects of GABA supplementation and combined nutritional therapies (probiotics, vitamin D3 and β-lactam) in a propionic acid (PPA)-induced rodent model of autism. Methods: In the clinical study, 46 male autistic individuals and 26 age- and gender-matched healthy controls were enrolled. Plasma levels of EAAT2, KCC2, NKCC1, VD3, GABA, GABRA5 and glutamate were measured using ELISA kits. Statistical analyses, including correlation, multiple regression, and ROC curve analysis, were performed to assess the diagnostic utility of these biomarkers. Combined ROC analysis was also carried out to evaluate the diagnostic precision.For the experimental study, 60 rats were divided into six groups: Group I (Control), Group II (PPA-treated), Group III (Control-GABA), Group IV (Control-Combination), Group V (PPA-GABA), and Group VI (PPA-Combination). Behavioural assessments were conducted using the three-chamber test to evaluate social interaction. Biochemical markers related to oxidative stress and neurotransmitter signalling were analysed in brain homogenates. Histopathological examination of the hippocampus was also conducted to assess cellular integrity. Results: The clinical study revealed significantly lower levels of EAAT2, KCC2, NKCC1, VD3, GABA, and GABRA5 in autistic individuals, especially in the severe subgroup. viii Altered KCC2/NKCC1 and GABA/Glutamate ratios highlighted the E/I imbalance in neurotransmission. Combined ROC analysis for GABA and KCC2/NKCC1 demonstrated high diagnostic accuracy (AUC = 0.968) in severe autism, with strong sensitivity and specificity. On the other hand, the experimental study demonstrated that PPA treatment caused significant oxidative stress, reduced GABA, and elevated glutamate levels, mimicking the pathophysiology of ASD. However, GABA supplementation caused moderate improvements in biochemical and behavioural markers, whereas combined therapy significantly restored GABA levels, reduced oxidative stress, and improved social interaction. Histopathology revealed that combination therapy mitigated neurodegenerative changes in the hippocampus caused by PPA. Conclusion: The findings from both clinical and experimental studies highlighted the importance of E/I imbalance and oxidative stress in ASD pathophysiology. Combined nutritional therapies showed superior efficacy in restoring neurochemical balance and reducing oxidative stress, presenting a promising therapeutic strategy for ASD management. Key words: Autism spectrum disorder (ASD), Excitatory/inhibitory (E/I), GABA, Glutamate, Probiotics, VD3, Oxidative stress, Propionic acid (PPA).

Poster Code:	PBE_2026_28
Student Name:	**Talal Abdulaziz Saad bin Muhayya**
Supervisor:	Prof. Salman Al-Rukayan
Degree:	Ph.D.
Title:	Therapeutic applications of Dual-Drug loaded nanofibers and their impact on wound healing biomarkers
Abstract:	Introduction: Burn wounds remain a significant clinical challenge due to delayed healing and high risk of infection. Advanced wound dressings that combine bioactive compounds with antimicrobial properties offer a promising strategy to accelerate tissue repair and prevent infection. This study focuses on the development and evaluation of a multifunctional nanofiber wound dressing incorporating polyvinyl alcohol (PVA), Chitosan (CS), β-sitosterol (B-S) and silver nanoparticles (AgNPs) to enhance wound healing outcomes. Objectives: Fabrication and characterization of nanofibers that have antimicrobial and anti-inflammatory capabilities. In vitro and in vivo evaluation of the electrospun nanofibers on the wound healing process. Conclusion: The developed CS/PVA-based electrospun nanofibers loaded with β-sitosterol and AgNPs exhibit favorable physicochemical properties, sustained drug release, and significant wound healing potential. These findings support their application as advanced multifunctional wound dressings

Poster Code:	PBE_2026_29
Student Name:	**Nourah mansour Altamrah**
Supervisor:	Dr. Suliman yousef Al Omar
Degree:	Ph.D.
Title:	Study of the relationship between the natural cytotoxic receptors NKp30, NKp44, and NKp46 and their ligands with kidney cancer susceptibility in Saudi patients.
Abstract:	Introduction: Human leucocyte antigen-G (HLA-G), a non-classical MHC class I molecule encoded by a gene on chromosome 6 at region 6p21, that plays several immune-regulatory functions. They are crucial in the development and progression of cancer via modulating immunological responses. The abnormal expression of HLA-G has been recognized as a mechanism associated with many cancers that enhances the escape of cancer cells. Several research studies have demonstrated that certain variants of the HLA-G gene are associated with cancer development. This study will investigate the role of genotyping in kidney cancer susceptibility within the Saudi population. Objectives: 1. Studies of genetic variation in kidney cancer within the Saudi population compared to healthy controls; 2. Investigation of the correlation between HLA-G polymorphisms (14-bp ins/del, rs1710, rs1063320, rs9380142, rs1233333, rs915668) and susceptibility to kidney cancer in Saudi patients and 3. Measurement of plasma soluble HLA-G (sHLA-G) levels in kidney cancer compared to healthy controls in the Saudi population. Conclusion: Cancer has developed different strategies to escape immune cell recognition. It may be the abnormal expression of sHLA-G and genetic polymorphisms in the HLA-G gene, which could play a role in susceptibility to kidney cancer in the Saudi population.

Poster Code:	MBE_2026_1
Student Name:	**Sahar Hashim Qaed Sultan**
Supervisor:	Dr. Badr Obeid Al-Mutairi
Degree:	.M.SC
Title:	The Impact of DNA Methylation on the Regulation of Tumor Suppressor Genes Expression in Leukemia Patients
Abstract:	Leukemia is among the most prevalent hematological malignancies in Saudi Arabia and is characterized by the uncontrolled proliferation of abnormal white blood cells and disruption of normal hematopoiesis. Epigenetic modifications, particularly DNA methylation, play a critical role in leukemia initiation and progression. The PITX1 gene has been identified as a tumor suppressor in various malignancies; however, its epigenetic regulation in leukemia remains insufficiently studied. This study investigated the epigenetic regulation of PITX1, with a specific focus on promoter DNA methylation and its potential role in leukemogenesis. Aberrant methylation of the PITX1 promoter may contribute to gene silencing and serve as a leukemia-specific biomarker. Methylation status and gene expression were assessed using methylation-specific PCR (MSP) and quantitative real-time PCR (qRT-PCR) in leukemia cell lines, blood samples from leukemia patients, and healthy controls. The findings revealed a significant downregulation of PITX1 expression in leukemia samples and cell lines compared with controls. Additionally, altered promoter methylation patterns were observed, particularly in KG1a and THP cell lines, which may account for the reduced PITX1 expression. Treatment of KG1a cells with 5-aza-2□-deoxycytidine (5-aza-dC) restored PITX1 expression, supporting the role of DNA methylation in regulating PITX1 transcription. In conclusion, these results suggest that epigenetic silencing of PITX1 contributes to leukemia pathogenesis and highlight PITX1 as a potential epigenetic biomarker and therapeutic target. Further studies are warranted to elucidate its functional and therapeutic significance.

Poster Code:	MBE_2026_2
Student Name:	**Ghufran Almuhaini**
Supervisor:	Nouf Mahdi Al-Yami
Degree:	M.SC
Title:	Exploring the impact of free fatty acid on the liver using rat animal models treated with a ketogenic diet with proniosomes-Glibenclamide
Abstract:	Based on our study, nonalcoholic fatty liver disease (NAFLD) and its advanced inflammatory stage, nonalcoholic steatohepatitis (NASH), were investigated in 63 rat models to evaluate a novel therapeutic strategy combining a ketogenic diet with an advanced drug delivery system. This approach demonstrated significant efficacy in improving metabolic and hepatic outcomes. The study focused on proniosomal Glibenclamide (GLB-pn), an engineered formulation designed to overcome the limitations of conventional Glibenclamide, including poor solubility and short duration of action. When combined with a ketogenic diet, GLB-pn produced superior therapeutic effects in the treatment of NAFLD associated with Type 2 Diabetes Mellitus (T2DM). The combined intervention resulted in a 1.78-fold reduction in blood glucose levels and significantly suppressed key disease markers, including the inflammatory cytokine TNF-α and the pro-apoptotic protein Bax, a critical indicator of hepatocyte apoptosis in NASH. Furthermore, Vitamin D deficiency was identified as an important modifier of disease severity. Deficient subjects exhibited a strong positive correlation between inflammation and apoptosis ($r = 0.86$, $p = 0.027$), along with a reduced metabolic response to therapy. These findings emphasize the importance of combination therapy targeting both metabolic dysfunction and hepatic inflammation in NASH management. In addition, routine screening and correction of Vitamin D deficiency may enhance therapeutic outcomes. Overall, this study highlights the potential of integrating advanced drug delivery systems, dietary interventions, and nutritional support to effectively manage NAFLD and prevent its progression to NASH.

Poster Code:	MBE_2026_3
Student Name:	**Zainab Ali Alnakhli**
Supervisor:	Dr.Nouf Mahdi Alyami
Degree:	.M.SC
Title:	Investigating the Effect of Proniosomal Glibenclamide Formulation on The Testicular Tissue and Antioxidant Defense in a Rat Model of Type 2 Diabetes
Abstract:	Type 2 diabetes causes high blood sugar due to insulin malfunction and is linked to male infertility. Using proniosomes can enhance the effectiveness of Glibenclamide, a medication that stimulates insulin secretion. In our study, male rats with diabetes were treated with GLB with or without proniosomal for 14 days. Proniosomal-formulations maintained glucose levels, prevented weight loss, and showed normal testicular tissue. GLB-proniosomal reduces ROS caused by T2DM through Nrf2, HO-1 pathway and increases CAT, SOD, and GSH production in response to insulin and glucose uptake. The reference and proniosomal treatments showed CAT and SOD significant enzymatic elevation compared to the positive and negative control. CAT significantly correlated with Gpx4 expression with P = 0.0169 and r = 0.98; similarly, the enzymatic activity of SOD also showed a positive correlation between the average glucose levels (r = 0.99 and P = 0.0037). Intestinally, GSH analysis revealed that only proniosomal-GLB samples are significantly elevated from the positive control, with a P value of 0.0210. The data showed proniosomal-GLB was more effective than pure GLB, confirmed by higher Nrf2 (2.050 folds), HO-1 (2.148 folds), and GPx4 (1.9 folds) transcript levels relative to the control with less sample diversity compared to the reference samples, indicating proniosomal stabilized GLB in the blood. Administering GLB and proniosomes formulation has effectively restored testicular function and sperm production in diabetic rats by regulating ROS levels and upregulating anti-ROS in response to glucose uptake. These findings may lead to better treatments for diabetic patients who have infertility issues.

Poster Code:	MBE_2026_4
Student Name:	**Noura Abdullah Ibrahim Al-Muhanna**
Supervisor:	Dr. Hessa Mohammed Al-Obaid
Degree:	M.SC
Title:	Evaluation the effect of Withania somnifera Ashwagandha on mercury-induced hepatorenal toxicity in male mice

Abstract:

Background: Mercury is a highly toxic heavy metal that persists in the environment, leading to significant bioaccumulation within the food chain. Exposure to mercury, from natural and industrial sources, induces severe oxidative stress, resulting in debilitating neurotoxicity and hepatorenal damage. With growing concern about such toxicity, herbal medicine offers safer alternatives; Ashwagandha is well known for its antioxidant and protective properties. This study investigates Ashwagandha's potential to mitigate pathophysiological and histopathological damage induced by Mercury in the liver of mice.

Methods: In this study, thirty healthy male albino mice (aged 14 weeks, weighing 25–30g), were divided into four experimental groups. Group 1 was control; Group 2 received Ashwagandha extract (500 mg/kg); Group 3 was treated with HgCl2 (3 mg/kg); and Group 4 was treated with Ashwagandha 1 hour before receiving HgCl2. All treatments were administered daily via oral gastric gavage for a duration of 28 days. Biochemical, inflammatory, and histopathological assessments were performed

Results: The Ashwagandha group showed a significant increase in liver enzymes and lipid profiles, nonsignificant change in inflammatory biomarkers (IL-6 and ITG-β). The Mercury group demonstrated significantly elevated liver enzymes, high lipid profiles, high IL-6 and ITG-β, and severe histological damage. Pretreatment with Ashwagandha resulted in a marked and highly significant reduction in IL-6 and ITG-β levels, with partial attenuation of biochemical and histological alternations.

