PALESTINIAN FORUM FOR MEDICAL RESEARCH
المنتدى الفلسطيني للبحوث الطبية

BIRZEIT UNIVERSITY

BOOK OF ABSTRACTS

8Th PFMR Biomedical Research Symposium

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PREFACE

We are privileged to host the 8th Palestinian Forum for Medical Research Symposium at Birzeit University as we are always welcoming our colleagues, students and visitors from local universities and abroad. On behalf of the organizing committee and the Birzeit family, I extend my warmest wishes for a successful and eventful research day. Thoughts, ideas and innovation will be freely discussed in the vicinity of this great university. We particularly welcome our esteemed guests from the City of Hope National Medical Center, the University of Southern California, as well as Rutgers University in New Jersey who are visiting Palestine specifically with a strong conviction to recruit brilliant Palestinian students to join their labs for postgraduate studies.

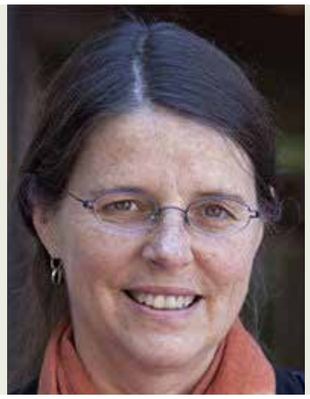
The organizing committee hopes that every attendee of this full day of science and technology would benefit greatly. This day promises to be exciting and informative for everyone. The organizing and scientific committees have been working for over 6 months to prepare for this event and we hope that our endeavors meet your high expectations. Our main goal, as always, remains to prepare Palestinian students mentally and scientifically to face the audience and expose them to the world of scientific meetings and conferences. This platform can be a seed for future collaborations and networking among different students, researchers and universities in Palestine and abroad. Moreover, we also expect the students to have good, publishable scientific work that is of high impact to the local population.

This year, the scientific committee received more than 50 abstracts, of which 39 were chosen to be included in the program. Ten of the abstracts were chosen to be presented in a poster teaser session, where the authors try to introduce their posters to the general audience and recruit them to visit that poster. This session will be moderated by two brilliant undergraduate students, who will gain plenty of experience chairing a session in a national and international scientific conference. Students presenting teasers as well as others who are presenting orally or by their posters would be immensely thrilled by this new experience, and this meeting will be cherished for years to come. The lucky ones who manage to secure strong connections and networking would be happy to be able to continue their education in one of the world-leading institutes in the world.

We hope that our efforts in the organization and logistics of this meeting match with the quality work that will be presented by our students, faculty members and international scholars. We would like to welcome you all to Birzeit University, a university that strives to be a beacon of undergraduate and graduate research in Palestine. We wish you a successful day filled with information, enjoyment, productivity and networking. Ahlan wa sahlan.

Johnny Stiban, Ph.D.
Biology and Biochemistry, Birzeit University
On behalf of the organizing committee
and the PFMR board of directors

ABOUT THE VISITORS



Victoria Seewaldt, MD
https://www.cityofhope.org/people/seewaldt-victoria

Victoria Seewaldt, M.D., is an accomplished clinician and researcher who's devoted to improving the lives of her patients and the community at large. She has led community outreach education efforts on cancer prevention through personal wellbeing and directed research aimed at finding biomarkers that can be used for early cancer detection, particularly triple-negative breast cancers that are especially resistant to treatment.
At City of Hope, Dr. Seewaldt will direct efforts to provide breast cancer education, free breast cancer screening and treatment, mentorship of young minority scholars, and a forum for community partnered trials. Clinically, Dr. Seewaldt aims to empower women at high breast cancer risk to be full partners in developing wellness strategies to promote personal health.
Dr. Seewaldt received her medical degree from the University of California, Davis, and completed her residency and clinical fellowship at the University of Washington in Seattle. She then pursued a medical oncology fellowship with the Fred Hutchinson Cancer Research Center and then became an assistant professor at Ohio State University. Afterwards, she transferred to Duke University, where she held various clinical, academic and leadership roles in its School of Medicine and Comprehensive Cancer Center — most recently as a professor, co-leader of the breast and ovarian cancer program and head of the cancer breast prevention program — before joining City of Hope.

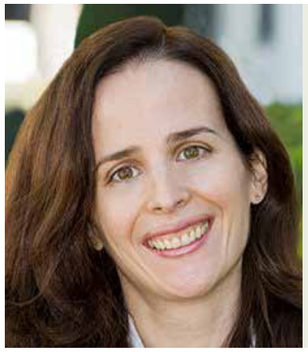
Bodour Salhia, PhD
http://www.pmed.io/bodour-salhia-phd/
https://keck.usc.edu/faculty-search/bodour-salhia/

Dr. Salhia received her Bachelor's degree (1998) in Biological Sciences from the University of Toronto. She earned a Master of Health Sciences (2001) and a Ph.D. (2006) in Cellular and Molecular Biology from the Department of Laboratory Medicine and Pathobiology, University of Toronto. Dr. Salhia is a translational genomics scientist with extensive knowledge and expertise in mechanisms that underlie tumorigenesis and tumor biology. She merges cutting edge genomics/epigenomics analyses with cell biological and functional studies towards the investigation of clinically relevant problems in human cancer. Dr. Bodour Salhia's laboratory and research are focused on understanding of the mechanisms that underlie tumorigenesis. During her graduate training, she focused on understanding the molecular and cellular determinants of glioma invasion. Her post-doctoral work focused on the genomics and epigenomics of breast cancer metastasis and multiple myeloma. She also characterized the function of AKT1(E17K) in breast cancer and performed immunophenotypic analysis of breast cancer in North

Africa. She has led and continues to lead numerous DNA methylation studies using a plethora of both array and sequencing based technologies to measure whole genome and targeted CpG methylation changes in a variety of cancer types. Dr. Salhia utilizes these data to develop DNA methylation liquid biopsies. Her lab is in the process of validating a DNA methylation liquid biopsy for breast cancer recurrence which would indicate patients with evidence of micrometastatic residual disease that are therefore likely to experience a recurrence. Dr. Salhia's lab also has research efforts in experimental therapeutics of brain metastasis by utilizing patient-derived xenografts and cell lines to identify novel treatment methods for this dismal disease.

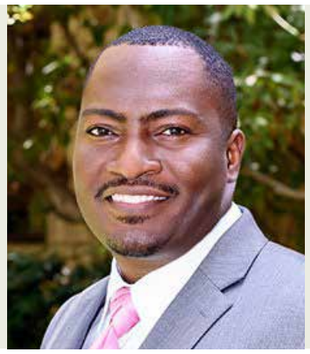
Mohammad M. Herzallah, PhD
Al-Quds University, Palestine; Rutgers University, NJ, USA

Mohammad M. Herzallah, M.D., Ph.D., is a neuroscientist and physician. He is the founder and director of the Palestinian Neuroscience Initiative at Al-Quds University in Palestine, and research scientist at Rutgers University in the USA. He obtained an M.D. degree from Al-Quds University, Palestine in 2009, and a Ph.D. in behavioral and neural sciences from Rutgers University, USA in 2015. Mohammad's research focuses on the cognitive, physiological, molecular and computational correlates of brain systems involved in feedback-based learning of approach (of positive outcomes) and avoidance (of negative outcomes) in patients and animal models of psychiatric and neurological disorders. Mohammad's research entails the identification of cognitive, physiological, molecular and computational biomarkers for diagnosis of psychiatric disorders and prediction of response to treatment. At the Palestinian Neuroscience Initiative, Mohammad's efforts aim to create a powerhouse for neuroscience research in Palestine, train the next generation of Palestinian researchers and healthcare professionals, and create a viable research institution in Palestine to host Palestinian and other neuroscientists to pursue research careers in Palestine (http://neuroscience.med.alquds.edu/). In 2011, Mohammad received the Dr. Raniyah Ramadan Young Arab Neuroscientist Award from the Society for Arab Neuroscientists. In 2013, Mohammad received the prestigious TED fellowship, and he was selected among the 500 most powerful Arabs in the world by Arabian Business. In 2016, Mohammad was selected by the *Lancet* to be on their Commission for Global Mental Health. His work was featured by Forbes, Science Magazine, Nature, TED, The Verge, and Ozy, among many other media outlets.



Tijana Jovanovic-Talisman, PhD
https://www.cityofhope.org/people/jovanovic-talisman%20-tijana

Dr. Tijana Jovanovic-Talisman obtained her Bachelor's degree in Physical Chemistry from University of Belgrade in Serbia, and her masters and PhD in Chemistry from Columbia University. Dr. Talisman's lab focuses on quantitative biology, extracellular vesicles and nucleo-cytoplasmic transport using microscopy techniques of single molecule localization. To investigate biological processes that are critical to the progression of cancer and other diseases, Dr. Talisman uses quantitative Single Molecule Localization Microscopy (qSMLM). qSMLM is a fluorescence-based imaging technique that evaluates single molecules with nano-scale precision. Her lab applies advanced qSMLM methods to quantify both the density and nano-organization of membrane receptors in cells and in tissues ex vivo. She is focusing on assessing G-protein coupled receptors and receptor tyrosine kinases. Recently, her lab used qSMLM to quantify the organization of human epidermal growth factor receptor 2 (HER2), a receptor overexpressed in 20% of breast cancers and a target for immunotherapy. Talisman's lab also uses qSMLM methods to assess both the size and the molecular content of individual extracellular vesicles shed from cells in cases of health and disease. Another focus of the lab is characterizing nuclear pore complexes for drug development purposes in cancer and neurodegenerative diseases.



Christopher Sistrunk, PhD
https://www.cityofhope.org/christopher-sistrunk

Dr. Christopher Sistrunk obtained his Bachelors' degree in microbiology from Winston-Salem State University, NC, his masters in Environmental Carcinogenesis from North Carolina Central University and his PhD in Molecular and Cellular Toxicology from North Carolina State University. Dr. Sistrunk is an Assistant Professor in the department of Population Sciences at the City of Hope, with the primary focus of developing a research program that serves underrepresented minority communities. As lead investigator, he currently utilizes his formal training as a molecular and cellular toxicologist to study the increasing role the environment plays on epigenetics, in particular genetic imprinting. Specifically, the environmental impacts on drinking water and how underrepresented communities are affected genetically through chronic exposures of toxins found in drinking water. Dr. Sistrunk will be discussing how his lab studies heavy metals found in drinking water and the role played in the initiation of cancers, heart disease, diabetes and obesity. Additionally, Dr. Sistrunk will be discussing the connection between poor water quality and health disparities found in underrepresented communities.

Sundus Shalabi, MD

Sundus Shalabi received her Medical Degree from Al-Quds University Medical School in Jerusalem in 2014. She started collaborating with Dr. Victoria Seewaldt at City of Hope to study the molecular drivers of breast cancer in Palestinian women. She is establishing a tissue bank from the samples she is collecting to be based at Al-Quds University. In 2016, she joined Irell and Manella graduate school at City of Hope to pursue her PhD studies. Dr. Shalabi is currently a PhD candidate in the lab of Dr. Mark LaBarge at City of Hope. She is investigating whether BRCA1 loss of function accelerates aging phenotypes in the in mammary epithelial cells and whether BRCA1 loss in the stroma accelerates aging of the epithelia and promotes breast cancer initiation.

ACKNOWLEDGEMENTS

The organizing committee of the 8th PFMR Biomedical Research Symposium extends its sincere gratitude to the speakers from all over Palestine and our distinguished guests from the United States, without whom the program would not have occurred. The passion, dedication and work ethic were evident in all the abstracts received. It is inspiring and heart-warming to observe the development of science and critical thinking in our beloved Palestine.

The PFMR board also thanks Birzeit University, in particular, President Prof. Abdullatif Abu Hijleh for his opening remarks and his role in the success of the meeting. We also are indebted to the Faculty of Pharmacy, Nursing and Health Professions, and Dean Dr. Rania Abu Hamdah for their efforts to make this symposium successful and for their generosity hosting this event. The board also is grateful for all the student help obtained throughout the preparation and execution of the program. The students of the department of Biology and Biochemistry and the faculty of Pharmacy helped to organize the meeting logistically.

Finally, we reserve special thanks to the following sponsors whose generous financial support has made this event possible.

