

Hana Hammad

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SUMMARY

Associate Professor of Physiology with over 15 years of teaching and research experience in the United States and Jordan, including undergraduate and graduate courses, supervision of graduate students, establishing research labs, and conducting research.

Courses (developed and taught):

- Pathophysiology for pharmacy students
- Physiology for Biology and Medical Technology students
- Advanced Physiology for graduate students
- Molecular Physiology for graduate students
- Endocrinology for Medical Technology students
- Physiology for Paramedic students
- General Biology
- Introductory Biology for Premedical students

Current research interests

- Angiogenesis
- Chronic hypoxia
- Stem cells
- Electrophysiology
- Natural products

Consultation

- Cell Therapy Center, The University of Jordan

JOB/POSITION HISTORY

University of Jordan

3/2014-present	Associate Professor, Department of Biological Sciences
9/2014-8/2015	Chair of the Department of the Biological Sciences
2/2014-present	Electrophysiology Consultant/ Cell Therapy Center
9/2007-3/2014	Assistant Professor

North Dakota State University

8/2006-5/2007	Assistant Professor, Department of Pharmaceutical Sciences
1/2006-5/2006	Lecturer, Department of Pharmaceutical Sciences

University of North Dakota

5/2005-12/2005	Postdoctoral fellow, Department of Pharmacology, Physiology and Therapeutics
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North Dakota State University

1999-2005	Graduate Research Assistant, Department of Pharmaceutical Sciences
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Amman University

1997-1998	Instructor, Department of Medical Analysis
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Al-Zaytoonah University

1995-1997 Lecturer, Faculty of Pharmacy

University of Jordan

1992-1995 Graduate Teaching Assistant, Department of the Biological Sciences

EDUCATION

North Dakota State University, Ph.D. Pharmacology, Fargo, North Dakota, USA, 2005
Dissertation "Physiological Studies of Cellular Adaptations Following Chronic Drug Exposure"

University of Jordan, M.Sc. Biology (Physiology), Amman, Jordan, 1995
Thesis "Physiological Effects of Selected Flavonoids on Smooth Muscle and Perfused Heart Isolated from Rat: Structure-Activity Relationship"

University of Jordan, B.Sc. Biology, Amman, Jordan, 1992

HONORS

- Faculty Development Travel Award, North Dakota State University, 2007
- Faculty Development Travel Award, North Dakota State University, 2006
- North Dakota Board of Higher Education Scholarship (Spring 2005)
- Rho Chi Pharmacy Honor Society, North Dakota State University, 2001

TEACHING EXPERIENCE

Associate Professor

University of Jordan
Amman, Jordan

2014-present

Developed and taught course in:

- Physiology for Biology and Medical Technology students
- Advanced Physiology for graduate students
- Molecular Physiology for graduate students

Assistant Professor

University of Jordan
Amman, Jordan

2007-20014

Courses taught included:

- Pathophysiology for Pharmacy students
- Physiology for Biology and Medical Technology students
- Advanced Physiology for graduate students
- Molecular Physiology for graduate students
- Endocrinology for Medical Technology students
- Physiology for Paramedic students
- General Biology

- Introductory Biology for Premedical students

Assistant Professor

2006-2007

North Dakota State University
Fargo, North Dakota, USA

- Developed and taught Pathophysiology for PharmD students
- Coordinator for Special Topics in Pharmaceutical Sciences

Instructor

1997-1998

Amman University
Amman, Jordan

- Taught General Biology 101 and 102 labs for Pharmacy and Medical Technology students

Lecturer

1995-1997

Al-Zaytoonah University
Amman, Jordan

- Taught General Biology 101 and 102 labs for Pharmacy and Medical Technology students
- Developed and taught Anatomy and Physiology labs for Medical Technology students

Teaching Assistant

1992-1995

University of Jordan
Amman, Jordan

- Taught General Biology Labs 101 and 102
- Taught Animal Physiology Lab
- Taught Plant Physiology Lab