Conclusion: Ashwagandha exhibit a potent anti-inflammatory effect against mercury-induced liver injury, significantly reducing key inflammatory mediators, although mild elevations in liver enzymes and lipid profiles were recorded.

Poster Code:	MBE_2026_5
Student Name:	**Athir Hussein Aswan**
Supervisor:	Prof. Saud Al-Arifi
Degree:	.M.SC
Title:	Green synthesis of arsenic silver bimetallic nanoparticles using peel of pomegranate and assessment of its toxic effect on human breast cancer cell line
Abstract:	Green nanotechnology offers a sustainable alternative to conventional chemical synthesis methods used in cancer research. In this study, silver–arsenic nanoparticles (Ag-AsNPs) were green-synthesized using pomegranate (Punica granatum) peel extract and evaluated for their anticancer activity in human breast cancer cells (MCF-7). The synthesized nanoparticles were physicochemically characterized using UV–Vis, FTIR, SEM, TEM, EDX, and DLS. Cytotoxicity and oxidative stress were assessed using the MTT and ROS assays, respectively, while apoptosis-related gene expression and protein signaling pathways were analyzed using qPCR and a high-throughput proteomic array. The results demonstrated stable Ag-AsNPs with significant dose-dependent cytotoxicity, increased intracellular ROS generation, and activation of apoptosis through pro-apoptotic signaling pathways, including p53, Bax, and caspase-mediated mechanisms. These findings highlight the potential of biogenic Ag-AsNPs as eco-friendly nanomaterials for future anticancer applications.

Poster Code:	MBE_2026_6
Student Name:	**Renad Jarallah Mohammad Al Jarallah**
Supervisor:	Dr. Suliman yousef Al Omar
Degree:	M.SC
Title:	Association of human leukocyte antigen-G (HLA-G) polymorphism with susceptibility to thyroid cancer in Saudi patients
Abstract:	Thyroid cancer is the most common endocrine malignancy worldwide, with an increasing incidence, including in Saudi Arabia, particularly among women. Although classical genetic and environmental risk factors have been widely investigated, growing evidence indicates that immune system dysregulation plays a crucial role in tumor initiation, progression, and immune escape. Natural killer (NK) cells are essential components of innate antitumor immunity, mediating the recognition and elimination of malignant cells through activating surface receptors, most notably NKp30, NKp44, and NKp46. This study aimed to investigate the association between genetic polymorphisms in NK cell receptor genes NKp30 (NCR3), NKp44 (NCR2), and NKp46 (NCR1) and susceptibility to thyroid cancer in a Saudi population. A case–control study was conducted including 50 histopathologically confirmed thyroid cancer patients and 50 age- and sex-matched healthy controls. Peripheral blood samples were collected, genomic DNA was extracted, and selected single nucleotide polymorphisms were genotyped using standardized molecular techniques. Genotype and allele frequencies were compared, with additional stratified analyses performed according to sex and age. All analyzed variants conformed to Hardy–Weinberg equilibrium, confirming reliable genotyping. The findings revealed a significant protective association between specific NKp44 polymorphisms and thyroid cancer risk, particularly among females and individuals aged 49 years or younger. Conversely, NKp30 polymorphisms were associated with an increased risk of thyroid cancer in males, indicating a sex-specific genetic effect, while no significant association was observed for NKp46. Overall, these results highlight immune genetic contributions to thyroid cancer susceptibility in the Saudi population and support large-scale functional studies with clinical relevance.

Poster Code:	MBE_2026_7
Student Name:	**Jumanah Saleh Alosaimi**
Supervisor:	Prof. Reem Alajmi
Degree:	.M.SC
Title:	Morphological and Molecular Identification of Oryctes species and their Role in Transmitting Pathogenic Fungi to Date Palms in Al-Kharj and Al-Qassim regions, Saudi Arabia
Abstract:	The rhinoceros beetle (Oryctes sp.) is a key pest of date palms, where larval and adult feeding on trunks, crowns, and roots reduces tree vigor and yield. Insects are recognized as potential vectors of plant pathogens, particularly fungi, yet the role of Oryctes beetles in transmitting fungal pathogens to date palms remains poorly defined. This study aimed to identify Oryctes species in two major date-producing regions of Saudi Arabia, Al-Kharj and Al-Qassim, and to characterize the fungal communities associated with beetles, infested roots, and rhizosphere soils. Adult beetles were collected from date palm orchards and identified using morphological characters and DNA barcoding of the mitochondrial cytochrome c oxidase I (mtCOI) gene. Fungi were isolated from beetle external surfaces, root tissues of infested palms, and rhizosphere soils. Isolates were cultured on Czapek Dox Agar, grouped by colony and microscopic features, and identified using standard morphological keys. Morphological examination of 28 adults revealed two species, Oryctes elegans and Oryctes agamemnon. Both species occurred in Al-Kharj, while only O. Agamemnon was recorded in Al-Qassim. mtCOI sequences of approximately 700 bp confirmed these identifications, with O. elegans dominant in Al-Kharj and all Al-Qassim specimens identified as O. agamemnon. In total, 72 fungal isolates representing 13 genera were recovered from beetles, roots, and rhizosphere. From beetles (27 isolates), nine fungal taxa were shared between regions, including Phytophthora parasitica, Fusarium sp., Aspergillus niger, Aspergillus flavus, Penicillium sp., Alternaria alternata, Helminthosporium sp., and Stemphylium verruculosum, alongside species uniquely associated with either O. elegans or O. agamemnon. Overlapping and region-specific assemblages were also detected in roots (23 isolates) and rhizosphere soils (22 isolates). Fusarium sp., Alternaria alternata, and Stemphylium verruculosum occurred in all sample types in both regions. The frequent detection of phytopathogenic fungi on beetle exoskeletons, together with their presence in roots and rhizosphere, supports a role for Oryctes species as mechanical vectors that facilitate fungal entry through feeding wounds. This study shows the value of integrating morphological and molecular tools for Oryctes identification and indicates that these beetles may contribute to fungal disease spread in date palm orchards. Integrated pest and disease management programs should account for interactions among Oryctes beetles, associated fungal communities, and date palm hosts.

Poster Code:	MBE_2026_8
Student Name:	**Ghada Abdulaziz Almeaigel**
Supervisor:	Dr. Nouf Omar Alafaleq
Degree:	M.SC
Title:	Analysis of Whole Exome Sequencing for Patients with Crohn's Disease and Ulcerative Colitis
Abstract:	Background: Inflammatory bowel disease (IBD), comprising Crohn's disease (CD) and ulcerative colitis (UC), is a chronic inflammatory condition with a strong genetic component. Although many susceptibility loci have been reported, the contribution of rare coding variants remains poorly characterized, particularly in Middle Eastern populations. Objective: This study aimed to identify rare and potentially pathogenic genetic variants associated with IBD using whole-exome sequencing (WES). Methods: The study included 34 IBD patients (25 CD and 9 UC) and seven healthy controls. Among CD patients, 19 were sporadic and six familial, while UC cases included seven sporadic and two familial cases. Males comprised 61% of the cohort and females 39%. WES was performed, followed by comprehensive bioinformatic analysis, including quality control, variant calling, annotation, and stringent filtering based on sequencing quality, allele frequency, and in silico pathogenicity predictions. Candidate genes were prioritized based on biological relevance and prior disease associations. Results: Rare coding variants were identified in multiple candidate genes, including MEGF6, PKHD1, TRPM4, COL6A5, STAB2, MGAM, LAMB4, GAS6, MSH2, TRPV3, CBL, COL6A3, COL18A1, FGG, COMP, DSP, and RYR1. Prominent candidates were enriched for immune, inflammatory, and extracellular matrix functions, such as MEGF6, TRPM4, TRPV3, LAMB4, and CBL, as well as fibrotic and structural genes including COL18A1, COMP, and COL6A3. Several variants were observed in more than one affected individual, including familial cases. Conclusion: This study demonstrates the value of WES in identifying rare candidate variants that may contribute to understanding the pathology.

Poster Code:	MBE_2026_9
Student Name:	**Ashna iqbal**
Supervisor:	Dr abdul aziz mohammed Alamri
Degree:	.M.SC
Title:	Impact of iron oxide and copper oxide nanoparticles on THP-1 human monocytic cell line phenotype and function
Abstract:	Nanoparticles are integral to biomedical applications, and their interactions with monocytes critically shape immune responses; however, the immunomodulatory effects of iron oxide (Fe_2O_3) and copper oxide (CuO) nanoparticles across monocytes and their differentiated macrophage and dendritic cell subsets remain poorly defined. Accordingly, this study uses the THP-1 model to evaluate phenotype- and function-specific immune outcomes. THP-1 monocytes were differentiated into macrophages, immature dendritic cells, and mature dendritic cells using PMA, GM-CSF/IL-4, and ionomycin/TNF-α or 2-mercaptoethanol protocols, respectively, in the presence or absence of Fe_2O_3 (50 and 150 µM) and CuO (20 and 50 µM) nanoparticles. Cell recovery and surface marker expression were evaluated by flow cytometry using lineage-specific marker gating strategies: macrophage (CD64, CD14, and CD11c) and immature dendritic cell (CD1a, CD1c, CD 86) and mature dendritic cell (CD86, CD1c, CD 11c). Fe_2O_3 nanoparticles showed minimal cytotoxicity and maintained stable expression of macrophage, immature dendritic cell and mature dendritic cell differentiation markers, indicating preserved cell viability and controlled immune modulation. In contrast, CuO nanoparticles induced a concentration-dependent reduction in cell recovery accompanied by marked upregulation of activation and maturation markers, suggesting stress-related inflammatory responses. Overall, Fe_2O_3 nanoparticles demonstrated superior biocompatibility compared to CuO nanoparticles, highlighting the critical role of nanoparticle composition and dose in determining immune cell responses for biomedical applications.

Poster Code:	MBE_2026_10
Student Name:	**Marwah Faisal Alruzayhi**
Supervisor:	Dr. Abir Abdullah Alamro
Degree:	M.SC
Title:	In Vitro Modulatory Effects of Three Plant Extracts on Cytochrome P450 Gene expressions In Hep G2 Cells
Abstract:	The use of herbs in the world is constantly popular and increasing due to specific health beliefs, and because the availability of scientific information proving their safety and efficacy is on the rise. However, the concomitant consumption of traditional medicine and pharmaceutical drugs can lead to pharmaceutical interactions and adverse drug effects resulting in ineffective drug treatment, drug toxicity, and death. In Saudi Arabia, a study in a major hospital revealed approximately eighty percent of cancer patients use some sort of dietary supplements including traditional medicine. In this study, Anastatica hierochuntica, Cassia alexandrina, and Rumex vesicarius extracts were tested on phase-I Cytochrome P-450 isoenzyme gene expressions in human hepatoma carcinoma cells (HepG2). The three plants were prepared by sonication and boiling, resembling the most popular traditional preparation of maceration and decoction. The viability of HepG2 cells treated with these aqueous extracts was determined using CellTiter-Glo® assay to select the efficient and non-toxic extract concentrations for phase-I metabolic CYP isoenzyme expression analysis. The gene expression levels of CYP 1A2, 2B6, 2C8, 2C9, 2C19 and 3A4 were assessed using reverse transcription-quantitative polymerase chain reaction (RT-qPCR). The aqueous extracts of all plants were tested at 20 µg/mL, as compared with the untreated cells. The CYP 1A2, 2B6, 2C8,2C9,2C19, and 3A4 mRNA expression levels were significantly up regulated when treated with sonicated Cassia alexandrina, and Rumex vesicarius aqueous extracts in addition to boiled and sonicated extract of Anastatica hierochuntica. In conclusion, further in vitro and in vivo experiments are required for CYP isoenzyme activity assessment and the establishment of herb-drug interaction profile for these traditional medicinal extracts.