THE PROGRAM

8:00-9:00	**Registration**
	Opening Session: *Dr. Johnny Stiban, Birzeit University*
9:00-9:30	- Prof. Abdullatif Abu Hijleh, President, Birzeit University - Dr. Rania Abu Hamdah, Dean, Faculty of Pharmacy, Nursing and Health Professions - Prof. Rami Aqeilan, on behalf of the PFMR board of directors and scientific committee
Session I – Genetics & Epigenetics **Moderator:** *Dr. Nouar Qutob, Arab American University*	
9:30-9:50	**The cognitive mechanism of action of SSRI antidepressants in responder and non-responder patients with major depressive disorder** *Dr. Mohammad M. Herzallah* Al-Quds University, Palestine; Rutgers University, NJ, USA
9:50-10:05	**Clinical exomes and genetic heterogeneity in the Palestinian population** *Lara Kamal* Molecular Genetics laboratory, Istishari Arab Hospital, Ramallah, Palestine
10:05-10:20	**Molecular characterization of β-thalassemia intermedia in the West Bank, Palestine** *Rashail Faraon* Department of Medical Laboratory Sciences, Al-Quds University, East Jerusalem, Palestine
10:20-10:35	**Potential treatment for diabetes type 1 in Wolfram syndrome 2 patients; using iron chelator and antioxidant combination** *Ola Karmi* Institute of Life Sciences, Jerusalem
10:35-10:50	**Novel mutations in NPRL3 gene in two Palestinian families with familial focal epilepsy with variable foci** *Christina Canavati* Hereditary Research Laboratory, Bethlehem University, Bethlehem, Palestine
10:50-12:00	**Coffee Break & Poster Session I**
Poster Teasers Session: **Moderators:** *Yara Khodour and Muna Abedrabbo, Birzeit University*	
12:00-12:30	***Mahmoud A. Najjar*** (Medical Laboratory Sciences, Islamic University of Gaza) Relationship between gene polymorphism and type 2 diabetes in a Palestinian population: A study of five gene polymorphisms ***Maram Jaghama*** *(Nursing and Health Sciences, Birzeit University)* Exploring nurses understanding of and attitudes toward incident reporting case study: A governmental hospital in the West Bank ***Ahmad Al Hammouri*** *(Faculty of Medicine, Al-Quds University)* Postoperative intestinal intussusception in infants: an easily missed cause of postoperative obstruction ***Wafa Abu Siba*** *(Faculty of Health Professions, Al-Quds University)* Expression of *GBGT1* gene and the Forssman antigen in red cells in a Palestinian population ***Nicola Saliba*** *(Faculty of Pharmacy, Nursing and Health Professions, Birzeit University)* Development and evaluation of Allicin (garlic extract) and vitamin D containing formulations for the topical enhancement of hair growth ***Ahmad Jaffal*** *(Department of Biology, Al-Quds-Bard College for Arts and Sciences)* *Effect of HRasG12V* transformation on MCF10A cells harboring different *TP53* variants ***Suheir Lolas*** *(Hereditary Research Laboratory, Bethlehem University)* A founder mutation in the *TP53* gene and its prevalence in Palestinian breast cancer patients
12:00-12:30	***Shahd Alnatsheh*** *(Faculty of Pharmacy and Medical Sciences, Hebron University)* Measurement of P53 and P53 autoantibodies in breast cancer patients in southern West-Bank, Palestine and the associated risk factors of the disease ***Leen Humos*** *(Department of Biology and Biochemistry, Birzeit University)* Antitumor effects of microwave intratumor therapy using magnetic ferucarbotran nanoparticles on breast cancer xenografts ***Ayman Salman*** *(Palestinian Neuroscience Initiative, Al-Quds University)* Rule vs. contextual generalization: insights into hippocampal-entorhinal involvement in posttraumatic stress disorder (PTSD)
Session II – Cellular and Molecular Pathophysiology **Moderator:** *Dr. Yaqoub Ashhab, Palestine Polytechnic University*	
12:30-12:45	**Characterizing Goal-Directed Behavior in Children with Attention-Deficit/Hyperactivity Disorder** *Anfal A.AbuHilal* Palestinian Neuroscience Initiative, Al-Quds University, Jerusalem, Palestine
12:45-13:15	**The clinical utility of cell-free DNA methylation for predicting breast cancer recurrence** *Dr. Budour Salhia* Department of Translational Genomics, University of Southern California, USA
13:15-13:35	**Single molecule quantification of trastuzumab-bound HER2 in patient breast cancer cells** *Dr. Tijana Jovanović-Talisman* Department of Molecular Medicine, City of Hope, California, USA
13:40-15:00	**Lunch Break, Round Table Discussion & Poster Session II (Including coffee)**
Session III – Microbiology & Molecular Genetics **Moderator:** *Dr. Musa Hindiyeh, Caritas Baby Hospital, Bethlehem*	
15:00-15:15	**Investigation of the re-emerging Brucellosis after 2015 in Hebron governorate using multiple-locus variable-number tandem-repeat analysis (MLVA)** *Bessan Aljanazreh* Palestine Korea Biotechnology Center, Palestine Polytechnic University, Hebron, Palestine
15:15-15:30	**Antibiotic resistance of bacterial strains isolated from patients with community-acquired urinary tract infections: A national study from Palestine** *Khaled Z. Badareen* Palestinian Ministry of Health, Hebron University, Hebron, Palestine
15:30-15:55	**Inherited mutations In the DNA helicase RTEL1 compromise telomere elongation by telomerase In Hoyeraal-Hreidarsson syndrome** *Aya Awad** **Knock-in mice models carrying missense mutations in the DNA helicase RTEL1** *Riham Smoom** *Department of Genetics, Jerusalem
Session IV – Cellular Models of Breast Cancer **Moderator:** *Dr. Zaidoun Salah, Al-Quds-Bard College, Al-Quds University*	
15:55-16:10	**Generating cellular model for studying novel mechanisms of transcriptional reprogramming in breast carcinogenesis** *Yousef S. Torman* Department of Biology, Al-Quds-Bard College for Arts and Sciences, Al-Quds University
16:10-16:30	**BRCA1 mutation and related tissue microenvironments drive acceleration of aging phenotypes in mammary epithelia.** *Dr. Sundus Shalabi* Department of Population Sciences, City of Hope, California, USA
16:30-17:00	**Closing Session: Concluding Remarks & Awards**

ABSTRACTS

SESSION I: GENETICS AND EPIGENETICS

Moderator: Dr. Nouar Qutob-Hussein, Arab American University

Nouar is a graduate of University of Cambridge with a Ph.D. in Population Genetics. Her Ph.D. work focused on the Major Histocompatibility Complex (MHC) in humans, a key component of the immune system of vertebrates. Her research showed that the MHC diversity is the product of both past demography and complex selective processes with the likely involvement of coevolution with KIR genes. Following her Ph.D., she worked as an Assistant Professor at Al-Quds Bard Honors College. She then started a post doctorate fellowship at the Weizmann Institute of Science and joined the field of Cancer research. Her research involved integrating genetics with in-depth functional assessment of mutations to comprehensively identify and evaluate genes that are affected by somatic mutations in Melanoma, the deadliest skin cancer. She has a number of publications in the field including the identification of RGS7 and RASA2 which was patented in the US. Her experience as a postdoctoral fellow strengthened her conviction to pursue cancer research and decipher the mutation spectrum in Palestine in order to further our understanding of its etiology and improve treatment. She has recently joined the Arab American University as an Assistant Professor. Nouar is the vice-president of PFMR and will be presenting the session on Genetics and Epigenetics, which consists of the following abstracts.

CLINICAL EXOMES AND GENETIC HETEROGENEITY IN THE PALESTINIAN POPULATION

Lara Kamal[1*], Fouad Zahdeh[2], Christina Canavati[2], Grace Rabie[2], Hanin Kassem[1], Dania Dajani[1], Amal Abu-Rayyan[1] and Moien Kanaan[1, 2]
[1]Molecular Genetics Laboratory, Istishari Arab Hospital, Ramallah, Palestine.
[2]Hereditary Research Laboratory, Department of Biological Sciences, Bethlehem University, Bethlehem, Palestine.
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Clinical whole exome sequencing (WES) is increasingly used for diagnostic evaluation of patients with a potentially genetic disorder. Here, we present our experience with clinical exome sequencing in the Palestinian population of 550 unrelated patients who were referred to us between 2017 and 2018 with broad range of clinical indications ranging from syndromic or non-syndromic, dominant or recessive, and congenital or later onset and utilized the consented data in order to describe Palestinian exonic variation architecture. Coverage of 45 Mb of exonic content was captured on NextSeq 500. The probe set was designed to enrich 214,405 exons. After sequencing, data was uploaded onto our server and reads were aligned to the reference human genome (hg19) using BWA aligner. The final list of variants was annotated by Annovar. Variants with low coverage, synonymous, predicted benign (SIFT, PolyPhen-2, REVEL) and MAF>0.1% were filtered out. All genetic inheritance patterns were evaluated, confirmed by Sanger sequencing and co-segregation analysis. A total of 362 cases (70.5%) were solved, of which 267 cases were autosomal recessive, 68 cases were autosomal dominant, 22 cases were X-linked and 5 cases were CNVs. We found ~150,000 single nucleotide variants (SNVs), 7% of which are rare variants. A total of ~5,000 (3%) SNVs are novel, previously not catalogued in 1KGenomes Project, ExAC or NCBI Reference Assembly dbSN. Taken together our results show the significant impact of WES in genetic diagnosis, clinical management, reduction of genetic diseases incidence rate and setting up an in-house population specific database for pathogenic versus benign variants.

MOLECULAR CHARACTERIZATION OF β-THALASSEMIA INTERMEDIA IN THE WEST BANK, PALESTINE

Rashail Faraon[1*], Mahmoud Daraghmah[2], Fekri Samarah[3] and Mahmoud A. Srour[1,4]
[1]Department of Medical Laboratory Sciences, Al-Quds University, East Jerusalem, Palestine
[2]Palestine Thalassemia Patients' Friends Society, Al-Bireh, Palestine
[3]Department of Medical Laboratory Sciences, Arab-American University, Jenin, Palestine
[4]Department of Biology & Biochemistry, Birzeit University, Birzeit, Palestine
Corresponding Author: Dr. M.A. Srour, Email: msrour@yahoo.com
*Presenting Author: Rashail Faraon, Email: rashail_faraon@yahoo.com

We aimed to determine the spectrum of β- and α –globin gene mutations and *Xmn*I polymorphism of Gγ-globin gene in β-Thalassemia intermedia (βTI) patients in the West Bank region as well as to evaluate the management practices of those patients.

This was a case series multi-center study. A total of 51 cases of βTI were enrolled. Complete blood count and hemoglobin electrophoresis were evaluated. DNA sequencing was used to analyze β-globin gene mutations. Common α-globin gene mutations were screened by Gap-PCR ($-\alpha^{3.7}$, $-\alpha^{4.2}$, $--^{MED}$, $\alpha\alpha\alpha^{anti3.7}$) or DNA sequencing (α2-IVS II 5 nt del). *Xmn*I -158 C>T polymorphisms of Gγ-globin gene was determined by RFLP-PCR.

Seven β-globin gene mutations were observed among the βTI patients, namely IVS-I -6 C>T, IVS-I-110 G>A, IVS-II-1 G>A, IVS-I-1 G>A, Codon 37 Trp>Stop, B -101 and IVS-II-848 C>A. Ten genotypes were observed. Homozygosity for IVS-I-6 accounted for the majority of βTI cases with a frequency of 74.5%. The second common β-globin gene genotype among study patients were homozygote IVS-I-110 G>A (5.8%) and homozygote IVS-II-1 G>A (5.8%). The remaining seven genotypes were each detected in about 2% of patients. α-Thalassemia mutations were seen in five patients (9.8%), and included ($-\alpha^{3.7}$, $\alpha\alpha\alpha^{anti3.7}$ and α2-IVSI 1-5 nt del). *Xmn*I polymorphism was observed in four patients (7.8%), three homozygotes and one heterozygote.

Inheritance of the mild β-globin gene homozygote IVS-I-6 allele was the major contributing factor for the βTI phenotype among the study subjects. The role of *Xmn*I SNP and α-thalassemia mutations in ameliorating the βTI phenotype was observed in few patients for each factor. The beta -101 C>T mutation was diagnosed in one patient in homozygote state for the first time in Palestine. The study results will positively affect the health management of βTI patients in Palestine

POTENTIAL TREATMENT FOR DIABETES TYPE 1 IN WOLFRAM SYNDROME 2 PATIENTS; USING IRON CHELATOR AND ANTIOXIDENT COMBINATION

Ola Karmi[1*], Yang-sung Sohn[1], Henri-Baptist Marjault[1], Ioav Cabantchik[1], Ron Mittler[4], U. Najwa Abdulhaq[2], Gil Leibowitz[3], David H. Zangen[2] and Rachel Nechushtai[1]
[1]Alexander Silberman Institute of Life Sciences & [2]Medical Center at Mt Scopus and [3]Ein Kerem, Jerusalem
[4]Christopher S. Bond Life Sciences Center, University of Missouri, USA
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The human NEET proteins, mainly NAF-1, are involved in several diseases; including diabetes, neurodegeneration, cardiovascular abnormalities, skeletal muscle maintenance, cancer, aging and longevity. Homozygous mutation in the NAF-1 encoding gene, *cisd2* which located on chromosome 4q22-24, causes an autosomal recessive disorder named Wolfram Syndrome Type-2 (WFS-T2). The mutation leads to exon skipping, frame shift and premature stop codon leading to an inherited multi-organ disorder. In 2007; a genetic study of three Jordanian families, identified a single missense mutation at nucleotide 109 that converts G⟶C, causing an amino acid change from Glutamic acid to Glutamine (E87Q). This mutation appears to be abundant in our regional local populations [1]. However, since 2007 there were several mutations in the *cisd2* gene, affecting NAF-1 protein expression or structure, characterized also to cause WFS-T2. Mainly WFS-T2 characterized by optical atrophy, deafness and β-cell dysfunction that results from cellular stress and apoptosis leading to sever insulin deficiency causing diabetes type I-like

phenotype.
NAF-1 protein is localized at the outer mitochondrial membrane also located at the Endoplasmic Reticulum and the ER-mitochondrial associated membranes. Abnormalities associated with this protein, affect the cellular integrity that facilitates stress of the cellular and whole organism metabolism. NAF-1 shown to be involved in Fe/Fe-S/ROS/Ca^{+2}/redox homeostasis, but mainly suppressing of NAF-1 protein expression (via shRNA); results in maldistribution of cellular iron, that causes oxidative damage with ensuing the key cellular processes of autophagy, mitophagy, ferroptosis and apoptosis. This suggests that NAF-1 could have a more pronounced regulatory role in cells [2].
In respect to the role of NAF-1 in Fe/Fe-S/ROS hemostasis, we hypothesized that mitochondrial iron/ ROS accumulation has a pathophysiological role in WFS-T2 and this may constitutes a potential pharmacological target. Using well-known treatments of an iron chelator or antioxidant or with a combination of both. Skin fibroblasts of four different patients were analyzed confirmed the absence of NAF-1. In addition, β-pancreatic cellular model (INS-1E) of WFS-T2 generated via shRNA against NAF-1 protein. Results appears to show mitochondrial labile Iron/ROS accumulation. Moreover, supports the conclusion that NAF-1 is critical for securing a correct distribution of Fe/Fe-S between the mitochondria and cytosol. By combining optimized levels of the both treatments, we got a complete correction of the mitochondrial destruction membrane potential, mitochondrial labile iron and ROS levels in the WFS-T2 patient cells or the β-pancreatic cellular model. Overall, we got a complete correction for the insulin production levels in the β-pancreatic cellular model.

REFERENCES

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[2] Mittler, Ron, et al. "NEET proteins: A new link between iron metabolism, reactive oxygen species, and cancer." *Antioxidants & redox signaling* (2018).

NOVEL MUTATIONS IN NPRL3 GENE IN TWO PALESTINIAN FAMILIES WITH FAMILIAL FOCAL EPILEPSY WITH VARIABLE FOCI

Christina Canavati[1*], Karl Martin Klein[2], Zaid Afawi[3], Manuela Pendziwiat[4], Amal Abu Rayyan[1], Lara Kamal[1], Fouad Zahdeh[1], Ingo Helbig[5], and Moien Kanaan[1]
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Familial focal epilepsy with variable foci (FFEVF) is an epilepsy syndrome with autosomal inheritance due to mutations in genes forming the GATOR1 complex (*DEPDC5*, *NPRL2* and *NPRL3*) [1]. Here, we identify the genetic basis of two families segregating heterogeneous focal epilepsy phenotypes consistent with FFEVF, and expand the associated phenotypic spectrum to more severe malformations of cortical development (MCD). Two unrelated multiplex Palestinian families – one large family with ten affected members, and the other with five affected members, underwent detailed phenotyping over three generations. Whole-exome sequencing and high-resolution single nucleotide polymorphism (SNP) array mapping were carried out. The phenotypic spectrum of the two families varied from non-lesional focal epilepsy including nocturnal frontal lobe epilepsy and temporal lobe epilepsy to severe structural epilepsy due to hemimegalencephaly. Whole-exome sequencing and SNP array analysis revealed two pathogenic variants in *NPRL3*, one *de novo* nonsense variant (p.Gln355*) within exon 12 of NPRL3 and a partial 38-kb deletion encompassing 7 exons and the 3'-untranslated region (3'-UTR) of the *NPRL3* gene. Our results implicate the association of *NPRL3* for the first time with hemimegalencephaly, a severe MCD, expanding the phenotypic spectrum of *NPRL3* in FFEVF and underlining the fact that partial deletions are part of the genotypic spectrum of *NPRL3* mutations.

