"Recent Trends in Postgraduate Research"

15-16 April, 2017
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Dear Colleagues,

It gives us great pleasure to welcome you to the ASU Pharmacy 3rd Conference and the 3rd Conference of the Association of Faculties of Pharmacy at Jordanian Universities, held under the patronage of his Excellency Doctor Haitham Abu Khadija, Council Vice President of Applied Science Private University, on the 15th and 16th of April 2017.

This ASU annual Conference is a unique conference that brings together pharmacy postgraduate students and some of the most recognized names in pharmacy research and education worldwide. Recognizing the valuable research conducted by our postgraduate students in Jordan and aboard, the theme for the conference remains “Recent Trends in Postgraduate Research”.

This year, the conference program is rich and varied, with 7 international and national keynote speakers who are leading experts in their regions. The program will showcase the latest scientific research in each field of pharmacy research, and offer attendees the opportunity to network with colleagues and other leading international and national scientists. The conference comprehensive program is indicative of the breadth of work currently underway in the various schools of pharmacy in Jordan. I sincerely thank all participants who facilitated our scientific program. The oral and poster presentations contribute to conserve a great scientific standard.

The postgraduate competition provides the students with the opportunity to present their work, share their experience, win a Distinguished Postgraduate Researcher prize, and nominate their supervisor for the Distinguished Postgraduate Supervisor prize. The conference will also host two different Poster competition sessions – Postgraduate (Masters and PhD) and Undergraduate (4th and 5th year pharmacy) sessions.

Acknowledging that learning is best accomplished through an engaging and interactive setting, the conference will also feature eight diverse workshops. The workshops will offer practical applications of learning to the real world, hands on learning, and skill development including communication and team work.

Finally, I would like to express my gratitude and appreciation to all members of the scientific and organizing committees for their dedicated efforts.

Prof. Iman Amin Basheti
Dean - Faculty of Pharmacy
Professor in Clinical Pharmacy; Honorary Professor (Sydney University)
Important Information

**Registration**

Location of conference registration will be at the entrance of the Conference Palace.

Registration will be open from 8:30 am till 9:30 am, on both conference days.

Badges and conference bags will be available at the registration desk.

**Prayer**

Coffee breaks are organized to suit prayer times.

The Conference Palace is very close (1 minute walking distance) from the University Mosque.

**Competition**

Each Oral presentation will be evaluated by three evaluators.

Each Poster will be evaluated by five evaluators.

Evaluators are pharmacy academics from different Jordanian Universities.

Evaluations are based on detailed pre-specified criteria set by the conference scientific committee. Each participant will receive a final mark based on the evaluations provided by the evaluators. Finally, marks will be compared and winners determined. Announcement of winners will take place during the closing ceremony of the conference.

**Workshops**

Workshop registration can be completed during the conference, before the workshop. Fees: Students 15 JD; Academics 20 JD. Workshops will be held at the Faculty of Pharmacy, ASU (5 minutes walking distance from the Conference Palace).

**Dinner**

Dinner on both days will be served in Square 360 (1 minute walking distance from the Conference Palace).

The dinner will include a buffet. Suitable for vegetarians as well.
About the Conference

ASU Pharmacy Conference - Recent Trends in Postgraduate Research

ASU Pharmacy Conference, supported by Applied Science Private University, Amman Jordan, is an annual event introduced in 2014. This unique annual meeting aims at presenting the latest developments and advancements in the field of postgraduate research in Jordan and the nearby region. It is also a ground for interaction for pharmacy professionals, including, but not limited to; lecturers, deans, researchers, students, pharmacists, and the wider pharmaceuticals industry.

This conference hosts world renowned keynote speakers and provides a competition between all postgraduate students from Jordan, presenting their research work through oral presentations or posters. The conference is distinguished by the variety of pharmacy research topics it presents, and the large number of attendees it hosts.

Throughout the previous years, we received great feedback about the conference from attendees and speakers. It is truly rewarding to see that ASU-Faculty of Pharmacy is fulfilling an important role that is welcomed by the world of pharmacy in Jordan.
Higher Committee Members

Prof. Iman Basheti (Chair of the Conference)

Dr. Wamidh Talib  
(Head of the committee)

Dr. May Abu Taha  
(Member)

M.Sc. Samar Khater  
(Member)

M.Sc. Alaa AbuHammad  
(Member)

Ph. Sanaa Shakhshir  
(Member)

M.Sc. Alaa Alfayez  
(Member)

Ph. Yara Salhi  
(Member)

Ph. Rana Rayyan  
(Member)

Mr. Fawzi Al-Areeni  
(Member)
Workshops Organizing Team

M.Sc. Rajaa Qudah

Ph. Rasha AlKurdi

Ph. Dalal Natour

Ph. Sanaa Shakhshir

Ph. Heba Nafea

Ph. Nawal Izzat

Ph. Yara Salhi
# Conference Agenda

**Day 1: Saturday April 15th, 2017**  
**ASU Conference Palace**

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<tr>
<td>8:30-9:30</td>
<td>Registration</td>
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<tr>
<td>9:30-10:30</td>
<td>Conference Opening Ceremony</td>
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<tr>
<td>9:30-9:32</td>
<td>National Anthem</td>
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<tr>
<td>9:32-9:35</td>
<td>Quran recitation</td>
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<tr>
<td>9:35-9:40</td>
<td>Welcoming words from the Chair of the Conference (Dean of Pharmacy at ASU)</td>
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<tr>
<td>9:40-9:45</td>
<td>Prof. Haitham Abu Khadija Welcoming words from the Council Vice President of ASU</td>
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<tr>
<td>9:45-9:50</td>
<td>Prof. Mahfouz Judeh, University President Welcoming speech from the President of ASU &amp; Higher Education in Jordan and ASU</td>
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<td>9:50-10:0</td>
<td>Dr. Hayel Obiedat, A memorial speech from the General Director of Jordan Food and Drug Administration</td>
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<tr>
<td>10:0-10:10</td>
<td>Dr. Veysel Kayser Welcoming words from the Prof. of Pharmaceutical Sciences at the University of Sydney</td>
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<tr>
<td>10:10-10:20</td>
<td>Prof. Sergio Rutella Welcoming words from the Prof. of Cancer Immunotherapy at Nottingham Trent University</td>
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<tr>
<td>10:20-10:25</td>
<td>Keynote speakers award presentation</td>
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<tr>
<td>10:25-10:30</td>
<td>Exchange of Collaboration Awards - between ASU &amp; University of Sydney &amp; Nottingham Trent University</td>
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<tr>
<td>10:30-11:15</td>
<td>Opening of Exhibition, Continental Breakfast and Posters Session Postgraduate Research Competition - Conference First Competition Session</td>
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<tr>
<td>11:15-11:45</td>
<td>Keynote Speech: Prof. Sergio Rutella Prof. of Cancer Immunotherapy at Nottingham Trent University</td>
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<tr>
<td>11:45-12:15</td>
<td>Keynote Speech: Dr. Fadi Alkhatteeb Director of Assessment &amp; Accreditation: Associate Professor of Pharmacy Administration at Texas A&amp;M Health Science Center</td>
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<tr>
<td>12:15-12:25</td>
<td>Enas Mkhaimr: Etazolate neuroprotective effects in a rat model of Parkinson’s disease induced by 6-hydroxydopamine. Jordan University of Science and Technology</td>
</tr>
<tr>
<td>12:25-12:35</td>
<td>Islas-Morales: Evolutionary cell biology: from cell evolution to biomedical application. King Abdullah University of Science and Technology</td>
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<td>12:35-12:45</td>
<td>May Almajawleh: Studying the effect of passage number and antibiotics of MCF7 cell line on DNA methylation levels and gene expression. Al-Zaytoonah University of Jordan</td>
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<td>Time</td>
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<td>12.45-12.55</td>
<td>Abdullah Al-Omari: Molecular mechanisms governing the development of induced T regulatory cells and their significance in the progression of breast cancer models.</td>
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<td>1.55-1.05</td>
<td>Afhan Atallah: Involvement of gonadal testosterone in the blood-brain barrier integrity.</td>
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<tr>
<td>1.05-1.15</td>
<td>Questions and answers</td>
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<td>1.15-1.45</td>
<td>Coffee break and Posters session</td>
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<td>1.45-2.45</td>
<td>Industrial Pharmacy and Pharmaceutics session</td>
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<td></td>
<td>Postgraduate Poster Evaluation Competition</td>
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<tr>
<td>1.45-1.55</td>
<td>Mohammad Bahaa Majzoub: Development, in vitro and in vivo evaluation of a polymeric nanoparticulate drug delivery system for the management of glaucoma.</td>
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<tr>
<td>1.55-2.05</td>
<td>Walaa Malkawi: Employing Supercritical Fluid Technology as a Solvent Free Method for Preparation of Dispersions for Atorvastatin.</td>
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<td>2.05-2.15</td>
<td>Ruba Mohammed AL-Jariri: Validation and Determination of Piracetam in Rat Plasma by using High Performance Liquid Chromatography/UV/VIS Spectrometry (HPLC/UV/VIS) in Presence of Pomegranate and Liquorice Juices for Pharmacokinetic Study.</td>
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<tr>
<td>2.15-2.25</td>
<td>Maha Alkhawaldeh: Development and evaluation of polymeric particulate ocular delivery system for dexamethasone.</td>
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<td>2.25-2.35</td>
<td>Muna Barakat: Effect of atmospheric pressure non-thermal plasma exposure on Pseudomonas aeruginosa-induced cytotoxicity in murine macrophages.</td>
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<td>2.35-2.45</td>
<td>Raman Subrahmanyam: Towards the production of new generation biopolymer aerogels at large scale.</td>
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<td>2.45-2.50</td>
<td>Questions and answers</td>
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<td>2.50-3.15</td>
<td>Keynote Speech: Prof. Tawfiq Arafat Dean of Faculty of Pharmacy, Petra University</td>
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<tr>
<td>3.15-3.45</td>
<td>Keynote Speech: Prof. Abeer M. Al-Ghananeem Vice Dean College of Pharmacy, Jordan University of Science and Technology, Adjunct Prof. at Sullivan University, USA</td>
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<tr>
<td>4.00 – 5.00</td>
<td>Conference Dinner</td>
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**Workshop Details**

- **Workshop 1**: 12.30-2.30 Hosted by Dr. Veysel Kayser University of Sydney, Australia
- **Workshop 2**: 12.30-2.30 Hosted by Prof. Sergio Rutella Nottingham Trent University, UK
- **Workshop 4**: 4.15-6.30 Hosted by JFDA, Jordan
- **Workshop 5**: 4.15-6.30 Hosted by Pharmacy One, Jordan
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<tr>
<td>10.10-10.40</td>
<td>Keynote Speech: Prof. Mayyada Al-Wazaify Prof. of Pharmacy Practice, Jordan University</td>
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<tr>
<td>10.40-10.45</td>
<td>Keynote speakers award presentation</td>
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<td>10.45-11.15</td>
<td>Coffee Break, Posters Session and Exhibition</td>
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<tr>
<td>11.15-12.15</td>
<td>Pharmacy Education / Pharmacy Practice Session</td>
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<tr>
<td>Moderators: Dr. Awni Abdullah Khrais (Philadelphia University), Dr. Basima Almomani (Jordan University of Science and Technology), Dr. Walid Adnan Al-Qerem (Al-Zaytoonah University of Jordan)</td>
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<td>Postgraduate Research Competition - Conference Third Competition Session</td>
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<td>11.25-11.35</td>
<td>Eman Taha Al-Issa: The economic impact of smoking on health care resources in patients with chronic diseases in Jordan. Jordan University of Science and Technology</td>
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<td>11.45-11.55</td>
<td>Ahmad Alsayed: Understanding the Lung Microbiome in COPD and its Clinical Influence on Disease Outcome/ From Genomics toward Personalised Targeted Therapeutics. Queen’s University Belfast</td>
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<td>11.55-12.05</td>
<td>Heba Salah Abu-Shahla: Levels of Ghrelin and Visfatin and the Correlation between Them in Diabetic and Non-Diabetic Patients with Metabolic Syndrome: A Cross-Sectional Study in Jordan. Jordan University</td>
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<td>12.05-12.15</td>
<td>Questions and answers</td>
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<td>12.15-12.45</td>
<td>Coffee Break, Posters Session and Exhibition</td>
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<td>12.45-1.45</td>
<td>Natural Products and Medicinal Chemistry Session</td>
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<tr>
<td>Moderators: Professor Tawfik Allussainy (University of Petra), Dr. Nabeel Nuaimi (Applied Science Private University), Dr. Pran Kishore Deb (Philadelphia University)</td>
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<td>Postgraduate Research Competition - Conference Fourth Competition Session</td>
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<td>12.45-12.55</td>
<td>Anas Natsheh: Computer Discovery of Multitargeting inhibitors of MetAP2 and VEGFR/2. The Hebrew University of Jerusalem</td>
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<td>12.55-1.05</td>
<td>Luma Abd Al-samad: Biological Evaluation of the Antimicrobial Activity of Novel 3,5-disubstitutedamido -1,2,4-thiadiazole and 2,5-disubstitutedamido -1,3,4-thiadiazole.</td>
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<tr>
<td>1.05-1.15</td>
<td>Rasha M. Bashatwah: Towards the discovery of new inhibitors against the highly conserved protein PPK1 followed by validation against relevant bacterial species.</td>
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<td>1.15-1.25</td>
<td>Tasneem Alzubi: Evaluation of camel milk as a functional food to enhance the anticancer activity of selected natural products.</td>
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<td>1.25-1.35</td>
<td>Asser Ashraf Ahmad: Effect of pomelo fruit peel extract for wound healing in diabetic rats.</td>
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<td>1.35-1.45</td>
<td>Wafa Naji Snaikat: Cytotoxic evaluation of doxorubicin in combination with baicalein and resveratrol against different cancer cell lines.</td>
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<tr>
<td>1.45-1.55</td>
<td>Questions and answers</td>
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<td>1.55-2.25</td>
<td>Keynote Speech: Dr. Alaa A Aljabali Assis Prof. in Nanoscience, Yarmouk University</td>
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<td>2.25-3.30</td>
<td>Coffee break</td>
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<td>3.30-4.00</td>
<td>Closing Awards Ceremony</td>
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<td>3.30-3.40</td>
<td>Awards Announcement and Presentation</td>
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<td>3.40-3.45</td>
<td>Launching the Distinguished Pharmaceutical Award (found at <a href="http://awardpharmajo.portokit.com/Award/Award.aspx">http://awardpharmajo.portokit.com/Award/Award.aspx</a>)</td>
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<tr>
<td>3.45-3.50</td>
<td>Words from Dr Malek Alsadi – Pharmajo - The Network of Jordanian Pharmacists</td>
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<td>3.50-3.55</td>
<td>Words from Dr. Yousef Najajreh, Dean of Pharmacy, Al-Quds University, Palestine</td>
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<td>3.55-4.00</td>
<td>Words from Pharmacy Students / Palestine</td>
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<td>4.00-5.00</td>
<td>Conference Formal Dinner</td>
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<td>Workshop 5</td>
<td>11.00-1.30 Hosted by Dr. Fadi Alkhatteeb, Texas A &amp; M Health Science Center</td>
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<td>Workshop 6</td>
<td>11.00-1.30 Hosted by Prof. Mayyada Al-Wazaify, Jordan University</td>
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<td>Workshop 7</td>
<td>4.15-6.30 Hosted by Ibn Alhaitham Hospital, Jordan</td>
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<td>Workshop 8</td>
<td>4.15-6.30 Hosted by Pharmacy One, Jordan</td>
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Deans Formal Meeting (2:25 – 3:25)
Deans of the Jordanian Faculties of Pharmacy Association
VIP Meeting Room / ASU Conference Palace
Keynote Speakers

Texas A&M University/ USA

Dr. Fadi Alkhateeb (Associate Professor)
Director of Assessment and Accreditation

Dr. Fadi Alkhateeb is the Director of Assessment & Accreditation office & Associate Professor of Pharmacy Administration at Texas A&M University College of Pharmacy in Kingsville, Texas. Dr. Alkhateeb has published more than 50 peer reviewed articles and over 60 presentations and proceedings related to his areas of interest of Pharmacy education, pharmaceutical marketing, programmatic and curricular assessment, and international pharmacy accreditation. Before joining Texas A&M, he worked at University of Charleston (UC) School of Pharmacy as an Associate Professor for more than five and half years. He played a key role in building a new pharmacy program at UC. He was a recipient of number of teaching excellence awards. In the pharmacy curriculum, Dr. Alkhateeb has taught in the areas of health care delivery, pharmacy management, pharmaceutical marketing, pharmacoconomics and clinical research methods. He also delivered lectures in the Executive Master of Business Administration (EMBA) program at University of Charleston.

Dr. Alkhateeb was elected as a secretary of the Assessment SIG of the AACP. He has been actively involved in AACP since 2007 and has served on several committees including those involved with programming, Institutional Research and Assessment Committee (IRAC), and nominations. He has served as an abstract reviewer and often serves as a Walmart Scholar faculty mentor. He also served in writing the PCOA exam questions for the National Association of Boards of Pharmacy (NABP). Besides being a Fellow for Commission on Accreditation of Healthcare Management Education (CAHME), he has served as a field reviewer for the following accreditation councils: Higher Learning Commission (HLC), ACPE, ACPE-CPE, and Saudi National Commission for Academic Accreditation and Assessment (NCAAA). In recent years he has been an invited plenary speaker at international pharmacy conferences held in the UAE, Saudi Arabia, Qatar and Kuwait. A long with being a pharmacist, Dr. Alkhateeb has an MBA degree with a concentration in Pharmaceutical Marketing & Management from Aspen University and a PhD in Pharmaceutical Socioeconomics from the University Of Iowa College Of Pharmacy. Recently, Dr. Alkhateeb has completed the AACP Academic Leadership Fellowship Program (ALFP).
Keynote Speakers

Nottingham Trent University, Nottingham, UK

Prof. Sergio Rutella, MD PhD
Professor of Cancer Immunotherapy

Professor Rutella is the Professor of Cancer Immunotherapy at the John van Geest Cancer Research Centre. He is a licensed haematologist with a long-standing clinical and research interest in immunotherapy approaches for patients with leukaemia. At NTU, Professor Rutella’s research focus on visualizing the state of cancer-immune interactions in individual patients and on biomarker discovery, with the aim to guide treatment choices and improve clinical outcome.