Poster Code:	MBE_2026_11
Student Name:	**Reem Mohammed Shatti**
Supervisor:	Dr. Amal Al-Mousa
Degree:	.M.SC
Title:	Evaluation of Mycotoxin Contamination in Fish Aquafeed Samples Collected from Different Regions in Saudi Arabia by Enzyme-linked Immunosorbent Assay (ELISA)
Abstract:	This study Evaluation of fungal colonization and mycotoxin contamination in fish aquafeed samples collected from Saudi Arabia evaluated the occurrence of mycotoxigenic fungi and major mycotoxins in fish feed samples collected from aquafeed factories and aquaculture farms across Saudi Arabia using the ELISA technique. A total of 22 samples, representing diverse regions and feed types, were analyzed for fungal contamination and for concentrations of aflatoxin, zearalenone, T-2 toxin, fumonisin, citrinin, ochratoxin A, and DON. Morphological and microscopic examination identified multiple fungal genera, predominantly Aspergillus spp, Penicillium spp, Rhizopus spp, Mucor spp, Alternaria spp, Fusarium spp. and Botrytis spp. ELISA analysis revealed that all detected mycotoxin concentrations were below the regulatory limits established Aflatoxin levels ranged from 1.6 to 8.6 µg/kg, which is well below the SFDA and CAC limit of 5–20µg/kg. Zearalenone concentrations varied from <50 to 215.5µg/kg, which falls within the 100–500µg/kg threshold. T-2 toxin and ochratoxin A were detected at low levels. Most samples had values below the quantification limit or within regulatory standards. Citrinin, DON, and fumonisin were also found at concentrations significantly lower than their respective maximum allowable limits. These findings demonstrate effective management of mycotoxin risks throughout the fish feed supply chain in Saudi Arabia, likely attributable to stringent manufacturing and storage practices. Continued monitoring is recommended to maintain feed safety and public health as environmental and sourcing variables evolve. This work underscores successful quality assurance in aquaculture feed production within Saudi Arabia.

Poster Code:	MBE_2026_12
Student Name:	**Amal musfer aldossari**
Supervisor:	Dr.Faheema Khan
Degree:	M.SC
Title:	Characterization of zinc oxide nanoparticles using orange fruit peel and their physiological and biochemical effect on Azadirachta indica A Juss seedlings under drought stress
Abstract:	The present study was conducted to evaluate the lipid peroxidation and antioxidant defense system of Neem (Azadirachta Indica) seedlings under water deficit conditions as affected by different levels of ZnO-NPs. In this experiment, an aqueous extract of orange fruit peel was used as an eco-friendly approach for the synthesis of ZnO NPs. After five weeks of emergence, the nano-suspension of ZnO-NPs was given at the following concentration (D=0, T1=50, T2=100, and T3=200 mg/L) as a foliar spray, seedlings were additionally irrigated with DW every 3 days until the relative soil water content reached approximately 30%. Further, the Neem seedlings were evaluated for lipid peroxidation and enzymatic activities. In our findings, maximum enhancement in MDA content was observed at the T1 level, followed by levels T2 and T3 of ZnO-NPs over the control. However, proline and antioxidant enzymatic activities showed an increment in a dose-dependent manner compared to non-treated plants. In neem seedlings, the highest SOD, APX, and CAT and GR activity was recorded at T3 treatment, followed by T2 and T1, compared to the control. It can be concluded from the obtained results that the exogenous application of green-synthesized ZnO-NPs could significantly reduce the negative impact of oxidative stress in Neem seedlings by activating the antioxidant defense system, which was sufficient to protect the plants from the detrimental effects of water deficit conditions

Poster Code:	MBE_2026_13
Student Name:	**Dalal Mesfer Mubarak Al-Qahtani**
Supervisor:	Prof. Asma Abdul-Kareem Al-Huqail
Degree:	M.SC
Title:	Physiological and Biochemical Analysis of Local Wheat (Triticum aestivum L.) Genotypes Exposed to Cerium Oxide Nanoparticles (CeO2-NPs) Under Salinity Stress
Abstract:	Salt stress is a major abiotic stressor that causes an adverse impact on grain yield and quality across various crops, including wheat (Triticum aestivum L.). To combat or to make crop plants more tolerant, several efforts have been made to mitigate the deleterious effects of salinity stress on plants. Of these efforts, engineered nanoparticles (NPs) have engrossed significant attention in recent years, and have been experimented with in several crop plants. The current study aimed to evaluate the impact on the lipid peroxidation levels and antioxidant defense system of local wheat (Triticum aestivum L.) genotypes, (#12 and #644) in response to different concentrations of cerium oxide nanoparticles (CeO2-NPs) under salinity stress. The randomized pot experiment was conducted in laboratory conditions. Salinity stress (150 mM NaCl) was imposed on wheat seedlings on alternate days, starting ten days after sowing, in a form of Hoagland solution for 20 days. After salt stress exposure, four levels of CeO2 NPs treatment (0, 25, 50 and 100 mg L – 1) were applied as a foliar spray on wheat seedlings, 4 times with 24 h intervals. 30 days after sowing lipid peroxidation levels and antioxidant defense system was conducted. The data suggest the application of CeO2 NPs reduced the lipid peroxidation (MDA) level that was elevated in the leaves of both wheat T. aestivum L. genotypes due to salinity stress. In genotype #12, the lowest MDA level was observed at 25 mg/L CeO2 NPs concentration. On the contrary, in the #644 genotype, the lowest MDA content was noted at a concentration of 100 mg/L CeO2 NPs. However, CeO2 NPs resulted in enhancement in antioxidant enzyme activities in both wheat T. aestivum L. genotypes compared to salt-stressed plants without CeO2 NPs exposure. In the genotype #12, treatment T1 showed the highest enzymatic activities (SOD, APX, CAT, and GR), followed by treatment T2 and T3 compared to the control. However, for genotype #644, the highest enzymatic activities were recorded at T3, followed by treatments T2 and T1 respectively, over control. It is concluded from the present study that the foliar application of CeO_2-NPs on wheat (Triticum aestivum L.) seedlings exposed to salt stress can reduce the negative effects of salinity.

Poster Code:	MBE_2026_14
Student Name:	**Shahad Azzam Shikh Alghannameh**
Supervisor:	Dr. Doaa Mohammad Elnagar
Degree:	M.SC
Title:	The anti-inflammatory activity of Astragalus membranaceus extract from different Saudi Arabia regions in male Swiss albino mice
Abstract:	The present study aimed to investigate the anti-inflammatory activity of Astragalus membranous extract from different Saudi Arabian regions in male Swiss albino mice. Materials and methods: Fifty-six healthy male Swiss albino mice were allocated into eight groups, with 7 mice in each group, including control, AME-only (north, middle, south), CGN-only, and three AME pre-treatment groups followed by CGN. The liver function, oxidative stress, chemokine mediator levels, and Histopathological analysis was performed on liver tissues, which included staining with hematoxylin and eosin (H&E), periodic acid-Schiff (PAS). In addition to immunohistochemical analysis of Tumor necrosis factor-alpha (TNF-α). Results: CGN increased liver enzymes, and oxidative stress markers, in addition to increasing levels of a chemokine mediator. However, CGN decreased antioxidant markers. Meanwhile, Pre-treatment with AME from different regions of Saudi Arabia to CGN exhibited a reduction in liver enzymes, oxidative stress, and chemokine mediator levels, while improving antioxidant enzymes. Moreover, histopathological changes in the liver tissue, represented by a large aggregation of inflammatory cells. However, Pre-treatment with AME from different regions of Saudi Arabia to CGN modified the histopathological alterations in the liver tissue. Furthermore, liver tissues were examined immunohistochemically for TNF-α, showed a strong immune response in the group that received CGN. Meanwhile, pre-treatment groups with AME from the north, middle, and south regions to CGN revealed a less immune response. Conclusion: It was concluded that Astragalus membranous extract (AME) from different Saudi Arabian regions had a protective effect by alleviating the pathophysiological and histopathological alterations induced by carrageenan (CGN).

Poster Code:	MBE_2026_15
Student Name:	**Waad Suleiman Al-Subaie**
Supervisor:	Dr. Doaa Al-Najjar
Degree:	M.SC
Title:	Evaluation of Melissa officinalis leaves extract potency on asthma induced by egg albumin allergen in male mice.
Abstract:	Asthma is a common chronic inflammatory lung disease affecting millions worldwide, characterized by airway inflammation, oxidative stress, and tissue remodeling. Oxidative stress contributes to lung damage and worsens inflammation. Ovalbumin-induced asthma in mice replicates these key features, including airway inflammation and oxidative stress, making it useful for testing potential treatments. Herbal treatments are increasingly recognized for supporting asthma management through antioxidant and anti-inflammatory effects. Melissa officinalis (lemon balm) has been shown to reduce airway inflammation, limit allergic reactions, decrease oxidative stress, and protect liver and kidney function, highlighting its potential as a natural and safe complementary therapy for asthma.

Poster Code:	MBE_2026_16
Student Name:	**Dalal Hamdan**
Supervisor:	Dr. Hisham A. Alhadlaq
Degree:	M.SC
Title:	Synthesis of Silver Nanoparticles Using Green Technology and Their Cytotoxic Effects on Selected Cancer Cells
Abstract:	Cancer remains a major global health challenge, and green nanotechnology offers a sustainable route to develop biocompatible anticancer agents. In this study, silver nanoparticles (AgNPs) were biosynthesized using Salvia officinalis (sage) extract as a natural reducing and stabilizing agent. AgNPs were prepared at different precursor concentrations, purified by centrifugation/washing, and characterized using XRD, SEM, TEM, XPS, FTIR, PL, DLS, zeta potential, and GC–MS. XRD confirmed crystalline FCC AgNPs with crystallite size increasing from ~21 to 29.7 nm as concentration increased, while SEM showed a shift from well-dispersed spherical particles at low concentrations to agglomeration at higher loadings. FTIR and GC–MS supported the role of sage phytochemicals in bio-capping and stabilization. Based on DLS, zeta potential, and PL, the 5% condition provided the best balance between particle size, colloidal stability, and radiative efficiency. Finally, MTT assays demonstrated a dose-dependent cytotoxic effect of AgNPs against HT1080 human fibrosarcoma cells after 24 h exposure, highlighting their potential for anticancer applications.

Second Track: Chemical and Physical Sciences

المسار الثاني : أبحاث العلوم الكيميائية والفيزيائية

Poster Code:	PCP_2026_1
Student Name:	**Reem Turki Almutairi**
Supervisor:	Prof. Abdulaziz AlHazaa
Degree:	Ph.D.
Title:	Development of High Entropy Alloy for High Temperature Applications
Abstract:	High-entropy alloys have attracted significant attention due to their promising mechanical and thermal properties, especially for high-temperature applications. However, achieving stable phase structures and enhanced performance using efficient fabrication techniques remains a challenge. In this study, CrFeCoNiTi alloys were fabricated using spark plasma sintering (SPS) to address this issue. The alloys were characterized using X-ray diffraction (XRD) to examine phase formation and scanning electron microscopy (SEM) to investigate the microstructure. Thermal stability was evaluated by thermogravimetric analysis (TGA) up to 1200 °C, while mechanical performance was assessed through Vickers hardness testing. The results revealed the formation of a single-phase FCC structure with a homogeneous microstructure and excellent thermal stability. High hardness values were also obtained, indicating improved mechanical strength. These findings suggest that SPS-processed CrFeCoNiTi alloys are strong candidates for high-temperature defense applications, and further studies on long-term mechanical behavior are recommended.