REFERENCE

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THE CLINICAL UTILITY OF CELL-FREE DNA METHYLATION IN BREAST CANCER RECURRENCE

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A number of clinico-pathological criteria and molecular profiles have been used to stratify patients into high and low risk groups. Currently, there are still no effective methods to determine which patients harbor micrometastatic disease after standard breast cancer therapy and who will eventually develop local or distant recurrence. In the last few years, circulating cell-free (cf)DNA has attracted attention for clinical use in the context of risk prediction, prognostication and prediction of response to chemotherapy in human cancer. Various types of DNA alterations have been reported in cfDNA including, point mutations, microsatellite instabilities, loss of heterozygosity and DNA methylation. Specifically, aberrant DNA methylation is among the earliest and most chemically stable molecular alterations in cancer, making it a potentially useful biomarker for early detection or risk prediction. The purpose of our study was to identify circulating DNA methylation changes that can be used for prediction of metastatic breast cancer (MBC). Plasma cell-free (cf)DNA from 40 MBC patients, 40 disease free survivors (DFS), and 40 healthy individuals (H) was analyzed by whole-genome bisulfite sequencing (WGBS) and differential analysis performed between groups (1). Targeted bisulfite amplicon sequencing was used as a validation strategy. Differential methylation analysis revealed ~5.0x106 differentially methylated CpG loci in MBC compared with H or DFS. In contrast, there was a strong degree of similarity between H and DFS. Overall, MBC demonstrated global hypomethylation and focal CpG island hypermethylation. Data analysis identified 21 novel hotspots, within CpG islands, that differed most dramatically in MBC compared with H or DFS. This first unbiased analysis of cfDNA identified 21 DNA hypermethylation hotspots associated with MBC, and demonstrated the ability to distinguish tumor-specific changes from normal-derived signals at the whole genome level. This signature is a potential blood-based biomarker that could be advantageous at the time of surgery and/or after the completion of chemotherapy to indicate patients with residual micrometastatic disease at high-risk of recurrence, and who could benefit from additional therapy.

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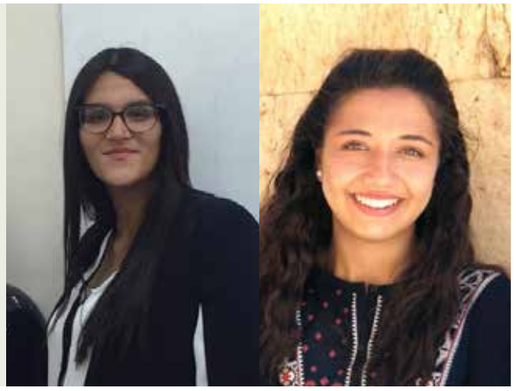
POSTER TEASERS SESSION



Moderators: Yara Khodour and Muna Abed Rabbo, Department of Biology and Biochemistry, Birzeit University

Yara and Muna are members of Dr. Johnny Stiban's research group at the department of biology and biochemistry at Birzeit University. Yara is graduating at the end of the semester and Muna is in her third year. Yara is currently writing a book chapter with Dr. Johnny on iron-sulfur clusters in nucleic acid metabolism to be published in the prestigious book series "The Enzymes". Muna is currently working on initiation and treatment of breast cancer in mouse models.

RELATIONSHIP BETWEEN GENE POLYMORPHISM AND TYPE 2 DIABETES IN A PALESTINIAN POPULATION: A STUDY OF FIVE GENE POLYMORPHISMS

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Type 2 Diabetes Mellitus (T2DM) is a multifactorial disease that results from the interaction between multiple genetic and environmental factors. Its prevalence rate in Gaza Strip is alarming. Human genome studies revealed many T2DM-associated genetic polymorphisms in various populations. Among the genes polymorphisms that were strongly associated with diabetes are (*KCNQ1 rs2237892*), (*KLF14 rs972283*), (*ZBED3 rs4457053*), (*COL8A1 rs792837*), and (*FTO rs8050136*).

To investigate the association between (*KCNQ1 rs2237892*), (*KLF14 rs972283*), (*ZBED3 rs4457053*), (*COL8A1 rs792837*), and (*FTO rs8050136*), genes polymorphisms and T2DM in Males Palestinian Population.

In this case-control study, 100 T2DM male patients and 100 control men were examined. The two groups were genotyped for the five genes polymorphisms using restriction fragment length polymorphism-PCR (RFLP-PCR) and Allele Specific (AS-PCR) techniques. Body mass index (BMI), glycated hemoglobin (HbA1c), insulin (C-peptide), total cholesterol, triglycerides, high density lipoprotein cholesterol (HDL-c), and low density lipoprotein cholesterol (LDL-c) were measured for all the study participants. The relation between the five genes polymorphisms, T2DM and the measured clinical parameters were statistically analyzed using appropriate tests.

Among the tested polymorphisms, significant association were evident between *KLF14* "GG" genotype (P-value = 0.014), *FTO* "CC" genotype (P-value = 0.043), and *COL8A1* TC genotype (P-values= 0.015) and increased risk of T2DM. The *KLF14* G-containing genotypes exerted significant effect on lowering HDL-c (P-value = 0.026) and on elevating LDL-c (P-value = 0.045) and cholesterol level (P-value = 0.042) in the control group. The *FTO* "CC" genotype showed a significant effect on raising HbA1c level in the patients (P-value = 0.007). *KCNQ1* (rs2237892 T>C), *ZBED3* (rs4457053 A>G) and *COL8A1* (rs792837 T>C) genotypes did not reveal significant effects on the tested parameters.

KLF14 "GG", *FTO* "CC" and *COL8A1* C allele and "TC" genotypes are significantly associated with T2DM in the investigated population. *KLF14* "GG" and "AG" have an association with the levels of HDL-c, LDL-c and Cholesterol in control subjects. The HbA1c level was significantly higher in patients with the *FTO* "CC" genotype. The study recommends confirming the obtained results on a larger sample and examining the association of other genes polymorphisms with T2DM in Palestinian Population.

EXPLORING NURSES UNDERSTANDING OF AND ATTITUDES TOWARD INCIDENT REPORTING. CASE STUDY: A GOVERNMENTAL HOSPITAL IN THE WEST BANK

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Healthcare practitioners are viewed to be 'perfect' and are expected to provide treatments that are free from any errors, due to this point of view this attitude limits the chances of error reporting by these professionals. Consequently, human performance is not perfect and errors should be anticipated as this will lead to greater chances of prevention. Therefore, in safety-critical industries such as healthcare, the presence of a reporting and learning system plays a significant role in making healthcare organizations successful.

The Ministry of Health (MoH) in Palestine has undertaken many endeavours to improve the quality of the delivered services as well as to improve and maintain the safety in
Palestinian hospitals. This study explored nurses' understanding and attitudes towards incident reporting, and took a place in a governmental hospital - the largest hospital in the West Bank. As a teaching hospital, the support and training provided for nurses regarding incident reporting will give an indication whether the level of training and support enhances nurses understanding of incident reporting as well as their likelihood to report.

A qualitative method employing semi-structured interviews was used in the completion of this study. These interviews were conducted with twelve nurses from different departments with different seniorities and years of experience. The study targeted nurses because they have direct contact with patients when providing treatment care, as their role prioritizes maintaining safety for patients and providing a high-quality service. They also have a key role in monitoring care quality and are required by their professional body to raise concerns regarding care service standards. The key findings are as follows: • Lack of knowledge and understanding regarding the benefits of reporting incidents and errors; • Prevailing culture of blame still exists and is highly dominant in Palestinian hospitals. • Lack of training as nurses often do not know what to report and they do not want to waste time reporting unimportant matters. • Lack of transparency in communication and feedback given. • Workload and lack of staff involvement resulted in nurses either not having the time to report incidents or eventually forgetting.

POSTOPERATIVE INTESTINAL INTUSSUSCEPTION IN INFANTS: AN EASILY MISSED CAUSE OF POSTOPERATIVE OBSTRUCTION

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Intestinal intussusception is the most common cause of intestinal obstruction and abdominal emergency in infants and children younger than two years of age. The incidence ranges from 30 to 70 cases per 100,000 live births with higher rates in Asian countries. Several causes lead to intestinal intussusception, though it is largely idiopathic in origin. However, some seldom causes are proposed including postoperative intestinal intussusception. While postoperative intestinal intussusception is a rare cause of intestinal obstruction with reported prevalence after laparotomies of 0.01 to 0.25%, the postoperative intussusception after ilio-colic intussusception is an extremely rare cause of postoperative intestinal obstruction. Postoperative intestinal intussusception was reported to follow many abdominal and non-abdominal operations with a high predilection rate of 51.2% for gastrointestinal tract-involving procedures. Frequently, postoperative intestinal intussusception presents with greenish vomitus, high nasogastric tube output, abdominal pain and distension during the first two weeks in 90% of patients. A late diagnosis of postoperative intestinal intussusception can have a tremendous risk of ischemia and necrosis. It also increases the morbidity

and mortality, rendering the early diagnosis and prompt management as life-saving.

Because postoperative intestinal intussusception is a forgotten cause of postoperative obstruction, and to increase the awareness of this rare entity, we present two cases of postoperative ileo-ilial intussusception and one case of postoperative ileo-colic intussusception followed different primary operations. We reviewed the medical charts retrospectively for the last ten years for patients with postoperative intestinal intussusception at Palestine Red Crescent Society Hospital, Hebron, Palestine.

Two cases of postoperative ileo-ilial intussusception and one case of postoperative ileo-colic intussusception followed different primary operations were presented. We reviewed the literature and presented characteristics of the most reported cases of postoperative ileo-colic intussusception in a comprehensive table, including presenting symptoms and signs, initial diagnosis, primary operation, interval to reoperation, and complications.

Postoperative intestinal intussusception is challenging in diagnosis and need a high index of suspicion for diagnosis, mainly due to its rarity, atypical presentation, and the abundance of postoperative adynamic ileus. Most often, postoperative intestinal intussusception is misdiagnosed as postoperative adhesive obstruction. By keeping the possibility of postoperative intestinal intussusception in mind, one can easily diagnose it and prevent its sequential risks.

THE ASSOCIATION BETWEEN ADHERENCE AND BELIEFS ABOUT MEDICATIONS AMONG PATIENTS WITH ISCHEMIC HEART DISEASE: A CROSS SECTIONAL STUDY FROM PALESTINE

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optimal medication adherence in patients with ischemic heart disease (IHD) is very important to prevent cardiac events and decrease the rate of mortality. Patients' beliefs about medicines are one of the most important factors that may affect adherence. The aims of this study are to measure adherence to medications among Palestinian ischemic heart disease patients, and to find the effect of some patient factors and medication beliefs on their medication adherence.

the study was a cross-sectional study among patients in governmental outpatient clinics, information was obtained from patients by a face to face interview and from medical files. The Morisky Medication Adherence Scale- 8 questions (MMAS-8) and Beliefs about Medicines Questionnaire (BMQ) were used to measure medication adherence and patients' beliefs about medicines respectively.

a total of 400 patients were included in the study, mean age ± standard deviation was 62.35± 9.30 years. Most patients 348(87.0%) had comorbid conditions. The majority 304 (76.0%) of patients were using at least 5 medicines. According to MMAS-8 score, 195 (48.8%) of participants were non-adherent to their medicines (adherence score < 6) and 205 (51.3%) were adherent (adherence score ≥ 6). Multivariable analysis showed that patients who had others disease (comorbid conditions) had higher odds (O.R=2.316(95%CI (1.192-4.499)) of being non-adherent. patients who had higher concerns about medicines had higher odds (O.R=1.124(95%CI (1.063-1.188)) of being non-adherent, also patients who had positive harmful beliefs of medications had higher odds (O.R=1.092(95%CI (1.018-1.171)) of being non-adherent. On the other hand, Patients who had positive beliefs of medication necessity had lower odds (O.R=0.902(95%CI (0.847-0.960)) of being non-adherent.

Poor adherence was very common among Palestinian IHD patients. Stronger positive beliefs about necessity of treatment was associated with lower non-adherence while high concerns of long term use of medicines or harmful effects of medications were associated with higher non-adherence, which emphasizes the importance of patients' beliefs about medicines in medication adherence.

DEVELOPMENT AND EVALUATION OF ALLICIN (GARLIC EXTRACT) AND VITAMIN D CONTAINING FORMULATIONS FOR THE TOPICAL ENHANCEMENT OF HAIR GROWTH

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Hair is one of the main accessories in human beings. People who have healthy and glamorous hair are more assure of themselves and proud of their appearance. A known problem suffered by many youngsters is the lack of hair growth on parts of their heads and beards. In order to address this problem, potential pharmaceutical products may be used to increase the rate of hair growth in these hairless patches. The main purpose of this study was to evaluate the effects of a cream containing natural excipients on the rate of hair growth in rats. In this project, hair growth rate in rats was monitored in order to study the effects of the following ingredients (allicin (garlic extract), vitamin D and coconut oil) separately and their combinations in the cream. For these purposes, six formulations were prepared:(i) control cream, (ii) cream containing allicin powder, (iii) cream containing vitamin D, (iv) cream containing fresh garlic juice, (v) cream containing both fresh garlic juice and vitamin D, and (vi) cream containing both allicin powder and vitamin D. The coconut oil was used as the base in all creams. These formulations were applied on six albino male rats after shaving their hair. Six rats were divided in two groups of three rats, one group for garlic juice creams and the other with allicin powder creams. Each cream was applied on one-quarter of rat body. The cream was applied once daily for two weeks. At the end of the first week of treatment, hair growth rate was assessed by measuring the lengths of ten hairs taken from each quadrant. Another length reading was obtained after the second week. Compared to the control cream, all experimental creams increased the rate of hair growth significantly(p<0.05). Interestingly, allicin cream had the greatest effect on hair growth rate compared to the remaining creams (mean difference 3.01600). The results demonstrate a novel approach to induce hair growth in skin patches with very limited hair. This project has a potential to patent a new cream into the market that can be used to induce hair growth.

HRAS G12V TRANSFORMATION EFFECT ON MCF10A CELLS HARBORING DIFFERNT P53 VARINTS

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On one hand, different types of cancer share some common phenotypes called "the cancer hallmarks", on the other hand it is well established that cancer is a very heterogeneous disease. This paradigm splits cancer treatment strategies between either targeting the common phenotypes or using tailored therapy specific for each cancer patient "personalized medicine". Here we hypothesized that high throughput analysis of different cancer cell transformation models would uncover, both, common changes that can be used as either diagnostic biomarkers or treatment targets, as well as model specific alterations that can be used as targets for personalized medicine. To test our hypothesis, we aimed to establish different and variable breast cancer cell transformation models by manipulating the expression of different oncogenes and tumor suppressor genes. As a proof of concept, we overexpressed *HRAS G12V* oncogene in MCF10A normal mammary gland cells harbouring different *TP53* variants. To do so, we re-introduced different *TP35* variants to *TP53* Knockout MCF10A cells. In all different *TP53* and *HRAS G12V* combinations, *HRAS G12V* induced cell proliferation, migration, EMT, cell survival, resistance to apoptosis, and cell tumorigenicity *in vitro*. Upon checking the expression level of different genes related to those phenotypes, we noticed a differential and heterogeneous expression pattern of these genes. In certain cases, we noticed a cell model specific expression pattern of certain genes, while in others the expression pattern was similar and common between different cell models. In conclusion, our approach can be a useful one for searching for new biomarkers and targets for breast cancer diagnosis and therapy.