Career overview

2014-2016: Executive Director of Clinical Research, Sidra Medical and Research Center, Doha, Qatar

2012-2014: Chairman, Immunohaematology and Transfusion Medicine, Bambino Gesù Children’s Hospital, Rome, Italy

2000-2012: Assistant Professor of Haematology and Consultant Haematologist, Agostino Gemelli University Polyclinic, Catholic University Medical School, Rome, Italy
Keynote Speakers

University of Petra, Amman, Jordan

Prof. Tawfiq Arafat

Professor of Pharmaceutical Medicinal Chemistry

Professor of Pharmaceutical Medicinal Chemistry,
Dean of the Faculty of Pharmacy and Medical Sciences
University of Petra, Amman Jordan.

EDUCATION

1. Ph.D in Pharmaceutical Medicinal Chemistry, 1980, School of Pharmacy U.W.I.S.T, Cardiff, United Kingdom.

2. M.Sc in Pharmaceutical Analysis, 1977, School of Pharmacy U.W.I.S.T, Cardiff, United Kingdom.

3. B.Sc Pharmacy, June, 1974, School of Pharmacy, Baghdad University, Iraq.
Keynote Speakers

Jordan University of Science and Technology, Irbid, Jordan

Prof. Abeer M. Al-Ghananeem

Vice Dean & Professor of Pharmaceutics and Biopharmaceutics.

Professor Al-Ghananeem is an Academic Leadership Fellow of the American Association of Colleges of Pharmacy (AACP). She was the Associate Dean of Research and Graduate Program at Sullivan University USA. Before that, she was a faculty member at the University of Kentucky, College of Pharmacy (ranked among the top ten Colleges of Pharmacy in USA). Also, she worked as a Vice President for Scientific Affairs at US WorldMeds pharmaceutical company and lead successful academic-industrial collaboration illuminating three pharmaceutical products in USA and global market; Revonto®, Valchor®, and SubSys®.

Prof. Al-Ghananeem received her Ph.D. in Pharmaceutical Sciences (Pharmaceutics and Biopharmaceutics) from University of Kentucky College of Pharmacy, USA and her B.Sc. Pharmacy with distinction from University of Jordan. During her academic journey, Dr. Al-Ghananeem secured over $2.5 million funding for her research projects and is an author of over 70 peer-reviewed research articles, symposium abstracts, and patent applications. She was among the executive team that head the College of Pharmacy ACPE PharmD accreditation and University SACScoc accreditation at Sullivan University USA. Her research focuses on Drug Delivery, industrial collaboration, FDA CMC guidelines/submissions, and nanotechnology for transmucosal drug delivery. Also, she serves on the Editorial Advisory Board for many reputable pharmaceutical and clinical journals.
Keynote Speakers

University of Sydney, Sydney, Australia
Dr. Veysel Kayser
Associate Professor in the Faculty of Pharmacy

Veysel Kayser is an Associate Professor in the Faculty of Pharmacy at the University of Sydney. He received his Ph.D. from the University of Leeds (UK). He then performed post-doctoral research at the Max-Planck Institute (Germany) and at MIT (US). Before joining the University of Sydney, he was a senior staff scientist at MIT.

Dr Kayser’s research focuses on biotechnology; development of therapeutic monoclonal antibodies (mAbs); biosimilars and biobetters; vaccine development; virus and vaccine characterization and formulation – in particular for rabies and influenza; protein folding and aggregation; biopharmaceutical formulation development; and the development and application of experimental based methods to biopharmaceutical products and processes. Since 2006, he has focused on the development of biopharmaceuticals (mAbs and vaccines), formulation of biologics, and molecular engineering for biotherapeutics. He has worked with several pharmaceutical companies including Sanofi-Pasteur in research or consulting.
Keynote Speakers

The University of Jordan, Amman, Jordan

Prof. Mayyada Al-Wazaify

A Professor of Pharmacy Practice at The School of Pharmacy - The University of Jordan.

- PhD, Queen's University of Belfast/UK (Dec 2003)
- Bsc. Pharmacy, The University of Jordan (June 2000)
- A visiting lecturer at The University of Bath/UK (May 2012-May 2015)
- Best Scientific Research Award at Hamad Medical Corporation Award (Qatar, Feb 2013)
- Editorial Board member of International Journals: Substance Use and Misuse, Journal of Drug Abuse Research
- Founder and Mentor of the Pharmacy Students Research Club (PSRC) at the Faculty of Pharmacy (since April 2013).
- University of Jordan Distinguished Researcher Award for 2 years 2011 and 2012.
- Member of the Society for The Study of Addiction (SSA)/ UK
- More than 40 research papers published in prestigious high profile international, regional and local peer reviewed journals. H-index= 15 (767 citations)
- Supervision of more than 35 Msc. Clinical Pharmacy students and served as an internal and external examiner for more than 15 students (Msc. and PhD) in and out of Jordan (ie- New Zealand, UK).
Keynote Speakers

Yarmouk University, Irbid, Jordan

Dr. Alaa Aljabali

Assistant professor at the department of pharmacy, Yarmouk University, Jordan

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Doctor Alaa Ahmed Aljabali got his Masters of Research - Essex University-UK- (working on breast cancer biomarkers for early detection and diagnosis) and PhD in Bionanoscience from John Innes Centre- UK (working on the development of plant viruses as tools and templates for nanomaterials synthesis)

He has published and co-authored more than 28 papers (one in Nature Communication and another in JACS) in peer-reviewed journal and 4 book chapters.

Worked as:

1. a postdoctoral scientist at John Innes centre on the development of plant viruses as drug carriers and for drug targeting
2. Postdoctoral Research fellow at the department of the Cardiovascular medicine at the University of Oxford for 3 years working on the development of nanoparticles for medical applications
3. Assistant professor at the department of pharmacy Yarmouk university- Jordan

Awards:

- John Innes foundation for excellence in scientific communication
- Best oral presentation in EuAsC2S (European/Asian) conference on material science
- Two fellow grants from Oxford university and the Wellcome Trust UK

His lab’s mission is to push to new frontiers in biomaterials science and medicine through design, development, and testing of novel natural bio-inspired materials using plant virus-based scaffold. Leading a research laboratory interfacing of bio-inspired, molecular engineering approaches with medical research, technology development, and materials science. His group’s research focuses on the design of viral nanoparticles-based materials for applications in imaging, therapy, and drug targeting.
Workshops
Workshop 1

Development of Biologics: Biosimilar mAbs and Vaccines

Dr. Veysel Kayser (Associate Professor)
Faculty of Pharmacy – The University of Sydney, Australia

The workshop will be about the development of biologics with a focus on therapeutic monoclonal antibodies (mAbs), specifically biosimilar mAbs. In addition to the development of viral vaccines, particularly rabies and influenza vaccine.

OBJECTIVES

After attending this workshop:

- In the biologics section, you will learn about:
  - The basics of biologics
  - Current state-of-play of mAbs
  - Rational formulation development
  - Formulation and stability
  - Recent developments on therapeutic mAbs
  - Biosimilars and biobetters
  - Brief introduction on regulatory issues on biologicals
  - Future outlook

- In the vaccine section, you will learn about:
  - The basics of vaccines
  - Rabies and flu vaccines
  - Rational formulation development
  - Formulation and characteristics of flu vaccine
  - Future outlook
HLA-haploidentical hematopoietic stem cell transplantation (HSCT) is increasingly offered to patients lacking related or unrelated HLA-matched donors. Historically, clinical success, i.e., full donor-type engraftment in 95% of patients with acute leukaemia and negligible incidence of acute and chronic graft-versus-host disease (GVHD), has been achieved with T-cell depleted (TCD) grafts containing a mega-dose of positively selected CD34+ cells, without the use of any post-transplant immunosuppression.

Granulocyte colony-stimulating factor (G-CSF) is widely employed as mobilizing agent in healthy donors and cancer patients. However, G-CSF-based regimes are associated with a 5-30% failure rate. AMD3100, also known as plerixafor, was approved in 2008 for use in combination with G-CSF to mobilize hematopoietic stem cells (HSC) for autologous HSCT. Plerixafor specifically and reversibly blocks the binding of C-X-C chemokine receptor 4 (CXCR4) to its natural ligand, stromal cell-derived factor 1 (SDF1), a CXC chemokine and key regulator of HSC homing and retention in the bone marrow (BM). Plerixafor synergizes with G-CSF through its different mechanism of action, as suggested by randomized phase III studies, where plerixafor and G-CSF were shown to be superior to G-CSF alone for CD34+ HSC mobilization and collection.

There is growing evidence that the biological activities of G-CSF are not limited to the myeloid lineage, but extend to other cell types mediating, amongst the others, inflammation, immunity and angiogenesis. The few available data on immunological effects of plerixafor are mostly limited to cancer patients and show that CD8+ T-cell release of IFN-γ and TNF-α may be higher in autologous grafts collected after G-CSF and MZ, compared with G-CSF alone.

Investigators have developed novel graft manipulation strategies aimed at extensively removing T-cell receptor (TCR)-αβ+ T cells and CD19+ B cells from haploidentical HSCs, prior to their infusion into patients with haematological disorders. TCR-αβ and B-cell depletion is intended to prevent GVHD and post-transplantation lymphoproliferative disorders, respectively. The results of the first clinical trials are encouraging and support the feasibility and potential efficacy of this approach. However, post-transplantation cellular therapies may be required to boost immunological reconstitution, reduce the incidence of infectious re-activations and promote durable leukaemia control.
Workshop 3

Pharmacovigilance, the Rational Drug Use, Drugs Registration, Natural Products, Clinical Pharmacy (Jordan Food and Drug Administration)

- Dr. Ghadeer Al-Sheikh Salem, Registration specialist.
- Dr. Ghadeer Al Qawasimi, Specialist in Pharmacovigilance, Rational Drug Use Department.
- Dr. Jaber Jaber, Head of Medicines Transparency Alliance section at rational drug use and pharmacovigilance department.
- Dr. Saleem Mohammad Al-Mahrouq, Head of clinical studies.

Objectives:

- To elaborate the main functions of the Jordan food and drug administration (JFDA) mainly the drug directorate.
- Assisting the participants in designing their career paths as being pharmacists.

Learning objectives

At the end of the workshop participants will have a full understanding for the major role of the drug directorate in JFDA regarding medicines supply chain starting from clinical studies, moving to registration and ending in post-marketing experiences (Pharmacovigilance & Rational Drug Use), which will give them the ability to determine their carrier path in the pharmaceutical sector.

Description of Workshop Activities:

The workshop will begin with a 30 min presentation from JFDA specialists each one in his field; clinical studies, registration, pharmacovigilance & rational drug use department(s). The order of presentations is according to the birth date of the medicine, so to draw a complete picture for the medicines pathway till post-marketing and each part with its related Job vacancies.
Workshop 4

Abuse and Misuse of Non-Prescription Medicines: The Elephant in The Room

Prof. Mayyada Wazaify
Professor of Pharmacy Practice
School of Pharmacy- The University of Jordan, Amman, Jordan

Abuse and Misuse of medications sold without prescription is a global problem. Pharmacists have a considerable role in the prevention, identification and management of Non-Prescription Medicines (NPM) misuse and abuse. In most cases of NPM misuse, the management involves patient education, whereas it takes more knowledge, skills and communication skills of the pharmacist to identify and manage NPM abuse or dependence.

Aims of the Workshop

- To identify and update terminology and NPM classes liable for abuse/misuse.
- To discuss how pharmacists can be proactive in identifying those at risk of dependence to NPMs.
- To consider how pharmacists might approach those considered at risk of dependence.

Learning Objectives

At the end of the workshop participants will i) have a solid understanding of which NPMs are particularly liable to misuse, abuse and dependence, ii) will have formulated a pharmaceutical care model for those at risk of dependence to NPM.

Description of Workshop Activities

The workshop will begin with a 30 min presentation on NPM misuse, abuse and dependence. The group will then split into small groups and be given the task of considering i) how they might identify people at risk of NPM dependence? ii) how they might approach people with potential NPM dependence? and iii) what might a Pharmaceutical Care Plan for those at risk of NPM dependence might look like? In the final part of the workshop each group will feed back to the whole group, followed by a group discussion.
Workshop 5

Learning Evidence Based Medicine in Hospitals

Msc. Hanan Nabeel Abunimeh  
Msc. Delia Omar  
Pharmaceutical Care Unit, Ibn Al-Haitham Hospital

Learning Evidence Based Medicine in Hospitals

Learning objectives

At the end of the workshop participants will

1. Be able to turn clinical problems into questions, followed by a systematic literature search, analyses, and use of current research findings to make clinical decisions.

2. Learn where to find the best evidence.

Aim of the workshop

To discuss how pharmacists can be proactive in finding the best available evidence according to specific clinical scenario to achieve the optimal patient outcomes.

Description of workshop Activities:

The workshop will begin with a brief introduction about evidence based medicine.

Describe the hierarchy of study designs with examples.

Students will be given 4 clinical scenario with clinical problem to practice how to turn it into a question and then how to find the best available evidence to answer the question.
Workshop 6

Sharing Insights, Best Practices and Strategies to Pursue a Postgraduate Degree in the USA

Dr. Fadi Alkhateeb
Director of Assessment & Accreditation office & Associate Professor of Pharmacy Administration at Texas A&M University College of Pharmacy, Kingsville, Texas.

Pharmacy graduates who wish to study Postgraduate degree in pharmacy in the U.S. must complete the TOEFL, GRE and other admission requirements. Other pharmacists who want to practice pharmacy are required to complete the Pharmacy Graduate Examination Certification (FPGE), the North American Pharmacist Licensure Examination (NAPLEX), the Multistate Pharmacy Jurisprudence Examination (MPJE) and around 1500-2000 of internship hours. Therefore, this workshop aims to provide a practical guide and insight for our pharmacy academic institutions administrators, pharmacists, and pharmacy students into parameters to improve their chances of getting a graduate education in pharmacy in the USA.

Objectives:

1. Explore the criteria for admission for the degree of Master's and PhD in Pharmacy from the US Universities (GRE, TOEFL, letters of interest, recommendation letters, and financial support statement).

2. Introduce the licensing pharmacy exams in the USA (FPGE, NAPLEX, MPJE) and the best strategies to prepare for them.

3. Introduce the Graduate Admission Examinations and the minimum requirements for the TOEFL and GRE exams and the best strategies to prepare for them.

4. Learn how to write a letter of interest in a specific program.

5. Learn about the postgraduate education opportunities (Residency PGY-1, Residency PGY-2, Research and Industrial Fellowships).

6. Learn about the Universities that offer graduate degrees in pharmacy in the USA.

7. Learn about the different Pharmacy Programs tracks and specializations.

8. Learn about the differences between Clinical Pharmacy, Clinical Pharmacology and Basic & Molecular Pharmacology.
Workshop 7

Retail Pharmacy Management

Dr. Lara Abbasi is the S. V. P. for Internal Control at Pharmacy One
Dr. Arwa Al-Khatib is the director of Training/Poison and Drug Information Center at Pharmacy One
Pharmacy One, Amman, Jordan

Retail Pharmacy management workshop aims to bridge the gap between the theoretical information that we learn at pharmacy school with the real practice in retail pharmacy business, it will give an insight on what do you need to run a successful business in the field of retail.

- Learning objectives

After attending this workshop the students will be able to:
1. Identify the services that can be provided by community pharmacy
2. Understand inventory principles
3. Know the effects of a good merchandising on sales and customer behavior
Workshop 8

Poison Control

Dr. Aida Fawadleh is the division Head of Pharmacy one Poison Information Center.
Pharmacy One, Amman, Jordan

- Poison control workshop will show you the most common poisoning cases in Jordan, will also help you to differentiate the first aid measures that are taken in case of poisoning, it will also give you an insight about the resources that we can use.

- **Learning objectives**

  - After attending this workshop the students will be able to:
  1. Know the poisoning categories
  2. Understand the algorithm of poisoning treatment and first aid
  3. Identify poison information resources for quick reference
  4. Understand first aid for the top drug poisoning cases in Jordan
In dry eye it is important to manage the underlying cause of dryness, not only the signs and symptoms.

TiORETIN® A
Golden Standard for Diabetic Dry Eye

TRIUM®
Golden Standard post-refractive and for corneal ulcers and erosions

BLU yalA®
Artificial Tear of Choice for Mild to Moderate Dry Eye

BLU gelA®
Artificial Tear of Choice for Severe Dry Eye
Keynote Speakers Abstracts
Recent Trends in Stem Cell Therapies

Prof. Sergio Rutella
Nottingham Trent University, UK

ABSTRACT

HLA-haploidentical hematopoietic stem cell transplantation (HSCT) is increasingly offered to patients lacking related or unrelated HLA-matched donors. Historically, clinical success, i.e., full donor-type engraftment in 95% of patients with acute leukaemia and negligible incidence of acute and chronic graft-versus-host disease (GVHD), has been achieved with T-cell depleted (TCD) grafts containing a mega-dose of positively selected CD34+ cells, without the use of any post-transplant immunosuppression. Granulocyte colony-stimulating factor (G-CSF) is widely employed as mobilizing agent in healthy donors and cancer patients. However, G-CSF-based regimens are associated with a 5-30% failure rate. AMD3100, also known as plerixafor, was approved in 2008 for use in combination with G-CSF to mobilize hematopoietic stem cells (HSC) for autologous HSCT. Plerixafor specifically and reversibly blocks the binding of C-X-C chemokine receptor 4 (CXCR4) to its natural ligand, stromal cell-derived factor 1 (SDF1), a CXC chemokine and key regulator of HSC homing and retention in the bone marrow (BM). Plerixafor synergizes with G-CSF through its different mechanism of action, as suggested by randomized phase III studies, where plerixafor and G-CSF were shown to be superior to G-CSF alone for CD34+ HSC mobilization and collection.

