Rania Hamed

Faculty of Pharmacy
Al-Zaytoonah University of Jordan
Amman-Jordan
Office Phone: 962-6-4291511, extension (471). Cell Phone: 962-79-7739590.
Email: rania.hamed@zuj.edu.jo and hamedr2@yahoo.com

EDUCATION

2005-2011: Ph.D. Pharmacy (Pharmaceutics)
The University of Iowa-Division of Pharmaceutics and Translational Therapeutics
Overall GPA: 3.71/4.00
Dissertation: Development of a physiologically relevant *in vitro* model system to study exhaled bioaerosols

2004-2005: Graduate student
The University of Louisiana-Division of Pharmaceutics
Overall GPA: 3.89/4.00

2002-2004: M.A. Clinical Chemistry
The University of Scranton-Chemistry Department
Overall GPA: 3.88/4.00
Dissertation: Permeation enhancers of Indomethacin using Franz diffusion cell technique

1988-1993: B.S. Pharmacy
Jordan University of Science & Technology
Overall GPA: 3.44/4.00

PROFFESSIONAL EXPERIENCE

2013-Present **Head of the Pharmacy Division,** Faculty of Pharmacy, Al-Zaytoonah University of Jordan, Amman-Jordan

2011-Present **Assistant Professor,** Faculty of Pharmacy, Al-Zaytoonah University of Jordan, Amman-Jordan

1999-2002 **Director of the Quality Control Department**, Jordan Veterinary and Agricultural Medicinal Industries (JOVET), Amman-Jordan

1996-1999 **Director of the Research and Development**, Jordan Veterinary and Agricultural Medicinal Industries (JOVET), Amman-Jordan

1993-1996 **Senior Scientist**, RAM Pharmaceutical Industries, Amman-Jordan

RESEARCH EXPERIENCE

Aug-Sep 2-16: **Visiting Research Fellow**, School of Pharmacy, The University of Manchester

Research: Bovine serum albumin-loaded nanoemulsion using spontaneous emulsification: A potential drug delivery system for protein therapeutics.

Aug-Sep 2015: **Visiting Research Fellow**, School of Pharmacy, Queen's University Belfast

Research: Development and optimization of oleogels for controlled drug delivery

2011-Present: **Assistant Professor,** Faculty of Pharmacy**,** Al-Zaytoonah University of Jordan

Current research:

- Development of controlled-release solid dosage forms based on hydrophilic and hydrophobic polymeric matrix systems.
- Determining the key parameters of the physiologically-relevant dissolution media that control the rate of dissolution of BCS class II drugs along the GI tract to better predict their *in vivo* performance.
- Nanoemulsion-based gel formulation as a carrier system for topical drug delivery.
- Mechanical characterization of matrix-forming polymers.

2006-2011: **Graduate Research Assistant**, Advisor: Dr. Jennifer Fiegel
Division of Pharmaceutics and Translational Therapeutics, The University of Iowa

Research: Develop a more physiologically relevant *in-vitro* model mimetic of tracheal mucus to study the surface rheology of tracheal mucus and elucidate the mechanism of bioaerosol formation

- Matched the chemical composition, component concentrations, and physicochemical properties (i.e. surface tension and bulk rheology) of the *in-vitro* model mimetic to native tracheal mucus
- Probed the surface rheology of surfactants adsorbed at the air-mucus interface
- Elucidated key parameters that control the size distribution of bioaerosols generated from tracheal mucus tract by utilizing an enhanced simulated cough machine

2003-2004: **Graduate Research Assistant**, Advisor: Dr. John Deak
Chemistry Department, The University of Scranton

Research: Permeation enhancers for indomethacin using Franz diffusion cell technique

- Determined conditions for *in-vitro* permeation test using Franz diffusion cell technique
- Evaluated silicones as new permeation enhancers
- Differentiated indomethacin permeability through skin obtained from different species

2003: **Aventis Scholarship Recipient**
Process Development Department, Aventis Pasteur, Swiftwater, PA

- Determined polysaccharide content using specific assays for phosphorus and sialic acid
- Determined protein content using Lowry's method
- Size exclusion and hydrophobic interaction chromatography techniques to further characterize polysaccharide/protein conjugate vaccine candidates