Poster Code:	PCP_2026_2
Student Name:	**Weam Abdulaziz Mohammed Al-Drees**
Supervisor:	Prof. Vasilios Lempesis
Degree:	Ph.D.
Title:	Mechanical Effects of Tightly Focused Optical Vortices on Nanoparticles and Two-Level Atoms
Abstract:	Introduction. In optical vortex beams, superkicks denote momentum transfer beyond ħk from light to atomic particles, occurring when the local wavevector magnitude satisfies |k_loc| > k, with k_loc = ∇Φ(r). Near a phase singularity the phase gradient can become large, but direct observation is difficult because paraxial vortices have weak on-axis intensity. Problem statement. In paraxial descriptions, the vortex has essentially zero on-axis intensity (Fig.1), so atoms rarely experience appreciable interaction in the near-axis region where |k_loc| can become large. As a result, superkick events are extremely rare and the effect is effectively superweak. Methodology. We exploit tight focusing, which generates a non-negligible longitudinal field component Ez and, for circular polarization, introduces SAM–OAM coupling that reshapes near-axis momentum flow (Fig.2). Using a quasi-paraxial vectorial model with first-order longitudinal corrections, we derive compact analytical expressions for k_loc and for the resonant scattering force in circularly polarized Laguerre–Gaussian beams. In the near-axis regime the key contribution is the azimuthal component k_phi = (sigma + ell)/rho, and we identify superkick signatures by benchmarking force components against the saturation scale F_sat = ħkΓ/2, declaring superkicks when scattering force components F_phi/F_sat > 1 (Fig.3(a)). As a complementary diagnostic, we compute |psi_e_tilde(k)|^2, where a peak shift away from k = 0 indicates enhanced near-axis momentum transfer consistent with the force-based criterion (Fig.3(b)). Summary of results. For Sr on the 689-nm line (pi-coupling via Ez), the scattering-force response becomes a direct near-axis indicator of superkicks. In the saturated limit with w0 = 1.15 lambda, opposite-handedness cases exhibit strong azimuthal enhancement; for example, ell = 2 reaches order 3 × 10^2 near the axis, while ell + sigma = 0 eliminates the effect. Key recommendations. This topic is important because Ez provides a direct and experimentally accessible route to near-axis signatures in vortex illumination that are absent in transverse-only descriptions, benefiting both atom-optics experiments and theory. Detection should focus on scattering-driven acceleration or momentum diffusion, since enhanced |k_loc| maps directly onto larger radiation-pressure impulses through repeated absorption and spontaneous-emission cycles. As a next step, extending the model to the full Richards–Wolf vectorial focusing integral will provide a quantitatively accurate high-NA baseline for Ez, k_loc, and the associated scattering-force signatures.

Poster Code:	PCP_2026_3
Student Name:	**Kholoud Mohammed Al-Qarni**
Supervisor:	Dr. Salman Fareeh Al-Omairi
Degree:	Ph.D.
Title:	Exploring Fisetin as a potential anti-cancer therapeutic against colorectal cancer using expression profiling and pathway analysis
Abstract:	Background and Objectives: Colorectal cancer (CRC) is characterized by aberrant expression of several tumour suppressor genes and oncogenes, which leads to dysfunction of signalling pathways that collectively contribute to cancer development. Fisetin is a plant-derived compound that has gained extensive attention due to its remarkable anticancer effects via modulating numerous genes and signalling pathways. However, its signalling pathways and molecular targets remain inadequately elucidated. Therefore, the study aimed to examine the molecular effects of fisetin on cancer-related signalling pathways in colorectal cancer cells. Materials and Methods: MTT assay was used to assess the cell viability of colon cancer cells treated with different concentrations of Fisetin. Changes in gene expression were measured by qPCR utilizing designed PCR array of 84 cancer-related genes representing various pathways. Functional enrichment analysis by g: Profiler was used to explore the biological significance of genes altered by Fisetin. Results: Fisetin inhibited proliferation by reducing cell viability and growth in both Caco-2 and HCT-116. The results showed that 72 and 51 genes were significantly up-regulated and down-regulated in Caco-2 and HCT-116 cells after Fisetin treatment, respectively. There was a variation between cell lines, suggesting a specific genetic response. We have identified 44 significant genes involved in different signalling pathways. The gene ontology and KEGG pathways revealed differences in biological functions and altered pathways for the differentially expressed genes, which were primarily associated with apoptosis and the cell cycle. Conclusions: It concluded that genes involved in the apoptosis, and cell cycle pathways were the most altered in Caco2 and HCT-116 cells. Our findings provide insight into the molecular targets of fisetin's therapeutic potential and endorsing its continued assessment as a candidate for CRC treatment.

Poster Code:	PCP_2026_4
Student Name:	**Aziza Abdullah Al-Anzi**
Supervisor:	Dr. Mona Alonazi
Degree:	Ph.D.
Title:	Impact of SPV106 on Calcified Aortic Valve Interstitial Cells from Sheep: A Potential Therapeutic Approach to Mitigate Calcific Progression OF Aortic Valve Disease
Abstract:	Calcific aortic valve disease (CAVD) is a progressive cardiovascular condition marked by aortic valve leaflet calcification, leading to stenosis and significant health impacts. Its prevalence is rising globally, driven by risk factors like hypertension, high sodium intake, and smoking. The pathogenesis involves oxidative stress, inflammation, and cellular changes, particularly the transformation of valve interstitial cells into osteoblast-like cells. Current treatments, including valve implantation, address severe cases, but preventive strategies remain lacking. Recent findings indicate that cellular senescence linked to epigenetic changes accelerates calcification of aortic valve interstitial cells by repressing the Notch-dependent signaling pathway. Treatment with SPV106, a drug activating the pCAF/KAT2B histone acetyltransferase, reduced cellular senescence and inhibited valve calcification in mice models. This project aims to develop an in vitro model using sheep aortic valve interstitial cells to explore senomorphic inhibition of calcification. These findings will guide preclinical strategies for testing epigenetic compounds to prevent aortic valve calcification, using sheep as a reference model for large-animal valve pathology studies

Poster Code:	PCP_2026_5
Student Name:	**Inas Saeed Rizwan**
Supervisor:	Prof. Abdullah Al-Anzi
Degree:	Ph.D.
Title:	Design, construction and characterization of novel biohybrid nanocomposites for biomedical applications
Abstract:	A green method was used for fabrication of core shell-structured nanofibers encapsulated antibiotics by emulsion electrospinning. Biocompatible and biodegradable polymeric mixtures loaded with biowaste oil in a water emulsion system was used. Compared with other electrospinning techniques like blending, emulsion electrospinning is more efficient in fabricating sustained drug release system. Biowaste oil is extracted from blending, with varying polarities. The concentration of the polymeric mixtures, amount of drug loading, and bio-oil were optimized. The morphology of the fabricated nanofibers and the form of the core- shell structures were examined by Scanning Electron Microscope (SEM) and Transmission Electron Microscopen (TEM). The interaction between the polymeric mixture, drug, and oil was analyzed by Fourier transform infrared spectroscopy (FTIR), and the thermal properties were studied by TGA and DSC. Additionally, GC-MS characterization has been utilized to examine the role of solvent in oil extraction. The mechanism of drug release was assessed by the Korsmeyer-Peppas, Peppas-Sahlin, Higuchi, and Hixon-Crowell kinetic models. The release kinetics results showed that the Korsmeyer-Peppas model was the best-fit model, confirming the Fickian diffusion nature of the release mechanism. Future research could explore other new mixtures of biocompatible polymers incorporated with biowaste oil.

Poster Code:	PCP_2026_6
Student Name:	**Basmah Abdulbasit Madhkali**
Supervisor:	Dr. Ali Al-Salmi
Degree:	Ph.D.
Title:	Synthesis and Characterization of Ruthenium (II) Arene Complexes and their Efficacy in Anti-Cancer and Anti-Alzheimer's Diseases
Abstract:	Two new half-sandwiched (η6-p-cymene) ruthenium compounds (Ru-CH3L and Ru-HL), have been prepared via metal-ligand coordination using two new heterocyclic organic motifs via condensation reaction between 2-amino-5-methylthiazole, 2-aminothiazole with 2-hydroxy-3-methoxysalicylaldehyde (o-vanillin) CH3L and HL, respectively. Utilizing the standard techniques, FT-IR, 1H NMR, 13C NMR and elemental analysis the synthesized compounds were characterized. Moreover, the single X-ray structure of the CH3L, HL, and Ru-CH3L unequivocally affirmed the coordination of the ligand through phenolic-O and imine-N atoms with the Ru(II) ion. Moreover, the interaction of the Ru-CH3L and Ru-HL with human serum albumin (HSA) was examined and various parameters were evaluated. The results exhibited moderate affinity of Ru-CH3L and Ru-HL towards HSA and followed by static mode of binding. Also, the cytotoxicity of the synthesized compounds was assessed against HCT116 cells, Caco2 cells (the colon cancer cells); MCF-7 (breast cancer cells); and HUVEC cells (Umbilical cords vein cells), using MTT assay. The results displayed significant activity against HCT116 cells with IC50 value of 18 μM for Ru-CH3L. Further we have examined potential of Ru-CH3L against HCT116 cells comprehensively, in vitro. The mechanism of action showed, upon treatment with Ru-CH3L with HCT116 cells, the cells exhibited shrinkage and detachment, promotes generation of intracellular reactive oxygen species (ROS), decrease in mitochondrial membrane potential (MMP) and activation of the caspase 3/7 activity, lead to the apoptosis of the cells. Furthermore, the cell apoptosis and perturbation of the cell cycle in the G2/M phase were also observed.

Poster Code:	PCP_2026_7
Student Name:	**Azza Farhan Al-Shalawi**
Supervisor:	Prof. Dr. Amal M. Al-Mohaimeed
Degree:	Ph.D.
Title:	Synthesis and Characterization of Metal Oxide Nanoparticles Using Shilajit Spectrofluorimetric Analysis of Antiepileptic Medications and Antioxidant potential of Nanomaterials
Abstract:	Piracetam (PRM) is a nootropic commonly used to improve cognitive function, memory and learning ability. This method introduces a new spectrofluorimetric strategy for the identification of PRM, using metal oxide nanomaterials from shilajit extract in a micellar medium. The technique is based on a unique fluorescent platform of aluminum oxide and nickel oxide nanoparticles combined with sodium dodecyl sulfate (SDS). The metal oxide nanoparticles were prepared by an environmentally friendly synthesis approach, using shilajit extract as a dual function agent for reduction and stabilization. Their morphology, size, and structural properties were comprehensively analyzed using a range of spectroscopic and microscopic methods. The innovative technique utilizes the unique fluorescence properties of alumina and NiO nanoparticles (NPs) in the presence of SDS to detect PRM with remarkable sensitivity and selectivity. This method enables high-precision measurements over a wide calibration range of 0.5–10 and 0.2–14 µg/mL for the two metal oxides, respectively. With PRM recoveries of 99.07±0.65% and 99.60±0.37%, the method has excellent accuracy and reliability. Medium precision was used to ensure that the method meets stringent precision standards. In addition, the environmentally friendly approach of using shilajit extract for the sustainable synthesis of metal oxides reduces the impact on the environment while maintaining excellent analytical performance, as confirmed by an environmental impact assessment.

Poster Code:	PCP_2026_8
Student Name:	**Faiz Ali Ghalib Al-Eizri**
Supervisor:	Prof. Mohamed Hasan El-Newehy
Degree:	Ph.D.
Title:	Surface Modification, Characterization and Synergistic effect study of Ethylene-Vinyl Alcohol Copolymer for Environmental Applications
Abstract:	The rapid expansion of the dyes used in textile industry has sparked considerable public concern about the pollution generated by dye effluent, which poses potential health hazards. This study demonstrates the successful enhancement of the adsorption efficiency of Ethylene–vinyl alcohol copolymer (PEVOH) via a single-step surface modification using itaconic acid (IA) and Citric acid (CA). This new and efficient method for the modification of Ethylene–vinyl alcohol copolymer (PEVOH), specifically PEVOH-IA and PEVOH-CA, shown significant efficacy in the removal of crystal violet dye (CV) from contaminated water. The modified PEVOH-IA and PEVOH-CA were characterized using FESEM, TGA, FTIR, DSC, and XRD techniques. The characterization validated the structure of PEVOH-IA and PEVOH-CA, as well as the efficacy of the surface modification. The adsorption capacities were 370.78 mg/g with PEVOH-IA and 324.75 mg/g with PEVOH-CA, reflecting enhancement relative to PEVOH at 40°C. The empirical results were evaluated using established models. The adsorption equilibrium represented that the Langmuir-Freundlich (L-F) isotherm was the best model, whereas the adsorption kinetics were accurately described by the pseudo-second-order (PSO) equation. The thermodynamic analysis established that the adsorption of CV dye onto PEVOH-IA and PEVOH-CA was endothermic, spontaneous, and thermodynamically advantageous. strongly recommend integrating these high-capacity adsorbents into Saudi Arabia's industrial wastewater treatment infrastructure to support the Saudi Green Initiative. This technology aligns with Vision 2030 by promoting water circularity and environmental sustainability, ensuring the protection of the Kingdom's natural resources and public health from hazardous industrial pollutants.