There is growing evidence that the biological activities of G-CSF are not limited to the myeloid lineage, but extend to other cell types mediating, amongst the others, inflammation, immunity and angiogenesis. The few available data on immunological effects of plerixafor are mostly limited to cancer patients and show that CD8+ T-cell release of IFN-γ and TNF-α may be higher in autologous grafts collected after G-CSF and MZ, compared with G-CSF alone. Investigators have developed novel graft manipulation strategies aimed at extensively removing T-cell receptor (TCR)-αβ+ T cells and CD19+ B cells from haploidentical HSCs, prior to their infusion into patients with haematological disorders. TCR-αβ and B-cell depletion is intended to prevent GVHD and post-transplantation lymphoproliferative disorders, respectively. The results of the first clinical trials are encouraging and support the feasibility and potential efficacy of this approach. However, post-transplantation cellular therapies may be required to boost immunological reconstitution, reduce the incidence of infectious re-activations and promote durable leukaemia control.
Role of Media in Promoting Faked Medicaments

Prof. Tawfiq Arafat

University of Petra, Amman, Jordan

ABSTRACT

The role of media considered to be very crucial in promoting faked medicaments especially to layman, in the presentation, case studies which focused on the role of media either, newspaper, radio, television, or the net well be presented and simply showed how dangerous to let people promote their herbal medicaments for the treatment of so many diseases through media.

I strongly believe that all people working in health authorities should have a say to stop promoting medication through media.

All people worked in health provider should have a say in faked medication, a clear laws should be implemented against anybody think in trading in faked medicaments.

Conclusion: Arab Health Ministers should stands firmly against anybody try to prepare faked medicaments of promoting false treatment for people suffering from any disease, that can be done by implementing a clear rules and regulations which control manufacturing and promoting any medicaments.
Recent Trends in Pharmaceutical Graduate Studies and Research in USA

Prof. Abeer M. Al-Ghananeem
Jordan University of Science and Technology, Irbid, Jordan

ABSTRACT

Pharmacy education evolved from educating pharmacists with a product focus in the past to patient-centered care. Accordingly, to meet the demands and expectations, there is much more to do to produce scientifically and technically competent graduates.

The bright future of graduate studies envisioned for the new integrated life and clinical sciences industry is being built around the emerging clinical advancements, pharmaceutical technologies, discoveries in genomics, and an increasing understanding of the molecular basis of many diseases.

This future scenario poses both opportunities and challenges for graduate programs in the pharmaceutical sciences in colleges and schools of pharmacy. The challenges primarily come from within the university as many biomedical sciences, biomedical engineering departments, and schools of clinical and public health refocus their research in areas related to pharmaceutical sciences, to avail themselves to the increasing financial resources available to conduct research in these areas.

To maintain and enhance a successful research and graduate program within the university environment, pharmaceutical science graduate programs and faculty in colleges and schools of pharmacy in USA provides currently a wide range of graduate studies specialty. Ensure while looking for graduate programs or research programs (as a student, a postdoc, visiting scientist, residency, fellow, or faculty) to pick the ones that fits with your aspiration.

Thus, an overview of recent trends in programs and specialties presented for pharmaceutical graduate studies and research in USA will be presented.
Mechanisms and Predictive Tools for the Degradation of Biotherapeutics and Influenza Vaccine

Dr. Veysel Kayser
University of Sydney, Sydney, Australia

ABSTRACT

Biologics and vaccines are now integral part of our healthcare system. However, most biologics and vaccines suffer from formulation stability issues due to their complex nature. Complicated manufacturing and processing steps also play an important role in their stability. For example, functional and immunological repercussions of degradation of therapeutic monoclonal antibodies are often a major concern. Degradation occurs mainly via protein aggregation and aggregates are known to be immunogenic; therefore, understanding its mechanism and accurate quantification of aggregates is important.

Another example is the formulation of seasonal flu vaccines, which are produced after chemical inactivation and non-ionic surfactant treatment. The aim is producing a vaccine product that has a low level of reactogenicity with high potency. Surfactants cause viruses to ‘split’ due to the membrane solubilisation and they further stabilize unbound membrane proteins. Consequently, this ‘splitting’ process affects the formulation stability and potency of flu vaccines greatly. Hence, optimizing manufacturing conditions and estimating the split-ratio and leftover surfactant in each step is of utmost importance for rapid preparation of flu vaccines.

Here, we present several approaches we developed over the years – employing spectroscopy, chromatography and microscopy, to study protein aggregation in monoclonal antibody formulations, to quantitatively estimate the split-ratio of flu virus following surfactant treatment, and to determine leftover surfactant in influenza vaccines. Results from different methods correlate well. This study forms the basis of an in-situ method to quantify split viruses and leftover surfactant during vaccine manufacturing, and will facilitate the rapid development of the flu vaccine in a more controlled manner. It will also be beneficial for the development of other biologics including biosimilars of monoclonal antibodies for the detection of protein aggregation.
The Clinical Pharmacist in Community Setting: Shooting for the Moon!

Prof. Mayyada Al-Wazaify

The University of Jordan, Amman, Jordan

ABSTRACT

The profession of pharmacy is well positioned to meet the primary care needs of patients, and the community pharmacist is the most accessible healthcare professional who can provide a professional, walk-in, free of charge pharmaceutical care service to patients. The definition of clinical pharmacy or the so-called Pharmaceutical Care focuses on drug therapy and recognizes the pharmacist as a health care provider who can actively participate in illness prevention and health promotion along with other members of the health care team. Until recently, community practice has been focused towards volume dispensing rather than the extent or quality of pharmaceutical care to the patient. However, the dispensing process does include a check on the safety and efficacy of each prescribed therapy and on many occasions this cannot be clarified without consultations with the prescriber. Community pharmacy practice settings (e.g. traditional independent or chain) incorporate some other aspects of clinical pharmacy services (e.g., patient counseling) that research has documented as a catalyst to improve disease control and thus quality of life, and to reduce adverse drug reactions and non-compliance among patients. This talk mainly aims to review guidelines for clinical pharmacy practice in community setting, highlight barriers to the provision of clinical pharmacy services in this setting and to make recommendations designed to promote the growth of clinical practice in community setting.
An overview of the international pharmacy accreditation systems

Dr. Fadi Alkhateeb
Texas A&M University College of Pharmacy, Kingsville, Texas

ABSTRACT

Most pharmacy colleges in the Middle East tend to emulate trends of pharmacy education in the developed world. Recently, many pharmacy colleges in the area have started to seek international pharmacy accreditation/certification (IPAC) as part of their quality improvement programs. Pharmacy program accreditation is recognized as an effective mechanism for assisting in quality assurance of academic programs, and enhancing the opportunities for international interchange. Typically, four IPAC programs are adopted by these schools: Accreditation Council for Pharmacy Education - International Services Program (ACPE-ISP), Canadian Council for Accreditation of Pharmacy Programs (CCAPP); German Accreditation Agency in Health and Social Sciences (AHPGS) and Australian Council for Pharmacy (APC). The status of pharmacy accreditation world wide is reported compared and, in view of the developments, the ways and means to achieve the "fully accredited" are discussed.
Viruses as tools of nanomedicine

Dr. Alaa Aljabali

Faculty of Pharmacy, Yarmouk University, Irbid, Jordan

ABSTRACT

In recent years, there has been increasing interest in the exploitation and the development of naturally-occurring nanoparticles in nanomedicine. Viruses are self-assembled protein cages bearing typical characteristics of ideal nanocarriers for medical imaging and drug delivery; their monodispersity (uniform size), polyvalency and biodegradability makes them ideal drug delivery platforms. In addition, viruses are amenable to site-selective functionalization to impart novel and desirable functionalities through the genetic or chemical modification for the exterior or the interior of the particles. The production of such nanoparticles is relatively inexpensive, easily produces and can be obtained in good quantities. Viral nanoparticles (VNPs) have been used as drug carriers for the selective delivery of therapeutics to the diseased cells with high precision and accuracy. Moreover, VNPs internal cavity can be loaded with various drug moieties while the exterior surface can by functionalized with different molecules for targeting, tracking and reducing immunogenicity. VNPs have shown to be biocompatible and biodegradable with enormous potential in the pharmaceutical and medical application.
MANUFACTURERS OF WIDE RANGE OF PHARMACEUTICALS WITH INTERNATIONAL STANDARD

Cardiovascular Drugs
Osteoporosis & Diabetes Drugs
Antidepressant & Antipsychotic Drugs
Acid Reducing & Anti-ulcer Drugs
Anti-infective Drugs
Analgesic, Antipyretic & Antirheumatic Drugs
Antitussive, Decongestants, & Antihistamines
Erectile Dysfunction Drugs
Dietary Supplements

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Abstracts for Oral Presentation
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Etazolateneuroprotective effects in a rat model of Parkinson’s disease induced by 6-hydroxydopamine

Enas Mkhaimr1, Kareem Alzoubi1, Amjad Abuirmeileh2

1Department of Clinical Pharmacy, Faculty of Pharmacy, Jordan University of Science and Technology, Amman, Jordan.
2Department of pharmacology, Faculty of Pharmacy, Israa university, Amman, Jordan.

ABSTRACT

Introduction: Parkinson’s disease (PD) is an incurable and debilitating neurodegenerative disease that is characterized by degeneration of dopaminergic neurons. Etazolate is a pyrazolopyridine compound that selectively modulates the Gamma-aminobutyric acid (GABA(A)) receptor through inhibition of adenosine receptors. Moreover, it selectively inhibits phosphodiesterase IV which is suggested to promote Cyclic adenosine monophosphate / cAMP-calcium response element binding protein / Brain-derived neurotrophic factor (cAMP/CREB/BDNF) signaling which in turn mediates neuronal survival and plasticity. Therefore, it has a potential beneficial effect in controlling PD pathogenesis.

Aim: To evaluate Etazolate treatment on defective motor performance, depressive – like behavior and cognitive impairment related to PD.

Method: PD was induced in rats by injecting 6-hydroxydopamine (6-OHDA) in the right medial forebrain bundle (MFB). Apomorphine induced rotation test was used to behaviorally evaluate 6-OHDA induced motor deficits, tail suspension was conducted as behavioral tests of depression-like symptoms, while radial arms water maze was used to evaluate cognitive function. Etazolate was administered orally at a dose of 1mg/kg/day for 14 days after 7 days of the stereotaxic surgical procedure and its effect was compared to other control group. Finally, the hippocampus was dissected; antioxidant markers and BDNF protein level were assessed by Enzyme-Linked Immunosorbent Assay (ELISA).

Results: Etazolate administration significantly improves the 6-OHDA induced PD related symptoms including motor deficits, depression and impairment in both short and long term memory. Moreover, our findings show that Etazolate significantly normalizes oxidative stress related parameters (GSH, GSSG, GPx) and BDNF levels.

Conclusion: Motor dysfunction, depressive- like behavior, and memory deficits in the 6-OHDA rat model of Parkinson’s can be significantly improved with Etazolate. This improvement could be through enhancing antioxidants capacity and BDNF level in 6-OHDA lesioned animal.
Evaluation of camel milk as a functional food to enhance the anticancer activity of selected natural products to treat breast cancer.

Tasneem Osama Al-zubi and Wamidh H. Talib

Department of Clinical Pharmacy, Faculty of Pharmacy, Applied Science University

Milk is one of the widely consumed foods and it represents an important source of calcium and protein. Cow milk is the main type of milk consumed globally. However, camel milk consumption is increasing recently in the Arabic region and various studies reported the benefits and biological activities of camel milk.

Camel milk and natural products have different targets in cancer cells. However, no previous studies tested the anticancer effect of combining both agents. It seems logical to assume that a combination of different anticancer activities of these two agents may provide effective anticancer therapy. Accordingly, this study was conducted to evaluate camel milk and selected natural products as a new potential combination therapy to treat breast cancer in vitro and in vivo.

The anti-proliferative activities for the combined therapy were tested against different breast cancer cell lines using MTT assay. TUNEL colorimetric assay was used to measure degree of apoptosis induction. ELISA was used to measure vascular endothelial growth factor (VEGF) expression in tumor cells and to measure levels of INF-γ, IL-4, IL-2 and IL-10 secreted by splenocytes after applying the combination therapy treatment. Comparative screening analysis by HPLC-MS and GS-MS was performed to compare camel milk and cow milk composition.

In general camel milk has higher protein content and a lower fat content as compared with cow milk. A precise analysis showed extreme higher percentage composition of: β-casein, α-lactalbumin, glutamic acid, prolin, vitamin C, lysozome, lactoferrin, lactoperoxidase and other elements in camel milk when compared with cow milk. Significant reduction in cell growth was observed in breast cancer cells treated with camel milk (EMT-6, MCF-7 and EMT-6). On the other hand, cow milk exhibited limited activity against the same cell lines.

When combing camel milk with thymoquinone (TQ) or resvertrol (RES) a huge regression in cancer cell growth any synergistic response was noticed.

Combining camel milk with TQ caused cancer inhibition through the reduction in VEGF expression, while camel milk and RES showed a synergistic activation of caspase 3 activity and apoptosis induction. Immune system evaluation showed an increase in both of TH1(IFN-γ, IL-2) and TH2 (IL-4) cytokines level after lymphocytes stimulation by both combinations. Camel milk with TQ was the most potent combination to stimulate lymphocytes proliferation.

In conclusion, combination of camel milk with either TQ or RES causes significant regression in cancer growth in vitro and in vivo. Camel milk with TQ combination was more active in angiogenesis inhibition, while camel milk with RES showed higher activity in apoptosis induction. Both combinations were active as immunomodulators. Results of this study may be used in future to design anticancer functional food. However, further testing is essential to explore the exact cellular targets of such combination and to test its efficiency against other cancer types.
Effect of atmospheric pressure non-thermal plasma exposure on
Pseudomonas aeruginosa-induced cytotoxicity in murine macrophages

Muna Barakat¹, L. Carson¹, W. Graham², B. Gilmore¹

¹Biofilm Research Group, School of Pharmacy, Queen’s University Belfast, Belfast, BT9 7BL, UK
²Centre for Plasma Physics, School of Math and Physics, Queen’s University Belfast

ABSTRACT

Atmospheric pressure non-thermal plasma (APNTP) exhibits a rapid and effective bactericidal activity against Pseudomonas aeruginosa in both planktonic and biofilm forms [1, 2]. The ability P. aeruginosa to cause serious infections is in part due to its ability to produce and secrete an extensive variety of virulence factors, including lipopolysaccharide (LPS), a cell wall related endotoxin [3]. Whilst LPS is extremely cytotoxic, studies have not yet demonstrated the effect of APNTP on neutralizing bacterial virulence factors such as LPS, despite it being a potential application for the treatment of infections. This study investigates the effect of APNTP exposure on P. aeruginosa supernatant and LPS induced cytotoxicity towards RAW264.7 murine macrophage cells using the MTT assay after incubation with plasma treated supernatants and LPS. In order to elucidate one of the potential factors for improvement in viability, LPS was exposed to APNTP separately and added to the macrophage culture. Plasma exposure of the P. aeruginosa supernatant demonstrated a significant improvement after 60 seconds exposure. APNTP exposure resulted in an improvement of macrophage viability after treatment of LPS only. This result suggests the improvement in viability of plasma treated bacterial supernatants may be related to plasma modification of the lipid A component of LPS. The lipid A component is responsible for the toxicity of LPS. Analysis of plasma exposed LPS using FT-IR, illustrated the main areas for modifications were changes in the fatty acid (C-H group) absorption band at ~2917 cm⁻¹, a new carbonyl bond peak was generated at ~1714 cm⁻¹ with plasma exposure and a decrease in absorbance of the phosphate stretch at ~1260 cm⁻¹. This study describes how plasma exposure of bacterial LPS can decrease its toxicity to mammalian cells through modification of the lipid A component of LPS.
Development and evaluation of polymeric particulate ocular delivery system for dexamethasone

Maha Alkhawaldeh, Yasser Bustanji, Sharif Abdelghany, Hatim AlKhatib
School of Pharmacy, University of Jordan, Amman, Jordan

ABSTRACT

Introduction: Uveitis, inflammation of the middle layer of the eye, is usually treated by corticosteroid drugs in the form of topical eye drops. This modality of delivery is associated with limited time for drug-surface contact after the administration which is responsible for poor absorption and bioavailability. Aim: To prepare and evaluate a sustained release nanoparticulate (NP) polymeric drug delivery system of dexamethasone using ionic gelation of chitosan triacetate (CTA).

Methods: The effects of ionic gelation parameters (CTA concentration and molecular weight, the use of carrageenan and its levels, the concentration of the crosslinking ion and the method of drug incorporation) on the NP size, zeta potential drug loading and drug release were studied. The NPs internal structure and molecular interactions were studied using DSC and FTIR. Stability study was performed to estimate the effect of storage conditions on the NPs size and zeta potential. The morphologic examination of NPs was performed by STEM. A cytotoxicity study was also carried out to determine the effect of NPs suspension application on the conjunctival cells viability. Results and Conclusion: The addition of dexamethasone before ionic crosslinking and the use of medium molecular weight CTA in the preparation of NPs has slowed the drug release and increased drug loading in comparison to drug addition after ionic crosslinking and the use of low molecular weight CTA. NPs were safe upon application on conjunctival cells, stable upon storage, spherical in shape. No chemical interaction was detected between the drug and the carrier system. The developed NPs are suggested as potential carriers for the treatment of uveitis.
Understanding the Lung Microbiome in COPD and its Clinical Influence on Disease Outcome/ From Genomics toward Personalised Targeted Therapeutics

Ahmad Alsayed¹, Deirdre Gilpin², Brendan Gilmore², Derek Fairley²,³, Peter Coyle²,³

¹ School of Pharmacy and the Centre for Experimental Medicine-QUB, UK
² School of Pharmacy-QUB, UK.
³Belfast Health & Social Care Trust-Royal Victoria hospital

ABSTRACT

Introduction/Aims: Chronic obstructive pulmonary disease (COPD) is associated with considerable morbidity and mortality worldwide. The primary aim of this project is to examine the impact of lung microbiome on the clinical outcome of patients with COPD and acute exacerbation (AE) of COPD.

Methods: This is a prospective, observational study of a cohort of COPD patients over a period of 17 months based in Canada. Sputum and nasal swabs samples for baseline screening were collected from 129 COPD patients. Of these, 79 patients were monitored for AECOPD throughout the study period (144 exacerbation events). Nucleic acid extraction is done for all specimens and tested by real-time qPCR to detect different types of microbes. Library preparation is ready for 16S rDNA analysis using IlluminaMiseq next-generation sequencing.