PUBLICATIONS

1. **R. Hamed,** Ali Al-Samydai, T. Al Baraghthi, Tarawneh O, S. Sunoqrot. Influence of HPMC K100LV and Compritol® HD5 ATO on drug release and rheological behavior of HPMC K4M matrix tablets. *J Pharm Innov. Accepted* Dec. 2016.
2. **R. Hamed,** T. Al Baraghthi, S. Sunoqrot. Correlation between the viscoelastic properties of the gel layer of swollen HPMC matrix tablets and their in vitro drug release. *Pharm Dev Technol*. 2016 Nov: 1-37.
3. **R. Hamed,** T. Al Baraghthi, A. Zaid Alkilani, R. Abu-Huwaij. Correlation between Rheological Properties and *In Vitro* Drug Release from Penetration Enhancers-Loaded Carbopol® Gels. *J Pharm Innov.* 2016 October: 1-13.
4. **R. Hamed**, A. Awadallah, S. Sunoqrot, O. Tarawneh, S. Nazzal, T. AlBaraghthi, J. Al Sayyad, A. Abbas. pH-dependent solubility and dissolution behavior of carvedilol-case example of a weakly basic BCS class II drug. *AAPS PharmSciTech.* 2015 Jul 23.

5. **R. Hamed**, M. Basil, T. AlBaraghthi, S. Sunoqrot, and O. Tarawneh. Nanoemulsion-based gel formulation of diclofenac diethylamine: design, optimization, rheological behavior and in vitro diffusion studies. *Pharm Dev Technol*. 2015 Sep 15:1-10.
6. **R. Hamed**, J. Fiegel. Synthetic Tracheal Mucus with Native Rheological and Surface Tension Properties. *J. Biomed. Mater. Res. A.* 2014 Jun; 102(6):1788-98.
7. T. Brenza, **R. Hamed**, and J. Fiegel. Controlled transport for pulmonary drug delivery. *In*: H. Smyth and A. Hickey (eds.) Controlled Release Science and Technology: Pulmonary Delivery. New York: Springer. 2011. [Book Chapter]

PUBLISHED ABSTRACTS AND PROCEEDINS

1. **R. Hamed.** A novel approach to determine the rheological properties of the gel layer of swollen hydrophilic matrix tablets. 8th International Conference and Exhibition on Pharmaceutics & Novel Drug Delivery Systems, Madrid, Spain, March 2016.
2. **R. Hamed**. Simulating the surface tension of the gastrointestinal fluid to enhance the dissolution of the weakly basic BCS class II drugs. 8th International Conference and Exhibition on Pharmaceutics & Novel Drug Delivery Systems, Madrid, Spain, March 2016.
3. R. AlJanabi & **R. Hamed.** The influence of the chemical properties of the dissolution medium on the rate of quetiapine fumarate release from HPMC and Compritol® HD5 ATO matrix tablets. Applied Science University Second Symposium, Amman, December 2015.
4. R. AlJanabi & **R. Hamed**. The effect of pH and ionic strength of the dissolution media on the rate of Quetiapine Fumarate release from polymeric matrix tablets. *Al-Zytoonah University of Jordan and University of Toledo (ZTIPC 2015)*, Amman, October 2015.
5. **R. Hamed**. Comparative rheological studies of diclofenac diethylamine conventional gel, emulgel, and a nanoemulsion-based gel formulation. *American Association of Pharmaceutical Scientists (AAPS*), San Diego, CA, 2014.
6. **R. Hamed**, Lina Hammad, Aiman Abbas. The effect of polymer type, ratio, and viscosity grade on the in vitro release of quetiapine fumarate, a BCS class II drug, from controlled release matrix tablets. *American Association of Pharmaceutical Scientists (AAPS*), San Diego, CA, 2014.
7. **R. Hamed**, J. Fiegel. Surface rheological properties of surfactants adsorbed at an air-mucus interface. *International Pharmaceutical Federation's PSWC and the American Association of Pharmaceutical Scientists (AAPS) Annual Meeting*, New Orleans, LA, 2010.
8. **R. Hamed**, J. Fiegel. Investigating the interfacial rheological properties of surfactants adsorbed at an air-mucus interface of the upper respiratory tract (URT). *James F. Jakobsen Graduate Conference, University of Iowa*, Iowa City, IA, 2010.
9. **R. Hamed**, J. Fiegel. Development of a more physiologically-relevant mucus mimetic of the upper respiratory tract. *American Institute of Chemical Engineers (AICHE) Annual Meeting,* Nashville, TN, 2009.
10. **R. Hamed**, J. Fiegel. Evaluating the role of mucus physicochemical properties on bioaerosol formation in the lungs. *James F. Jakobsen Graduate Conference, University of Iowa*, Iowa City, IA, 2009.
11. R. Hamed & J. Fiegel. Investigating the properties of lung mucus: Toward understanding the role of mucus physicochemical properties in bioaerosol formation. *The International Society for Aerosols in Medicine,* Monterey, CA, 2009.
12. **R. Hamed**, J. Fiegel. Evaluating the role of mucus physicochemical properties on bioaerosol formation in the lungs. *Pharmaceutics Graduate Student Research Meeting*, Purdue University, IN, 2009.
13. **R. Hamed**, J. Fiegel. Determining key factors that control the formation of pathogenic bioaerosols within the upper respiratory system. *James F. Jakobsen Graduate Conference, University of Iowa*, Iowa City, IA, 2008.
14. **R. Hamed**, J. Fiegel. Bioaerosol formation from lung surfaces: Evaluating the role of mucus physicochemical properties. *American Association of Pharmaceutical Scientists (AAPS*), Atlanta, GA, 2008.
15. **R. Hamed**, J. Fiegel. The role of mucus physicochemical properties in controlling bioaerosol formation within the upper respiratory tract. *Pharmaceutics Graduate Student Research Meeting*, University of Michigan, MI, 2008.