A FOUNDER MUTATION IN THE TP53 GENE AND ITS PREVALENCE IN PALESTINIAN BREAST CANCER PATIENTS

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Germline TP53 mutations predispose to multiple cancers and are associated with Li-Fraumeni syndrome (LFS). Breast Cancer is one of the cancers diagnosed in TP53 mutation carriers. The founder mutation TP53 p.R181C is the most frequent mutation observed in our cohort. It was detected in 1% (9/919) of patients in which allele-specific testing has been completed. Its prevalence assessed in two groups: (1) "discovery series" includes 515 women diagnosed by age 40 or with familial breast or ovarian cancer and (2) "older-onset sporadic patient series" includes 401 women diagnosed after age 40 and with negative family history. The mutation was significantly enriched in the discovery series and was responsible for 15% of breast cancers among young onset or familial patients. None of the TP53 p.R181C families in our series fulfill clinical criteria for LFS.

The mutation risk assessment includes genetic testing of affected and unaffected relatives among carrier families. Segregation of this mutation has been tested in 7/9 families. Of the tested family members, including probands 36/66 (54.4%), including 7 males were TP53 p.R181C carriers. This mutation is significantly more frequent in breast cancer cases vs. healthy Palestinian controls (P=0.01), suggesting increased breast cancer risk in carriers. Direct penetrance analysis for breast cancer in female carriers is being performed using Kaplan-Meier survival. Censoring is at age of diagnosis in affected women and at age of last follow-up in unaffected women. Current breast cancer risk estimates are 6.5% (SE 4.5%) by age 30 years, 18% (SE 7.5%) by age 40 years, 37% (SE 10%) by age 50 years and 58% (SE 18.5%) by age 60 years.

Pathological features of tumors were studied in seven TP53 p.R181C carriers. In addition to standard histopathological information (age, stage at diagnosis, tumor histology and grade, hormone receptor and Her2 status) TP53 staining was also examined, and tested for somatic TP53 mutations using the Illumina TruSight Tumor 15 panel. TP53 staining was present in 4/8 tumors, but high (> 50%) in only 1/8, perhaps reflecting the hypomorphic nature of the p.R181C mutation. Somatic, damaging TP53 mutations were found in 4/6 tumors tested, and in 2/6 more than one somatic mutation was identified. All tumors tested also harbored the germline p.R181C mutation in the heterozygous state. These preliminary results suggest that perhaps point mutations are more common as the second hit in TP53 p.R181C-related tumors.

In conclusion, TP53 p.R181C predisposed specifically to breast cancer with incomplete penetrance, and not to other Li-Fraumeni cancers.

MEASUREMENT OF P53 AND P53 AUTOANTIBODIES IN BREAST CANCER PATIENTS IN SOUTHERN WEST-BANK, PALESTINE AND THE ASSOCIATED RISK FACTORS OF THE DISEASE

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Breast cancer (BC) is the most common cancer among Palestinian women[1]. P53 is a known tumor suppressor protein, which is often mutated in BC. P53 gene mutation leads to overexpression of nonfunctional p53 protein. Abnormally high level of mutated p53 and p53 autoantibodies are found in 30% of BC patients. In addition, there are many possible risk factors contributed to BC. This study is aimed to determine the concentration of p53 and p53 autoantibodies in the serum of BC patients as well as to identify different risk factors associated with BC.

Blood samples of 45 BC patients and corresponding controls were collected from Al-Hussein Hospital in Beit-Jala and Alia Hospital in Hebron. P53 and P53 autoantibodies levels were analyzed by ELISA. Moreover, a case-control study of 91 BC women was compared to 91 aged-matched women control group. They were interviewed using a structured questionnaire to evaluate different risk factors such as family history and smoking. The questionnaire was valid and reliable for most of the questions.

High level of P53 (0.49 ng/ml) was detected in 58% of the BC patients compared to control (0.17 ng/ml), however, P value was not significant. The P53 autoantibodies were significantly raised (p value=0.025) in 13% of the BC patients with mean value of 405.5 U/ml compared to the cut off value (120 U/ml), whereas 23% of the patients were defined as critical (77.3 U/ml, critical value= 60-120 U/ml). We further analyzed the questionnaire and found significant differences in active smoking (p=0.006), parity (p=0.016), and age (p=0.001). In contrast, no significant differences were observed in other factors such as family history and diabetes.

The current study suggests that P53 autoantibodies could be useful biomarker for BC assessment. In addition, preventions should be taken for certain habits in the Palestinian community such as smoking which may have an impact on the incidence of BC disease.

ANTITUMOR EFFECTS OF MICROWAVE INTRATUMOR THERAPY USING MAGNETIC FERUCARBOTRAN NANOPARTICLES ON BREAST CANCER XENOGRAFTS

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Breast cancer is the most frequent type of cancer encountered by women globally. It is amongst the leading causes of death in women worldwide with an estimated 627,000 deaths in 2018, approximating around 15 % of all cancer deaths in women. The conventional treatments used in breast cancer include: surgery, radiotherapy, chemotherapy, or a combination of these methods. However, all these treatment modalities have their own drawbacks including but not limited to: severe side effects, invasiveness, cosmetic damage, relapse and resistance. From here arose the need for new and enhanced treatment options. One of the treatment options that has been under study recently is thermal ablation therapy. Thermal ablation therapy employs high temperatures to produce an enhanced heating zone covering tumor cells leading to cytotoxicity and cellular death. It has found application in several techniques amongst which are nanoparticles and electromagnetic ablation. To evaluate the potential of this technique for minimally invasive treatment, we carried out a systematic analysis of its effects on an experimental breast cancer xenograft model in BALBc mice. Tumors were induced by subcutaneous injection of a murine breast cancer cell line. Mice were randomly allocated to three groups, including controls. Animals received one electromagnetic radiation treatment following a single intratumoral injection of dextran-coated iron oxide nanoparticles. The effectiveness of the treatment was determined by measuring tumor regression and by the survival time of the animals. Electromagnetic radiation with dextran-coated iron oxide nanoparticles led up to more than a 4-fold prolongation of survival over controls. In more than 50% of all animals, tumors regressed and disappeared as early as 4 days post-treatment. This new technology is non-invasive, selective and safe and shows high efficacy in preclinical models. It is suitable for clinical use and may be a novel strategy to treat breast cancers as well as other cancers.

RULE VS. CONTEXTUAL GENERALIZATION: INSIGHTS INTO HIPPOCAMPAL-ENTORHINAL INVOLVEMENT IN POSTTRAUMATIC STRESS DISORDER (PTSD)

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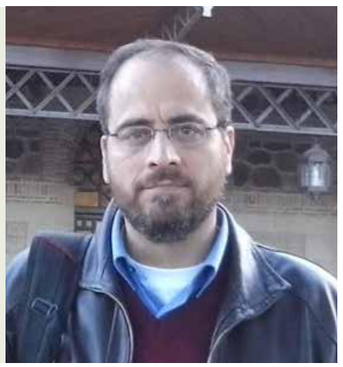
Posttraumatic Stress Disorder (PTSD) is a common but serious psychiatric illness that occurs as a result of exposure to a traumatic event. PTSD is assessed as a function of three main symptoms, re-experiencing, avoidance, and hyper-arousal. Individuals with PTSD show an overgeneralization of past traumatic when they encounter similar contexts and commands. Prior studies demonstrated that individuals with PTSD exhibit structural and functional changes in the hippocampus and the entorhinal cortex. Rodent studies showed that lesions in the entorhinal cortex but not the hippocampus impair generalization of learned rules. On the other hand, lesions in the hippocampus impair contextual generalization. In this study, we used two computer-based cognitive tasks that measure contextual generalization through sequence learning, and rule generalization through acquired equivalence. We tested 251 subjects; 43 with PTSD, 31 trauma-exposed without PTSD, and 177 healthy controls. All trauma-exposed subjects were administered the clinician-administered PTSD scale IV (CAPS-IV) to quantify re-experiencing, avoidance, and hyper-arousal. Subjects with PTSD and trauma-exposure made significantly more errors in rule generalization than healthy controls. Individuals with PTSD showed a significant but negative relationship between avoidance and hyper-arousal symptoms and rule generalization errors; the higher the severity of symptoms the better the performance in rule generalization. Individuals with trauma-exposure without PTSD did not show the same correlational pattern. There was no difference between groups in contextual generalization. Further, there were no correlations between CAPS scores (or re-experiencing, avoidance, and hyper-arousal scores) and performance in contextual generalization across groups. These differences shed the light on the importance of the medial temporal lobe in the pathogenesis of PTSD. Higher severity of PTSD symptoms was associated with better performance in rule generalization, a potential reflection of higher functionality of the entorhinal cortex. The absence of a cognitive effect in contextual generalization alongside the key role of the entorhinal cortex as a neural gateway might argue against the direct involvement of the hippocampus. These results warrant further evaluation of the dissociable roles of the entorhinal cortex and the hippocampus in cognition and the pathogenesis of PTSD.

SESSION II: CELLULAR AND MOLECULAR PATHOPHYSIOLOGY



Moderator: Dr. Yaqoub Ashhab, Palestine Polytechnic University

Dr. Ashhab received his Ph.D. in molecular immunology from the Autonomous University of Barcelona in 1998. In 1999, he joined the Hematology Department of Hadassah Medical Center to do his postdoctoral research. During his postdoc, he discovered and characterized the BIRC7 gene, a new member of the IAP family. In 2006 he joined Palestine Polytechnic University to lead the establishment of a biotechnology research unit. He is currently an associate professor of molecular biology and the director of Palestine-Korea Biotechnology Center. His main academic interest is to build a network to establish bioinformatics training and research models in developing countries. His research interest is using multi-omics data to discover new biomarkers and using immunoinformatics methods to study host pathogen interaction in order to develop effective vaccine delivery system. He is chairing the second session on cellular and molecular pathophysiology.

SINGLE MOLECULE QUANTIFICATION OF TRASTUZUMAB-BOUND HER2 IN PATIENT BREAST CANCER CELLS

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Antibody Herceptin® (trastuzumab) has drastically improved the prognosis of HER2-positive breast cancer patients. Patient eligibility for this therapy relies on the assessment of HER2 using fluorescence *in situ* hybridization (FISH) and immunohistochemistry. Limitations in both of these tests include variability and relatively long processing times. Additionally, neither test offers information on the extracellular domain of HER2. While this domain is required for the binding of trastuzumab, in number of patients it is found truncated or sterically hindered. We have developed a quantitative single molecule localization microscopy (qSMLM) approach to directly assess trastuzumab-bound HER2 [1]. HER2 density and organization were quantified in freshly excised breast cancer tissues. A touch prep method was used to image large areas of intact cell membranes. With eleven tissue samples, HER2 copy numbers via FISH were significantly correlated with detected HER2 densities via qSMLM. Tumor heterogeneity was also assessed with touch prep-qSMLM, taking advantage of our ability to rapidly image many regions of tissue from a single patient. Key strengths of touch prep-qSMLM include its sensitivity to subtle variations in HER2 expression and rapid assessment (within one working day). Ultimately, touch prep-qSMLM may prove a valuable tool for clarifying ambiguities in HER2 status and help to inform therapeutic decisions.

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THE COGNITIVE MECHANISM OF ACTION OF SSRI ANTIDEPRESSANTS IN RESPONDER AND NON-RESPONDER PATIENTS WITH MAJOR DEPRESSIVE DISORDER

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According to recent clinical trials, only 30% of patients with major depressive disorder (MDD) respond to pharmacological treatment with antidepressants such as selective serotonin reuptake inhibitors (SSRIs). A significant barrier to understanding cognitive function in MDD in both responders and non-responder has been the inadequate dissociation of cognitive changes due to MDD from the side effects of antidepressants such as SSRIs. One of the most implicated brain regions in the pathophysiology of MDD are the basal ganglia (BG), which are also key for feedback-based probabilistic classification. Here, we utilize a computer-based cognitive assessment that selectively and sensitively evaluate BG function to tease apart the cognitive effects of MDD from those of SSRIs on learning stimulus-response rules from positive and negative feedback in responders and non-responders. All patients were tested at baseline (medication-naïve) and then 4-6 weeks after receiving SSRIs. Further, we use computational trial-by-trial analysis of cognitive data to fit accuracy and response time allowing us to detect and characterize differences between SSRI responders and non-responders that are not revealed by cognitive results. Our findings define the cognitive profile of MDD and delineate the cognitive mechanism of action of SSRIs in the context of feedback-based probabilistic classification. Further, we present statistically reliable cognitive markers that can *a priori* differentiate SSRI responders and non-responders. This research can lead to clinically significant transformations to inform innovative individualized treatment and diagnosis protocols for MDD, guiding physician choices among treatment modalities according to a patient's individual cognitive profile upon initial diagnosis.

SESSION III: MICROBIOLOGY AND MOLECULAR GENETICS

Moderator: Dr. Musa Hindiyeh, Caritas Baby Hospital

Dr. Musa Yahya Hindiyeh obtained his Bachelor's degree in Clinical Laboratory Medical Sciences and his Doctorate of Philosophy in Microbiology and Immunology from the University of Arkansas for Medical Sciences in the USA. He then did a post-doctoral fellowship in Diagnostic Microbiology and Public Health at the University of Utah. Dr. Hindiyeh has double American board certifications in clinical laboratory medicine and in diagnostic microbiology (ASCP and Diplomat ABMM). Dr Hindiyeh won several awards including the Young Investigator award from the Pan American Society for Clinical Virology in 2007. He currently serves on the editorial board of the Journal of Clinical Microbiology (JCM) and The International Arabic Journal of Antimicrobial Agents (IAJAA). In addition, he is an adviser for the Clinical and Laboratory Standard Institute (CLSI) on Specimen Collection and Transport. Dr. Hindiyeh's interest includes bacterial drug resistance, characterization of respiratory and gastrointestinal viruses and infection control. Dr. Hindiyeh is the Director of Caritas Baby Hospital and Augusta Victoria Hospitals Clinical Laboratories and a founding member of the Palestinian Forum for Medical Research (PFMR).

INVESTIGATION OF THE RE-EMERGING BRUCELLOSIS AFTER 2015 IN HEBRON GOVERNORATE

USING MULTIPLE-LOCUS VARIABLE-NUMBER TANDEM-REPEAT ANALYSIS (MLVA)

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Brucellosis is a major endemic disease that causes a serious public health problem in Palestine. Of the different species of the *Brucella* genus, *Brucella melitensis* is the predominant causative species, which is associated with sporadic cases and outbreaks in humans. In the last six years, the disease has reemerged with a significant increase of incidence rate in the Hebron area. In this study, the genetic profiles of 73 *B. melitensis* isolates collected from human cases were analyzed and compared by MLVA-16 genotyping technique. The BioNumerics program was used to analyze MLVA data and carry out clustering analyses. The resulting genotypes were compared to the public databases available at the MLVABank website to investigate the genetic relationships with a set of global strains. The genetic diversity of the used markers was calculated using the online V-DICE tool using the Hunter-Gaston Diversity Index (HGDI).
The categorical UPGMA analysis clustered the 73 isolates into 22 unique genotypes not found in the public database. All sample genotypes were clustered into one major group. The most common genotype was genotype 12, which was suggested as the ancestral genotype. Genotypes 2, 13, 4 and 16, which differ from genotype 12 in one or two loci, were less common. These genotypes were considered closely related strains with a common source of infection. The remaining less common genotypes, differ from genotype 12 in one or more loci. The most diverse markers are Bruce04, Bruce16, Bruce19 and Bruce30, which belong to panel II of MLVA-16. Categorical UPGMA and Minimum Spanning Tree (MST) clustering analysis of the global samples and our samples revealed four major clades: Middle East (I), Europe (II), America (III) and Africa (IV). Our samples fall within the Middle East clade.
This study is the first genotyping study of B. melitensis in Palestine using the MLVA-16 technique. Further work is needed to determine the common biovars in this region. In addition, human and animal samples from different areas in Palestine should be investigated periodically to understand the molecular epidemiology of brucellosis in Palestine and to take more effective decisions regarding control and treatment programs.