Poster Code:	PCP_2026_9
Student Name:	**Rahmah Almalki**
Supervisor:	Dr. Hamad Albrithen
Degree:	Ph.D.
Title:	Investigating structural and optoelectronic properties of metal-halide alloys prepared by chemical methods
Abstract:	PbI2(1-X) Br2(X) films have been synthesized utilizing chemical solution mixing. Both PbI2 and PbBr2 were dissolved using DMF-DMSO mix solvent of the same intended stoichiometry at room temperature. Optical measurements of transmission showed wider transmittance window for Br rich materials, in consistence with the extracted magnitudes of the bandgap showing an increase from 2.4 eV (for x=0) to 3.59 eV for (x=1). X-ray diffraction indicated two major behaviors: 1) for the range x=0-0.5 (Iodine Rich) there are clear peaks following PbI2 with a reduction in 2θ as Br concentration increased, indicating an increase of lattice constant; 2) for the range x> 0.5 (Bromine Rich) there was a reduction in the XRD peak height indicating lower crystallinity. Indeed, scanning electron microscopy imaging of the films exhibited different structure behaviors consistent XPS and ellipsometer are being performed and going to presented.

Poster Code:	PCP_2026_10
Student Name:	**Magdy Hussein Ali Bajseer**
Supervisor:	Dr. Mohammed Hasan Al-Hakami
Degree:	Ph.D.
Title:	Quantum information applications via double-tripod system
Abstract:	We propose a scheme to coherently control the Goos-Hänchen (lateral) shift for a reflected TM-polarized light beam from Kretschmann configuration. The structure we consider contains a dielectric prism coated by a graphene layer backed by a three-level gain medium. As the optical properties of the graphene layer and the atomic medium can be externally modified, we can effectively manipulate the lateral displacement of the the reflected light without making any change in the actual arrangement of the structure.

Poster Code:	MCP_2026_1
Student Name:	**AFNAN SHAWQI ALSAQQAF**
Supervisor:	Dr. Abir Alamro
Degree:	M.SC
Title:	An effective cox 2 inhibitor green nanotechnology from extracted resin of Dracaena cinnabari to treat IBD and colon cancer
Abstract:	we present a green seed-mediated method for synthesizing gold nanoparticles (AuNPs) using the ethanolic extract of Dracaena cinnabari resin a natural material rich in bioactive compounds. Upon reduction of aqueous $HAuCl_4$, a distinct purple colloid was formed. The synthesized nanoparticles were characterized using scan-ning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR). SEM analysis showed mainly spherical nanoparticles ranging from 30 to 70 nm in size, while FTIR spectra revealed the involvement of phenolic (O–H) and carbonyl (C=O) groups in the reduction and stabilization of gold. These findings lay the groundwork for future investigations into the potential COX-2 modulating properties of these biogenic na-noparticles in IBD relevant models.

Poster Code:	MCP_2026_2
Student Name:	**Hajar Sahl Al-Turki**
Supervisor:	Dr. Seham Suleiman Al-Tariri
Degree:	M.SC
Title:	Direct Hydrogen Production from Methane via Development of High-Performance Heterogeneous Catalysts
Abstract:	The decomposition of methane offers a sustainable and efficient approach to hydrogen production, devoid of COx emissions, while simultaneously yielding valuable carbon materials. This study investigates the development of Fe catalysts supported on modified- aluminum with either zirconium oxide (ZrO2) or cerium oxide (CeO2) materials. The catalysts were prepared by the impregnation method and characterized by XRD, BET, TPR, Raman, and TEM. The results showed that the addition of ZrO2 improved the dispersion of iron particles and strengthened the interaction between the metal and the support, while the CeO2 modification increased the degree of crystallinity. The Fe catalyst supported upon ZrO2 modified alumina achieved the highest hydrogen yield (74.1%), the best stability, and the formation of carbon nanostructures. Post-reaction XRD analysis of all catalysts confirmed the presence of Fe3C and graphite phases, indicating the crucial role of iron carbides in the methane decomposition mechanism. These results demonstrate that the nature of the support directly affects the performance of the catalyst and hydrogen production efficiency.

Poster Code:	MCP_2026_3
Student Name:	**Kholoud bint Abdulmohsen Abu Hmeid**
Supervisor:	Dr. Ahmed Al-Saleh
Degree:	M.SC
Title:	Developing Electrocatalysts for Upcycling of Plastic Waste in Parallel with Green Hydrogen Generation
Abstract:	The electro-upcycling of plastic waste into value-added chemicals/fuel is an attractive and sustainable method of managing plastic waste. A great deal of interest has been generated in electrocatalyzing the conversion of PET into formate and hydrogen, but the development of low-cost catalysts with high efficiency and selectivity for the ethylene glycol (PET monomer) oxidation reaction (EGOR) has been challenging. This project presents an innovative nickel sulfide catalyst that supports plastic waste electro-upcycling by co-doping with copper and fluoride. Due to its interconnected ultrathin nanosheet architecture, dual dopants induced d band center shifting and helped reconstruct the structurally damaged area on Ni3S2 (Cu, F-NiS), making it superior to a single doped Ni3S2 and an undoped Ni3S2. A self-evolved sulfide-oxyhydroxide heterostructure can catalyze EG-to-format conversion at high current densities (> 550 mA cm-2 @ 1.81 V vs RHE) thanks to its strong catalytic ability. As part of this study, we demonstrate how to engineer cost-effective bifunctional catalysts for electrochemical conversion processes. In addition, the catalyst exhibits superior Faradaic efficiency toward formate production, reaching up to 97%, indicating highly selective EGOR performance.

Poster Code:	MCP_2026_4
Student Name:	**Sarah Abdullah Abdulrahman Al-Subaie**
Supervisor:	Prof. Asim Mahmoud Al-Sayed Barakat
Degree:	M.SC
Title:	Development of New Small Molecules as Human Carbonic Anhydrase Inhibitor for Cancer Therapy
Abstract:	Human carbonic anhydrases (hCAs) are zinc-containing metalloenzymes that catalyze the reversible hydration of carbon dioxide into bicarbonate and protons. Any abnormality in the functioning of these enzymes may lead to morbidities such as glaucoma and different types of cancers including brain, renal and pancreatic carcinomas. Given the absence of highly effective therapeutic agents specifically targeting these enzymes in cancer treatment, the development of potent and selective carbonic anhydrase inhibitors (CA) remains both a crucial and challenging task. To address this need, a series of novel small molecules incorporating spirooxindole and sulfonamide moieties were designed and synthesized as core structural motifs for potential CA inhibition. These compounds were prepared via a one-pot, three-component [3+2] cycloaddition reaction, yielding spiro derivatives with chemical yields up to 98%. The structures of the synthesized compounds were confirmed using FT-IR, ^{1}H NMR, ^{13}C NMR, and Elemental analysis. Their biological activities were evaluated against four distinct (hCA I, hCA II, hCA IX, hCA XII) human carbonic anhydrase isoforms. Among the tested compounds, 5a-3 and 5a-4 demonstrated the strongest inhibitory activity toward hCA IX, with K values of 9.5 nM and 9.7 nM, respectively, outperforming the standard drug AAZ (K = 25.8 nM). Based on analysis of the results revealed important structure–activity relationships, emphasizing how specific for sulfonamide molecular features influence inhibitory potency. These findings highlight the potential of selected spirooxindole-based sulfonamides as promising lead compounds for further development as chemotherapeutic agents targeting carbonic anhydrase isoforms involved in cancer.

Poster Code:	MCP_2026_5
Student Name:	**Noha Saud T.Almutairi**
Supervisor:	Prof. Abdullah M Al-Mayouf
Degree:	M.SC
Title:	Upcycling of Plastic Waste using Nickel chalcogenides electrocatalysts for hydrogen production
Abstract:	The rapid accumulation of plastic waste poses a major environmental challenge and leads to the loss of valuable carbon resources. Converting plastic-derived feedstocks into clean energy and value-added chemicals offers a promising strategy for sustainable waste valorization. In this study, plastic-derived ethylene glycol (EG) was electrocatalytically oxidized using nickel sulfide (NiS)–based catalysts supported on nickel foam (NF) to simultaneously generate hydrogen and formate. NiS/NF catalysts were synthesized via aerosol-assisted chemical vapor deposition (AACVD), and the effects of sulfur precursor concentration and deposition time were systematically investigated. The optimized NiS/NF catalyst prepared with 8 mmol sulfur at 300 °C for 20 min exhibited the highest activity toward EG oxidation. To further enhance performance, vanadium (V)-doped NiS catalysts were developed. The optimized NiS/V catalyst delivered a current density of ~170 mA cm^{-2} at 1.38 V vs. RHE in 1 M KOH + 0.1 M EG. Electrochemical impedance spectroscopy revealed a marked reduction in charge-transfer resistance after V incorporation, indicating accelerated electron-transfer kinetics. Faradaic efficiency analysis demonstrated efficient hydrogen generation (FE_H_2 ≈ 30–55%) along with high selectivity toward formate production, achieving Faradaic efficiencies of 83% for NiS and 94% for NiS/V. Overall, this work highlights the potential of low-cost NiS-based electrocatalysts for integrated hydrogen production and plastic waste upcycling into value-added chemicals.

Poster Code:	MCP_2026_6
Student Name:	**Reem Saad Al-Mutairi**
Supervisor:	Prof. Asim Barakat
Degree:	M.SC
Title:	Synthesis of New Fluorinated Spiro- Compounds for Pharmaceutical Applications
Abstract:	Spirooxindole-based heterocycles represent an important class of three-dimensional scaffolds in medicinal chemistry due to their structural complexity and broad biological relevance. In particular, halogenated spirooxindoles have attracted considerable interest in drug discovery. Fluorine incorporation can significantly enhance key pharmacological properties, including metabolic stability, membrane permeability, and binding affinity. In this study, a novel library of fluorinated heterocyclic spirooxindole derivatives was designed and synthesized via an efficient, regio- and stereoselective one-pot three-component [3+2] cycloaddition reaction. The reaction proceeded through in situ generation of azomethine ylides from substituted isatins and secondary amino acids, followed by cycloaddition with chalcone dipolarophiles via an ortho-endo transition pathway. All synthesized compounds were evaluated for their antiproliferative activity against A549 human lung cancer cells, with cellular selectivity assessed using normal WI-38 lung fibroblasts. Among the tested derivatives, compound 6a exhibited outstanding cytotoxic activity against A549 cells (IC_{50} = 0.35 μM) while showing negligible toxicity toward normal WI-38 lung fibroblasts (IC_{50} ≥ 50 μM), corresponding to a high selectivity index (>140) and superior potency compared to the reference drug erlotinib (IC_{50} = 1.39 μM against A549 cells). Several additional derivatives demonstrated moderate to strong anticancer activity within the low micromolar range. These findings highlight fluorinated spirooxindoles as promising anticancer scaffolds and identify compound 6a as a valuable lead for further structure–activity relationship optimization and drug development.

Poster Code:	MCP_2026_7
Student Name:	**Rasha Salem Al-Anazi**
Supervisor:	Dr. Salwa Bader Al-Reshaidan
Degree:	M.SC
Title:	Determination of the Optimum Production of Syngas via Partial Oxidation of Methane
Abstract:	Global warming poses serious environmental challenges due to greenhouse gas emissions, particularly methane (CH_4) and carbon dioxide (CO_2). Partial oxidation of methane (POM) offers a sustainable route for converting methane into synthesis gas (syngas), producing valuable hydrogen and carbon monoxide for clean energy applications. This study investigates the effects of silica incorporation into alumina-supported nickel catalysts, calcination temperature, and samarium (Sm) promotion on catalytic performance in the POM reaction. Increasing silica content reduced surface area and weakened metal–support interactions, leading to decreased catalytic activity. Among the studied catalysts, the 5Ni/10Si–90Al composition exhibited the highest activity due to stronger metal–support interaction and reduced formation of graphitic carbon. This catalyst achieved a hydrogen yield of approximately 54% with an H_2/CO ratio of 3.4 and demonstrated stable performance over 15 h time-on-stream. Calcination temperature significantly influenced catalyst properties, including surface area, nickel reducibility, and coke formation. The catalyst calcined at 500 °C showed superior activity and resistance to graphitization, whereas higher calcination temperatures resulted in sintering and surface area loss. Further enhancement was achieved by promoting the optimal catalyst with samarium. The addition of 1 wt.% Sm resulted in the highest methane conversion (57.85%) and hydrogen yield (56.89%) at 600 °C. Optimization of reaction conditions for the promoted catalyst yielded a maximum hydrogen yield of 88.39%, in good agreement with theoretical predictions. Catalyst structure and performance were characterized using BET, XRD, TPR, FTIR, Raman, TGA, and TEM techniques.