16. **R. Hamed**, J. Fiegel. Physiologically-relevant cough machine to study bioaerosol formation in the lungs. *American Association of Pharmaceutical Scientists (AAPS*), San Diego, CA, 2007.

ORAL PRESENTATIONS

1. **R. Hamed**. Investigation of the rheological properties of the gel layer of swollen HPMC matrix tablets to better predict their *in vitro* release. Al-Zytoonah University of Jordan and University of Toledo (ZTIPC 2015), Amman, October 2015.
2. **R. Hamed.** Comparative rheological studies of diclofenac diethylamine conventional gel, emulgel, and nanoemulsion-based gel. Al-Zytoonah University of Jordan, Amman, 2014.
3. **R. Hamed**, J.Fiegel. Development of a more physiologically-relevant mucus mimetic of the upper respiratory tract. *American Institute of Chemical Engineers (AIChE)*, Nashville, TN, 2009.

HONORS AND AWARDS

- Daniel Turnberg Travel Fellowships, Visiting Research Fellow, School of Pharmacy, the University of Manchester, Aug 1st – Sep 10th 2016 (€3,500).
- Mobility grant funded by EU-JordanNet II European, Visiting Research Fellow, School of Pharmacy, Queen's University Belfast, Aug 9th – Sep 20th 2015 (€2,600).
- Division of Pharmaceutics and Translational Therapeutics Dissertation Fellowship, The University of Iowa-2010.
- Graduate College Summer Fellowship, The University of Iowa-2010.
- Executive Council of Graduate and Professional Student (ECGPS) Research Grant, The University of Iowa-2010.
- Division of Pharmaceutics and Translational Therapeutics Travel Award, The University of Iowa-2010, 2008 & 2007.
- Women in Science and Engineering Travel Award, The University of Iowa-2009.
- Executive Council of Graduate and Professional Student (ECGPS) Scholarly Presentation Award, The University of Iowa-2009.
- Graduate Student Senate Travel Fund Award, The University of Iowa-2008.
- Division of Pharmaceutics John L. Lach Memorial Scholarship, The University of Iowa-2007.
- American Association of Pharmaceutical Scientists (AAPS)-Travel Award 2007.

GRANT WRITING EXPERIENCE

- Deanship of Scientific Research, Al-Zaytoonah University of Jordan
  Nanoemulsion-based gel formulation for topical drug delivery systems, Funded 2013 (97,170 JD).