ANTIBIOTIC RESISTANCE OF BACTERIAL STRAINS ISOLATED FROM PATIENTS WITH COMMUNITY-ACQUIRED URINARY TRACT INFECTIONS: A NATIONAL STUDY FROM PALESTINE

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Periodic assessment of antimicrobial resistance (AMR) pattern in uropathogens is important because treatment of urinary tract infections (UTI) heavily depends on empiric therapy. The aim of this study was to determine AMR in uropathogens obtained from a national sample of urinary isolates obtained from outpatients diagnosed with UTI.

A multi-regional cross-sectional study conducted between September 2016 and February 2017 on urinary isolates obtained from outpatients diagnosed with UTI from all regions in the West-bank of Palestine.

Four hundred urine samples were collected; 278 (69.5%) belonged to female patients. *E. coli* was present in 232 (58%) samples while *Klebsiella spp* was present in 48 (12%) samples. Overall, gram-negative bacteria accounted for 84% of the cultures. A high proportion of isolated strains showed a high degree of resistance to amoxicillin/clavulanic acid, cephalexin, nalidixic acid, and sulfamethoxazole/trimethoprim. *E. coli* showed the highest resistance to amoxicillin/clavulanic acid (68%) and cephalexin (62%). *Klebsiella spp* and *P. mirabilis* showed a similar pattern of resistance. Susceptibility of *E. coli* to meropenem was 97.8% and that for fosfomycin was 86.2%. For *S. aureus*, the highest resistant was recorded for nalidixic acid (82.2%) followed by cephalexin (60%) while the highest susceptibility was recorded for nitrofurantoin (75.6%) and fosfomycin (68.9%). Bacterial isolates from the Southern region of West-Bank showed significantly higher resistance to amoxicillin/clavuanic acid (p=0.009) and cefuroxime (p=0.013) while those from the Middle region showed significantly higher resistance to ceftriaxone (p=0.002), cefuroxime (p=0.008), cephalexin (p=0.034), meropenem (p=0.003), and nalidixic acid (p=0.003). Bacterial resistance to nitrofuarntoin (p=0.003) was significantly lower in the Southern region compared with that in the Northern region of West-Bank.

Regional differences in AMR in uropathogens do exist. National therapeutic guidelines and empirical therapy for UTI need to consider these regional differences.

INHERITED MUTATIONS IN THE DNA HELICASE RTEL1 COMPROMISE TELOMERE ELONGATION BY TELOMERASE IN HOYERAAL-HREIDARSSON SYNDROME

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Telomeres protect the chromosome ends from being recognized as double strand breaks, activating the cellular DNA damage response, and causing cell cycle arrest and genomic instability. Telomeres are elongated by telomerase in a tightly regulated manner to compensate for sequence loss during replication and ensure a sufficient number of cell divisions throughout life, yet restrict lifespan and prevent cancer development. Hoyeraal-Hreidarsson syndrome (HHS) is an inherited telomere biology disease characterized by accelerated telomere shortening and a broad range of symptoms, including bone-marrow failure, immunodeficiency, developmental

defects and death at early age. Mutations in the DNA helicase RTEL1 were found to cause HHS, among other mutations in genes implicated in telomerase biogenesis, recruitment or activation. While RTEL1 has been shown to regulate telomere length in mice, it is unclear why is it essential for telomere maintenance and what telomeric functions does it provide.

To further understand RTEL1's function, we have been studying the telomere phenotypes in HHS patient cells carrying RTEL1 mutations, and the suppression of these phenotypes by inducible ectopic expression of wild-type RTEL1. We have identified a 1,300 amino acid splice variant that is essential for the telomeric function of RTEL1. We found that RTEL1 is essential for the maintenance of the telomeric 3' overhang, for prevention of telomeric aberrations such as telomere loss, heterogeneity, fragility, and for telomerase action at the telomere 3' ends. Altogether, RTEL1 is a major regulator of telomeres and cell proliferation. Manipulating RTEL1 expression and function will provide new therapeutic opportunities for curing telomere biology diseases as well as cancer.

KNOCK-IN MICE MODELS CARRYING MISSENSE MUTATIONS IN THE DNA HELICASE RTEL1

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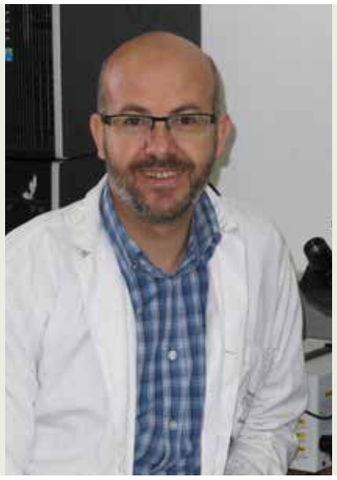
Telomeres are nucleoprotein structures protecting the ends of eukaryotic linear chromosomes. Inherited mutations in the helicase regulator of telomere elongation 1 (RTEL1) are associated with telomeric defects in the fatal disease Hoyeraal-Hreidarsson Syndrome (HHS). RTEL1 is essential in both human and mouse, but its role at telomeres is not yet understood. We generated knock-in mice with two missense mutations in a conserved amino acid of RTEL1 (M492), using CRISPR/Cas9 nickase. The first is an HHS-causing mutation (M492I) and the second is a variation found in *Mus spretus,* which has much shorter telomeres than those of *M. musculus.* The aim of my study is to understand the role of RTEL1 at telomeres and how mutations in RTEL1 cause a fatal disease. Mouse embryonic fibroblasts (MEFs) carrying homozygous M492K MEFs showed slower growth and, after passing a crisis, changed their cell morphology, while the WT MEFs grew well and did not change their morphology. Heterozygous MEFs had an intermediate phenotype. Pulsed-field gel electrophoresis followed by in-gel hybridization to a telomeric probe showed slight shortening in the mutant homozygous MEFs overtime in culture, indicating that telomere shortening is not rapid but gradual. Fluorescence in situ hybridization (FISH) of a fluorescent telomeric RNA probe to metaphase chromosomes showed different aberrations in the homozygous mutant MEFs, such as telomere loss, heterogeneity, fragility, Robertsonian fusion and chromosome fragmentation. Interestingly, the heterozygous MEFs displayed high frequency of aberrant interstitial telomere insertions. These preliminary results indicate that missense RTEL1 mutations cause telomere defects, which may affect rapidly-proliferating tissues such as bone marrow, epithelial cells and gonads. Studying these effects in whole mice will expand our knowledge of RTEL1 and its telomeric role, and elucidate pathways causing HHS. Hopefully it will lead to developing novel therapeutic approaches for HHS and other telomere and genome instability diseases, aging and cancer.

SESSION IV: CELLULAR MODELS OF BREAST CANCER



Moderator: Dr. Zaidoun Salah, Al-Quds University

Dr. Salah has a Bachelor Degree in Medical Technology from the University of Jordan in Amman. He then obtained both Masters and Ph.D. degrees in the field of experimental medicine and cancer research from the Department of Oncology, Hadassah-Hebrew University Medical School. Following his Ph.D. studies, Dr. Salah did his post-doctoral research fellowship at Prof. Rami Aqeilan›s lab, at the Hebrew University-Hadassah Medical School, also in the field of cancer biology. Currently he is an associate professor for molecular and cellular cancer biology at Al-Quds Bard College for Arts and Sciences, Al-Quds University, Abu Dis, Jerusalem. He is also the head of the Molecular Genetics department that he has established back to 2005 at Medicare laboratories network. His current research interests include understanding transcriptional reprogramming in breast carciniogenesis as well as the molecular epidemiology of certain genetic diseases in the Palestinian population.

CREATING CELLULAR MODEL FOR STUDYING NOVEL MECHANISMS OF TRANSCRIPTIONAL REPROGRAMMING IN BREAST CARCINOGENESIS

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Breast cancer is one of the most common and heterogonous cancer types, and the first cause of death related to cancer in women worldwide [1]. Breast cancer is triggered by endogenous and/or exogenous factors. These factors lead to critical mutations and/or eipmutations in important genes including oncogenes and tumor suppresser genes. These genetic and epigenetic changes lead to cancer initiation and cancer progression [2]. During these processes, cells gain alteration and dysregulation in gene expression at different levels. The most important and critical level of gene expression alteration in cancer is the transcriptional level [3] [4].

Our current project is part of a larger project, in which we hypothesized that breast cancer transformation might have common transcriptional reprograming events, that are associated with misregulation in gene expression, which reflects on cellular activity and homeostasis. In this part of the project, the aim was to test the ability to generate a proof of concept breast cancer transformation model that can be used to study transcriptional reprogramming in breast cancer and identify specific TFs that can be used as biomarkers for diagnosis, prognosis or even treatment of breast cancer. An *in vitro* breast cancer transformation model using HRAS overexpression in immortalized non transformed normal epithelial mammary gland cells (MCF10A) was generated. After HRAS overexpression, different cell phenotypes were tested, known to be induced by HRAS overexpression, that in order to ensure successful transformation. The transformed cells were then tested (not by us in this part of the project), for transcriptional reprogramming. Using different techniques, the model, indeed, showed massive genome wide transcriptional re-programming. Among the different transcription site activities that were lost are transcription sites of p53 and p63. In order to evaluate the role of these transcription factors in this transformation model, the functions of these two important TFs (p53 by using Nutlin-3a, and p63 by its overexpression) were

reactivated. Our results, showed that the induction of these TF functions was enough to revert to certain extent some the transformation process-related phenotypes.
In conclusion, our transformation model can be used as an efficient tool to learn about transcriptional re-programing during cellular transformation, to identify and study the role of specific TFs in transformation. This may contribute to identifying some target genes involved in breast carcinogenesis and employ them in prognosis, diagnosis and treatment.

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BRCA1 MUTATION AND RELATED TISSUE MICROENVIRONMENTS DRIVE ACCELERATION OF AGING PHENOTYPES IN MAMMARY EPITHELIA

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Breast cancer is a disease of aging; 75% of breast cancers occur in women after the age of 50. The aging process alters the microenvironment (ME) within the mammary gland. As women age, tumor suppressive myoepithelial cells decrease, dysfunctional progenitors accumulate and luminal cells increase in number and start to express basal markers. Increased basal markers is a key feature of triple negative breast cancer (TNBC). TNBC occur in women at a younger age and is highly associated with BRCA1 mutation ($BRCA1^{mut}$). Our preliminary data show that mammary epithelial cells harboring $BRCA1^{mut}$ have gene expression patterns resembling aged cells. One key transcript that is involved in luminal fate decision making is ELF5 that is down regulated in both aged and $BRCA1^{mut}$ cells. I **hypothesize** that BRCA1 loss accelerates age-related ME defects contributing to TNBC initiation via down-regulation of ELF5. I will characterize human mammary epithelial and stromal components from tissues taken form women carrying $BRCA1^{mut}$ using RNA seq. I will use co-culture systems of mixtures of epithelial and stromal cells from normal and $BRCA1^{mut}$ women to determine emergence of aging phenotypes using qRT-PCR and immuno-florescence of our previously identified aging markers. Our preliminary data show emergence of age-related cell-composition and transcriptional changes in $BRCA1^{mut}$ epithelial cells that resembles the aged phenotype, particularly downregulation of ELF5 expression. It also shows that MEs created by $BRCA1^{mut}$ epithelial cells downregulated ELF5 in young healthy luminal cells. Identifying nodes responsible for transmitting age-related phenotypes in $BRCA1^{mut}$ epithelia serves as targets for chemoprevention in this high-risk group.

CLOSING SESSION: CONCLUDING REMARKS & AWARDS

POSTER ABSTRACTS

POSTER #1

THE RELATIONSHIP BETWEEN PTSD, ANXIETY, AND DEPRESSION IN PALESTINIAN CHILDREN WITH CANCER AND MENTAL HEALTH OF MOTHERS

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The aim of the study was to investigate the prevalence of PTSD, depression and anxiety among children with cancer and relationship to mother's mental health. A sample of 50 children with their mothers was selected from oncology department at El Nasser pediatric hospital in Gaza city. The results showed that 22% of children had partial PTSD and 18% had full criteria of PTSD, 62% of children had anxiety disorder, and 68% had depression. For mothers, 70.8% of mothers scored above cut-off point of GHQ-28. The results showed that there were no correlations between total general health and subscale of mothers with children PTSD, anxiety, and depression. However, there were relationship between depression and anxiety in children with cancer.

The results of this study revealed that mental health among parents of children with cancer in Palestine is higher compared with their counterparts in the other contexts. Based on the results, pediatric oncology nurses can raise parents' awareness about their mental health problems, by interventions intended to decrease the risks. Parents could gain experience and information in group discussion, which provides appropriate opportunity for mothers to reflect on their own life stories. This life story perspective provides a realistic foundation that can support parents' wellbeing and contribute to satisfying the needs of their children.

POSTER #2

POSTTRAUMATIC STRESS AND GROWTH AMONG PALESTINIAN ORPHANED CHILDREN VICTIMS OF WAR IN THE GAZA STRIP

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Our study aimed to explore the impact of trauma due to war on children post-traumatic stress disorder and posttraumatic growth among orphaned children in the Gaza Strip.

The sample consisted of all children attending the orphanage institute (El-Amal Institute) in Gaza city (N=83). Socio-demographic information form, The Gaza Traumatic Events Checklist, Post-traumatic Stress Disorder Reaction Index (UCLA PTSD-RI), Posttraumatic growth inventory (PTGI).

The results showed that orphaned children reported from 3-28 traumatic events, mean traumatic events was 11.19, children in the age 12-14 years reported more traumatic events than the younger and older groups. Regard PTSD, the study showed that 49.4% reported no PTSD, 32.5% reported partial PTSD, and 18.1% reported full criteria of PTSD. Children in the middle age group (12-14 years) reported more PTSD than younger and older groups. Children living in the middle area reported PTSD than those live in the other four areas of the Gaza Strip. Regard posttraumatic growth, 78.31% said that they have a stronger religious faith, 70.7% said they learned a great deal about how wonderful people are. Total posttraumatic growth among orphan children mean was 25.27. The study showed that there was statistically significant positive relationship between total traumatic events due to war and PTSD, numbness symptoms, and arousal symptoms. While, there were no correlation with posttraumatic growth. Also, no correlation between posttraumatic disorder and posttraumatic growth.

The study concluded that orphaned children had a considerable level of trauma and posttraumatic disorder after 4 years of war on Gaza, which highlight for the need for more attention from governmental and Non-governmental institutions towards finding therapeutic programs for the orphans to enable them to live and be functional and be productive in the

future. In addition, there is need for training courses for caregivers in different institutes to enable them of early detection of children with mental health problems and ways with dealing with such problems.