Poster Code:	MCP_2026_8
Student Name:	**Nuha M Alotaibi**
Supervisor:	Riyadh H. Alshammari
Degree:	M.SC
Title:	Studying the Effect of the Size Differenceof Gold Nanoparticles on Fibrin Network Degradation
Abstract:	Fibrin plays a critical role in wound healing and is a key factor in cardiovascular diseases. This study examined how gold nanoparticles coated with polyaniline (AuNPs@PANI) affect fibrin networks. AuNPs of varying sizes were synthesized, characterized using methods including UV-visible spectroscopy and Fourier Transform Infrared spectroscopy. The investigation focused on how core size influences fibrin degradation; larger nanoparticles caused significant morphological changes in the fibrin network upon laser exposure, enhancing fibrin degradation compared to smaller cores. The findings suggest that nanoparticle size is a vital design parameter for improving plasmonic nanotheranostics in personalized fibrinolytic therapies.

Poster Code:	MCP_2026_9
Student Name:	**Ruba Fahd bin Yahya**
Supervisor:	Dr. Widad Al-Anzi
Degree:	M.SC
Title:	Development of sensitive and selective solid phase microextraction–gas chromatography–mass spectrometry method for the aromatic compounds in water

Abstract:

Summary: Despite efforts to reduce environmental pollution, the release of chemicals from human activities remains a significant issue. Aromatic compounds are particularly concerning due to their harmful effects on health and the environment. Studies have shown their presence in various environments, including seawater, wastewater, and soil. Analyzing their concentrations is crucial for assessing pollution impacts, human activities, and remediation processes. The detection of low concentrations poses challenges, often due to the lack of reactive functional groups in their structures, necessitating effective sample preparation and pretreatment methods to concentrate these compounds and eliminate interferences before analysis.

Solid phase microextraction (SPME) is regarded as one of the most curious extraction methods due to its simplicity of use, portability, compactness, solvent-free procedure, automation, and broad range of linear response. The performance of the extraction process and the interaction mechanism depend on the coating materials of the SPME fibers and selecting the optimal extraction parameters for extracting the analytes. However, commercial SPME fibers exhibit relatively low selectivity toward aromatic analytes which limits their ability to concentrate these compounds based on specific hydrophobic interactions and π-π stacking. In contrast, using laboratory-made SPME fibers, particularly those made of polydimethylsiloxane (PDMS), for extracting aromatic compounds has resulted in high accuracy and selectivity.

This work aims to develop the optimal SPME procedure for the extraction of various aromatic analytes, then used gas Chromatography coupled with mass spectrometry (GC/MS) for qualitative and quantitative analysis of some Aromatic compounds in deferent types of water samples (plastic bottled drinking water sourced from groundwater, Artesian water and spring water from different local brands (P1 to P11), glass bottled drinking water, one of which contained sparkling water (G1 and G2), Zamzam water (Z1), collected rainwater (R1), laboratory tap water, and home tap water from the northern and western regions of Riyadh (T1 and T2), as well as home-filtered water (F1) and Milli-Q water (Q1)).

These aims were developed and investigated in this thesis and are clarified in the following parts of the thesis:Part one: Introduction This part introduces the classification of water pollution and various types of pollutants, especially aromatic pollutants, including their definition, sources in water, and associated hazards. In addition, the steps of analysis are also discussed, starting with the extraction process and its various methods, particularly the solid phase microextraction (SPME) method, followed by the method of qualitative and quantitative analysis using gas chromatography coupled to mass spectrometry (GC/MS). It also includes a review of the most important research in this field.

Part 2 Experimental This part details the collection, preparation, and analysis of water samples. Solid phase micro extraction was utilized to extract the aromatic compounds from the samples. Also, optimization of GC/MS parameters in the analysis of Aromatic compounds was Accomplished by investigating the flow rate of the carrier gas, temperature program, and the condition of the MS detection. In addition, method validation steps were illustrated in this part.

Part 3 Results and Discussion This part covers three key aspects of the results obtained during the proposed research.First, it discusses the use of full scan and SIM modes. Second, it focuses on monitoring the extraction conditions, including extraction temperature, extraction modes, fiber condition, sample volume, and extraction time. The third aspect discusses the validation of the methods and their results, including the application of the method to real samples and comparing the results obtained with those from previously published methods. An analysis of aromatic compounds was conducted using various PDMS-SPME fiber coatings. The HS-SPME method with a 100 mg PDMS fiber and GC/MS effectively identified these compounds in water samples. Optimal conditions included a 50 mL sample volume and a 10-minute extraction at 40°C. The method showed good sensitivity with LOD values from 0.00002 ng/mL to 5 ng/mL and LOQ values from 0.00007 ng/mL to 17 ng/mL, maintaining fiber stability after 165 injections.

Phenanthrene was found in several drinking water samples, ranging from 0.67 to 13.82 ng/mL, with most below EPA MCL standards, except for one home-filtered sample. Tap water showed no contamination, indicating effective purification in Riyadh. Rainwater samples also remained uncontaminated, suggesting high purity. Similarly, Zamzam, groundwater, rainwater, and tap water samples in plastic bottles showed no contamination.

Poster Code:	MCP_2026_10
Student Name:	**Mohammed Almaker**
Supervisor:	Dr. Abdulmajeed Alayyaf
Degree:	M.SC
Title:	Reducing Environmental Pollution via Cost-effective Process for Recycling Polyolefin Using Compatibilizers
Abstract:	Plastics, such as polyethylene and polypropylene, have become essential materials in our everyday life due to their unique features. The consumption of plastics exceeds the capacity of existing waste management systems, causing a rapid accumulation of plastic waste in the environment, which harms both wildlife and humans. A key approach to reducing plastic pollution is by developing an efficient recycling process. The common commercial technique to process plastic waste is termed mechanical recycling. This process involves collection, sorting, cleaning, shredding, and melt-processing. Sorting remains the most challenging step because some plastics have similar chemical and physical properties. Inefficient sorting reduces the quality of recycled plastics due to the weak interactions between different plastics. One method to overcome the sorting problem of plastic waste is through the addition of a compatibilizer. Typically, compatibilizers are copolymers that can achieve strong interactions with different plastics. During the melt-processing step, the compatibilizer migrates to the interphase area and enhances the adhesion between two different plastics. This method simplifies and reduces the cost of the mechanical recycling process by eliminating the need for sorting. In this study, the effect of poly(ethylene-ran-1-octene) on compatibilizing a blend of polyethylene and polypropylene will be analyzed through mechanical, thermal, microscopic, and spectroscopic techniques. The addition of the compatibilizer led to better adhesion between the blend components, which resulted in a large enhancement in the mechanical performance and supported by microscopic evidence. The compatibilization mechanism is attributed to the chain flexibility of poly(ethylene-ran-1-octene) as described by the conformational asymmetry theory.

Poster Code:	MCP_2026_11
Student Name:	**Fay Nawaf Al-Otaibi**
Supervisor:	Dr. Nojood Altwaijry
Degree:	M.SC
Title:	Virtual screening and in vitro validation of inhibitors for amyloid: targeting neurological diseases
Abstract:	Amyloid fibril formation is associated with protein misfolding, cellular toxicity, and the progression of several neurodegenerative disorders. However, effective small-molecule inhibitors that prevent or modulate amyloid aggregation remain limited, highlighting the need for identifying safe and repurposable therapeutic agents. This study aimed to evaluate the potential of the antidepressant drug paroxetine as an inhibitor of insulin amyloid formation, using insulin as a well-established model for amyloid studies. Human insulin (50 μM) was incubated under acidic conditions (pH 1.6) at 50°C with constant agitation to induce fibrillation in the absence and presence of increasing concentrations of paroxetine. Aggregation kinetics were monitored using thioflavin T fluorescence assays, while far-UV circular dichroism spectroscopy assessed secondary structural changes. Transmission electron microscopy examined fibril morphology, and molecular docking analysis investigated drug–protein interactions. Paroxetine produced a concentration-dependent reduction in fluorescence intensity, indicating inhibition of fibril growth. CD spectra demonstrated preserved but altered β-sheet organization, and TEM imaging revealed shorter and fragmented fibrils compared with untreated controls. Docking studies showed favorable binding of paroxetine to aggregation-prone regions of insulin. These findings suggest that paroxetine interferes with fibril elongation and may serve as a promising repurposed candidate for modulating amyloid aggregation. Further studies are recommended to validate its therapeutic potential in disease-relevant models.

Poster Code:	MCP_2026_12
Student Name:	**Abeer Abdulkarim Al-Anzi**
Supervisor:	Dr. Huda Al-Saeedi
Degree:	M.SC
Title:	Synthesis and Characterization of Phthalimide Derivatives for Biological Applications.
Abstract:	In this study, Bis-phthalimide derivative were prepared with the aim of studying the binding interaction with DNA. Bis-phthalimide derivative was obtained by reacting two units of phthalic acid with hydrazide. The obtained compound was successfully characterized using (IR and NMR). Furthermore, a docking study was performed to study the interaction of this compound with DNA. Finally, the interaction of compound with ct-DNA was investigated using UV-vis titration.

Poster Code:	MCP_2026_13
Student Name:	**Al-Jawhara Mansour Saleh Al-Anqari**
Supervisor:	Prof. Layla Abdulkareem Al Juhaiman
Degree:	M.SC
Title:	Protective Coating of C-steel using nanocomposite prepared from polystyrene and clay impregnated with some inhibitors
Abstract:	This research dealt with a natural phenomenon, and it is truly a disaster that affects the whole world, especially in the fields of industry and steel-dependent construction. This phenomenon is known as (corrosion). Corrosion global cost was estimated in 2016 to be around 2.5 US$ trillion. Here in Saudi Arabia, it was estimated in 2011 that corrosion costs 24.8 US$ billion, about 5.2% of its GDP. New protective coatings were prepared from polystyrene/organoclay nanocomposites (PCNs) impregnated with polystyrene microcapsules (MCs) loaded with inhibitors (Ce+3 ions and silanol), labeled as 1% PCN (MC) and 3% PCN (MC). The Structural and morphological characterization techniques confirmed the success of preparing the new coating formulations. The electrochemical measurements confirmed the enhancement in the protection efficiency of PCN (MC) compared with the PS-coated samples and the unimpregnated samples. The prepared, 3% PCN(MC clearly exhibited more efficient protection properties reaching 270.5 MΩ after 48 h of immersion, higher than all the other formulations. The diffusion mechanism of the inhibitors released from the MCs has been suggested through CeO2 precipitation on the C-steel surface after being released and by the silanol functionality as a coupling agent. The enhanced properties of the developed PCN (MC) coatings make them attractive for their potential application in the oil industry. We recommend using some recent techniques used in evaluating the self-healing behaviour of the protective coatings of C-Steel such as scanning vibrating electrode technique (SVET), with the temperature and time effect up to 120 h.

Third Track: Geological Sciences

المسار الثالث: أبحاث العلوم الجيولوجية

Poster Code:	MG_2026_1
Student Name:	**Naji Abdullah Rikan**
Supervisor:	Prof. Faisal Kamal Zaidi
Degree:	M.SC
Title:	Water Resources in the Vicinity of Faifa Mountains, Jazan Area, Southern Saudi Arabia
Abstract:	This study addresses water scarcity in the Faifa Mountains and surrounding areas, southern Saudi Arabia, through the delineation of Groundwater Potential Zones (GWPZ) using integrated Remote Sensing (RS) and Geographic Information System (GIS) techniques. The primary objective was to identify areas with varying groundwater potential to support sustainable groundwater management. The Analytic Hierarchy Process (AHP) was applied to assign relative weights to nine thematic layers, determining that drainage density (23.5%), rainfall (15.7%), and slope (15.3%) were the most influential factors governing groundwater potential. These layers along with lithology, land use/land cover, soil type, topographic wetness index, elevation, and lineament density, were integrated using a weighted overlay analysis to generate the GWPZ map. The results classified the study area into four categories: Good, Moderate, Poor, and Very Poor. The analysis indicated that most of the area falls within the Moderate (41.5%) and Poor (39.7%) classes. Areas with Good potential constitute a very limited proportion (2%), mainly confined to low-lying wadi channels and fractured zones with gentle slopes. The model was qualitatively validated using field observations and the spatial distribution of existing wells, providing a valuable framework for future artificial recharge and development strategies.