Results: 66/79 (84%) patients suffered from at least one exacerbation event during the study period. Baseline samples showed 11% of patients (14/129) were virus-positive, all for rhinovirus (HRV). In comparison, the overall viral positivity in exacerbation patients was 53% (35/66), with 32% (21/66) HRV; indicated a significant difference in the number of overall viruses including HRV detected between the two groups (p<0.05). The cycle thresholds (Ct-values) generating from qPCR were significantly lower in virus-positive exacerbation samples compared to baseline (p<0.05). Moreover, there were no significant differences between nasal and sputum samples regarding viral-positivity and Ct-values. We are developing a novel method that allows sequencing of the VPs genes of HRV-positive samples using Sanger sequencer; six assays, consisting of RT-PCR, nested, and semi-nested PCR, showed primarily successful results.

Conclusion: The results of this project allow classifying COPD patients into different phenotypes according to their lung microbiome analysis using bioinformatics platforms. Understanding the changes of the lung microbiome along with COPD, antibiotics, and steroids use will allow for novel therapeutic options and moving toward individualised medicine in COPD.
Validation and Determination of Piracetam in Rat Plasma by using High Performance Liquid Chromatography/UV/VIS Spectrometry (HPLC/UV/VIS) in Presence of Pomegranate and Liquorice Juices for Pharmacokinetic Study

Ruba Mohammed AL-Jariri, Wael AbuDayyih, Eyad Mallah
Department of Pharmaceutical Medicinal Chemistry & Pharmacognosy, University of Petra

ABSTRACT

Pomegranate and liquorice juices are widely consumed around the world especially in the Middle Eastern countries due to their prevention and treatment of common diseases. Piracetam drug is a nootropic agent used to improve cognition and to enhance memory.

A new validated, simple and rapid method for determination of piracetam in presence of pomegranate and liquorice juices was developed by using High Performance Liquid Chromatography–Ultra Violet-Visible Spectroscopy (HPLC/UV/VIS). The mobile phase was composed of 98 % of Water and 2 % of Acetonitrile. BDS C18 Column (150mm x 4.6 mm, 5μm), and a flow rate of 1.0 ml/min were used, the autosampler injection volume was 5 microliters. Cefadroxil was used as an internal standard.

Rats were divided into 3 groups, group A (n=6) received a single dose of piracetam only (50mg/Kg), group B (n=6) received piracetam with pomegranate juice, while group C (n=6) received piracetam with liquorice juice. The precision of the predicted measurements for piracetam was high (mean CV% <10%). The accuracy for piracetam over all the three days of validation and all the four tested target concentration was within the accepted criteria. The standard curves for piracetam matched the requirements, linear relation (R^2) ranged between (0.9992 to 1).

According to the results obtained, the Cmax for piracetam alone was (61.254µg/ml), there was no significant effect (P>0.05) of pomegranate or liquorice juices on the Cmax of piracetam. For the AUC, the difference between piracetam alone and piracetam with pomegranate and liquorice was also insignificant (P>0.05). The total body clearance of piracetam significantly increased ( p < 0.05) when combined with either pomegranate or licorice. However, in spite this significant increment, this does not seem to affect the whole pharmacokinetic profile of piracetam when given with pomegranate or licorice juices.
Effect of Pomelo Fruit Peel Extract for Wound Healing in Diabetic Rats

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ABSTRACT

Introduction: Diabetes mellitus is life threatening disease and has become the third leading cause of death after cancer & cardiovascular diseases. Delayed cutaneous wound healing is a chronic complication in diabetics than in healthy individuals, may be due to hyperglycemia, diminished expression of cytokins, oxidative stress and/or microbial infections. Pomelo (Citrus Maxima) also known as Chinese grapefruit, belongs to the genus Citrus of the family Rutaceae, one of the most important fruit crops with great economic significance and value for humans in the world. Previous studies showed that pomelo peels contain an abundance of bioactive compounds, such as flavonoid and vitamins which may promote wound healing in experimental animals.

Aim & objective: The objective of this study was to investigate the effect of oral treatment with ethanolic pomelo peel extract on skin excision wound healing in diabetic rats compared to control.

Methods: Pomelo fruits were collected from the local retail market of Jordan after the peel were removed off and shade dried for about one month, the powder of the peel were extracted with aqueous ethanolic mixture. Diabetes mellitus was induced in rats by intraperitoneal injection of a single dose of streptozotocin (STZ, 75mg/kg body weight). One week after diabetes induction, full thickness excision wounds were made in hyperglycemic rats and were divided into groups, each containing 8 rats. Different test group animals were treated with two doses of peel extract, 400mg/kg & 600mg/kg orally for 3 weeks. The blood glucose level, body weight and rate of wound closure was calculated as percentage of wound size reduction. Time taken for 50% of wound closure was calculated for each rate were measured and digital camera photos were taken for wound every 4 days during the experimental period.

Results & Conclusion: The results showed significant reduction in blood glucose and in both percentage & time to wound closure. Our experimental data showed that oral administration of pomelo peel extract has good therapeutic potential in the treatment of chronic wounds in diabetes.
The economic impact of smoking on health care resources in patients with chronic diseases in Jordan

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ABSTRACT

Background: Tobacco smoking is a widely spread phenomenon around the world. Jordan, has a high prevalence of cigarette and waterpipe smoking among Middle Eastern countries and an increasing rate of smoking-related diseases. The burden of chronic diseases in terms of health care expenditures and death is increasing worldwide. Evaluating how smoking impacts health care utilization and expenditures among patients with chronic diseases in Jordan as a developing country with modest economy and resources will assist in conducting economic evaluations for supporting tobacco control in Jordan.

Objective: This study aimed to estimate and analyze the impact of smoking on the direct medical expenditures of chronic diseases’ management in Jordan.

Methods: A retrospective analysis of a cohort of patients with chronic diseases conducted during August 2016 to November 2016 in KAUH. Socio-Demographic, clinical, smoking status, economic and visits’ data were collected. Statistical analysis was performed using SPSS™ for Windows and a p value of < 0.05 is defined as statistically significant.

Results and Conclusion: Data were collected from 845 patients having at least one chronic disease (mean age of 61 ± 10.7 years). Smokers formed 22% of total patients. The total expenditure for the sample was 1,895,197 JD. The median total expenditure per patient of smokers, former smokers and non-smokers was JD 845, JD 911 and JD 714, respectively. Drugs were the most expensive healthcare resource used, accounting for 43% of total expenditure, followed by inpatient and outpatient related services (19%). Smokers and former smokers were associated with the highest inpatient expenditures and inpatient and outpatient related services expenditures. However, smokers were associated with the lowest outpatient expenditures and drugs expenditures. This study suggests that smoking has a notable economic impact associated with chronic disease management and is a useful tool to promote tobacco control.
Employing Supercritical Fluid Technology as a Solvent Free Method for Preparation of Dispersions for Atorvastatin

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ABSTRACT

Introduction: Supercritical fluid have unique physical properties including density, viscosity, diffusivity, surface tension and solvent strength which vary between gas-like and liquid-like values, depending on the temperature and pressure conditions. This technique proved its suitability for preparing solid dispersions because they are prepared in a light-free and oxygen-free atmosphere.

Objective: To prepare solid dispersions of poorly water soluble Atorvastatin using supercritical CO₂ technology without the using of additional solvents.

Methods: Four different polymers were used. These were PVP, PEG, Soluplus, and chitosan. Full physicochemical characterizations were performed in addition to in-vitro dissolution study. Also stability study was conducted for three months.

Results: The crystal particles of Atorvastatin were observed in the physical mixtures as well as in the dispersions after studying the physicochemical characteristics. The used polymers enhanced the dissolution rate of Atorvastatin. However, supercritical parameters affected the dissolution profile especially for dispersions prepared using Soluplus and chitosan. The drug loading increased by increasing the processing temperature for the dispersions prepared using PVP and PEG. Also increasing the processing time increased loading efficiency for PEG-based dispersions. HPLC method and loading efficiency indicated the stability of the PEG, Soluplus and chitosan-based dispersions. On the other hand, PVP was not stable and a sticky paste formed.

Conclusion: SCF technology proved to have great potential to prepare dispersions for class II drugs, yet the physicochemical properties of the drug and polymer should be considered.
Towards the discovery of new inhibitors against the highly conserved protein PPK1 followed by validation against relevant bacterial species

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ABSTRACT

Inorganic polyphosphate (poly P) is present in all living forms in each of the three kingdoms of life. Studied mainly in prokaryotes, polyP and its associated enzymes are vital in diverse basic metabolism, in at least some structural functions and, notably, in stress responses. These plentiful roles for polyP are probably the consequence of its presence in life-forms since early in evolution. The genomes of many bacterial species, including pathogens, encode a homologue of a major polyP synthesis enzyme, poly Phosphate kinase (PPK), two different genes code for PPK resulting in two types of enzymes; PPK1 and PPK2. Genetic deletion of ppk1 gene results in reduced polyP levels and loss of pathogens’ virulence. Thus far, no PPK1 homologue has been identified in higher-order eukaryotes and, therefore, PPK1 represents as a novel target for chemotherapy. The idea of the current study is to study the PPK1 from Escherichia coli in order to study the effect of active site point mutations on PPK1 catalysis. Comprehensive understanding of the enzyme’s structure and binding sites will be used to design pharmacophores and screen a library of synthetic compounds for potential discovery of selective PPK1-inhibitors. Inhibitors’ activity will be evaluated by studying their effects on the metabolic phenotype map of the wild type strain and comparing their fingerprint to the ppk1 knock-out mutant.
Development, *in vitro* and *in vivo* evaluation of a polymeric nanoparticulate drug delivery system for the management of glaucoma

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ABSTRACT

**Introduction:** A nanoparticulate controlled release system for the delivery antiglaucoma drugs can improve the drug residence on the surface of the eye, improve permeation through the cornea and result in a continuous control over the intraocular pressure thus enhancing the therapeutic outcomes.

**Aim:** To formulate and evaluate muco-adhesive nanoparticles (NPs) for controlled release ophthalmic application of antiglaucoma drugs dorzolamide HCl (DH), brimonidine tartrate (BT) and timolol maleate (TM).

**Methods:** Double emulsion solvent evaporation method was used to prepare Eudragit® RL100 – based (ERL100) NPs with soya lecithin (SL) and polyvinyl alcohol (PVA) as surfactants for the oily and aqueous phases respectively. Six formulation factors were investigated including the volume and the pH of the external aqueous phase, the levels of drug, ERL100, SL and PVA in the formulation. NPs were characterized in terms of drug loading, encapsulation efficiency, particle size, zeta potential and morphology. A stability study was performed to detect changes in particle size or zeta potential and drug leaching. In vitro drug release, muco-adhesion transcorneal permeation were also evaluated. NPs safety was determined using cell viability testing and Draize test on rabbit eyes. Pharmacodynamic effect of drug loaded NPs was evaluated by measuring the reduction of intraocular pressure in rabbit eyes.

**Results and Conclusion:** Particle size and zeta potential of NPs were below 500 nm and above +20 mV respectively. Drug loading in formulas containing DH, BT and TM reached 5, 15 and 0.6% respectively. Electron microscopy showed spherical particles. NPs sustained drug release for more than 24 hours in vitro. No significant change in particle size and zeta potential was observed and none more than 32, 11 and 53% of DH, BT and TM respectively leached from samples of suspended particles during the stability study. NPs have shown good muco-adhesion and resulted in moderate drug permeation through freshly excised cornea. Formulas were well tolerated after application onto rabbit eyes. No cell toxicity was observed after one hour incubation with NPs. Pharmacodynamic studies revealed that NPs caused an increase in the intensity and duration of IOP reduction in rabbit eyes.
My inhaler tutor: The impact of new individualized video in Improving asthma patient's inhaler use and asthma control

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ABSTRACT

Background: Asthma is a chronic condition affecting millions of people around the world. Inhaled medications are effective therapies for Asthma management, however, many patients may falsely perceive themselves to proper inhaler use. In addition, inhaler misuse can be missed during patient-doctor visits and/or during drug dispensing. Smart phones have helped people in many ways, but their value in teaching and assessing people on correct inhaler use has not been evaluated previously.

Methods: this interventional randomized controlled study involve recruiting patients diagnosed with asthma then allocating them to Active and Control groups. All Patients will be assessed on the use of their prescribed inhalers (pressurized metered-dose inhalers (pMDIs) and the turbuhaler (TH)), using predefined published checklists. Patients will then be asked to watch smart phone-based multimedia educational videos which involve the demonstration of correct inhaler technique. Patients can replay the video as much as they need. All patients will be assessed after watching the video. Over three months, patients in the Active group will be videotaping their inhaler technique and sending it to the pharmacist for assessment and correction if needed (via smartphone). All patients will be reassessed on their inhaler technique after 3 months. Baseline and follow-up respiratory symptoms will be measured by spirometer (FEV1), in addition to asthma control, asthma adherence, and asthma quality of Life.

Effect on Practice: using this novel educational method on correct inhaler use, incorporating the use of patient's own videos of their inhaler technique, is expected to be more effective than the conventional educational videos; since information alone, rarely make people change their attitude, but personal experience often does. Moreover, this method would allow for continuous assessment and education of inhaler technique, utilizing patient's and pharmacist's free time.
Levels of Ghrelin and Visfatin and the Correlation between Them in Diabetic and Non-Diabetic Patients with Metabolic Syndrome: A Cross-Sectional Study in Jordan

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ABSTRACT

Background and aims: Ghrelin and Visfatin are deregulated in obesity and associated with insulin resistance. This study aimed to compare and correlate ghrelin and visfatin plasma levels, adiposity indices [conicity index (CI), waist circumference (WC), weight-to-height (WHtR) ratio, hip circumference (HC), and body adiposity index (BAI)], lipid ratios (atherogenicity index of plasma (AIP= log10 TG/HDL-C ratio), TC/HDL-C and LDL-C/HDL-C ratios) and hematological indices [red cell distribution width (RDW) and mean platelet volume (MPV)].

Methods: In a cross-sectional study, 30 normoglycemic lean subjects (control), 30 MetS subjects and 30 MetS-Pre-DM/T2DM, plasma ghrelin and visfatin were measured by colorimetric-enzymatic assays. The comparisons and correlations between metabolic biomarkers, adiposity, atherogenicity and hematological indices were also examined.

Results: Ghrelin levels (pg/mL) lacked any statistically significant difference between undiabetic MetS or MetS-pre/T2DMand the normoglycemic lean control. Visfatin level (ng/mL) was significantly higher in both MetS groups (nondiabetic and pre/diabetic) vs. controls There was a direct ghrelin - visfatin correlation in the whole study population as well as in both MetS and MetS-pre/T2DM arms. In MetS patients; ghrelin and visfatin proportionally correlated with waist/hip ratio (WHR) while ghrelin correlated directly with BMI. In MetS-pre/T2DM; ghrelin and visfatin directly correlated with MPV and ghrelin proportionally correlated with platelet/lymphocyte ratio, while visfatin correlated directly with BAI but inversely with WHR.

Conclusions: Based on a cross-sectional study we report that patients with either MetS or MetS-pre/T2DM have elevated visfatin levels, while ghrelin levels do not differ from the apparently healthy controls. Correlations exist between the two biomarkers and between them and adiposity, hematological and atherogenicity indices. Our data further support the importance of ghrelin and visfatin in the metabolic pathogenetic pathways of and represent potential therapeutic targets in the management of metabolic syndrome and diabetes.
Biological Evaluation of the Antimicrobial Activity of Novel 3,5-disubstituted amido-1,2,4-thiadiazole and 2,5-disubstituted amido-1,3,4-thiadiazole

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ABSTRACT

Introduction: The emergence of pathogenic resistance to several antimicrobial agents becomes a major health problem worldwide in hospital and community, lead to severe infections, complications and even increase in mortality rates; developing a new antimicrobial agent with modified mechanism of action to deal with this resistance becomes an urgent need in the last decades.

Aims: In this study, novel derivatives of 2,5-diamino-1,3,4-thiadiazole derivatives (I), 3,5-diamino-1,2,4-thiadiazole derivatives (II) and Schiff base derivatives (III) were synthesized and screened for their potential antimicrobial activity against Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa and Candida albicans. In addition the structural basis of binding of 2,5-bis-(4-hydroxyphenylimine)-1,3,4-thiadiazole (9) in β-carbonic anhydrase binding sites, were also determined.

Results: Antimicrobial activity evaluation indicated that Compounds 4, 9, 7 and 11 showed good activity against ATCC and clinical isolates of E.coli with best activity seen with compound (9) having MIC value of 100µg/ml, while compounds 1, 2 and 3 showed moderate activity towards clinical E.coli isolates. Compound 1 showed equal activity against ATCC and clinical strains of Candida albicans when compared with fluconazole as reference drug, the results also indicated that Schiff base derivatives of thiadiazole mainly compound (9) was the promising active compound to inhibit bacterial growth. Compound (9) showed a good fitting in the active site pocket of β carbonic anhydrase enzyme; this enzyme became an interesting target for the development of novel inhibitors.

Conclusion: Thiadiazole derivatives have potential narrow spectrum antimicrobial activity against E. coli with β-carbonic anhydrase inhibitory effect.
Evolutionary cell biology: from cell evolution to biomedical application

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ABSTRACT

Evolutionary cell biology has raised increasing attention in last decades as an historical opportunity to combine microbial diversity, systematics and cell physiology towards our notion that cell evolution underlies organismic complexity. Biomedical relevance comes up to question relating the diversity new genes and proteins form microbes, adaptation of cell pathways to extreme conditions and host-parasite cell complexity. Discoveries such as Giardia lambia nucleolus, etiological agent of infant diarrhea, come from evolutionary cell biology and impact in our understanding for treatment of disease and development of new drugs. In the post-genomic era, where the potential of combining high throughput omic's approach with functional in situ, in silico studies exist, the lack of model organisms and cultivation techniques still excludes the majority of extant diversity from the scope of experimental inquiry. The conceptual simplification of evolutionary process in functional biosciences limits the conformation of a successful disciplinary link between functional and evolutionary biology and the possibility of addressing the mechanistic nature cellular events that underlie microbial as well as organismic diversity and evolution. Here we provide a critical review of Evolutionary Cell Biology; its current disciplinary constraints and its potential in biomedical application.
Cytotoxic evaluation of doxorubicin in combination with baicalein and resveratrol against different cancer cell lines

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ABSTRACT

Majority, if not all, of the available chemotherapeutic agents such as doxorubicin are known of their severe side effects such as cardiotoxicity. Moreover, tumor resistance that is being developed gradually and leading to a decrease in the cytotoxic activity of such chemotherapeutic drugs, also contribute to the current challenges in cancer therapy.