POSTER #3

EXOME SEQUENCING AND GENOME EDITING FOR STUDYING HUMAN VARIANTS ASSOCIATED WITH HEARING LOSS USING CRISPR/CAS9 MICE

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Genomic sequence manipulations in animal models has always been a powerful tool in the study of genes and their function. Traditional methods are laborious, expensive and time consuming. In recent years, the genome editing tool CRISPR/Cas9 has been developed based on bacterial immune systems. CRISPR/Cas9 was shown to be both flexible and efficient and has already been utilized successfully for many purposes, including gene editing, gene silencing, epigenetic modification and more. Among human disease, hearing loss is the most prevalent sensory disease, affecting 466 million people worldwide (WHO, 2018). Hearing loss can be caused by environmental factors; such as noise, trauma and drugs, and by genetic variants. While some deafness-causing genetic variants are common, others are unique and involve genes and pathways about which little is known. We developed a pipeline for studying human variants in new genes associated with hearing loss in mice using CRISPR/Cas9. One mode of manipulation involves delivery of complementary DNA oligos activating homology-directed repair (HDR), resulting in integration of desired point-mutations or small indels. Another mode of action involves delivery of two sgRNA molecules resulting in a deletion of choice. We then phenotype the transgenic mice using auditory brainstem response (ABR) for assessment of hearing function and various imaging techniques and molecular assays to dissect the mechanisms underlying the pathology. We hope this work will confirm the pathological variants and expand the knowledge and understanding of the biology of the inner ear and hearing mechanism.

POSTER #4

VALIDATION OF CLEANING PROCEDURES IN THE MANUFACTURE OF DIFFERENT TABLETS IN SHARED FACILITY (DICLOFENAC POTASSIUM, IBUPROFEN AND OLANZAPINE)

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Diclofenac Potassium 50 mg, Ibuprofen 200 - 600 mg and Olanzapine 2.5 - 20 mg tablets were manufactured in a multi-product facility, They could be possible cross-contaminants, may alter the safety, identity, strength, quality and purity of the subsequent drug product beyond the established requirements. Validation of cleaning processes provides documented evidence that the approved cleaning procedure will provide clean equipment suitable for subsequent product processing. To achieve that, the worst-case product, difficult to clean locations of each equipment and the sampling methods (swab or rinse) for each sampling location were determined, in addition the acceptable limits for API residue was calculated, and an analytical method for estimation of the worst-case product was developed and validated. Simulation study using coupons was accomplished. Finally, one batch of the worst-case product was manufactured and cleaned using the suggested procedures, and then the worst-case samples were analyzed to verify the effectiveness of the cleaning procedure for removal of product residues and cleaning agents to acceptable limits. Cleaned Equipment hold time was determined to control the potential of microbiological contaminants before equipment reuse or recleaning.
Olanzapine tablets were the worst-case over the other products, since it had risk in its solubility and in potency. The maximum allowable Olanzapine residue from the previous product using swab technique should be below 0.2273 ppm/ swab of 5 cm x 5 cm, while the acceptance criteria for Olanzapine residue using rinse technique for Bin Mixer, Tablet Press Punches and Dies and for Coating Pan equipment were 0.45453 ppm, 0.020980 ppm, 0.031817 ppm, 0.62489 ppm, respectively.
The average recovery for swab technique was found to be 76.73%, while it was 102.98% and 102.99% for rinse technique for Bin Mixer and Coating Pan, respectively. According to soak technique for Tablet Press Punches and Dies, the average recoveries were 89.03% and 89.19%, respectively. So depending on WHO TRS 937 guidelines, the sampling technique is considered good.
Pilot scale Olanzapine Tablets were manufactured on SDI equipment, and cleaned using the suggested cleaning procedure. In addition, CEHT was studied for eleven days, giving good results for microbiological contamination during the period. The analytical results insure with documented evidence that the used cleaning procedure for the equipment, reduce the residues of the worst-case Olanzapine product and cleaning agent (15% SLS) from the equipment contact surface to acceptable limits and leave the equipment safe for manufacturing the subsequent product.

POSTER #5

CAN SIMPLE LINEAR AND AREAL DIMENSIONS BE USED TO CALCULATE THE TOTAL LEFT VENTRICULAR MYOCARDIAL MASS ADEQUATELY? A CARDIOVASCULAR MAGNETIC RESONANCE STUDY

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Accurate assessment of the total left ventricular myocardial mass (LVM) is of utmost clinical importance. The first line diagnostic tool is two-dimensional echocardiography, which uses left ventricular (LV) linear and/or areal dimensions for its calculations but faces several limitations [1]. In the present study, we sought to determine if simple, easily obtainable linear and/or areal LV dimensions can be used to determine the total LVM with acceptable precision under the superior contrast conditions of cardiovascular magnetic resonance using the slice summation technique (SST) as reference.
The study comprised a total of 20 healthy volunteers, 37 patients with aortic and 37 patients with mitral regurgitation, which were subsequently divided into two subgroups (Derivation and Test group). CMR imaging was performed at 1.5 T using balanced steady-state free precession sequences. The total LVM was obtained using the SST (reference standard) and according to the truncated ellipsoid technique (TET). In the derivation group, the length of the cylindrical (CL) and elliptical part (EL) of the left ventricle in 4-chamber view and the myocardial cross-sectional area (MCSA = epicardial minus endocardial cross-sectional area) in short-axis view were obtained.

Linear regression analysis (Derivation group) showed that a regression equation (RE) including CL, EL and MCSA could best predict the total LVM as determined by the SST (LVM = -196.3 + (32.5 x CL) + (9.4 x EL) + (7.8 x MCSA), r = 0.97, p <0.0001). All three mass quantification methods determined overall a significantly different total LVM (Test group, Table). The TET overestimated the total LVM and our own RE underestimated the total LVM in relation to the SST (mean difference ± SD 24 ± 24 g (limits of agreement -23 to 71 g) and -9 ± 16 g (limits of agreement -40 to 22 g) respectively) although the limits of agreement were narrower than for the TET.

Our results show that simple, easily obtainable linear and areal LV dimensions can be used to obtain the total LVM with acceptable precision. Our findings are of interest for the quantification of the total LVM using two-dimensional echocardiography, although further studies are needed to evaluate feasibility and applicability.

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POSTER #6

THE EFFECT OF L- ASCORBIC ACID (VITAMIN C) ,DL- ALPHA – TOCOPHEROL ACETATE (VITAMIN E) AND WHITE GRAPE SEED OIL ON COLORFUL MELANIN CONCENTRATIONS USING SYNTHETIC MELANIN AND MELANOMA CELLS

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Vitamin C is used as antioxidant to treat UV-induced skin pigmentation disease, While combining it with vitamin E increase its antioxidant effect by 4 folds, Grape seed oil contains mainly phenols like catechins which express a powerful antioxidant effect that has a very good activity as antioxidant and whitening effect [4], combining the three agents together give synergistic effect that magnify the decreasing in colorful melanin concentrations .

To determine the effect of Vitamin C, E and grape seed oil on melanin concentrations, separately then determine the synergistic effect for three ingredients together.

Synthetic melanin calibration's curve was constructed using spectrophotometer, then Vitamin C, Vitamin E and grape seed oil were added to the melanoma cell line , Cell viability was measured after 72 hours using hemocytometer [2], then a different concentrations of the agents and its combinations were added to the synthetic melanin solutions , to measure melanin concentrations using spectrophotometer [5,6].

The combination of the three ingredients (Vitamin C, E & grape seed oil) had the highest effect on the reduction of melanin concentration that was extremely statistically significant , while The combinations that contain grape seed oil showed higher effect on melanin concentration reduction than the combinations that contain Vitamin C & E without grape seed oil, while Vitamin C and Vitamin E separately did not show significant effect on melanin concentrations and grape seed oil had a significant effect on decreasing melanin concentrations.

The combinations of the three ingredients together (Vitamin C, Vitamin E, Grape seed oil) achieved the lowest p value (Extremely statistical significant) and the lowest melanin concentration, while Grape seed oil was the only ingredient that achieved statistically significant decreasing in melanin concentrations.

POSTER #7

EVALUATION OF KITCHEN-BASED THERMAL INACTIVATION METHODS FOR LISTERIA MONOCYTOGENES IN PALESTINIAN WHITE CHEESE

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Palestinian white cheese production is a cottage industry, and local consumers commonly prefer the taste of white cheese from small producers to that from large factories. However, small producers generally use unpasteurized milk, which exposes consumers to a variety of microbial health risks, and consumption of semi-soft cheeses made from unpasteurized milk is commonly identified as a source of Listeriosis outbreaks worldwide. Listeriosis can be fatal and is caused predominantly, in humans, by *Listeria monocytogenes*, which is the most heat-tolerant, foodborne bacterial pathogen that does not form spores. Many Palestinian consumers of white cheese boil the cheese before consumption, while others do not boil the cheese because of its effect upon the texture of the cheese. Furthermore, varying conditions and times of boiling are used in homes, with varying effects presumably upon microbial reduction.
To compare the effectiveness of varying conditions and times of boiling white cheese, *L. monocytogenes* was inoculated into pasteurized milk used to prepare white cheese in the laboratory under class 2 pathogen safety conditions, and the resulting cheese was heat-treated in various ways and quantified for remaining *L. monocytogenes*.In addition, asmall survey of white cheese from retailers and producers from Hebron city and surrounding villages was performed, and 31 pieces of cheese were tested by microbial culture and PCR for *L. monocytogenes*.

L. monocytogenes was detected by culture and confirmed by PCR in 5 of 31 cheese samples from Khorsah, Yattah and Al-Samooa' in the southern area of Hebron district. Putting white cheese into boiling water resulted in a 3 log inactivation of *L. monocytogenes* over the first 2 minutes, with a mean decimal reduction time (D-value) over the next 2-6 minutes of 2.76 minutes. Leaving cheese to cool in the water to 55^0C after initial heating resulted in a further reduction of *L. monocytogenes* numbers by an additional log, without major deterioration of cheese texture. Bringing white cheese in water to the boil resulted in a 3.5 log thermal inactivation.

Food safety regulators recommend a 6-D reduction in numbers of pathogen as a benchmark for food-safety, and none of the treatments performed here singly resulted in this level of inactivation, however a combination of placing cheese in water and bringing it to the boil with continuation of boiling for a further 2 minutes would be expected to meet this requirement with minimal loss of cheese quality.

POSTER #8

EXTRACTION, ISOLATION AND PRELIMINARY STRUCTURAL ELUCIDATION OF SOME ANTI-CANCER CONSTITUENTS OF WILD URGINEA MARITIMA AND THEIR ANTIOXIDANT ACTIVITIES

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For thousands of years, the holy land/Palestine, despite its small area, it contains colossal number of medicinal plants to which has been used as folkloric herbal medicine. *Urginea maritima (U. maritima)* (عيصلان) is one of the medicinal plants that grows widely in Palestine. Samples of *U. maritima* were collected from Abu-Dies region in January 2017, dried in shade for two weeks until it became completely dry, grinded, and then extracted by sonication. The aim of this research is to investigate the anticancer of flowers of *U. maritima* on HCT 116 and MDA (Colon and Breast cancer cells respectively), using solvents of different polarities (Distilled water, Ethanol, Ethyl acetate, Dichloromethane, and Hexane). Antioxidant activity (AA) was studied using different tests like FRAP, DPPH, ABTS, and CUPRAC. Total phenolic content (TPC) and total flavonoids content (TFC) of the extracts was also conducted. Results showed that ethanolic extract of *U. maritima* has higher anticancer activity compared to other solvents. Therefore, ethanolic extract was utilized to HPLC-PDA analysis, semi-preparative HPLC-PDA fractionation and LCMS in both positive and negative ESi modes to elucidate some structures of the separated compounds.
All antioxidant activity tests (FRAP, DPPH, ABTS, CUPRAC), as well as TPC and TFC, was found to be higher for polar solvents like Distilled water, Ethanol, and Ethyl acetate, while it was found to be lower for non-polar solvents like dichloromethane and hexane. The inhibition of HCT-116 and MDA cancer cells were found to be high when the concentration is 100*m*g/ml, which was (50% after 24 hours and 90% after 72 hours for HCT 116 cells – 90% after 24 hours and 100% after 72 hours for MDA cells). Anticancer activity of *U. maritima* extracts of 50*m*g/ml was found to the similar to the concentration of 100*m*g/ml, while (1, and 10) *m*g/ml has very low activity. Which mean breast cancer cells have more efficacious as anticancer activity than colon cancer cells.

POSTER #9

THE ASSESMENT OF KNOWLEDGE OF NURSING ABOUT HEPATITIS BIN THE GOVERNMENT SECTOR IN PALESTINE / SOUTHERN WEST BANK

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HBV the most common causes of liver cirrhosis and

cancer . HBV enters the liver via blood stream and replication occurs in the liver tissue , the study included Health care workers (HCWs) include nurses represent high risk population for viral hepatitis infection because the workers in health fields are susceptible to the hepatitis B disease 4 time than other people . The aim of the study was assessed the Knowledge , attitudes and practices of HCWs including nursing interns regarding hepatitis B , another important objective of the study was to correlate the awareness regarding hepatitis B infection to the clinical attitudes and behavior regarding this disease . The result was A total of 300 nurses from different government sectors were recruited for the study ,the sample was almost equally split between females (52%) and males (48%) after then the data was entered and analyzed using SPSS version 20 .Divide knowledge section for HBV included the following category (natural of disease , transmission , prevention . treatment and vaccine) . The mean knowledge of nurses was 62.55 % with a standard error of 0 .6 . The result of this study indicate a lower level of knowledge among nurse about HBV especially in prevention(53.4%) ,treatment(47.3%) and vaccination(46.6%) while the nature the highest (77.8%) . On the other hand the younger nurse (age below 50 year) that is reported better knowledge about hepatitis B virus than the older (age above 50 year) also the knowledge of the nurses about titer of antibodies against hepatitis B virus antigen (HBV-Ag) that is very low . So we need the service training about standard precaution and also improvement in work condition can decrease the probable risk for health professional also the ministry of health should be make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure and that post exposure evaluation and follow-up be provided to all employees who have an exposure incident and Provide advanced treatment for viral hepatitis B .

POSTER #10

MOLECULAR CHARACTERIZATION AND ANTIBIOGRAM OF METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS IN WEST BANK-PALESTINE

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Methicillin-resistant *Staphylococcus aureus* (MRSA) is a public health threat and a major cause of hospital-acquired and community-acquired infections. This study aimed to investigate the genetic diversity of MRSA isolates and to characterize the major MRSA clones and antibiogram trends in Palestine.

Isolates were obtained from 112 patients admitted to different hospitals of West Bank and East Jerusalem, originating from different clinical sources. Antibiotic susceptibility patterns, staphylococcal chromosomal cassette *mec* (SCC*mec*) typing and *Staphylococcus aureus* protein A (*spa*) typing were determined. Also, a panel of toxin genes and virulence factors was studied, including: Panton-Valentine Leukocidin (PVL), ACME-*arc*A, Toxic Shock Syndrome Toxin-1 (TSST-1) and Exfoliative Toxin A (ETA).