GRADUATE STUDENTS

- Sophia Al-Adwan, Ph.D., “Influence of Diabetes Mellitus on the Angiogenicity Potential of Bone Marrow Derived Mesenchymal Stem Cells: An miRNA Perspective,” expected defense date: ~~Fall-Spring 2017~~ **2018**, Major advisor
- Laila Baqlouq, M.Sc., “Dermining the relative gene expression level of hyoxia related genes in different cancer cell lines”, expected defense date: **Spring 2018**, Co-advisor
- Fuad Mansour, Ph.D., “The Effect of Long Term Hypoxia on Cancer Stem Cells and The Impact of Developed Cells Secretions on Angiogenesis Using Human Umbilical Vein Endothelial Cells (HUVEC),” expected defense date: Fall 2017, Major advisor
- Nihad Othman, Ph.D., -~~Projeet~~ **entitled** “Role of Androgens in Differential Profiling of miRNA in Relation to the Biology of Triple Negative Breast Cancer,” ~~expected defense date: Summer,~~ **July 2017**, Co-advisor
- Hashem Al-Mousa, M.Sc., “Investigating the potential genotoxic effect of etoposide on human lymphocytes”, **May 2017**, committee member
- Dana Hattab, Ph.D., “The Effect of Oxytocin on Mesenchymal Stem Cells Isolated from Human Umbilical Cord: Gene Expression Analysis and Cardiomyocytes Differentiation,” July 2016 , Co-advisor
- Aya Alwais, M.Sc. “Study the Relationship Between Trace Elements, Hormones and Interlukin-6 among Jordanian Infertile Women,” February 2016, External examiner
- Aman Ishaqat, M.Sc. “Phytochemical Screening and Evaluation of Antioxidant, Antimicrobial, Antiangiogenic and Antiproliferative (Against Different Breast Cancer Cell Lines) Activities of the Leaves of *Elaeagnus angustifolia* Grown in Jordan,” August 2015, committee member
- Amani Harb, M.Sc., “Effects of Betacaryophyllene and Eugenol as Antioxidant Compounds on Hypercholesterolemic Rats”, 2015, committee member
- Zina Habib, M.Sc., “Antiangiogenic Activities of the Hydro-alcoholic Extract of *Trigonella*

- foenum-graecum*,” December 2014, Major advisor
- Abeer Harb, M.Sc., “Effects of trans-resveratrol, isolated from *Smilax aspera*, on smooth muscle, blood pressure, inflammation in rats and nociception in mice,” 2008, committee member

ADMINISTRATIVE EXPERIENCE

Chair

Department of Biological Sciences, University of Jordan 9/2014-8/2015

Director for the four academic programs offered by the department: B.Sc. in Biology, B.Sc. in Medical Analysis, M.Sc. and Ph.D. in Biology.

- Conduct regular department meetings; establish department committees as needed and oversee the work
- Direct and oversee all matters related to advising and counseling students
- Supervise and evaluate support staff
- Submitting course schedules for various terms
- Prepare the Department's Annual Report

RESEARCH EXPERIENCE

Faculty Member

9/2007-present

University of Jordan

Department of Biological Sciences

- Established a research lab equipped for cell culture studies
- Established an electrophysiology lab equipped to carry patch-clamp studies using both conventional and automated methods

Grant support and active research projects include:

- “Determining the gene expression changes that cause chemoresistance in chronic hypoxic MCF7 Breast Cancer Cell line”, Funded by Scientific Research Support Fund/ Ministry of Higher Education and Scientific Research Amman, Jordan ~ 38,000 JD (Active), PI
- “Antiangiogenic Activities of the hydro-alcoholic extracts of *Achillea* species grown in Jordan” Funded by the University of Jordan Deanship of Academic Research, ~ 30,000 JD (Active), PI
- “The Effect of Oxytocin on Mesenchymal Stem Cells Isolated From Human Umbilical Cord and Amniotic Fluid: Gene Expression Analysis and Cardiomyocytes Differentiation”, Funded by Scientific Research Support Fund/ Ministry of Higher Education and Scientific Research Amman, Jordan ~ 62,000 JD (Active), Co-investigator (PI: Dana Hattab)
- “The effects of topically applied agents on extra- and intraoral wound healing in a rat model”, Funded by the University of Jordan Deanship of Academic Research, ~ 23,000 JD (6/11-12/14), PI
- Polymorphic CYP2A6 and Risk of Tobacco-Dependence. In collaboration with Dr. Malek Alzihlif, Collage of Medicine, University of Jordan, Amman, Jordan (active)
- Antioxidant, antiproliferative and antiplatelet activities of selected Jordanian plants. In collaboration with Dr. Fatma Afifi, Collage of Pharmacy, University of Jordan

Post-doctoral Fellow

5/2005-12/2005

University of North Dakota

School of Medicine and Health Sciences

Department of Pharmacology, Physiology and Therapeutics

Prof. Van Doze, Lab Director

Electrophysiology (patch clamp technique) and molecular biology (single cell RT-PCR technique)

approaches were used to:

- study the catecholaminergic modulation of hippocampal excitability
- determine the mechanism underlying the α_2 adrenergic receptor-mediated anticonvulsant actions of norepinephrine in the hippocampal CA3 region

Pre-doctoral Student

2002-2005

North Dakota State University

College of Pharmacy, Nursing and Allied Sciences Department of Pharmaceutical sciences

Prof. John Wagner, Dissertation Advisor

Patch clamp technique was used to record from the CA1 pyramidal neurons in rat hippocampal slices in an attempt to:

- Characterize the effects of cocaine on the hippocampus and the molecular mechanisms underlying these effects.
- Study the effect of cocaine on synaptic plasticity

Pre-doctoral Student

1999-2002

North Dakota State University

College of Pharmacy, Nursing and Allied Sciences

Department of Pharmaceutical sciences

Prof. Stephen O'Rourke, Lab Director

To study nitrate tolerance in blood vessels focusing on the role of K-channels in nitroglycerin-induced relaxation in tolerant blood vessels. The work consisted of two phases:

- Phase 1 was to study nitroglycerin tolerance *in vitro* in porcine coronary arteries using the organ bath technique.
- Phase 2 was to develop an *in vivo* animal model for nitroglycerin tolerance induction and then studying tolerance in isolated rat aorta.

M.Sc. Student

1992-1995

The University of Jordan

Department of Biological Sciences

Prof. Shtaywy Abdalla, Thesis advisor

- The effects of eleven selected flavonoids on isolated rat smooth muscles (ileum, aorta, and urinary bladder) and perfused heart was evaluated

PUBLICATIONS

- [Al-Othman N, Hammad H, Ahram M. Type of serum as a cell culture supplement influences regulation of microRNA expression in MDA-MB-231 cell line. JMJ \(Accepted\)](#)
- Abdelqader A, Al-Fataftah A, Hammad HM, Abuajamieh M. Effects of Dietary Butyrate Supplementation on Intestinal Integrity of Heat-Stressed Cockerels. *J Anim Physiol Anim Nutr.* 2017 DOI: 10.1111/jpn.12622
- Zina A. Habib-Martin, Hana M. Hammad, Fatma U. Afifi, Malek Zihlif, Hamzeh J. Al-Ameer, Mohanad M. Saleh, Ismail F. Abaza, Zeyad D. Nassar. *In vitro* and *in vivo* evaluation of the antiangiogenic activities of *Trigonella foenum-graecum* extracts. (Submitted)
- Ishaqat AA, Afifi FU, Abu Dahab R, Hammad HM, Al-Zihlif M., Nassar ZD. Phytochemical analysis and evaluation of anti-angiogenic and anti-proliferative activities of the leaves of *Elaeagnus angustifolia* L. grown in Jordan. (Submitted)
- Al Aqtash R, Zihlif MA, Hammad HM, Nassar ZD, Al Meliti J, Taha MO. Search for New Platelet-derived Growth Factor Beta Receptor Inhibitors for Potential Anti-angiogenesis Therapy via Computer Aided Molecular Modeling Followed by Bioassay. (Submitted)