Resveratrol and Baicalein are well known polyphenolic compounds that belong to stilbene and flavone subclasses respectively. Combination of natural polyphenolic compounds with chemotherapeutic agent is recently being a novel strategy in cancer therapy researches owing to their potential antioxidant and antiinflammatory properties that modulate several intracellular signaling pathways.

This study aims to investigate the possible potentiating effect of resveratrol and baicalein when combined with doxorubicin in two cancer cell lines: HCT 116 and Hep G2.

It also trying to investigate the probability of such natural compounds to provide a protection effect on cardiocytes (H9C2) when treated by resveratrol and baikalein and followed by doxorubicin treatment.

Results obtained have shown that doxorubicin cytotoxicity on the two cancer cell lines has been increased when combined with resveratrol and baikalein compared to doxorubicin alone. This combination also has resulted in less cardiotoxicity when compared with treatment using doxorubicin alone.
Towards the production of new generation biopolymer aerogels at large scale

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ABSTRACT

Aerogels are three dimensional ultra-light porous structures that present high surface areas (200-1200 m²/g) and mesoporous (2-50 nm) pore size distributions along with specific material characteristics (of inorganic, organic or hybrid nature). These characteristics make them exciting candidates for research, development and commercialization catering to a broad scope of applications ranging from insulation and catalysis to pharmaceuticals and care.

At present, the commercial aerogel market caters to super-insulation applications with silica being the material of choice. Presenting best in class thermal insulation properties and energy savings, they command premium pricing compared to all other insulation materials. While the exceptional properties of aerogels allow premium pricing in the insulation sector, we are convinced through our R&D that the same properties can also be exploited in other sectors.

The present work is aimed to highlight the remarkable progress we made in the last decade in developing organic and biopolymer aerogels, with select application examples. We also highlight the present challenges and issues we encounter in advancing aerogel technology. Finally, we present our solution to advance our vision of proving the commercial viability of the biopolymer aerogel production process for food, care and pharmaceutical applications.
Computer Discovery of Multitargeting inhibitors of MetAP2 and VEGFR/2

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ABSTRACT

Angiogenesis is the formation of new blood vessels and is highly problematic in conditions that supply blood vessels to solid tumors and in other disease conditions.

Signaling through the vascular endothelial growth factor (VEGF) family of receptors plays a crucial role in angiogenesis. However, VEGF blockade is not sufficient to inhibit angiogenesis. Methionine aminopeptidase 2 (MetAP2) is an enzyme that also has critical role in angiogenesis. Preclinical models have shown MetAP2 is a potential target for the inhibition of angiogenesis.

Thus inhibitors are needed for both targets. But, although such inhibitors are known for each separate target, no single molecule has been suggested yet for simultaneously blocking both.

Our in-house developed algorithm ISE (Iterative Stochastic Elimination) is a generic optimization method for solving highly complex problems in drug discovery. It has been extremely successful for discovering highly active, novel and diverse molecules, as hits and leads.

ISE is used to construct models for the two targets, each model is a set of filters of molecular properties, which allows to virtually screen millions of molecules and to score them for finding the best single molecules that could block both targets simultaneously. Best candidates are purchased and sent for wet experiments at the lab of Dr. Ofra Benny, who initiated this project.
Molecular mechanisms governing the development of induced T regulatory cells and their significance in the progression of breast cancer models

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ABSTRACT

Regulatory T cells (Tregs) comprise diverse subsets of immunosuppressive cells that play critical roles in maintaining immune homeostasis and self-tolerance. They are also involved in controlling autoimmunity, infection, graft-versus-host disease, inflammation, foetal-maternal tolerance, and tumour immunity. In cancer, Tregs are able to suppress anti-tumour immune responses and contribute to the development of an immunosuppressive tumour microenvironment (TME), thus promoting immune evasion and cancer progression. An accumulation of Tregs within tumour tissue is associated with worse prognosis in many cancers including breast cancer, ovarian cancer, lung cancer, glioblastoma, melanoma and other malignancies. Moreover, the presence of Tregs in the tumour microenvironment represents one of the main obstacles for successful cancer immunotherapy. To date, a number of questions remain unanswered and need further experimental and clinical trials. For example, the mechanisms underlying the increased infiltration of Tregs in triple negative breast cancer (TNBC), an aggressive subtype of breast cancer, and the implications for tumour prognosis remain elusive. The aim of this project is to assess the role of T regulatory cells and their mechanisms in the progression of breast cancer using both human and mouse models. This proposed study will provide a new insight into the biology and function of induced T regulatory cells in the breast tumour microenvironment, and thereby reveal new therapeutic approaches for preventing/or inhibiting their capacity to attenuate protective anti-tumour immunity.
Prevalence and pattern of substance use among anesthesia health care personnel in Jordan: A quantitative cross-sectional survey

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ABSTRACT

Introduction: Substance use disorder is considered an important, widely reported problem among health care personnel. This can lead to serious consequences on the side of patients as well as health care provider. The reported prevalence of drug use among healthcare professionals varies between 10% - 15% which is similar to the percentage among general population. In the literature, anesthesiologists showed the highest rate of substance use compared to other physicians while nurses showed the highest rate compared to other health care professionals. The aim of this study is to show prevalence of substance use among anesthesia personnel in Jordan and the types of drugs they mostly tend to use. In addition, the study looked at their knowledge, attitude and practice regarding self-medication. A quantitative cross-sectional survey has been conducted using an anonymous, validated questionnaire. To date, this was distributed on a sample of anesthesia personnel (ie- consultants, residents and technicians) in different hospitals in Amman using drop and pick and online techniques. The study is still in progress and 43 questionnaires were returned out of 76 distributed (response rate: 56.6%). Respondents were mainly male (90.7%) between 26 and 30 years old.

The preliminary results show that 7/43 (16.3%) used controlled drugs which they self-prescribed or stocked at home, 4 out of which (9.30%) reported to have used them for non-medical reasons. Conclusion: Data so far is premature to draw a representative conclusion. However, as a first study of its kind in Jordan, it is promising to have some sort of documentation for this type of self-medication.
Studying the effect of passage number and antibiotics of MCF7 cell line on DNA methylation levels and gene expression

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ABSTRACT

Introduction: Up on increasing studies on DNA methylation, it has become evident that DNA methylation has a strong and complex correlation with gene expression and has a role in various types of diseases including cancer. The levels of DNA methylation and its role in gene expression are key factors that could affect the diagnosis, prognosis and treatment options.

Aims: To study the effect of different culturing conditions on the DNA methylation levels in mcf-7 breast cancer cell line.

Methods: In this study, the methylation levels of 22 genes that are mostly correlated to breast cancer were determined using, EpiTect methyl II PCR array. This analysis was performed to see the effect of cell culturing conditions on gene methylation levels in MCF7 cell line, in which the effect of cells passage number and the use of antibiotics in the culturing media.

Results: After analysis, ten genes (ADAM23, CCND2, CDH13, GSTP1, HIC1, RASSF1, PYCARD, TNFRSF, SLIT2 and THBS1) were found to be hypermethylated among passages 4 and 63. Therefore, they were chosen to follow their gene expression levels after demethylation using 5-Aza.

Conclusion: This study shows that the presence of antibiotic within cultured media and cell line’s passage number could greatly affect the methylation levels that need to be considered in future epigenetics studies on cell lines.
Involvement of gonadal testosterone in the blood-brain barrier integrity

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ABSTRACT

The blood-brain barrier (BBB) is located at the level of the cerebral microvasculature and is critical to maintain homeostasis and normal function of the central nervous system (CNS). Interaction between all the components of the neurovascular unit is important for the induction and maintenance of the BBB function. Endothelial tight junctions are primarily responsible for limiting paracellular diffusion of substances from the blood to the CNS. Functional integrity of the BBB is compromised in many neurological and metabolic pathologies, suggesting that BBB dysfunction may be the cause or consequence of these diseases. Cerebral blood vessels are non-reproductive target tissue for sex steroid hormones. Sex steroid hormones have been found to alter vascular tone, endothelial function, oxidative stress and inflammatory responses in cerebral vessels of rat females and males or in cultured endothelial cells. However, to date, the most is known regarding the protective effects of estrogens on the vascular function in females. The prevalence of cerebrovascular diseases shows a distinct male predominance, with numerous studies showing women to be relatively protected. In the male nervous system, testosterone can act either directly through activation of the androgen receptor or indirectly by stimulating the estrogen receptors after conversion into estradiol by aromatase cytochrome P450, leading conclusions rather complex. In this context, the effects of testosterone at both the cellular and molecular levels on brain microvasculature remains to be studied in details. Understanding the BBB physiology is, indeed, critical to get new insights in neurological and metabolic diseases involving BBB dysfunction and for the development of drugs that can cross the BBB. The goal of my study was to study the effects of gonadal sex steroid hormones on the mouse neurovascular unit, focusing on the hypothalamic medial preoptic area (MPOA), a highly sensitive brain area to gonadal steroid hormones. To address this question, gonadectomized male mice were used to study at first the involvement of these hormones in the integrity and function of the BBB and the impact of these on the surrounding parenchyma. My results show an increase of the BBB permeability in the MPOA in chronically testosterone-depleted male. In castrated mice, the BBB leakage is associated with tight junction disorganization and lower expression of tight junction proteins, activation of astrocytes and microglia, and up-regulation of inflammatory molecules. Supplementation of testosterone after castration restores the BBB impermeability and tight junction integrity, and cancels almost completely inflammatory features. Androgen receptor as well as estrogen receptors may be involved in testosterone-induced regulation of the formation and/or maintenance of tight junction in males. These results show for the first time the reversible activational role of testosterone on the BBB physiology and neuroinflammation in male mouse, and, to a greater extent, provide new insights on the modulating effects of sex steroid hormones on mouse cerebrovascular physiology. Keywords: blood-brain barrier, tight junction, testosterone, androgen receptor, estrogen receptors, neuroinflammation
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Evaluation of enoxaparin dosing regimens used in obese patients in Jordan

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ABSTRACT

Background: Enoxaparin is the most commonly used low molecular weight heparin in clinical settings. Optimum doses of enoxaparin are very essential to ensure the desired antithrombotic effect, and to avoid adverse effects such as bleeding. Obesity is a serious public health problem with very high prevalence. Enoxaparin recommended doses for both prophylactic and treatment indications are not always effective and safe in obese patients.

Objectives: The study main objectives were to investigate enoxaparin dosing regimens used in obese and morbidly obese patients, and to assess the degree of anticoagulation achieved with enoxaparin dosing regimens used in a hospital setting in Jordan. In addition, to investigate the short term and long term health outcomes associated with enoxaparin dosing regimens used in obese and morbidly obese patients including side effects.

Methodology: Our study performed prospectively at KAUH. All obese adult patients (18 years and older) who were not currently participating in a clinical study and being prescribed enoxaparin for prophylactic or treatment purposes were invited to participate in the study. Those who agreed to participate had the research goals and methods explained to them and signed an informed consent. After signing informed consent, patients were interviewed and medical records reviewed to collect demographics and relevant clinical characteristics. Baseline complete blood count and anti-Xa were measured for each patient during hospital stay, clinical assessment of VTE symptoms, major and non-major bleeding and thrombocytopenia were also assessed.

Results: 86 patients were enrolled in the study; however, 52 patients completed the study. The study found that 51.2 % (n= 44) of the study population was obese and 48.8 % (n= 42) was morbidly obese. Among the 52 patients, 19 patients (36.5 %) had therapeutic anti-Xa level, and 33 patients (63.5 %) had non-therapeutic anti-Xa level and most of them were on capping dosing regimens. Four different dosing regimens were used at KAUH for either treatment or prophylaxis indications. The results showed no significant difference between regimens that were used and therapeutic anti-Xa level (P-values >0.05). No bleeding events or thrombocytopenia were noticed, but there was one case of recurrent thrombosis.

Conclusion: The dosing regimens of enoxaparin currently used for obese patients at KAUH vary based on prescribing physicians. The majority of participant had non-therapeutic anti-Xa.
Preparation and characterization of an oral norethindrone sustained release nano-particles formulation based on chitosan

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ABSTRACT

Norethindrone is an oral progestin-only contraceptive drug which is administered once daily. The objective of this study is to design an oral sustained release liquid nanoparticles formulation for norethindrone in an effort to extend its release for 4 days through complexation with low molecular weight chitosan (LMWC). As norethindrone is a hydrophobic drug, solubilization was achieved through complexation with HP-β-cyclodextrin. The solubilized norethindrone was complexed with different concentrations of two molecular weight of LMWC. The formed complexes were confirmed using DSC, FTIR, particle size and polydispersity index measurement and zeta potential determination. The complexes were dispersed in oleic acid and tween 80 to form liquid nanoparticles formulation which releases its component slowly. The size of the particles in the final formulation was about 10.5 nm. In vitro release characteristic was conducted in both HCl media and phosphate buffer media for the six prepared polyelectrolyte complexes and the six prepared liquid nanoparticles formulations using dialysis membrane. In vivo study was conducted by using two animal models; dogs and mice. Dogs were used for pharmacokinetics evaluation. Mice were used to determine the adhesion potential of the nanoparticles to mucus gel layer of the stomach and intestines. Short term stability study was performed physically and chemically for the liquid medicated formula for storage condition determination.
Ophthalmic drug abuse and misuse: An observational study in community pharmacies in Jordan

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ABSTRACT

Introduction: Self-medication with ‘Over the Counter’ (OTC) medicines and prescription drugs is a common patient practice, of which ophthalmic medications are a major part. There has been a trend in the past five years in Jordan for ophthalmic medications to be abused, ie-used to experience mental altering effects as euphoria or hallucinations. Many of these drugs are obtained from community pharmacies without a prescription. Such products, especially anticholinergic drugs are abused individually or in combination with other drugs. The aim of our study was to evaluate the prescription and OTC eye drops most frequently suspected of abuse and misuse and to describe current methods that pharmacists use to manage such requests.

Methods: A prospective cross-sectional observational study was conducted at different community pharmacies in Amman. A form has been designed to collect data about all requests of ophthalmic drugs during the study period.

Results: A total of 140 ophthalmic product requests for 130 patient in community pharmacy setting were observed in 2 months. In 19/130 (14.6%) of cases, the use of the product reported to be for non-medical reasons, 11/19 reported abuse of Pentolate eye drop, 7/19 reported abuse of Prisoline eye drop and one reported abuse of Naphcon-A eye drop. A total of 16/19 asked for the product without prescription, and 12/19 weren’t sold due to suspicion of abuse.

Conclusion: The study underscores the need for regulatory efforts and pharmacovigilance to manage OTC ophthalmic medication abuse, along with pharmacist and ophthalmologist education.
Pregabalin abuse - an observational study from community pharmacy settings and Addiction Treatment Centers in Jordan

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ABSTRACT

Introduction: Pregabalin is currently approved for the treatment of epilepsy, generalized anxiety disorder, neuropathic pain and fibromyalgia. Rising attention to the abuse liability of pregabalin causing addictive behaviors is partially based on case reports and published literature of pregabalin used in dosages that override the approved therapeutic range. The aim of our study was to investigate pregabalin abuse and how suspected cases are managed in community pharmacy setting. Secondly, we aimed to explore the use of pregabalin from the perspectives contained in user experiences.

Methods: We conducted a prospective cross-sectional observational study at different community pharmacies in Amman. A semi-structured interview study was conducted with all pregabalin-users admitted to the two public addiction treatment centers in Amman during the past 2 months.

Results: 40 pregabalin requests in community pharmacy setting were observed during the research timeframe. In 16/40 (40%) of users admitted to use it for non medical reasons, and 8/16 users had no prescription presented by patient, 8/16 were not sold due to suspicious reasons. Regarding the qualitative part, ten pregabalin users were interviewed who showed a poly-substance abuse pattern in addition of pregabalin, mainly used with alcohol or sequentially with cannabis. Most users resorted to abuse pregabalin as legal drug available in pharmacies. The study highlights the need for additional pharmacovigilance and patient education at community pharmacy level regarding potential hazards of pregabalin abuse.
The Role of a Clinical Pharmacist in the Treatment of Drug Abuse: a Randomized Control Trial

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ABSTRACT

Introduction: Drug addiction is defined as a chronic relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. Successful pharmacotherapy treatment begins with detoxification which by itself is not considered to be a treatment but rather aimed to managing withdrawal or intoxication.

Aims: To evaluate the impact of the clinical pharmacist intervention as part of a healthcare team on clinical outcomes of patients admitted to Addiction Treatment Centers in Jordan.

Methods: The study has been designed as a single blinded randomized controlled clinical trial (RCT). Eligible patients had been randomized into control and intervention groups and invited to an interview with the researcher where they were evaluated for withdrawal symptoms, insomnia and quality of life. The assessment is being conducted at the baseline, during the treatment and at the discharge. Ultimately both of the study arms will be compared.

Results: The study is still in progress. The preliminary results show that there is no difference in the quality of life between the two arms, but there is a difference with respect to the quality of sleep and the withdrawal symptoms.

Conclusion: Clinical pharmacist intervention may help in improving clinical outcomes of treatment of drug addicts.
The role of clinical pharmacist in improving oral Medications administration through Enteral Feeding Tubes at Intensive Care Units at Jordan University Hospital

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ABSTRACT

Introduction: The use of enteral feeding tubes (EFTs) is increasing recently in hospitalized patients. It is a common practice to administer medications in addition to nutrients through these tubes.

Aims: This study was designed to evaluate the effect of a clinical pharmacist intervention in improving the knowledge and practice of intensive care units’ nurses regarding medication administration via EFTs.

Methods: This is a pre-/post-test interventional study. At the pre-intervention phase, a questionnaire was filled by each nurse to assess knowledge and self-reported practice regarding enteral medication administration via EFTs. A checklist was also utilized to document nurses’ observed practice of enteral medication administration. Then, nurses were randomized into two groups; intervention and control group. During the interventional phase, the clinical pharmacist provided an educational program that consisted of a lecture, a booklet, and daily ward visits for a one-month period to the nurses in the intervention group to educate them about enteral medications administration. At the post-intervention phase, the same questionnaire and checklist were used to re-assess any change in nurses’ knowledge and practice.