Of the 112 confirmed MRSA isolates, 100% were resistant to all β-lactam antibiotics. Resistance rates to other non- β-lactam classes were as the following: 18.8% were resistant to trimethoprim-sulfamethoxazole, 23.2% were resistant to gentamicin, 34.8% to clindamycin, 39.3% to ciprofloxacin, and 63.4% to erythromycin. All MRSA isolates were susceptible to vancomycin (100%). Of all isolates, 32 isolates (28.6%) were multidrug- resistant (MDR). The majority of the isolates were identified as SCC*mec* type IV (86.6%). The molecular typing identified 29 *spa* types representing 12 MLST-clonal complexes (CC). The most prevalent *spa* types were: *spa* type t386 (CC1)/(12.5%), *spa* type t044 (CC80; European clone)/(10.7%), *spa* type t008 (CC8)/(10.7%) and *spa* type t223 (CC22)/(9.8%). PVL toxin gene was detected in (29.5%) of all isolates, while ACME-*arcA* gene was present in 18.8 % of all isolates and 23.2% had the TSST-1 gene. The two most common *spa* types among the TSST-1 positive isolates were the *spa* type t223 (CC22; Gaza clone) and the *spa* type t021 (CC30; South West Pacific clone). All isolates with the *spa* type t991were ETA positive (5.4%). USA-300 clone (*spa* type t008, positive for PVL toxin gene and ACME-*arcA* genes) was found in nine isolates (8.0%).

Our results provide insights into the epidemiology of MRSA strains in Palestine. We report a high diversity of MRSA strains among hospitals in Palestine, with frequent SCC*mec* type IV carriage. The four prominent clones detected were: t386-IV/ CC1, the European clone (t044/CC80), Gaza clone (t223/CC22) and the USA-300 clone (t008/CC8).

POSTER #11

HEALTHY LIFESTYLE BEHAVIORS AMONG STUDENTS OF BIRZEIT UNIVERSITY STUDENTS

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Lifestyle is a major concern that reflects individual's health status and it has become a common concept of discussion about health. World Health Organization (**WHO**) has stated that "60% of an individual's health-related quality of life depends on his/her lifestyle". Many studies have shown that bad lifestyle behaviors increase mortality rates as they increase the risk of having many diseases such as heart diseases, hypertension, diabetes and certain types of cancer. Current healthy lifestyle behaviors of students in universities, reflect their lifestyle behaviors later on. This cross sectional, descriptive study was conducted to understand lifestyle behaviors among students of Birzeit University and to examine relationships between health-promoting lifestyles and certain students' characteristics. The research question is "do students of Birzeit University follow a healthy lifestyle behaviors?" Health promotion lifestyle profile-2 (HPLP-II) questionnaire was used to collect the data which included six subscales: physical activity, nutrition, health responsibility, spiritual growth, interpersonal relation and stress management. When controlling other variables, the total healthy lifestyles score was predicted by age, gender, height, weight, smoking, alcohol consumption, marital status, specialty, educational Level, residence, occupation, family income, education level of parents and occupation; it is predicted that physical activity and health responsibility is modulated by gender, nutrition is modulated by specialty and stress management is modulated by residence. Data was collected by distributing questionnaires to 210 student from all faculties and then analyzed by descriptive and inferential statistics using SPSS program. The mean of overall health promoting lifestyle behaviors was 2.4 (SD=0.4) out of 4. Mean of spiritual growth was the highest (2.8), and physical activity was the lowest (2.1). Mean scores for subscales were categorized to high, moderate and low. Scores over 3 were considered high; between 2.5 and 3 were considered moderate; and scores less than 2.5 were considered low. The study revealed low healthy lifestyle adoption; this significantly needs to be improved in order to maintain a healthy lifestyle away from diseases for students in Birzeit.

POSTER #12

MUTATIONS IN SNX10 AND TCIRG1 GENES IMPLICATE THE PATHOGENICITY OF MALIGNANT INFANTILE OSTEOPETROSIS IN PALESTINE

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Autosomal recessive osteopetrosis (ARO) is a life-threatening rare disorder, attributed to reduced bone resorption by osteoclasts which results in increased bone density. Osteoclast dysfunction are mainly due to defined failure to maintain an acid pH at the ruffled border. Osteopetrosis is a genetically heterogeneous disorder, however; over 50% of humans with osteopetrosis have mutations in the transmembrane channels at the osteoclast ruffled border, especially in the V-ATPase proton pump [1]. In this work, we identify the genetic basis of eight consanguineous Palestinian families of ARO, from Hebron and Ramallah city. Most of these families are related with multiple affected members of early onset disease manifestations. Whole Exome Sequencing, and Microsatellite analysis were carried out. Whole exome sequencing, verified by Sanger sequencing, identified two pathogenic variants in two different genes. In seven families, a missense mutation (p. R51Q) in a conserved amino acid of *SNX10* co-segregated with the phenotype. Microsatellite analysis was performed on the affected individuals to show that

(p. R51Q) mutation originated from the same ancestry. In only one family from Ramallah, a homozygous nonframshift variant in *TCIRG1* (p.462_461del) was identified, which is a novel mutation. It is speculated that mutations in both *SNX10* and *TCIRG1* result in V-ATPase deficiency weather directly or indirectly, leading to osteoclast defect. These results confirm the involvement of the *SNX10* gene in osteoclast physiology, and underlining the fact that partial deletions are part of the genotypic spectrum of *TCIRG1* mutations. Thus, understanding the molecular mechanisms of osteoclast activity may provide new potential therapeutic targets to treat bone diseases.

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POSTER #13

Note: Poster Teaser #9

POSTER #14

EXPANDED CUG REPEATS TRIGGER DISEASE PHENOTYPE AND EXPRESSION CHANGES THROUGH THE RNAI MACHINERY IN C.ELEGANS

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Myotonic Dystrophy (DM1) is an autosomal-dominant inherited disorder caused by the expansion of CTG repeats in the 3' untranslated region of the DMPK gene. The RNAs bearing these expanded repeats have a range of toxic effects. Here we provide evidence from a *Caenorhabditis elegans* DM1 model that the RNAi machinery has a key role in causing RNA toxicity and disease phenotypes. We show that the expanded repeats systematically affect a range of endogenous genes bearing short non-pathogenic repeats and that this mechanism is dependent on the small RNA pathway. By perturbating the RNAi machinery, we could reverse the RNA toxicity effect and reduce the disease pathogenesis. Our results support a role for RNA repeats as templates - based on sequence homology - for moderate but constant gene silencing. Such a silencing effect (although small) might affect the cell steady-state over time, with diverse impacts depending on tissue, developmental stage and the type of repeat. Importantly, such a mechanism might be common among repeats and similar in human cells with different diseases.

POSTER #15

ANTIBACTERIAL EFFECT OF SOME WILD MEDICINAL PLANTS IN PALESTINE AGAINST MULTIDRUG RESISTANT ESCHERICHIA. COLI CLINICAL ISOLATE

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The antimicrobial resistance of bacterial pathogens has increased worldwide as a result of the extensive use of broad-spectrum antimicrobials. Therefore, the emergence of multidrug resistant (MDR) strains of various bacterial species caused serious challenges for effective medical treatment. Due to the scarcity of effective antibacterial agents available to cure infections caused by MDR strains in general and *E. coli* in particular, the rate of morbidity and mortality have increased. Hence herbal alternative medicine has always been known with its rich source for the creation and development of potentially new drugs, recently, many scientists have paid attention to the active phytochemicals. The antimicrobial assay investigation of the medicinal plants may yield the discovery of new potential bioactive plant components. Therefore, the determination of antimicrobial susceptibility of multidrug resistant *E. coli* strain to different plant species extracts was carried out. Six wild plant species in Palestine which are *Calamintha incana, Lupins pilosus, Parietaria judica, Satureja thymbra, Thymbra spicata* and *Verbascum fruticulosum* were used in this research. The dried areal parts of the previous plant species were extracted with water, ethanol and methanol solvents. All extracts were screened for their antibacterial activity using micro-dilution method. Plant extraction with alcohol solvents provided stronger antibacterial effect compared to the aqueous ones. All alcoholic extracts have an inhibitory effect against *E. coli* except the ethanol extract of *L. pilosus* and the methanol extracts of *V. fruticulosum* and *C. incana*. Moreover, *C. incana* aqueous extract was the only aqueous extract with bacteriostatic activity. Among the studied plant species, ethanol extract of *T. spicata* was the most potent one with MBC value 12.5 mg/ml. However, *P. judica* ethanol extract which exhibited the best MIC effect (6.25 mg/ml) killed *E. coli* isolate at a 25 mg/ml. Thus plant extracts contain variable constituents with different bioactivity based on the type of extraction of a particular plant species. This efficacy could be related to various degree of solubility of different molecules. Moreover the observed variation in this study and other studies could be related to chemotype, location, collection period and vegetation cycle of the examined plant species. In conclusion, it is interesting to note that the crude extracts of these plants showed pronounced activity against the multidrug resistant *E. coli* strain up on which antibiotic therapy has failed. The extracts of the studied plant species could be possible source for effective medication to treat infectious multidrug resistant strains of microorganisms.

POSTER #16

AWARENESS OF BREAST CANCER, ITS RISKS FACTOR AND TREATMENT, AND BREAST SELF-EXAMINATION AMONG THE PALESTINIAN COMMUNITY

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Breast cancer is the highest cause of cancer deaths among Palestinian women but with very high rates of cure when early detected. Therefore, early detection remains the first priority, and regular practice of breast self-examination (BSE) influences treatment, quality of life, survival, and prognosis of breast cancer patients.

This study aimed to determine and detect knowledge and attitudes about breast cancer, its treatment and BSE in the Palestinian community.

Data was collected through a pre-validated questionnaire that was adopted from previous studies and then modified to be satiable to the Palestinian population. The questionnaire consisted of two parts; the first part was related to demographic data while the second part collected data regarding knowledge, attitudes and practices related to breast cancer and BSE.

A total number of 1000 respondents participated in this study. The study revealed a good awareness of breast cancer (81%), but less than half of the study participants mentioned that they have practiced BSE (41.9%). Regarding the barriers to BSE, the majority who never practiced BSE mentioned that not having any symptoms, lack of knowledge and being afraid of being diagnosed with breast cancer were the main barriers to practicing BSE (31.4%, 25%, 13.8%, respectively). The most widely reported risk factors by the respondents were family history (80.5%), followed by genetic factors (78%) and radiation to the chest (75.4%). Regarding the sources of information about BSE, the majority stated that internet was the main source of information (73.4%).

The current status of practicing BSE is insufficient. Women need to be encouraged to selfmonitor themselves in order to detect abnormalities in their breasts.

POSTER #17

AUTOPHAGY PROTECTS NEURONS AND ASTROCYTES FROM BILIRUBIN-INDUCED CYTOTOXICITY

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Unconjugated bilirubin (UCB) neurotoxicity involves oxidative stress, calcium signaling and ER-stress. The same insults also induce autophagy, a process of "self-eating", with both a pro-survival or a pro-apoptotic role. Our aim was to study the outcome of autophagy activation by UCB in the highly sensitive neuronal SH-SY5Y cells and in the resistant astrocytoma U87 cells. Upon treatment with a toxic dose of UCB, the conversion of LC3-I to LC3-II was detected in both cell lines. Inhibition of autophagy by E64d before UCB treatment increased SH-SY5Y reduction of cell viability from 40% to 60% and made U87 cells sensitive to UCB. In SH-SY5Y cells autophagy related genes ATG8 (5 folds), ATG18 (5 folds), p62 (3 folds) and FAM 129A (4.5 folds) were induced 8h after UCB treatment while DDIT4 up-regulation (13 folds) started at 4h. mTORC1 inactivation by UCB was confirmed by phosphorylation of 4-EBP1. UCB induced LC3-II conversion was completely prevented by pre-treating the cells with the calcium chelator BAPTA and reduced by 65% using the ER-stress inhibitor 4-PBA. Pre-treatment with the PKC inhibitor reduced LC3 mRNA by 70% as compared to cells exposed to UCB alone. Finally, autophagy induction by Trifluoroperazine (TFP) increased the cell viability of rat hippocampal primary neurons upon UCB treatment from 60% to 80%. In SH-SY5Y cells, TFP pre-treatment blocked the UCB-induced cleaved caspase-3 protein expression, decreased LDH release from 50% to 23%, reduced the UCB-induction of HO1, CHOP and IL-8 mRNAs by 85%, 70% and 97%. Collectively these data indicate that the activation of autophagy protects neuronal cells from UCB cytotoxicity. The mechanisms of autophagy activation by UCB involves mTOR/ER-stress/PKC/calcium signaling.

POSTER #18

CHEMICAL CONSTITUENTS, ANTIOXIDANT, CYCLO-OXYGENASE INHIBITOR, AND CYTOTOXIC ACTIVITIES OF TEUCRIUM PRUINOSUM BOISS. ESSENTIAL OIL

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In traditional medicine, many pharmacological activities have already been ascribed to the genus of *Teucrium* plant. These include anti rheumatic antispasmodic, anthelmintic, diuretic, hypoglycemic, and anticancer effects. The recent investigation aimed to characterize and estimate the chemical composition, anti-inflammatory, antioxidant and anticancer potentials of the essential oil isolated by the microwave-ultrasonic apparatus from *Teucrium pruinosum* leaves collected from Palestine. The essential oil (EO) was analyzed by Gas Chromatography equipped with mass spectrometry (GC-MS), whilst its anticancer activity was evaluated against HeLa cervical adenocarcinoma cells. The ability of *T. pruinosum* EO to inhibit the conversion of Arachidonic Acid (AA) to PGH_2 by ovine COX-1 and human recombinant COX-2 was determined using a COX inhibitor screening assay. In addition, the antioxidant activity of the EO was evaluated on the basis of the scavenging activity with a stable 2,2-diphenyl-1-picrylhydrazyl (DPPH) method, while Trolox was used as a positive control. Forty-four molecules were identified in *T. pruinosum* EO, representing 100% of the total EO. Agarospirol was found to be the most abundant component (45.53 %) followed by caryophyllene (19.35%). However, the cyclooxygenase inhibitor assay revealed that *T. pruinosum* has potential COX-1 and Cox-2 inhibitory activity with IC_{50} values of 0.25 µg/ml and 0.5 µg/ml, respectively. Moreover, the *T. pruinosum* EO showed moderate antioxidant capacity with an IC_{50} value of 16.98±0.84 µg/ml in comparison with the positive control Trolox, which has an antioxidant potential with an IC_{50} value of 2.09±0.17 µg/ml. In addition, 250, 125, 62.5, 31.25, 15.625, 7.67 and 3.84 mg/ml of *T. pruinosum* EO treatments inhibited mitochondrial activity (cell viability) significantly and extremely by 90-95%. The current study provided data that revealed that the *T. pruinosum* EO could be a suitable candidate for use as a novel anticancer, anti-inflammatory and antioxidant medication. Further clinical trials would be required to ensure these effects and to allow the design of suitable pharmaceutical dosage forms from this natural oil.

POSTER #19

PULSE VERSUS DAILY ORAL ALFACALCIDOL TREATMENT OF SECONDARY HYPERPARATHYROIDISM IN HEMODIALYSIS PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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Secondary hyperparathyroidism is a common complication of chronic kidney disease and is managed using vitamin D replacement therapy. Very few studies have examined the effectiveness of pulse alfacalcidol therapy in comparison to daily oral alfacalcidol therapy in suppressing serum parathyroid hormone (PTH) levels in hemodialysis patients. The aim of this randomized controlled trial was to replicate the findings of prior studies comparing effectiveness of pulse oral alfacalcidol therapy versus daily oral alfacalcidol therapy in suppressing PTH after 13 weeks of therapy using a Palestinian sample of hemodialysis patients, and identify demographic and biomedical patients' characteristics independently associated with PTH levels.