- Al-Jaber HI, Hammad HM , Al-Qudah MA , Abaza IF , Al-Humaidi JY , Khater DF , Saleh AM , Barham M , Abu-Zarga MH, Afifi FU. *Achillea santolina*: Growth Dependent Variation in Essential Oil Composition and Some in-vitro Bioactivity Studies. Eur J Med Pl 2016, 13(1): 1-11, DOI : 10.9734/EJMP/2016/23870
- Alefishat E, Hammad H, Shehadeh M, Ramadan S, Mukattash T. Increasing patient knowledge and awareness of osteoporosis among Jordanian women. EJPCH. 2015; 3(1): 100-107.
- Anani J. and Hammad H., Effects of drugs and psychotropic substances abuse, In: Oweidat A., Training manual for the prevention of abuse of Narcotics and Dangerous Drugs, Arab Society for Public Awareness from Dangerous Drugs and Narcotics, Jordan. 2015, pp. 47-78
- Shehadeh MB, Sosa S, Suaifan G, Darwish RM, Giangaspero A, Vassallo A, Lepore L, Oran SA, **Hammad H**, Tubaro A, De Tommasi N, Della Loggia R. Topical Anti-Inflammatory Potential of Six *Salvia* Species Grown in Jordan. JJPS. 2014; 7: 153-161.
- Hammad HM, Matar SA, Litescu SC, Abuhamdah S, Al- Jaber HI, Afifi FU. Biological Activities of the Hydro-alcoholic and Aqueous Extracts of *Achillea fragrantissima* (Forssk.) Grown in Jordan. Nat Sci. 2014; 6: 23-30.
- Hammad HM, Litescu SC, Matar SA, Al- Jaber HI, Afifi FU. Biological Activities of the Hydro-alcoholic and Aqueous Extracts of *Achillea falcata* L. (Asteraceae) Grown in Jordan. Eur J Med Pl 2014; 4(3):259-270.
- Al-Jaber HI, Hammad HM, Al-Qudah MA, Abaza IF, Al-humaidi J, Abu-Zarga MH, Afifi FU. Volatile Oil Composition and Antiplatelet Activity of Jordanian *Achillea biebersteinii* Collected at Different Growth Stages. J ESSENT OIL BEAR PL. 2014; 17:584-598.
- Hammad HM, Albu C, Matar SA, Litescu SC, Al Jaber HI, Abualraghib AS, Afifi FU. Biological Activities of the Hydro-alcoholic and Aqueous Extracts of *Achillea biebersteinii* Afan. (Asteraceae) Grown in Jordan. Afr. J. Pharm. Pharmacol. 2013; 7(25): 1686-1694.
- Mukattash TL, Tahaine L, AlRawi N, Jarab A, Hammad H, Nuseir K. Behaviors and Attitudes towards Dysmenorrhea; a Cross-sectional Survey of 2,000 Jordanian University Students. Jordan Medical Journal. 2013; 47(1): 26-34.
- Jurgens CW, Hammad HM, Lichter JA, Boese SJ, Nelson BW, Goldenstein BL, Davis KL, Xu K, Hillman KL, Porter JE, Doze VA. α 2A Adrenergic Receptor Activation Inhibits Epileptiform Activity in the Rat Hippocampal CA3 Region. Mol Pharmacol. 2007; 71(6):1572-81.
- Hammad H and Wagner JJ. Dopamine-mediated Disinhibition in the CA1 Region of Rat hippocampus via D3 Receptor Activation. J Pharmacol Exp Ther. 2006; 316(1):113-20.
- O'Rourke ST, Hammad H, Delagrang P, Scalbert E, Vanhoutte PM. Melatonin Inhibits Nitrate Tolerance in Isolated Coronary Arteries. Br J Pharmacol. 2003; 139(7):1326-32.
- Hammad HM and Abdalla SS. Pharmacological Effects of Selected Flavonoids on Rat Isolated Ileum: Structure-Activity Relationship. Gen Pharmacol. 1997; 28:767-71.