Results: The knowledge score of nurses in the intervention group, the self-reported practice and the observed practice in the intervention group, all have improved.

Conclusion: This study showed that nurses did not have sufficient baseline knowledge about appropriate medication administration through EFTs. However, an educational program by a clinical pharmacist to promote proper medication administration had favorable effects on nurses’ knowledge and practice.
Oral delivery of Liraglutide

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ABSTRACT

Introduction: Liraglutide is peptide can’t deliver orally because of the harsh conditions in stomach and intestine. It is use for type II diabetic patients. Liraglutide is in the market under the brand name Victoza®. Victoza® takes as single daily subcutaneous injection. Aims: The main problem with peptides drugs they are giving as subcutaneous injection; which consider as a source of fearness, and patient incompliance. In this work, we sought to prepare oral Liraglutide through combination the advantages of Nanoparticles and W/O microemulsion.

Methods: Liraglutide was binded with low molecular weight chitosan and HP-βCD to form polyelectrolyte complex Nanoparticles. The complex formed was confirmed by Differential scanning Calorimetry and Fourier transform infrared spectroscopy. Entrapment efficacy, physical and chemical stability were evaluated. To confirm the efficacy of the prepared oral formula. Animal model using wistar rats for diabetes type II was made. Using High fat diet-Streptozotocin protocol. For pharmacokinetics study, blood samples were collected from French rabbits at different time intervals, Liraglutide concentration in plasma was calculated using ELISA.

Results: Through in-vitro study the prepared oral formula improved, it is ability to tolerate the harsh conditions in stomach and intestine. The reduction in blood glucose level was demonstrated for orally Liraglutide Nanoparticles in the diabetic rats. For pharmacokinetics study, the blood samples were analyzed. The results confirm the ability of drug to reach blood and exert its effect. Conclusion: The present research improved the possibility of Liraglutide oral delivery, using LMWC and HP-βCD to form nanoparticle. The external oily phase plays critical role for protection the peptides from enzymatic degradation.
Stabilization and dissolution enhancement of Meloxicam in prepared dispersions: A comparison with commercial products

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ABSTRACT

Introduction: Meloxicam is an antipyretic and analgesic drug that is mainly used for rheumatoid arthritis; it is classified as Biopharmaceutical Classifications (BSC) class II corresponding to its high permeability and low solubility (12μg/ml). One of the techniques of enhancing the solubility and dissolution of these low-soluble drugs was solid dispersion (SD) technique.

Objective: In this study there was an attempt to increase the dissolution behavior of meloxicam by using solid dispersion prepared by using different polymers.

Methods: Five different polymers were used. These were two molecular weights chitosan carriers (16 and 11KDa), Polyvinylpyrrolidone K30, and two different molecular weights Polyethylene glycol (4000 and 6000) using two different methods; solvent evaporation (for chitosan carriers and PVP K30) and melting method for PEG(4000 and 6000). Full physicochemical characterizations were performed in addition to in-vitro dissolution study; the solid dispersions that had the highest release from all the polymers were then compared to two selected marketed drugs. Also stability study was conducted for three months.

Results: The dissolution rates of the prepared solid dispersions using the different polymers were in this order; Polyvinylpyrrolidone K30 and Polyethylene glycol 6000> chitosan 16 KDa> chitosan 11 KDa> Polyethylene glycol 4000. All polymer-based solid dispersions showed an increase in the release as the drug/polymer ratio decreased except that of the two different molecular weights chitosan, that by increasing the drug ratio the release was increased. All of the prepared solid dispersions have decreased the crystallinity of meloxicam, increased the wetability and decreased the agglomeration of the drug particles which in turn increased the dissolution rate. All of the prepared dispersions in its highest release got a higher release than that of the two marketed drugs release.

Conclusion: the dissolution profile of meloxicam has been increased successfully in a reproducible manner.
Effect of Different Polymeric Dispersions on In-Vitro Dissolution rate and Stability of Celecoxib Class II Drug

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ABSTRACT

Introduction: Low aqueous solubility behavior of drugs remains the most challenging aspect encountered the design of pharmaceutical formulations development. Solid dispersions can play an important role in enhancement of drug dissolution and stability.

Aim: The objective of this study was to evaluate the effect of several polymers on enhancement in-vitro dissolution behavior of celecoxib class II drug. In addition to compare prepared dispersions with selected commercial products.

Methods: Solid dispersions form celecoxib and five different polymers (Soluplus®, polyvinyl pyrrolidine (PVP-K30), chitosan and polyethylene glycol (PEG)4000&6000) were prepared. Soluplus® and chitosan based solid dispersions were prepared by solvent evaporation using vacuum oven. PVP-K30 dispersions were prepared by solvent evaporation using rotary evaporator. PEGs based solid dispersion were prepared by melting method. Physicochemical properties of all solid dispersions were characterized. Dispersions were subjected to in-vitro drug release studies and stability studies for three months.

Results: Results revealed enhancement in dissolution rate for all dispersions prepared except for chitosan based dispersions that showed clear retardation in the drug release. Prepared dispersions from other polymers succeeded to match with release profile of two commercially marketed products (Celebrex® and Flamex®). Although both polyvinyl pyrrolidine, and polyethylene glycol dispersions showed an excellent enhancement in drug release; both failed to maintain stability.

Conclusion: Celecoxib solid dispersions have different release behavior due to different polymeric effect that varies according to the possibility of intermolecular forces with the drug. Soluplus®, PVP-K30 and PEGs proved to enhance the dissolution rate of the drug matching two commercially marketed products (Celebrex® and Flamex®). Unlike Chitosan which is caused retardation of the drug release due to the presence of hydrogen bonding with Celecoxib. Maximum enhancement was achieved for PVP-K30, followed by PEG 4000, Soluplus®, and PEG 6000 exhibiting the minimum effect.
Evaluating the protective effect of etazolate on anxiety and depression-like behavior and cognitive impairment induced by post traumatic stress disorder

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ABSTRACT

Background: Post-traumatic stress disorder (PTSD) is a neuropsychiatric disorder that develops after an individual experiences severe, life-threatening traumatic stress. PTSD has a lifetime prevalence of 8-10% and is often co-morbid with various neuropsychiatric diseases. Etazolate is a selective phosphodiesterase IV inhibitor that is highly specific for cAMP. Etazolate shows anxiolytic and antidepressant effect and could also be a lead candidate for Alzheimer’s disease.

Aim: To evaluate the role of etazolate in preventing anxiety, depression, and cognitive impairment associated with PTSD.

Method: PTSD was induced by single prolonged stress (SPS) model. Elevated plus maze test, open field, and tail suspension were conducted as behavioral tests of anxiety- and depression-like symptoms, while radial arms water maze was used to evaluate cognitive function. Etazolate was administered orally at a dose of 1mg/kg/day and its protective effect was compared to other control group. At the end, hippocampus was dissected and antioxidant markers and BDNF protein level were assessed.

Findings: Results revealed that PTSD is associated with symptoms of anxiety and depression and impairment in both short and long term memory. Etazolate administration significantly prevents these PTSD related symptoms. Moreover, etazolate significantly normalize oxidative stress related parameters (GSH, GSSG, GPx, TBARS) and BDNF levels.

Conclusion: Anxiety, depression, and memory deficits induced by PTSD can be significantly prevented with etazolate probably through enhancing antioxidants capacity and BDNF level in PTSD animals.
N-substituted- 4-hydroxy-2-quinolone-3-carboxamides as Potential PI3Kα Inhibitors

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ABSTRACT

The oncogenic potential of phosphatidylinositol 3-kinase (PI3Kα) has been highlighted as a therapeutic target for anticancer drug design. A new series of N-substituted- 4-hydroxy-2-quinolone-3-carboxamides was prepared and characterized using FT-IR, 1H and 13C NMR, and elemental analysis techniques. The identity of the core nucleus (5) was successfully characterized using x-ray structural analysis. Biological investigation in human colon carcinoma (HCT116) cell line exhibited that the analogues inhibited cell proliferation and induced apoptosis through an increase in caspase-3 activity and a decrease in DNA cellular content. Promising PI3Kα inhibitory activity was shown for analogues (7, 14, and 17) bearing H-bond acceptor moiety on p-position. Derivatives tailored with bulky and hydrophobic motifs (16 and 18) on o- and m-positions exhibited moderate activity. Molecular docking studies against PI3Kα and caspase-3 showed that there is an agreement between the predicted binding affinity (ΔGobsd) and IC50 values of the derivatives for the caspase-3 model. Furthermore, Glide docking studies against PI3Kα demonstrated that the derivatives accommodate PI3Kα kinase catalytic domain and form H-bonding with the key binding residues.
Factors Associated With Hypertensive Patients' Compliance With Recommended Lifestyle Behaviors In North Of Jordan

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ABSTRACT

Background: Hypertension, also called high blood pressure, is classified as a chronic disease and defined as a persistent systolic blood pressure (BP) of 140 mmHg or more and/or diastolic BP of 90 mmHg or more. In Jordan, the prevalence of hypertension is very high, approaching 32%. Controlling of BP can be achieved by using antihypertensive medications and adherence to lifestyle changes. Compliance with therapeutic lifestyle recommendations decreases the risk of cardiovascular problems. Therefore, non-compliance can worsen the quality of life and increase the cost of medical care.

Objective: This study aimed to identify factors correlating with hypertensive patients’ compliance with lifestyle recommendations in north of Jordan.

Method: A cross sectional survey and face to face interview method were used to collect the data from 1000 adult Jordanian patients (>18 years old) who have been diagnosed with hypertension for at least 1 month, on medical treatment, and attending hypertensive clinic in King Abdullah University Hospital from (11/October/2016-12/December/2016). The questionnaire was developed based on previous literature and with the help of experts in the field of hypertension, and was piloted with 20 patients. Data analysis was conducted using the SPSS Version 23. In the beginning, descriptive statistics was conducted. Then chi-square test was conducted to find bivariate correlations with the outcome variables. All variables significant at the 0.05 level were entered into binary logistic regression models as potential predictors of compliance to lifestyle recommendations.

Result: In this study, only 23% of the patients were fully compliant with healthy lifestyle behaviors. About 95% were knowledgeable on hypertension, and 86% of the patients had positive beliefs about management of this condition. Logistic regression revealed that gender, physician counseling on a healthy lifestyle and self-care, patients’ beliefs about hypertension management, and their knowledge on hypertension and its management, have an independent effect on compliance with recommended lifestyle behaviors.

Conclusion: Despite the high level of patients’ knowledge about hypertension disease, and most of the patients showed positive beliefs regarding hypertension management, the rate of compliance with recommended lifestyle behaviors was low. Receiving counseling from a physician about a healthy lifestyle and self-care, being informed about hypertension and its management, and having positive beliefs about managing this disease are significant predictors of patients' compliance with recommended lifestyle behaviors.
Preparation of nanostructured drug carrier based on carrageenan Using Supercritical CO2 Technology

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ABSTRACT

Introduction: Owing to its availability, thermo-stability, low toxicity and encapsulating properties, carrageenan (anionic polysaccharide) polymer was chosen as one promising candidate for drug delivery applications. Aerogels are highly porous, open pore structure materials with a high specific surface area. These properties combined with carrageenan properties make them an ideal candidate for drug adsorption and delivery applications. In this work, Sc. CO2 was used to prepare Carrageenan aerogel microparticles. This method is green, simple, rapid and approved for large-scale production.

Aim: The primary objectives of this work were preparation of Carrageenan porous micro-spherical nano-porous particles (Aerogels) and investigation of its potential as a drug carrier. Moreover, investigating several process parameters to control the particle size, and the textural properties of the preparation as well as the drug loading and release characteristics.

Methods: Emulsion-gelation technique used to prepare Carrageenan gel microparticles. Supercritical CO2 used for drying and loading purposes. The prepared particles were characterized using Particle Size Analysis, X-Ray Diffraction, Differential Scanning Calorimetry (DSC), Fourier Transform Infra-Red (FTIR), Scanning Electron Microscope (SEM), density measurements, surface area and porosity measurements. Finally, dissolution studies applied to test in-vitro Ibuprofen release from the prepared carriers.

Results and conclusions: Micro-spherical nano-porous Carrageenan formulations with the high specific surface area and large porosity were successfully prepared. The effect of polymer concentration, preparation temperature, cross-linker type and concentration, shows to be controlling parameters for the final properties of the prepared formulations. Loading with the model drug was performed.
Development and Optimization of Hydrogels, Oleogels, and Bigels as Topical Drug Delivery Systems for Periodontitis

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ABSTRACT

Periodontal disease is a chronic inflammatory disease of gum and tissues that surround and support the teeth. One approach of treating periodontitis is loading the nonsteroidal anti-inflammatory drugs (NSAIDs) in topical drug delivery systems to ease swelling and inflammation symptoms. The objective of this study was to investigate the mechanical properties (rheological, bioadhesive, and cooling-heating cycle) and in vitro drug release for topical gel formulations of the NSAID Ibuprofen (hydrogel, oleogel, and bigels (Ibuprofen-loaded oleogel and Ibuprofen-loaded hydrogel)). Ibuprofen hydrogel was prepared using the gelling agent Carbopol® 971P. Whereas, Ibuprofen oleogel was prepared using the organogelator Compritol® 888. Bigels were prepared by combining Ibuprofen hydrogel and Ibuprofen oleogel. Each gel formulation was characterized in terms of its viscoelastic properties (elastic modulus G’ and viscous modulus G’’), heating-cooling cycle, and bioadhesion properties using a controlled stress rheometer. The in vitro drug release was investigated using Franz diffusion cells. The four gels exhibited elastic behavior, where G’ dominated G’’ at all frequencies. Ibuprofen oleogel exhibited the highest viscoelastic properties, indicating the formation of strong gel. However, Ibuprofen hydrogel exhibited lower viscoelastic properties than those of bigels, indicating the formation of a weaker gel. A negative interaction was found between mucin dispersion, and Carbopol® hydrogel and Carbopol®/Compritol®. Whereas, a positive interaction was found between mucin dispersion and Compritol® oleogel. The heating-cooling cycle showed no crossover point (i.e G’=G’’), in agreement with the elastic behavior of gels. The release of Ibuprofen from the four gels showed a controlled release pattern over 6 h. An enhancement in drug release was found in Ibuprofen bigels and oleogels. Our results provide valuable insights into the mechanical properties and in vitro diffusion studies for the four gels by which different gel formulations can modulate drug release from topical gels.
The Correlation between Plasma Levels of Malondialdehyde and Sirtuin 1 in Newly Diagnosed Pre/Diabetic Patients with Metabolic Syndrome

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ABSTRACT

Background and aims: Malondialdehyde (MDA); a lipid peroxidative biomarker, and sirtuin 1 (SIRT1; a NAD+-dependent deacetylase) were implicated in metabolic syndrome (MetS) and type 2 diabetes mellitus (T2DM) pathophysiology. This study aimed to compare and correlate MDA and SIRT1 plasma levels, adiposity indices [conicity index (CI), waist circumference (WC), weight-to-height (WHtR) ratio, hip circumference (HC), and body adiposity index (BAI)], lipid ratios (atherogenicity index of plasma (AIP=\log_{10}TG/HDL-C ratio), TC/HDL-C and LDL-C/HDL-C ratios) and hematological indices [red cell distribution width (RDW) and mean platelet volume (MPV)].

Methods: In a cross-sectional study, 30 normoglycemic lean subjects (control), 31 MetS subjects and 30 MetS-pre/T2DM were enrolled. Plasma SIRT1 and MDA were evaluated using colorimetric assays. The comparisons and correlations between metabolic biomarkers, adiposity, atherogenicity and hematological indices were also examined.

Results: The gradual increase in mean MDA levels (µM), though not ascribed any statistically marked variation, was appreciable in both MetS groups (MetS and MetS-pre/T2DM). Conversely, the mean circulating SIRT1 levels (ng/mL) were markedly lower in both MetS groups (nondiabetic and pre/diabetic) vs. controls. All adiposity and atherogenicity indices as well as MPV and PLT were substantially higher in both MetS groups vs. controls'. Significantly inverse MDA-SIRT1 relationship was observed in the total study population. Expectedly, MDA correlated directly but SIRT1 inversely with each of A1C and TG and each of adiposity indices (WC, HC, BMI, WHtR, CI and BAI). Exceptionally, SIRT1 negatively associated with MPV, platelet count, AIP, TC/LDL-C and LDL-C/HDL-C ratios. Distinctively, MDA related inversely to controls’ TC/HDL-C ratio, monocytes and lymphocytes counts and their ratio, but directly with platelet/lymphocyte ratio.

Conclusion: As MDA and SIRT1 may reciprocally participate in the development of MetS and T2DM; and thus, can be substantiated as surrogate biomarkers for prediction/prevention of metabolic disturbances.
Levels of Glycated-LDL-C and Glycated-HDL-C in Drug Naïve Diabetic and Non-Diabetic Patients with Metabolic Syndrome

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ABSTRACT

Background and aims: Glycated LDL-C (GLDL-C) and GHDL-C are dysfunctional lipoproteins due to persistent hyperglycemia, aggravated by hyperlipidemia, culminating into metabolic syndrome (MetS), prediabetes and type 2 diabetes mellitus (T2DM). Thus, this cross-sectional study aimed to investigate GLDL-C and GHDL-C as surrogate biomarkers for prediction/prevention of metabolic disturbances.

Methods: Sandwich enzyme-linked immunosorbent assay (ELISA) was used to evaluate plasma GLDL-C and GHDL-C levels in 30 normoglycemic lean subjects (controls), 30 MetS non-diabetic patients and 30 MetS-pre/T2DM. The correlations between these MetS-biomarkers and clinical parameters of patients as well as adiposity, atherogenicity and hematologic indices, namely conicity index (CI), waist circumference to hip circumference (WHR) ratio and body adiposity index (BAI), plasma atherogenic index (PAI = \( \log_{10} \frac{\text{TG}}{\text{HDL-C}} \) ratio), LDL-C/HDL-C and TC/HDL-C ratios, red cell distribution width (RDW_CV%) and mean platelet volume (MPV), and blood ratios of platelet-to-lymphocyte, monocyte-to-lymphocyte and neutrophil-to-lymphocyte (respectively PLR, MLR and NLR) were conducted.