Poster Code:	MG_2026_2
Student Name:	**Saddam Ali Hazaea Ahmed**
Supervisor:	Sattam Almadani
Degree:	M.SC
Title:	Evaluation of near surface Geotechnical Parameters by Integrated Geophysical Techniques in Historical Diriyah Riyadh Saudi Arabia
Abstract:	Historic Diriyah, located northwest of Riyadh along Wadi Hanifa, is currently undergoing major urban development as part of the Diriyah Gate Project within Saudi Vision 2030. The area is characterized by complex geological and geotechnical conditions, including wadi deposits, collapsible soils, and cavernous limestone, which pose potential risks to infrastructure development. Therefore, detailed subsurface characterization is essential to ensure safe and sustainable construction. This study aims to evaluate near-surface geological and geotechnical conditions, identify weak zones and hazards, and develop reliable shear-wave velocity (Vs) profiles using an integrated geotechnical and geophysical approach. The investigation combined borehole data, including 300 Standard Penetration Tests (SPT) from 30 boreholes and 477 Rock Quality Designation (RQD) measurements from 140 boreholes, with a Multichannel Analysis of Surface Waves (MASW) survey to derive Vs profiles down to 30 m depth (Vs30). Seismic data was processed to generate dispersion curves and inverted to produce 1D and 2D Vs models. Results indicate the presence of weak zones at depths of 8–14 m, with Vs values of 1,000–1,500 m/s, likely associated with cavities, fractures, or weathered limestone. Deeper layers (15–30 m) show higher Vs values (1,500–2,700 m/s), reflecting compact limestone. Shallow sedimentary layers (3–4.5 m) exhibit low SPT and RQD values, confirming poor rock quality. The integrated results demonstrate that geotechnical conditions improve in depth and highlight critical zones requiring treatment. It is recommended that foundation designs account for shallow weak zones through ground improvement or deep foundations to ensure long-term structural stability.

Poster Code:	MG_2026_3
Student Name:	**Muhammad Zakariya Panatagama**
Supervisor:	Talal Ghazi Al-Harbi and Elkhedr Hassan Ibrahim
Degree:	M.SC
Title:	EXPLORATION OF GEOTHERMAL POTENTIALITIES AT HARRAT UWAIRIDH, WEST SAUDI ARABIA, USING MAGNETOTELLURIC AND AEROMAGNETIC DATA
Abstract:	This study investigates the geothermal potential of Harrat Uwairidh, Saudi Arabia, supporting the national energy diversification goals of Saudi Vision 2030. As a "blind" geothermal system lacking surface manifestations, Harrat Uwairidh presents a unique exploration challenge. We integrated Magnetotelluric (MT) data from 18 wide-band stations with high-resolution Aeromagnetic data to characterize the subsurface thermal and structural framework. 2D resistivity modeling successfully imaged a geothermal system comprising a shallow conductive clay cap (<10 Ohm.m), a fractured basaltic reservoir (30–125 Ohm.m), and a deep resistive magmatic heat source (>500 Ohm.m). Structural analysis confirms that hydrothermal circulation is governed by the intersection of NW–SE Red Sea-parallel faults and NE–SW transfer faults. The most prospective zone is identified in the western sector (Stations 30a, 31a, and 33) at depths of 1.5 to 4 km, providing a viable target for future geothermal exploitation.

Fourth Track: Mathematical and Computational Sciences

المسار الرابع : أبحاث العلوم الرياضية والحاسوبية

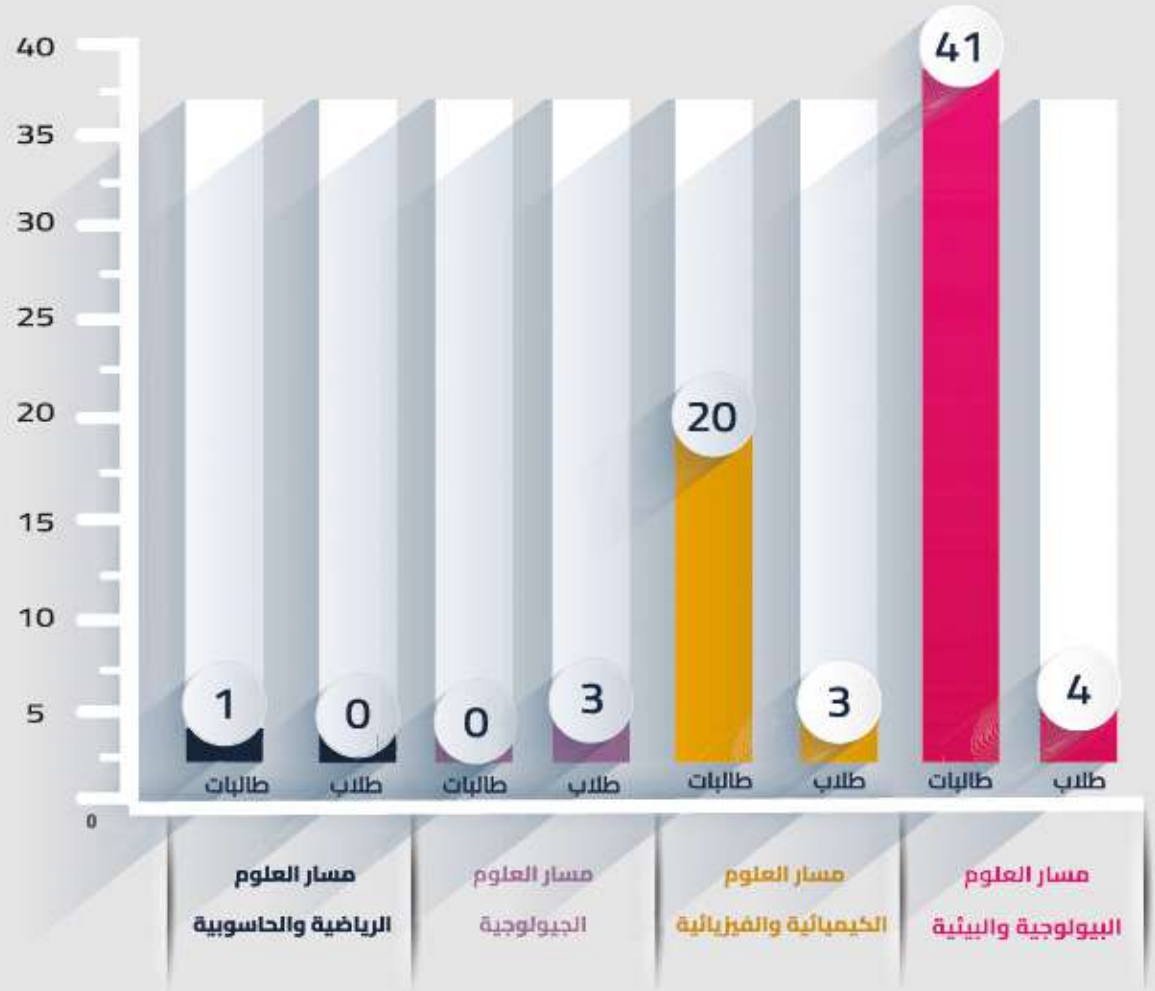
Poster Code:	PMC_2026_1
Student Name:	**Faten Musaad Saud Al-Ruwaili**
Supervisor:	Prof. Mohammed Qaid Abdeljawad
Degree:	.Ph.D
Title:	EXTROPY MEASURES AND THEIR PROPERTIES IN SYSTEMS RELIABILITY ENGINEERING
Abstract:	This study explores the extropy of consecutive r-out-of-n:G systems, offering a detailed framework for theoretical analysis and practical applications. Exact expressions for system lifetime extropy are derived, with comparative evaluations across diverse lifetime distributions. Theoretical contributions include bounds, characterization results, and insights into the variability of extropy. Practically, a nonparametric extropy estimator is introduced and validated through simulations and image processing applications. A novel test statistic for exponentiality is also proposed, with the critical values computed numerically and the performance assessed against alternative distributions. The results highlight the test's superior efficacy in specific contexts while noting its limitations. This work combines theoretical and practical advances, providing valuable tools for reliability analysis and statistical inference.

إحصائيات المشاركين

عدد المسجلين من طلاب وطالبات الدراسات العليا

حسب الفئة

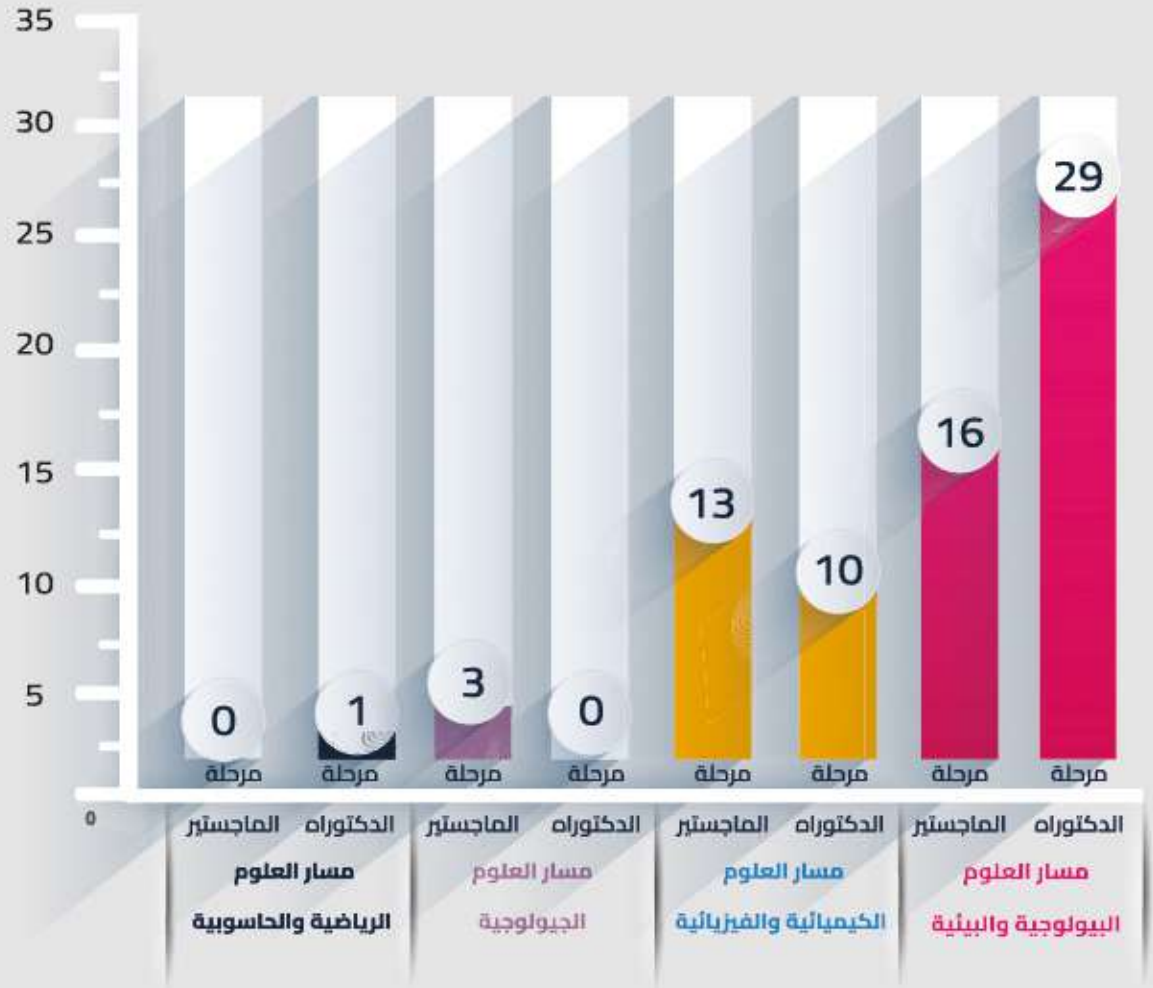
المسار	طلاب	طالبات
مسار العلوم البيولوجية والبيئية	4	41
مسار العلوم الكيميائية والفيزيائية	3	20
مسار العلوم الجيولوجية	3	0
مسار العلوم الرياضية والحاسوبية	0	1