CONFERENCE PAPERS

- **Hammad HM**, Matar SA, Al-Jaber HI, Afifi FU. Comparative Screening of Chemical Composition and Biological Activities of *Achillea* species in Jordan. The 15th International Congress of the International Society for Ethnopharmacology 2015, Petra, Jordan
- **Hammad H**, Habib Z, Afifi F, Zihlif M. Antiangiogenic Activities of the *Trigonella foenum-graecum* Seed Extracts. The FASEB Journal 2015; 29(1) Supplement LB536. Experimental Biology 2015, Boston, MA.
- Shehadeh MB, Kolodziej H, **Hammad H**. *In vitro* Effect of Medicinal Plant Extracts on Collagen-Induced Platelet Aggregation of Human Blood. The 13th Jordan Pharmacist Association Conference 2010, Amman Jordan.
- Xu K, Hillman K, **Hammad H**, Jurgens CWD, Goldenstein B, Johnson J, Porter J, Doze V. Adrenergic Receptor Characterization of Rat Hippocampal Neurons Using Real Time, Single Cell RT-PCR. Experimental Biology 2007, Washington, D.C.
- **Hammad HM**, Hillman KL, Porter JE, Doze VA. Adrenergic Receptor Characterization of

- Rat Hippocampal CA3 Pyramidal Neurons Using Real Time Single Cell RT-PCR. Experimental Biology 2006, San Francisco, California.
- Rau KE, Jurgens CWD, **Hammad HM**, Porter JE, Doze VA. Adrenergic Receptor Expression in Rat Hippocampal CA3 Pyramidal Neurons Using Real Time, Single Cell RT-PCR. The Annual Meeting of the Society for Neuroscience 2005, Washington, D.C.
 - **Hammad HM** and Wagner JJ. Cocaine Decreases IPSCs in CA1 Pyramidal Cells via Dopamine Receptor Activation. The Annual Meeting of the Society for Neuroscience 2004, San Diego, California.
 - **Hammad HM** and Wagner JJ. Cocaine Modulation of Inhibitory Circuitry in the Hippocampal Formation. Engebritson Symposium 2004, Fargo, North Dakota.
 - O'Rourke ST and **Hammad H**. Role of K Channels in Nitroglycerin-Induced Vasorelaxation: Functional Implication for Nitrate Tolerance. Experimental Biology 2003, San Diego, California.
 - **Hammad H** and O'Rourke ST. Nitrate Tolerance Unmasks a Role for TEA-Sensitive K Channels in Nitroglycerin-Induced Relaxation of Isolated Rat Aorta. Experimental Biology 2002, New Orleans, Louisiana.
 - O'Rourke ST, **Hammad H**, Yang Q, Scalbert E, Delagrang P, Vanhoutte PM. Melatonin Prevents Nitrate Tolerance in Porcine Coronary Arteries. Experimental Biology 2001, Orlando, Florida.
 - **Hammad H**. and Abdalla S. Effect of Flavones on Ileal Smooth Muscle: Structure- Activity Relationship. Proceedings of the 1st scientific conference of Faculty of Pharmacy/University of Philadelphia 1995, Jerash, Jordan.

SERVICE AS REVIEWER

- Journal of Applied Life Sciences International, ISSN: 2394-1103, ScienceDomain International, Since 1/2015
- Jordan Journal of Biological Sciences, ISSN 1995- 6673, The Hashemite University, since: 12/2014
- Journal of Medicinal Plant Research, ISSN: 1996-0875, Academic Journals, since: 4/2014
- African Journal of Pharmacy and Pharmacology, ISSN: 1996-0816, Academic Journals, since: 4/2014
- British Journal of Pharmaceutical Research, ISSN: 2231-2919, ScienceDomain International, since: 8/2013