Results: Both GHDL-C and GLDL-C levels lacked any intergroup statistically significant discrepancies in either MetS or MetS-pre/T2DM vs. the normoglycemic lean controls. Interestingly, there were highly significant intergroup differences in GHDL-C/HDL-C ratios when comparing both MetS and MetS-pre/T2DM groups vs. the healthy controls. Comparable outcomes could not be established when comparing the means of the ratios of GLDL-C/LDL-C for both MetS groups (pre/diabetic and undiabetic) vs. controls’. In MetS patients; GHDL-C and GLDL-C proportionally correlated with WHR, but MetS GHDL-C correlated inversely with MLR and monocytes. In MetS-pre/T2DM; GLDL-C directly correlated with BAI, Plt count and PLR. In the whole study population GHDL-C proportionally correlated with AIP, TG/HDL-C and LDL-C/HDL-C.

Conclusion: Our study cannot rule out any potential molecular crosstalk of GHDL-C and GLDL-C in the pathophysiology of MetS and its related dysregularities. Taken together, both biomarkers as metabolic risk factors may be putative diagnostic/prognostic tools for metabolic anomalies prediction/prevention and pharmacotherapy.
Do we consume the correct herbal drink?

Immunomodulatory and anticancer activities of herbal drinks from Jordanian medicinal plants

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ABSTRACT

Herbal drinks are highly popular in Jordan and consumed in large quantities to prevent and treat different ailments. Although many studies were conducted to evaluate the biological activities of Jordanian plants, studies are missing to evaluate herbal drinks prepared from these plants. This is the first study to evaluate the immunomodulatory and anticancer properties of selected herbal drinks consumed in Jordan. The antiproliferative activities of selected herbal drinks were tested against different breast cancer cell lines using MTT assay. Degree of apoptosis induction of the most potent antiproliferative herbal extract was detected by using TUNEL colorimetric assay. ELISA was used to measure vascular endothelial growth factor (VEGF) expression in tumor cells and to measure levels of INF-γ, IL-4, IL-2 and IL-10 secreted by splenocytes after extract treatment. The effect of the extracts on splenocytes proliferation was measured using MTT assay. Macrophage function was evaluated using nitro blue tetrazolium assay. The growth of breast cancer cell lines (MCF-7, and T47D) was inhibited by herbal drinks in dose dependent manner. Ginger and Lemon Verbena was most potent against both cell lines. Ginger and Lemon Verbena targets cancer cells through the induction of apoptosis and suppression of breast cancer angiogenesis. An increase in TH1 cytokines (IFN-γ, IL-2) level and decrease in TH2 cytokine (IL-4) level were evident after lymphocytes stimulation by both herbal drinks. Jordanian Zhourat was the most potent herbal drink to stimulate lymphocytes proliferation followed by Syrian Zhourat and Lemon Verbena. Jordanian Zhourat was also the most active herbal drink to stimulate phagocytosis followed by Lemon Verbena.

The consumption of different herbal drinks provides variable health benefits. Ginger and Lemon Verbena herbal drinks exhibit anticancer activities. Jordanian Zhourat is a potent stimulator of innate and acquired immunity.

Results obtained in this study can be used to augment the traditional treatments of different diseases with specific functional herbal drink.
Effects of medication management review service on patients diagnosed with type π diabetes: randomized controlled trial

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ABSTRACT

Medication management review (MMR) is a distinct service or group of services that optimize clinical outcomes for each patient to ensure the appropriateness, usefulness, safety for each patient's medications, along with ability of the patient to take their medications as should be. Type II diabetes is a chronic condition of great concern where Jordan has one of the highest prevalence of diabetes in the world.

The purpose of this study was to investigate and explore the effectiveness of the MMR service on Jordanian patients with type II diabetes. This study is the first randomized controlled MMR study conducted in the Middle East that deals with, and concentrates on patients with diabetes type II only. A total of 139 patients were approached and were randomly selected from three comprehensive health care centers, Ajloun, Jordan. Patients were divided into two groups experimental (n=70) and control (n=69). Both groups were reassessed after 3 month to find out the effects of MMR service.

A total of 407 TRPs were identified during the study period. The mean number of TRPs per patient was (2.92±0.95). There was a significant decrease in the mean number of TRPs in the experimental group after three month from 3.02±0.95 to 0.5±0.62 per patient, p<0.0001. Also, there was a significant decrease in the mean of HA1c from 7.80 to 7.31 after the intervention, (p< 0.01) the same also for the mean of self-care activity improved from 27.22 to 35.85, (p< 0.001) where the drug adherence improved as the mean score decreased from 12.95 to 10.38, (p< 0.001) and the quality of life improved as the mean score decreased from 29.60 to 26.01, (p< 0.001). However, the lower the number the better the adherence and quality of life.

Due to the positive effects of the MMR service and the role of the clinical pharmacist played in this study, more than 88.20% of the TRPs were eventually resolved in the intervention group. The feasibility and the acceptances of the MMR service were excellent. The physicians showed high acceptance (67.53%) of the clinical pharmacist recommendations.

Results of this study showed that MMR service is needed for the management of patients with type II diabetes in Jordan. The service was well accepted and hence can be implemented following to the approval from policy maker.
Syrian Refugees Crises in Jordan: The Impact of Medication Management Review Service

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ABSTRACT

The main aim of this study was to identify the types and frequencies of the Treatment Related Problems (TRPs) among the Syrian refugees in Jordan, to explore the impact of the Medication Management Review (MMR) service on reducing the total number of the identified TRPs and to explore the impact of the MMR service on patients’ self-reported adherence, Quality of Life, knowledge about drug therapy and on the scale of anxiety. In addition, the study aimed to assess the approval rate of the physicians for the clinical pharmacist recommendations, to measure the satisfaction of the refugees with the MMR service delivered to them and to measure the perspective of physicians about the MMR service. The study was conducted over 6 months from May 2016 to October 2016. Ethics approval was obtained from the Jordanian Ministry of Health. A pre-prepared validated questionnaires and interviews were the data collection tools used to conduct this study. This study was a pre-post interventional parallel controlled study. A total of 109 patients were recruited and randomly distributed into two groups (control and intervention). Intervention group patients were assessed at baseline, receiving the MMR service and assessed three months post the intervention. Patients in the control group were assessed at baseline and at follow-up. A total of 1141 TRPs were identified for the study sample during the study period. At the end of the study, the mean number of TRPs was significantly reduced in the intervention group (baseline: 11.3 ± 4.2, follow-up: 3.4 ± 1.5, P <0.001, paired sample t-test). As with the control group, no significant difference was noted (baseline: 10.2 ± 4.1, follow-up: 9.7 ± 4.5, P = 0.116, paired sample t-test). The need ‘ monitoring’ and the ‘education about pharmacological and non-pharmacological therapy’ were the most common types of interventions that were required in order to resolve the identified TRPs among the study sample (active and control). Regarding the adherence, there was a significant difference in the adherence mean changes among the intervention group at follow up (P <0.001) but not for the control group (P= 0.229). A significant improvement resulted in the intervention and the control group regarding quality of life, yet the improvement in the intervention group was higher (P < 0.001 versus P = 0.028 respectively). The knowledge about drug therapy was improved significantly in the intervention group but not the control group (P <0.001 versus P= 0.07 respectively). The anxiety scale was improved significantly as a result of the intervention among the intervention group only (P <0.001). Perspective of physicians about the MMR service was very positive. In addition, most of the patients were satisfied about the MMR service.

As a conclusion, applying the MMR service for the Syrian refugees with chronic conditions decreased significantly the total number of TRPs and improved their clinical and humanistic outcomes. Long term studies with larger sample sizes and more direct physicians’ involvement from different specialties to facilitate pharmacist’s recommendations must be considered in future studies.
Levels of Metabolic Syndrome Biomarkers Myeloperoxidase and Alpha 1-Acid Glycoprotein in Newly Diagnosed and Drug Naïve Pre/Diabetic Patients

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ABSTRACT

Background and aims: Myeloperoxidase (MPO) and alpha 1-acid glycoprotein (AGP) are implicated in the subclinical chronic proinflammation of metabolic syndrome (MetS) and type 2 diabetes mellitus (T2DM). This study aimed to compare and correlate MPO and AGP plasma levels, adiposity [conicity index (CI), waist circumference (WC), weight-to-height (WHtR) ratio, hip circumference (HC), and body adiposity index (BAI)], lipid ratios (atherogenicity index of plasma (AIP=log_{10} TG/HDL-C ratio), TC/HDL-C and LDL-C/HDL-C ratios] and hematological indices [red cell distribution width (RDW_CV%) and mean platelet volume (MPV); MLR: monocyte/lymphocyte ratio; NLR: neutrophil/lymphocyte ratio and PLR: platelet/lymphocyte ratio] in MetS patients with/without pre/diabetes.

Methods: Plasma MPO and AGP levels in 29 normoglycemic lean subjects (control), 29 undiabetic MetS and 30 MetS-Pre/T2DM patients were tested using enzyme-linked immunosorbent assay. The comparisons and correlations among these metabolic-biomarkers as well as participants’ adiposity, atherogenicity and hematological indices were also examined.

Results: While AGP levels (µg/mL) were significantly higher in both both MetS groups (pre/diabetic and undiabetic) vs. controls’; MPO levels (pg/mL) were significantly higher in non-diabetic (but not pre/diabetic) MetS group vs. controls’. Neither metabolic biomarker was ascribed any statistically marked variation between MetS groups nor did they correlate appreciably with each other. Collectively adiposity, atherogenecity indices as well as MPV (but not RDW or any of MLR, NLR or PLR) and monocyte counts were substantially higher in both MetS (non-diabetic and pre/diabetic) groups vs. respective normoglycemic controls’ parameters. Distinctively metabolic biomarkers correlated proportionally and pronouncedly with each of BMI, A1c (but not FBG), TC, LDL-C (but not HDL-C), WHtR, MPV, Platelet counts, MLR, LDL-C/HDL-C and TC/LDL-C ratios in the total study pool of participants.

Conclusion: Given the substantial intergroup variations and correlations between adiposity, atherogenecity and hematological indices as well as metabolic risk biomarkers; both MPO and AGP may be advocated as putative diagnostic/prognostic tools for metabolic anomalies prediction/prevention and pharmacotherapy.
Cytotoxic evaluation of doxorubicin in combination with Cynarin and Isoliquiritin against different cancer cell lines

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ABSTRACT

Cytotoxicity of tumor drugs is well known with much more undesirable side effects on cancer patients. Among these cytotoxic drugs is doxorubicin which have cardiotoxicity side effects. Hopefully, the developing of less cytotoxic chemotherapeutic drugs on normal cells are contributed to current study.

The aim of this study is combination of natural pure compounds (Cynarin and Isoliquiritin) with chemotherapeutic agent doxorubicin on different cell lines: colorectal cells (HCT116), hepatic cells (HEP G2) and in addition to fibroblasts and cardiomyocytes (H9C2) as a normal cell.

Cynarin and Isoliquiritin are polyphenolic compounds which extracted purely from artichoke and licorice, respectively.

Results have shown that the two combination (Cynarin and Doxorubicin) cytotoxicity is higher than doxorubicin alone, almost similar results has been obtained with the other two combinations (Isoliquiritin and Doxorubicin).

Although the three combination (Cynarin, Isoliquiritin and Doxorubicin) have shown different results.
Towards the discovery of new inhibitors against the highly conserved protein PPK1 followed by validation against relevant bacterial species.

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ABSTRACT

Inorganic polyphosphate (poly P) is present in all living forms in each of the three kingdoms of life. Studied mainly in prokaryotes, polyP and its associated enzymes are vital in diverse basic metabolism, in at least some structural functions and, notably, in stress responses. These plentiful roles for polyP are probably the consequence of its presence in life-forms since early in evolution. The genomes of many bacterial species, including pathogens, encode a homologue of a major polyP synthesis enzyme, poly Phosphate kinase (PPK), two different genes code for PPK resulting in two types of enzymes; PPK1 and PPK2. Genetic deletion of ppk1 gene results in reduced polyP levels and loss of pathogens’ virulence. Thus far, no PPK1 homologue has been identified in higher-order eukaryotes and, therefore, PPK1 represents as a novel target for chemotherapy. The idea of the current study is to study the PPK1 from Escherichia coli in order to study the effect of active site point mutations on PPK1 catalysis. Comprehensive understanding of the enzyme’s structure and binding sites will be used to design pharmacophores and screen a library of synthetic compounds for potential discovery of selective PPK1-inhibitors. Inhibitors’ activity will be evaluated by studying their effects on the metabolic phenotype map of the wild type strain and comparing their fingerprint to the ppk1 knock-out mutant.
DIRECT MEDICAL COSTS OF BREAST CANCER IN NORTH OF JORDAN

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ABSTRACT

Background: Breast cancer (BC) is the most common cancer and a major cause of morbidity and mortality in women worldwide. In Jordan, BC is the most common cancer in women, it accounted for 20.1% of all cancers in 2012. It represents a huge burden to healthcare systems and economic resources. Estimating the cost associated with BC management is essential for evaluating the burden it imposes as well as conducting economic evaluations for prevention, detection or treating strategies of BC.

Objective: This study aimed to estimate and analyze the direct treatment costs of BC patients in Jordan.

Methods: A retrospective analysis of a cohort of patients with BC treated for 12 months in 2015 in KAUH. Demographic, clinical and economic data were collected. Statistical analysis was performed using SPSSSTM for Windows and a p value of < 0.05 is defined as statistically significant.

Results: 119 female patients with BC were identified. The mean age was 50.82 ±10.22 years. The total cost for the sample was JD 1,393,325. Mean cost per patient from stage I to IV was JD 6,696, 9,183, 11,970 and 15,073, respectively. Medications were the most expensive healthcare resource used, accounting for 75% of total cost, followed by laboratory and diagnostic test.
Pharmacy practice in procurement field

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ABSTRACT

Introduction: pharmacy is the medical field that deals with medicines in all various stages of its life cycle. A pharmacist usually works in a community or hospital pharmacy, representative, industry, but what are the new trends?

Definition of procurement: is the act of obtaining or buying goods and services or works. The process includes preparation and processing of a demand as well as the end receipt and approval of payment.

general view on procurement: public procurement is always of great importance as it presents 15%-20% of gdp (gross domestic product) of most of the countries, through which the government execute their vital responsibilities e.g. Transportation, infrastructure, health, schools, universities---etc, with the economic problems found worldwide, public procurement had to be more regulated & controlled. Many laws & regulations had been found to regulate pp like unicetral law, eu directives for public procurement &gpa agreement.

Why should pharmacists join procurement? As a buyer you are in an extremely powerful position. But because buyers often operate behind the scenes, many people aren’t aware of procurement and supply as a career choice. Top buyers are in huge demand around the world and can achieve extremely high positions within companies. Whether it's sourcing goods from local suppliers or running global supply chains, buying essential services and resources at the right price, particularly in today’s challenging economic environment, can make or break a business.

Conclusion: procurement is relatively modern field that absorbs many talented, professional educated people of different studying back grounds, you can find pharmacists, doctors, nurses, engineers, accountants, annalists, it technologist working as procurers. Go on, decide to be a great procurement professional, starting today.
Complementary and Alternative Medicine Used by Syrian Traditional Healers and Refugees in Al-Zaatari Refugee Camp

Aya Al-Ubaidi, Dr Kenza Mansoor, Dr Talal Aburjai.

ABSTRACT

Natural drugs have been used since antiquity for prophylaxis and treatment of many diseases. Conservation of the traditional heritage and plant species is essential to develop effective treatment for different diseases. However, few studies reported the ethnobotanical and ethnomedicinal background of commonly used plants in refugee camps. Therefore, the current research aims to highlight the ethnobotanical and ethnomedicinal background behind the use of Complementary and Alternative Medicine (CAM) in Al-Zaatari Refugee Camp. Furthermore, perceptions, attitudes, beliefs and awareness of CAM used by traditional healers and refugees will be measured and determined.

The current study was divided into two phases; phase (1) was semi-structured interviews that targeted experienced herbalists in Al-Zataari Camp, while phase (2) was semi-structured interviews that targeted refugees with different health conditions. Study tools were designed, translated and verified to obtain information regarding demographics, medical history for patients, extensive information regarding CAM used as treatment, practice of CAM and sources of information. Plant samples were also collected and identified. Three hundred patients and 26 herbalists were interviewed to obtain required data. Statistical analysis was carried out using SPSS version 17. Plant samples were identified and verified by a taxonomist.

Our results highlighted the correlation between demographics and awareness, belief and practice of CAM. Safety and efficacy were studied and analyzed. The perceptions, attitudes, beliefs and awareness of patients were investigated. Furthermore, ethnobotanical and ethnomedicinal background of both patients and herbalists were evaluated. Information Consensus Factor (ICF) was also calculated.

The use of unsafe or toxic plants was noticed to be practiced by traditional healers. Most of the interviewed patients dealt with well-known safe medicinal plants for the treatment of constipation, diarrhea, flatulence, hemorrhoids, obesity, allergy, asthma, back pain, hepatitis, gout, different type of infections, kidney stone, diabetic, sexual dysfunction, burn and wound healing. Searching the literature evidenced some concordance with the solicited plant uses mentioned by the traditional healers and refugees.
Abstracts for Undergraduate Poster Presentation

Undergraduate committee

Dr. Mohammad Alnajjar  
(Applied Science University)

Dr. Ahmad Al-Azayzih  
(Jordan University of Science and Technology)

Dr. Eyad Malah  
(University of Petra)

Dr. Beisan Mohammad  
(Applied Science University)
Screening for the level of hygiene in Faculty of Pharmacy from a microbiological perspective

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ABSTRACT

Aims/objectives: The main aim of this study was to evaluate the level of hygiene in solid surfaces and hands of students at Faculty of Pharmacy by using microbial screening basic techniques.

Method: Swabs from different sites at Faculty of Pharmacy in the ASU were taken for microbial examination after cultivation on solid agar media and broth. Samples were taken from different sites, including toilet cabinets, basins, doors handles, student’s desks stairs handrails, as well as students hands.