One hundred and sixty-seven 167 patients completed the study, 88 in the daily group and 79 in the pulse group. The pulse group had more clinically significant reduction in mean PTH level by 75 pg/dl at 13 weeks than the daily group, but was not statistically significant.

The effect of alfacalcidol therapy on metabolism of phosphate and corrected calcium levels was comparable in both groups, and pulse therapy was not associated with increased risk of hypercalcemia and hyperphosphatemia. Serum PTH levels were independently and inversely associated with older age and diabetes.

Switching daily alfacalcidol therapy to thrice weekly alfacalcidol pulse therapy seems safe and convenient especially for haemodialysis patients with poor compliance with treatment. This study also highlights the importance of monitoring and preventing malnutrition in haemodialysis patients, and maintaining optimal glycaemic control in diabetic haemodialysis patients.

POSTER #20

ISOLATION AND CHARACTERIZATION OF KLEBSIELLA PNEUMONIA BACTERIOPHAGE

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Klebsiella pneumonia is a Gram-negative, non-motile bacteria that are found ubiquitously in nature. It frequently causes human nosocomial infections especially in immune-compromised patients, leading to respiratory tract, urinary tract and blood stream infections. Due to the extensive usage of broad-spectrum antibiotics in hospitalized patients, the incidence of multidrug-resistance producing strains among clinical isolates has been increasing. Consequently, this has rekindled the interest in using phage therapy as a safe and effective treatment for multidrug resistance pathogens. The rapid ability of phages to lyse bacteria and their specificity make them effective alternative to antibiotics [4]. The objective of this study was to isolate *Klebsiella pneumonia* bacteriophages as a significant alternative to antibiotics. Results demonstrated a successful isolation of a *Klebsiella* bacteriophage isolated from sewage water. The bacteriophage was able to host and completely lyse the *Klebsiella* bacterium as a first case reported in Palestine. The results were confirmed several times to ensure consistency. It also gave positive results when spotted to more different

Klebsiella strains. In addition, one-step growth curve using a double layer plaque assay was performed to determine the phage life cycle phases of infection. It showed a latent period of about 3.5 h, burst period of 10 h and a burst size of about 102.5×10^6 PFU /plaque, Furthermore, SDS-PAGE results reveled that four major bands have been detected for phage structure proteins their size: 75KDa,100KDa,135KDa,and 180KDa . We believe the isolated phage can be used as an effective and simple replacement to antibiotics used in the treatment of *Klebsiella pneumonia*.

POSTER #21

Note: Poster Teaser #4

POSTER #22

ELEVATION OF MATRIX-METALLOPROTEINASE-9 AMONG GRAVES OPHTHALMOPATHY PATIENTS IN HEBRON, SOUTH PALESTINE

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Graves' ophthalmopathy (GO),also known as Thyroid associated ophthalmopathy is characterized by tissues overactivity, , include inflammation and remodeling in the presence of GO.

To study the prevalence of Thyrotropin hormone in Hebron south Palestine and investigate major symptoms of hyperthyroidism, and to measure the concentration of MMP-9 in the serum of GO patients.

Questionnaires distributed among GO and healthy people. A total number of sixteen serum samples (14 Females, 2 Males) were further, processed and analyzed for measuring the concentration of MMP-9 in patients serum using Human MMP-9 Quantikine ELISA Kit (Sigma-Aldrich). SPSS and graphpad prism were used to perform the statistical analysis and graphs.

Hyperthyroidism is significantly elevated among female gender, rough patches was among the most common symptom in Hyperthyroidism female patient. Marked elevation of MMP-9 was seen in Hyperthyroidism patient.

There is an association between MMP-9 and GO, this elucidate that MMP-9 could be an important future biomarker for GO.

POSTER #23

THE RELATIONSHIP BETWEEN BILIRUBIN AND CREATINE KINASE LEVELS IN PATIENT WITH CARDIOVASCULAR DISEASE

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Bilirubin is the end product of heme catabolism, At physiological levels, bilirubin has both anti-oxidant and anti-inflammatory properties. A comment feature of cardiovascular disease is the elevated oxidative stress. Studies demonstrated that mild-hyperbilirubinemia is protective against CVD. Patients with decrease activity UGT1A1 (the enzyme responsible of bilirubin conjugation) have a protective effect against CVD.

The aim of this study was to evaluate the relationshiop between total serum bilirubin levels and the markers of CVD, in particular, the CK and AST, The study is an on going retrospective study, community based case-control study, The data were containing total serum bilirubin and cardiovascular enzyme for each patient. The volume of data we received was 28,000 patients from all sections of the hospital during the previous seven months, Subjects were categorized into four (G1-G4) according to baseline total bilirubin concentrations, After some exceptions The data volume was 119 people, including 63 females and 56 males. They were between 14 and 99 years old, a negative association was observed between the TSB and CK levels, while no relationship was observed between TSB and AST, patient with higher TSB have low level of CK suggesting its protective role against CVD.

POSTER #24

FORMULATION AND OPTMIZATION OF IBUPROFEN DUAL RELEASE BILAYER IBUPROFEN TABLET USING DESGIN OF EXPERMENT

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This study aims to optimize the formulation of ibuprofen biphasic tablets. Ibuprofen is a non-steroidal anti-inflammatory drug used for reduction of fever, pain, and inflammation .many auto-immune diseases such as rheumatoid arthritis requires chronic large doses to relive pain and inflammation. Ibuprofen biphasic tablets aim to prolong the action of the drug by releasing it slowly from the sustained release (SR) layer after providing the loading dose from the immediate release (IR) layer; this will reduce dosing frequency, so the patient compliance will improve. We followed some arranged steps to reach our goal in obtaining the best formula with best release. First of all, HPC, 1/2 amount of MCC and 120 mg Ibuprofen were mixed together. Different amounts of HPC and HPMC were used to produce 8 various formulations to choose the best one for making the sustained release layer. After that, wet granulation method was used for making granules by using an appropriate solvent which is water, then drying, sizing of them, and adding Mg stearate (lubricant) and the reminder amount of MCC to the formula. Many of the official and nonofficial tests were utilized such as sieve analysis, tap density, and angle of repose to check the properties of granules. Following that, tableting machine was used to produce ibuprofen tablets. Later, many quality control tests were conducted to check properties of these tablets such as, disintegration, hardness, friability, weight variation and dissolution test. Dissolution test was done according to the USP type 2(pedal type) and the samples were collected over12 hours period via auto sampler, the samples were analyzed using high performance crystallography (HPC). After choosing the best release according to the dissolution test results, the immediate release formula was made, and was compressed with the sustained release. This biphasic formula can be a standard matrix that can be applied using different APIs to improve the compliance of patients and to extend the effect of drugs.

POSTER #25

NEGATIVE ASSOCIATION BETWEEN TOTAL SERUM BILIRUBIN AND DIABETIC NEPHROPATHY IN HEBRON GOVERNMENTAL HOSPITAL

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Bilirubin is the end product of heme catabolism and at the physiological levels, bilirubin has a potent antioxidant and anti-inflammatory properties that protects organs form damage. Several studies demonstrated that mild-hyperbilirubinemia is associated with low risk of metabolic syndrome, cardiovascular diseases, and cancer. Diabetes mellitus is one of the most common chronic disease in the world, especially in the Arab countries and associated with many complications such as retinopathy, neuropathy and nephropathy. The aim of this study was to find the relationship (if any) between total serum bilirubin level and diabetic nephropathy in type 2 DM. The data were collected from Alia hospital in Hebron from the period(1/1-1/9/2018). The biochemical parameters including age, sex, FBS, TSB,type of DM and the health status for each person were collected for the total number of samples (1200). Only diabetic patients with kidney disease were included. Patients who have only the FBS (but not TSB) and children's were excluded. Data were analyzed by SPSS version 20. Results demonstarted that the TSB was not affected by age. Their were no relationship between TSB and FBS levels. In both male and female the TSB level is 50% lower in patients with diabetic nephropathy compated to diabetic patients without nephropaty. In conclusion. A negative relationship between diabetic nephropathy and TSB was observed suggesting that highr TSB is protective against T2D nephropathy.

POSTER #26

IDENTIFICATION OF CROSS-PROTECTIVE POTENTIAL ANTIGENS AGAINST PATHOGENIC BRUCELLA SPECIES THROUGH COMBINIG PAN-GENOME ANALYSIS WITH REVERSE VACCINOLOGY

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Brucellosis is a zoonotic infectious disease caused by bacteria of the genus Brucella. *Brucella melitensis*, *Brucella abortus*, and *Brucella suis* ***are the most*** pathogenic species of this genus causing the majority of human and domestic animal brucellosis. There is a need to develop a safe and potent subunit vaccine to overcome the serious drawbacks of the live attenuated Brucella vaccines. The aim of this work was to discover antigen candidates conserved among the three pathogenic species. In this study, we employed a reverse vaccinology strategy to compute the core proteome of 90 completed genomes: 55 *B. melitensis*, 17 *B. abortus*, and 18 *B. suis*. The core proteome was analyzed by a metasubcellular localization prediction pipeline to identify surface-associated proteins. The identified proteins were thoroughly analyzed using various *in silico* ***tools to obtain the most potential protective antigens.***
The number of core proteins obtained from analyzing the 90 proteomes was 1939 proteins. The surface-associated proteins were 177. The number of potential antigens was 87; those with adhesion score ≥ 0.5 were considered antigen with "high potential," while those with a score of 0.4–0.5 were considered antigens with "intermediate potential." According to a cumulative score derived from protein antigenicity, density of MHC-I and MHC-II epitopes, MHC allele coverage, and B-cell epitope density scores, a final list of 34 potential antigens was obtained. Remarkably, most of the 34 proteins are associated with bacterial adhesion, invasion, evasion, and adaptation to the hostile intracellular environment of macrophages which is adjusted to deprive Brucella of required nutrients. Our results provide a manageable list of potential protective antigens for developing a potent vaccine against brucellosis. Moreover, our elaborated analysis can provide further insights into novel Brucella virulence factors. Our next step is to test some of these antigens using an appropriate antigen delivery system.

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POSTER #27

THE EFFECT OF INDUCED EXPRESSION OF NEUROGLOBIN USING CINNAMIC FATTY ACID ON THE HYPOXIC ISCHEMIC ENCEPHALOPATHY IN NEWBORNS

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One of the many complications of pregnancy is hypoxia in the fetus that may be resulting from a wide variety of risk factors. Asphyxia or hypoxia that occurs to newborns during birth causes Hypoxic Ischemic Encephalopathy (HIE). HIE is not a rare disease and is the main cause of morbidity and mortality in the newborns around the world. We suggested that inducing the expression of neuroglobin (Ngb) may be a protective mechanism against HIE in the newborns. Ngb is an intracellular, O_2-binding protein that is expressed in neurons and endocrine cells. Ngb expression is induced by neuronal hypoxia and cerebral ischemia as it has neuroprotective effects. In the first part of the research, Ngb expression were induced through intraperitonial injections for pregnant rats with cinnamic fatty acid during pregnancy and the levels of Ngb mRNA and protein were detected from neonatal brains. In the second part we will induce HIE in new born rats using a risk factor such as maternal hypotension (using methyldopa) and test the induction of Ngb with and without cinnamic acid. This project may serve as a base for further research on the possibility of the treatment of brain and nervous tissue injuries through the elevated expression of Ngb.

POSTER #28

KNOWLEDGE AND SKILLS AMONG NURSING STUDENTS IN FOLEY CATHETER PROCEDURE

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Urinary catheters are largely used in hospitalized patients worldwide. However, improper catheterizations can lead to serious complications, resulting in longer stay in the hospital. This study aimed to assess the level of knowledge and skill among nursing students regarding urethral catheterization. Furthermore, this study explored the effects of various independent variables such as GPA, teaching method, and level of education on knowledge status and skill efficacy among junior and senior year nursing students.
A Descriptive (quantitative) cross sectional design was conducted in the (15th March-15th April 2017) to assess the knowledge and skill of nursing students (3rd and 4th year students), in the selected universities Birzeit university, AL-Najah university, Al-Quds and Bethlehem university in Palestine regarding Foley catheter. The sample size included 160 nursing students with an equal number of male and female. The data was collected by using a questionnaire obtained from (Manalo, Lapitan & Buckley, B. S. (2011)) and was modified to contain 15 items in a form of multiple answer questions covering knowledge, skill, teaching method, and GPA of the participants. The data was analyzed by using SPSS version 20.
A total of 160/160 (100%) of junior and senior year students completed the survey and was distributed among (50.6%) female, (49.4%) male. Among the sample, 75.6% of students have performed catheterization, while 24.4% of students have never performed the procedure. Students who answered correctly regarding lubricant application were reported 88.9%, angel prior to insertion 39%, and level of insertion 33.5%. Results also showed that students who reported using lectures answered correctly the question regarding Lubricant application (P=0.01), fundamental key aspects of Foley catheter cannot be assessed by GPA of a nursing student and only 45.1% of the students answered they were very confident while preforming the procedure. These findings reflect lack in knowledge and skill regarding catheterization. To conclude; there is a need to fulfil the gap between theoretical and practical training on Foley catheterization. Moreover, an ongoing evaluation of knowledge and practice is essential in order to focus on the consequence of inadequate knowledge on urethral complications. We recommend that clinical instructors work together to link theory and practice of nursing skills, also seek chances for students to perform urinary catheterization.

POSTER #29

A NEUROPROTECTIVE EFFECT OF L-TYPE CALCIUM CHANNEL BLOCKERS ON EARLY BRAIN INJURY AFTER INTRACEREBRAL HEMORRHAGE

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Intracerebral hemorrhage (ICH) is the highest deadly subtype of stroke with an overall incidence rate of 24.6 per 100,000 people per year. ICH is characterized by a neurological deficiency, which happens because of spillage of blood into the cerebrum parenchyma. This damage to the cerebrum may cause a lasting and irreversible harm, which leads to debilitated physiology and working of the organs related to the injured part of the brain. The treatment options for spontaneous ICH are limited and based on hemorrhage prevention through regular neuroimaging, management of coagulopathy, blood pressure and post hemorrhage consequences. Our objective was to assess the outcomes of the pretreatment with L-type calcium blocker (Azelnidipine) in a rat model of collagenase induced ICH. A significant protection was observed on mitochondrial enzymes, mitochondrial respiration, antioxidant enzymes in azelnidipine pretreated animals P<0.05 as compared to ICH animals.

Moreover, the histological examination showed a protective effect of azelnidipine on hematoma expansion and neuronal apoptosis. On the other hand, the behavioral parameters for the locomotor activity, motor coordination and grip strength did not show significant recovery in azelnidipine pretreated animals as compared to ICH animals. The lagging improvement in the behavioral parameters could be explained by the need for long term management and rehabilitation. The cellular and molecular findings suggest that the pretreatment with azelnidipine could help to prevent the post hemorrhage early consequences in ICH prone patients and further studies are required to address its long-term effect.

NOTE THAT POSTERS NUMBERED 30-38 ARE INCLUDED IN THE POSTER TEASER SECTION.

REMARKS

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