ACADAMIC/SERVICE UNIVERSITY COMMITTEES

- Scientific Research Committee, Department of Biological Sciences, Collage of Science, The University of Jordan, Amman, Jordan, 20013- present
- Collage Council, Collage of Science, The University of Jordan, Amman, Jordan, 2014-2015
- Development and Modernization Committee, Collage of Science, University of Jordan, Amman, Jordan, 2008- 2014
- Students Board Election Committee, Collage of Science, The University of Jordan, Amman, Jordan, 2012
- Department Board Secretary, Department of Biological Sciences, Collage of Science, The University of Jordan, Amman, Jordan, 2009- 2013
- National Nanotechnology Committee, Higher Council for Science and Technology, Amman, Jordan, 2008- 2009
- Website committee, Collage of Science, The University of Jordan, Amman, Jordan, 2008- 2009
- Drug Addiction Awareness (speaker), Community Service Office, The University of Jordan, Amman, Jordan, 2008- 2009

- Social Committee, Collage of Science, The University of Jordan, Amman, Jordan, 2007- 2013
- Curriculum Committee, College of Pharmacy, Nursing and Allied Sciences, North Dakota State University, 2006 - 2007
- Assessment Committee, College of Pharmacy, Nursing and Allied Sciences, North Dakota State University, 2006 - 2007
- NDSU-ADVANCE/FORWARD committee, North Dakota State University, 2006 - 2007
- Faculty Women in Science, Math, Engineering and Technology (WISMET), North Dakota State University, 2006 - 2007
- Student WISMET, faculty advisor, North Dakota State University, 2006 - 2007
- Search Committee, Assistant Professor of Pharmacology, Department of Pharmaceutical Sciences, North Dakota State University, 2004

PUBLIC SERVICE

- Arab Society for Public Awareness from Dangerous Drugs and Narcotics, member (4/2015-present)

WORKSHOPS/TRAINING

- Building Capacity for Health and Engineering Education: Open Educational Resources(OER) with Dr. Khalaf Al Tell, Ministry of Manpower-Oman, Technological Education, held at the University of Jordan, 12/4/2017
- Polymerase Chain Reaction, Art & Science, Medical Technology & Laboratory Society, Amman, Jordan, 31/3-1/4/2017
- Advanced electrophysiological techniques with Dr. Benjamin Whalley, Reading School of Pharmacy, University of Reading, UK, 25-29/7/2016
- The Muse microelectrode array (MEA) system online user training with Dr. Elena Dragicevic, Axion BioSystems, 24/5/2016; 6/6/2016
- IonFlux Automated Patch Clamp System user training with Dr. Mark McPate, Molecular Devices, Berkshire, UK, 26-27/1/2016
- Designing Study Plans, The University of Jordan, 26-27/8/2012
- Teaching Design and Its Strategies, The University of Jordan, 28/8-2/9/2012
- Effective University Teaching Skills, The University of Jordan, 3-6/9/2012
- Exams Preparation and Learner's Assessment, The University of Jordan, 9-12/9/2012
- Laws, Bylaws and Regulations of the University of Jordan, The University of Jordan, 13/9, 16/9/2012
- Academic Ethics, The University of Jordan, 17/9/2012
- Advanced molecular and cell culture techniques with Dr. Anumantha Kanthasamy, Department of Biomedical Sciences, Iowa State University, Ames, IA, 2010
- PharmD curricula accreditation training, the American Association of Colleges of Pharmacy (AACP) Institute, Salt Lake City, UT, 2007
- Using 'Low Technology' to Enhance Engagement, Learning and Embodied Knowledge. The Teaching Professor Conference, Nashville, Tennessee, 2006
- Advanced patch-clamp techniques with Dr. Nancy Rusch, Department of Physiology, Medical College of Wisconsin, Milwaukee, WI, 2001

PROFESSIONAL AFFILIATIONS

- American Society for Pharmacology and Experimental Therapeutics (ASPET)
- International Society for Ethnopharmacology (ISE)

LANGUAGES

- Fluent in English and Arabic