Results: E. Coli and Staphylococcus were found in different surfaces in the classrooms, male and female bathrooms, door handles, stair handrails and students’ hands. Candida was detected in samples taken from stairs handrails. Quantitatively, the highest contaminated surfaces were in the classrooms, with average reading of $3 \times 10^{11}$ CFU/ml.

Conclusion/discussion: Microorganisms that might cause serious infections are present in Faculty of Pharmacy facility surfaces and students’ hands. Good hygiene practices should be emphasised, accompanied with awareness campaigns about the importance of surface and body hygiene.
Does topical use of Aspirin with Vaseline ameliorate acne?

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ABSTRACT

Introduction: Acne is one of the most common chronic skin disorders. It starts in adolescence and may persist into young adulthood or longer especially in females. Although acne is not physically disabling, its psychological impact can be striking, contributing to low self-esteem, depression, and anxiety. Recently, I was asked about my opinion as a pharmacist in a traditional recipe that is being used by some female to treat acne. The recipe consisted of grinding Aspirin tablet and mixing it with small amount of Vaseline. This recipe is used topically to ameliorate acne. As a pharmacist, I decided to look for scientific evidence to justify this practice.

Method: Several questions needed to be answered in order to decide whether this recipe is useful in treating acne or not:

- Is acetylsalicylic acid, in its native form, active as an anti-inflammatory agent?
- What is the solubility of acetylsalicylic acid in the oily vehicle?
- What is the penetration potential of acetylsalicylic acid through the skin and pilosebaceous glands?
- Is there any feedback from acne patients who used this recipe?
- Does this recipe have potential side effects?

Results: Acetylsalicylic acid was found to possess anti-inflammatory activity and can be solubilized in oily vehicle. It is shown to penetrate deep into the skin layers and pilosebaceous glands but not into the systemic circulation. A short survey was performed to ask for feedback from pharmacists and users for this recipe. A number of respondent claimed that they have used it with good results in ameliorating acne.

Conclusion: Based on our literature search, this recipe may be used to ameliorate inflammatory acne grade. We suggest the use to be once weekly and just on the affected area to avoid skin irritation.
Pharmacy Ethical Practice in Jordan: Community Pharmacists’ Attitudes, knowledge, and Practices

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ABSTRACT

Introduction: Having a local code of ethics, based on moral obligations and virtues, known to all practicing pharmacists is important in order to guide them in relationships with patients, health professionals, and society. It is important that they follow the principles that form the fundamental basis of their roles and responsibilities.

Objectives: To investigate pharmacists’ knowledge of the Jordanian code of ethics, their interest in following the code, and barriers towards applying the ethical principles set in the code.

Method: The study objectives were addressed in a cross-sectional study completed by randomly selected community pharmacists. The questionnaire investigated pharmacists’ socio-demographic and pharmacy practice characteristics, current knowledge about the pharmaceutical code of ethics in Jordan, their interest in following the code of ethics in their practice, and barriers towards applying the ethical principles in the code. Data was entered into SPSS and analyzed.

Primary Result: Over a 2-month period in 2016, 83 questionnaires were completed by community pharmacists in Amman. Most respondents were females (58.5%) with a mean age of 31 years (SD 8.4). Although only 52% of the pharmacists received education regarding the Jordanian code of ethics, xx% of them showed interest towards following the principles set in the code. Only 31% recorded ethical concerns in their pharmacies. Lack of time was the main reported barrier (42%) limiting pharmacists from discussing ethical issues with their patients. Majority of the pharmacists referred their ethical dilemmas to their managers (45.6%) or to the Jordanian Pharmacy Association (38%).

Conclusion: Many pharmacists in Jordan are not receiving any education with regards to the code of ethics, and a few of them keep records of ethical concerns. Certain barriers need to be eliminated before pharmacists can fulfill their responsibilities in this area. Results of this study are important for the authorities in the country responsible for setting the pharmaceutical code of ethics and for integrating it into the pharmacists’ day to day practice.
An exploratory study on medications storage in Jordanian households

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ABSTRACT

Introduction: The presence of medicines in households is a risk factor for irrational drug use mainly due to the easy access, and improper storage. If the recommendations for storage are not followed, the drug stability can be affected which in turn leads to ineffective & unsafe drug therapy.

Objectives: We aimed to characterize medications stored in Jordanian homes and to explore their methods of storage and which medications are stored mostly.

Methods: This is a cross-sectional study involving a pre–tested questioner which consists of 20 closed questions. The data were obtained from Jordanian households. Family members were interviewed personally and were asked about storage of the drugs and type of medications they have. Data were analyzed using descriptive statistics and bivariate and multivariate logistic regression.

Results: Data were collected from a total of 219 homes from different areas in Amman, Jordan. Almost thirty eight percent from west of Amman (38.4%), north of Amman (25.6%), east of Amman (18.7%), south of Amman (17.4%). A total of 3167 drugs products were recorded. The majority of drugs were kept in kitchen (26.5%) and a number of respondents were keeping their drugs in bedroom (20.1%). Most of the respondents stored drugs appropriately (71.7%) compared to (28.3%) who had not had a proper storage condition. There was no significant difference was found from where participants sought information related to drug use & storage i.e. doctor or pharmacist. After conducting logistic regression analysis, Number of medications regardless if it is over the counter (allergy, cough, cold & flu preparation’s) [P= 0.045, (1.004–1.449)] or antibiotics [P=0.026, (0.560–0.964)] was the main factor that affect drug storage.

Conclusion: Most drugs kept at home were appropriately stored in a safe place. However, there is a need for more societal awareness about the safe handling and storage of drugs in the home, and about the professional role of the pharmacist in such domain.
A Review on some tradition and therapeutic uses of different bees products

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ABSTRACT

Objectives: In this review we discussed the most recent studies case reports and evaluations done on the use of different bees product including (HONEY, BEES WAX, BEES VENOM, ROYALE JELLY AND PROPOLIS)

Method: Data base research was performed on Google Scoolar, Text Book, Pub Med, Drugs.com and from ethnobotanist experts in this field using the following key words (HONEY, BEES WAX, BEES VENOM, PROPOLIS and ROYALE JELLE)

Results: Traditional and therapeutic uses of different bees products were evaluated including:

- The use of honey as anti inflammatory and for treatment acne , use of BEES VENOM as antiRheumatic and cervical apodyloptosis , use of PROPOLIS as Irritable bowel syndrome and anti bacterial effect ,the use of ROYALAR JELLE for treatment of secondary infertility and leukemia.

Conclusion: There is a need for more scientific research, studies and clinical experiment to be conduct in order to evaluate the described ethnobotany uses, side effect and contraindication examined or reported by the users before we can prescribe and use these products, especially for patient suffering from chronic diseases with potential risk of side effects or interaction.
The awareness of Jordanian population about the safe use of otc medications

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ABSTRACT

Over the counter medications (OTC) are drugs that are found to be safe and appropriate for use without the supervision of a health care professional. The aim of this research was to study the effects of gender and educational levels of Jordanians on the safe use of OTC medications. The study was conducted on a random sample of Jordanians in 2017 via questionnaire written in Arabic language distributed by social media, seventeen parameters related to the safe use of OTC medications were assessed. The number of participants were 238, 80.7% were females. We have found that the mostly used OTC medication was analgesics, we have also found that females were more interested in knowing the information written on the box and in the leaflet of the medication \( (P > 0.05) \). Moreover, participants with secondary education or less used antihistamines as sleeping aid agents \( (P > 0.05) \), and participants with medical background knew the active ingredient \( (P > 0.05) \). We have concluded that females and medically educated people are more aware towards the safe use of OTC medications.
Weight loss medications use in community pharmacies: A pilot study

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ABSTRACT

Introduction: Globally, obesity has become a burden with epidemic proportions. In Jordan, nearly three-quarters of adult are overweight or obese. Therefore, this study was conducted to assess the ways of dispensing and the most commonly used medication for weight loss and to provide information on how consumers use weight loss medications without physician supervision.

Method: In this descriptive study, 40 participants were selected and included adults of 18 years old of age or more, with body mass index defined as overweight or obese (BMI  $\geq 25$), and who is taking a weight loss medication either as prescription or OTC medication or had previously used one of the medications for at least one month.

Results: Metformin was the most commonly used by participants followed by herbal medications, and finally Orilstat. 50% of participants were self-treated and 45% of the participants chose the weight loss medication according to the pharmacist advice. The rate of discontinuation was significantly different between the medications used, and was the highest for herbal products.

Conclusion: Results suggest that weight loss medications were often dispensed upon participant request and the rate of discontinuation is high due to adverse effect.
Over The Counter counseling in community pharmacy

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ABSTRACT

Introduction: Community pharmacists play a crucial role in optimizing medication use and improving patient's outcome, while preventing medication misuse and reducing costs.

Evidence suggests that pharmacists counseling improves clinical outcomes, patient's drug knowledge and reduces health service utilization, while optimizing a safe use of the drugs.

Method: The study consisted of two parts evaluated the pharmacist counseling practice toward over the counter medicine (1) A 100 cross-sectional survey to the community pharmacists in west Amman was conducted from January 2017 to March 2017, with data collection through a pre-piloted self-administered questionnaire and (2) A 30 simulated patients (SPs) visits to pharmacies. The data was analyze with spss.

Results: In the simulated data only 24% of pharmacist provided OTC counseling information, where this percent increases to 47% after the simulated patient intervenes. The most asked questions were about “who’s the medication for” and “Whether the patient had taken this medicine before”. In the survey pharmacists documented that they cover nearly every aspect of OTC counseling, where the main barrier to counseling is the lack of time. Conclusion: The study highlights some deficiencies in appropriate medication dispensing and counseling practice at community pharmacies in west Amman.
HMG-CoA-reductase Inhibitors Use in Jordan: Patients Experience of Adverse Drug Reactions and Their Attitude to Medicine

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ABSTRACT

Introduction: The number of patients taking HMG-CoA-reductase inhibitors "statins" is growing rapidly among Jordanian patients. Treatment with these agents showed a significantly reduced risk of cardiovascular morbidity and mortality, however, these drugs may cause unpleasant adverse drug reactions (ADRs). The most serious ADRs of statins are musculoskeletal symptoms including myopathy and myositis, rhabdomyolysis and liver failure. Furthermore, memory loss has been reported and peripheral neuropathy might occur, especially after a long-term use.

Objectives: To evaluate patients’ experience of ADRs associated with the use of "statins" and the patients’ attitude toward these ADRs in Jordan, in terms of patient adherence and patients’ beliefs. To the best of our knowledge, this study is considered the first study in the region.

Method: a paper-based questionnaire consisting of 19 questions, covering areas of interest, was distributed among Amman pharmacies to be filled by adult patient taking statin.

Results: A total of 153 patients have completely answered the questionnaire. A significant number of patients experienced myopathy, peripheral neuropathy, and some incidents of memory loss problems. The prevalence of ADRs of statins among participated patients was influenced by different drug generics with simvastatin being the one with highest rate of ADRs. Furthermore, the presence of ADRs affects patient adherence to their statin therapy.

Conclusion: with the increased number of patients taking statins, they should be educated about the possible ADRs associated with the use of these agents. Monitoring ARDs of statin and patient experience may help in ensuring patient adherence.
Paracetamol knowledge and misuse at the Isra university students

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ABSTRACT

Introduction: Most patients consider self-medication as the first option to treat illness. Among the most self-medicated drugs is paracetamol which is highly accessible yet potentially dangerous when used incorrectly.

Method: A cross-sectional survey of different colleges sectors and levels was undertaken. The study was conducted from December 2016 to March 2017 at the Isra university with data collection from 185 students through a self-administered questionnaire to determine the knowledge and perceptions of paracetamol. The data was analyzed using SPSS version 21.

Results: Most students' use paracetamol for the indicated reasons. About 75% of students didn’t know the main side effect of paracetamol, while nearly 40% consider 500 mg as the maximum dose. About 15 – 20% of students use two to three different drugs of paracetamol at once which could increase the risk of misuse and side effects.

Conclusion: A general safe use of paracetamol was apparent with some evidence of knowledge gaps which increase the risk of misuse.
Knowledge and attitude toward pharmacovigilance among pharmacy teaching fellows in the Jordanian universities

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ABSTRACT

Background: Adverse drug reactions (ADR), associated with medication use, resulted in the development of pharmacovigilance centers in many countries. Pharmacovigilance is the pharmacy discipline that aims to reduce ADRs and ensure safe clinical practice.

Objective: To evaluate the knowledge and attitudes toward pharmacovigilance and ADRs reporting among pharmacy teaching fellows in Jordanian universities.

Method: A cross-sectional study was conducted among pharmacy teaching fellows. A questionnaire was developed for this purpose and a total of 29 teaching fellows were recruited to participate in this study.

Results: The majority of participants had sufficient knowledge about pharmacovigilance concept and definition. About half of the participant knew the national ADRs reporting center and the special ADRs reporting form. Around 62% of the participants believed that pharmacovigilance should be included as a core topic in pharmacy education; however, only 3.4% mentioned that pharmacovigilance is well covered in current pharmacy school curriculum.

Conclusion: Although pharmacy schools’ teaching fellows have sufficient knowledge on pharmacovigilance concept and ADR reporting process in Jordan, the need for more pharmacovigilance workshops might help in insertion of pharmacovigilance as a core topic inside pharmacy teaching outline. This will improve pharmacy teaching fellows ability to educate students about this topic, which in turn, promotes students’ preparedness to maximize patient safety.
Prevalence of Depression Among Palestinian Adults With Diabetes Mellitus: A cross sectional study

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ABSTRACT

Background & Objectives: Diabetes mellitus (DM) is one of the most psychologically demanding chronic medical illness in adult. Comorbidity between diabetes and depression is quite common, but most studies were based on developed country sample. Depression affects DM patients treatment goals negatively. This study was carried out to determine the prevalence of depression and identify its socio-demographic or clinical correlates in patients with established diabetes mellitus attending an out-patient clinical health care in Ramallah.

Methods: This was a cross-sectional study at Ramallah primary healthcare clinic, Ramallah, Palestine. About two hundred patients with established DM were evaluated for depression using Patient Health Questionnaire the nine-item PHQ-9 (Arabic version). Patients data were also collected including age, sex, marital status, Body Mass Index (BMI), level of education, smoking status, physical activity, duration of diabetes mellitus, use of insulin, presence of additional illnesses, glycosylated hemoglobin (HbA1c) levels and medications. In order to achieve the objectives of the study, we used descriptive and analytical approach for representing the results.

Results: The majority of the study patients have their sources of information about how to use the medications are from physician (94.9%), then from pharmacist (3.6%). The majority of the study patients have duration of diabetes (5-9.99 years, 34.2%). 25% of patients do not suffer from other disease but others have more than one disease and about 28.1% suffer also from hypertension. Majority of patients used two drugs (132, 67.3%) and (64, 32.7%) uses insulin for treatment of DM. Majority of them (132, 67.3%) have family history of diabetes. HbA1c was found 7 or higher in 105 patients (53.6%) and 91 patients (46.4%) their HbA1c was less than 7. The blood glucose levels during fasting were found in these patients and the majority 118 patients 60.2% was found above 140. The BMI for 95 patients (48.5%) was between 25-29 (over weight) and for 62 patients (31.6%) were found above 30 (obese). The Number of prescribed medication administration per day was relatively high and varied from 1-10 medications. Of the study patients, 139 (71%) met the criteria for major depression, 43 (21.9%) for moderate depression and the remaining 14 (7.1%) had no clinically significant depression. Among these 139 patients diagnosed major depression, 84 patients (42.9%) suffered from major depression, mild severity, 45 patients (23%) suffered from major depression, moderate severity and 10 patients (5.1%) diagnosed major depression, severe severity.

Interpretation & conclusion: This study showed high prevalence of depression in patients with DM. The risk factors for depression were age, obesity, diabetic complications, diseases and increased of medications. However, the likelihood of depression was not significant with duration of diabetes and insulin use. Major depression was highly prevalent among people with DM and none were being treated with anti-depressants. Psychosocial assessment should be part of routine clinical evaluation of these patients at primary healthcare clinics and possible treatment for depression in order to improve quality of life and decrease adverse outcomes among diabetic patients.
The Effect of Energy Drinks, Caffeine-Containing Beverages and Dietary Supplementation on Academic Achievement and Social Performance Among Students of Scientific Faculties of Zarqa University

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ABSTRACT

Introduction: Caffeinated beverages are very popular in these days and they are consumed by most people globally. Central nervous system active substances may be used to relief anxiety and increase concentration on variety of subjects, but the abuse of caffeinated beverages may develop to be a serious problem such as tolerance and many others.

Method: Structured drop-and-pick questionnaire was prepared to investigate the most commonly used energy drinks, caffeinated beverages and dietary supplements among 51 participants of Zarqa University students.

Results: Energy drinks were the most commonly used being RedBull® on the top list and Nescafe among caffeinated beverages. More than 50% of students stated excellent communication skills with their families while using these drinks. Weak positive effect of CNS stimulants on academic performance was observed. Harmful side effects were reported by most of students.

Conclusion: Caffeinated drinks, beverages and dietary supplements have a negligible effect on central nervous system of our students. Caffeine was unable to affect cognitive function in students and would not be able to improve memory and academic achievements.
Pharmacogenetics

Tasneem Sameer, Anwar Metani

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ABSTRACT

Genetic variation is what makes us all unique, whether in terms of hair color, skin color or even the shape of our faces. Therefore, it is important to study of how inherited variation affects drug response and metabolism which is known as Pharmacogenetics. Pharmacogenetics seeks to find the right drug and right dose for patients regarding to their genes. This short review discuss the importance of the new field of pharmacogenetics and ways in which genetic factors influence drug response including warfarin as a model drug.
Prizes

Awards:

- ASU Pharmacy Third Conference Student Scholarship
- Four Best Postgraduate Oral Presentation Awards (one per Competition Session)
- Three Best Postgraduate Poster Awards
- Two Best Undergraduate Poster Awards
- Distinguished Postgraduate Supervisor Awards

Prizes for oral and poster competitions are distributed as following:

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<th>Prize Description</th>
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<tr>
<td>ASU Pharmacy Third Conference Student Scholarship</td>
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<tr>
<td>Best oral presentation (one in each session)</td>
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