- Executive Council of Graduate and Professional Student (ECGPS) Research Grant, The University of Iowa
  Investigating the effect of salts on the surface viscoelastic properties of the upper respiratory tract: Towards developing simple aerosols to halt airborne disease transmission, Funded 2010

- Pre-Doctoral Fellowship Program Grant, Parenteral Drug Association (PDA)
  Correlating mucus physicochemical properties to bioaerosol formation in the respiratory tract: Towards the development of new infectious disease control strategies, not funded

PROFESSIONAL MEMBERSHIPS

- Member, Quality Assurance Committee, Al-Zytoonah University of Jordan; 2015-2016.
- Technical consultant, Jordan Food and Drug Administration (JFDA), Amman, Jordan; 2012-2013
- Member, Abstracts and Posters Selection Committee, the 14th Jordan Pharmaceutical Conference, Jordan Pharmaceutical Association, Amman, Jordan; 2012

- American Association of Pharmaceutical Scientists
    - Chair of Student Chapter 2009-2010
    - Vice-chair of Student Chapter 2006-2009
- Women in Science and Engineering
- Jordan Pharmacists Association
- Phi Lambda Upsilon (Honory Chemical Society)
- Who's Who Among Students in American Universities and Colleges

ATTENDED WORKSHOPS

- Proposal Writing for H2020 EU funding opportunities. Support to research, technological development and innovation in Jordan (SRTD) – Phase II. Amman 5-7 Dec, 2016
- National brokerage event, transferring innovative science into business. Support to research, technological development and innovation in Jordan (SRTD) – Phase II. Amman, 23rd Nov, 2016.
- Quality assurance workshop (External reviewers and site visit for the academic program). *Al-Zaytoonah University of Jordan*. Amman, 2-4 Nov, 2013.

COLLABORATIONS

- Dr. Aiman Abbas, Hikma Pharmaceuticals; Amman-Jordan.
- Dr. Sami Nazzal, University of Louisiana/Monroe; Louisiana-USA.
- Dr. Ahlam Zaid Kilani, Zarqa University; Zarqa-Jordan.
- Dr. Rana Abu Hwaij, Al-Ahliyya Amman University; Amman-Jordan.

TEACHING

- Pharmaceutics I: physical pharmacy (3 credit hours)
- Pharmaceutics II: routes of administration and pharmaceutical dosage forms (2 credit hours)
- Pharmacoeconomics
- Advanced pharmaceutical technology/Graduate level (2 credit hours)
- Biostatistics and applications/Graduate level (3 credit hours)
- Physical pharmacy laboratory (1 credit hour)
- Pharmaceutical calculations (1 credit hour)
- Practical industrial pharmacy laboratory II (1 credit hour)
- Pharmaceutics laboratory (1 credit hour)
- Pharmaceutical technology laboratory (1 credit hour)

RESEARCH SUPERVISION – M.S STUDENTS

Research Assistants

Arej Eissa (March 2016-Present)
Research area: Nanoemulsion formulations for poorly soluble drugs.

Tamadur Al-Baragthi (April, 2014-March 2016)
Research Area: 1) Development of controlled-release solid dosage forms based on hydrophilic and hydrophobic polymeric matrix systems, and 2) Nanoemulsion based gel formulation of Diclofenac Diethylamine. 3) Investigating the rheological properties of the gel layer of swollen HPMC matrix tablets to better predict their *in vitro* release.

Enaam Shahadeh (October, 2012-August, 2013)
Research area: Preparation and characterization of nanoemulsion.

Graduate Students (Master's degree)

Ala'a Abu Rezq (October 2015-Present)
Research area: Development and optimization of oleogels and bigels as topical drug delivery systems for periodontitis.

Reem AlJanabi (March 2015-March 2016)
Research area: The effect of pH and ionic strength of the dissolution media on the rate of Quetiapine Fumarate release from polymeric matrix tablets.

Marwa Basel (October 2014-September 2015)
Research area: Development and optimization of diclofenac diethylamine nanoemulsion-based gel formulation.

Ali Al-Samydai (October 2014-May 2015)
Research area: The effect of polymer type, ratio, and viscosity grade on the *in vitro* release of quetiapine fumarate, a BCS class II drug, from a controlled release matrix tablets.

Areej Awadalah (March, 2014-December, 2014)
Research area: Determining the key parameters of the physiologically relevant dissolution media that control the rate of dissolution of BCS class II drugs along the GI tract to better predict the *in vivo* performance.

DISSERTATION/THESIS COMMITTEE MEMBERSHIP

External Member on M.S Defense Committee

Tamara Athamneh (Pharmaceutics; Supervising Professor: Bassam Tashtoush)
Faculty of Pharmacy, Jordan University of Science and Technology
Thesis title: Preparation and evaluation of Levodopa-β-cyclodextrin patches for transdermal delivery, defense: June, 2014.