عدد المسجلين من طلاب وطالبات الدراسات العليا

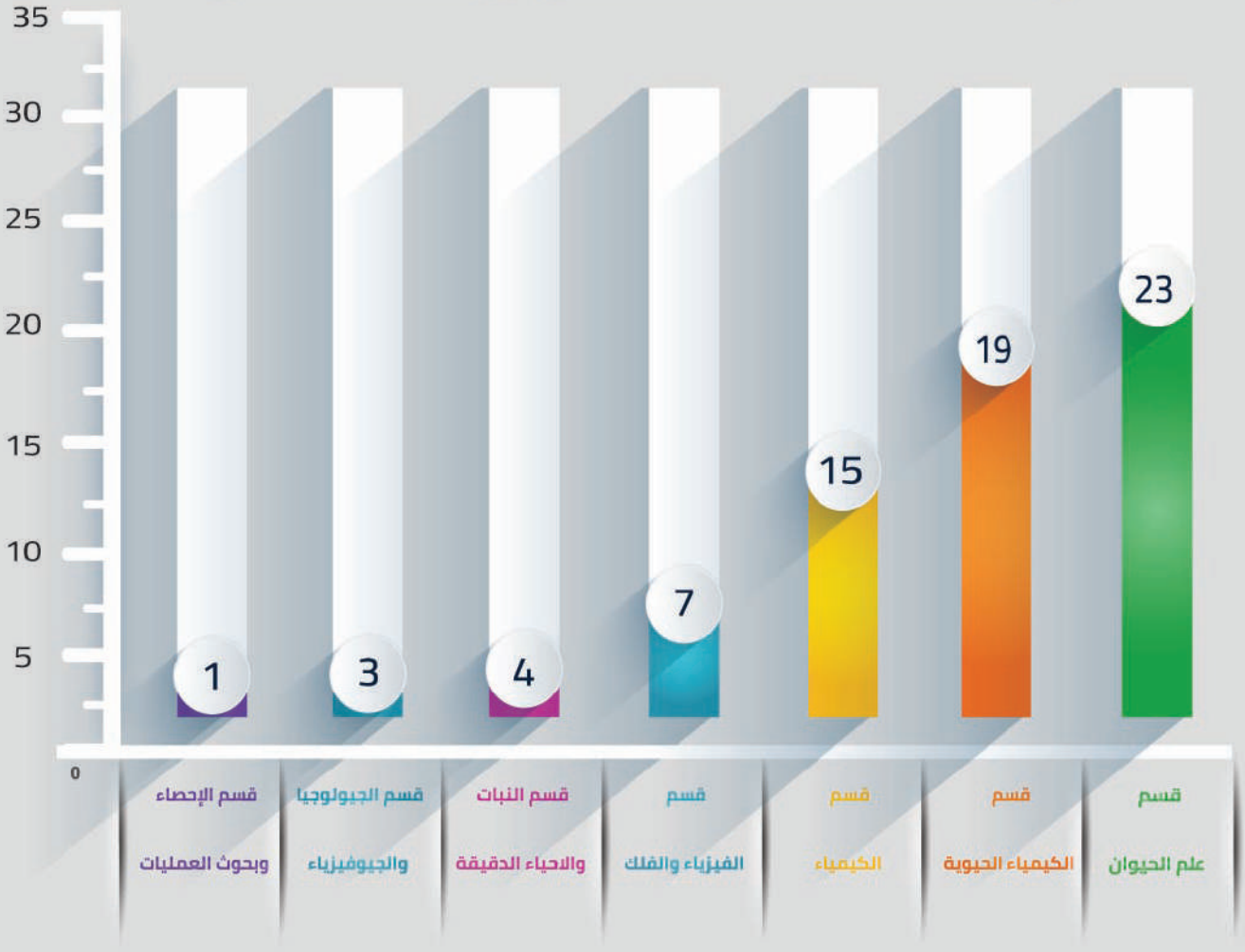
حسب المسارات

المســـار	مرحلة الدكتوراه	مرحلة الماجستير
مسار العلوم البيولوجية والبيئية	29	16
مسار العلوم الكيميائية والفيزيائية	10	13
مسار العلوم الجيولوجية	0	3
مسار العلوم الرياضية والحاسوبية	1	0



عدد المسجلين من طلاب وطالبات الدراسات العليا
حسب أقسام كلية العلوم

المسار	مرحلة الدكتوراه
قسم علم الحيوان	23
قسم الكيمياء الحيوية	19
قسم الكيمياء	15
قسم الفيزياء والفلك	7
قسم النبات والاحياء الدقيقة	4
قسم الجيولوجيا والجيوفيزياء	3
قسم الإحصاء وبحوث العمليات	1



لجان التحكيم

رؤساء لجان التحكيم

منسق الدراسات العليا قسم الكيمياء	أ.د. أحمد بن حامد الغامدي
منسق الدراسات العليا قسم علم الحيوان	أ.د. عبدالحليم بلقاسم حراث
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منسق الدراسات العليا قسم الإحصاء وبحوث العمليات	د. أمل بنت عبدالله المحيسن

أعضاء لجان التحكيم حسب الأقسام

أعضاء لجان التحكيم

	الاســـــــم	القســـم
1	أ.د. عاصم محمد بركات	قسم الكيمياء
2	أ.د. أحمد عقل أفسيسي	قسم الكيمياء
3	أ.د. محمد علي غانم	قسم الكيمياء
4	أ.د. محمد عبد العاطي هبيلة	قسم الكيمياء
5	د. عمار محمد تغيزه	قسم الكيمياء
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7	د. سعد بن محمد القحطاني	قسم الكيمياء
8	د. راجح بن ذيب العتيبي	قسم الكيمياء
9	د. وداد بنت التهامي العنزي	قسم الكيمياء
10	د. نوف بنت حزام العتيبي	قسم الكيمياء
11	د. تهاني بنت سعد القرني	قسم الكيمياء
12	د. خلود بنت أحمد دهلوس	قسم الكيمياء
13	د. عبدالمجيد بن عبدالله العياف	قسم الكيمياء
14	أ.خالد مشاى العنزي	قسم علم الحيوان
15	أ.داليا فؤاد إبراهيم	قسم علم الحيوان
16	أ.غادة إبراهيم البشر	قسم علم الحيوان
17	د. معاذ قاسم الغادي	قسم علم الحيوان
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19	فارس أحمد الزهراني	قسم علم الحيوان
20	هناء الحسن حكمي	قسم علم الحيوان
21	أ.د. أحمد محمد النجار	قسم الفيزياء والفلك
22	أ.د. بندر علي الأصبحي	قسم الفيزياء والفلك
23	محمد حمد راشد الدوسري	قسم الفيزياء والفلك
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25	أ.د. أجمل الدين مالك	قسم الكيمياء الحيوية
26	أ.د. عبير الغنوشي بن باشه	قسم الكيمياء الحيوية

	الاســـــــم	القســم
27	أ.د. محمد شهنواز خان	قسم الكيمياء الحيوية
28	أ.د. سيما زارقار	قسم الكيمياء الحيوية
29	أ.د. عبير محمد الدباس	قسم الكيمياء الحيوية
30	د. سلمان فريح العميري	قسم الكيمياء الحيوية
31	د. محمد سمير الربع	قسم الكيمياء الحيوية
32	د. شون لوي باباسا سابيكو	قسم الكيمياء الحيوية
33	د. محمد شمس العلا	قسم الكيمياء الحيوية
34	د. صبا عبدي	قسم الكيمياء الحيوية
35	د. محمد حسانين حسن محمود	قسم الكيمياء الحيوية
36	د. محمد سعد داود	قسم الكيمياء الحيوية
37	د. منى غازي الحربي	قسم الكيمياء الحيوية
38	د. حميدة إبراهيم العنزي	قسم الكيمياء الحيوية
39	د. أريج علي الزهراني	قسم الكيمياء الحيوية
40	د. إيمان حسن الشهري	قسم الكيمياء الحيوية
41	د. ريم ناصر العتيبي	قسم الكيمياء الحيوية
42	د. أمل عبدالله البطي	قسم الكيمياء الحيوية
43	د. حمزه مفرح حنتول	قسم الكيمياء الحيوية
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45	أ.د. منى سليمان الوهيبي	قسم النبات والأحياء الدقيقة
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48	أ.د. بسام عبدالمعطي أبوعمارة	قسم الجيولوجيا والجيوفيزياء
49	أ.د. كمال عبدالرحمن حسانين	قسم الجيولوجيا والجيوفيزياء
50	د. فارس عبدالمحسن أبانمي	قسم الجيولوجيا والجيوفيزياء
51	د. سهيل صالح الحجي	قسم الجيولوجيا والجيوفيزياء
52	أ.د. محمود محمد الدريني	قسم الإحصاء وبحوث العمليات
53	د. عائض القحطاني	قسم الإحصاء وبحوث العمليات

نتائج الطلاب والطالبات الفائزين

جوائز الملصق العلمي المتميز على مستوى الكلية

أولا: مرحلة الدكتوراه

المركز	اسم الطالب(ه)	قسم
المركز الاول	فايز علي العيزري	الكيمياء
المركز الثاني	ايناس سعيد رضوان	الكيمياء
المركز الثالث	صابر مصطفى النهدي	علم الحيوان

ثانيا: مرحلة الماجستير

المركز	اسم الطالب(ه)	قسم
المركز الاول	ريم سعد المطيري	الكيمياء
المركز الثاني	نهى سعود المطيري	الكيمياء
المركز الثالث	ساره عبدالله السبيعي	الكيمياء

جوائز الملصق العلمي المتميز على مستوى الأقسام الأكاديمية

أولا: قسم علم الحيوان

جائزة الملصق العلمي المتميز على مستوى قسم علم الحيوان

اسم الطالب(ه)	مرحلة (الدكتوراه / الماجستير)
صابر مصطفى النهدي	الدكتوراه

ثانيا: قسم الكيمياء الحيوية

جائزة الملصق العلمي المتميز على مستوى قسم الكيمياء الحيوية

اسم الطالب(ه)	مرحلة (الدكتوراه / الماجستير)
خلود محمد القرني	الدكتوراه

ثالثا: قسم الكيمياء

جائزة الملصق العلمي المتميز على مستوى قسم الكيمياء

اسم الطالب(ه)	مرحلة (الدكتوراه / الماجستير)
ريم سعد المطيري	الماجستير

جوائز الملصق العلمي المتميز على مستوى الأقسام الأكاديمية

رابعا: قسم الفيزياء والفلك

جائزة الملصق العلمي المتميز على مستوى قسم الفيزياء والفلك

اسم الطالب(ه)	مرحلة (الدكتوراه / الماجستير)
دلال حمدان العنزي	الماجستير

خامسا: قسم النبات والأحياء الدقيقة

جائزة الملصق العلمي المتميز على مستوى قسم النبات والأحياء الدقيقة

اسم الطالب(ه)	مرحلة (الدكتوراه / الماجستير)
دلال مسفر القحطاني	الماجستير

سادسا: قسم الجيولوجيا والجيوفيزياء

جائزة الملصق العلمي المتميز على مستوى قسم الجيولوجيا والجيوفيزياء

اسم الطالب(ه)	مرحلة (الدكتوراه / الماجستير)
ناجي عبدالله الركيان	الماجستير

ألبوم الصور


كلية العلوم
COLLEGE OF SCIENCE
College Administration
Physics & Astronomy Dept.
Statistics & O. Research Dept.
Geology Dept.
Mathematics Dept.
Public Relations and Media Unit-College of Science


جامعة الملك سعود
King Saud University
Public Relations and Media Unit-College of Science


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