

Tania R. Iqbal

Curriculum Vitae

Department of Neuroscience and the Farber Institute
Suite 408, Jefferson Hospital for Neuroscience
900 Walnut Street
Philadelphia, PA 19107

tania.iqbal@jefferson.edu
linkedin.com/in/taniariqbal
www.taniariqbal.weebly.com

EDUCATION

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- PhD**, Neuroscience Program, Michigan State University May 2015
Thesis: Elucidating mechanisms of neurogenic inflammation in the mouse olfactory epithelium
- University Graduate Certification in College Teaching in Science**, December 2013
College of Natural Science, Michigan State University
- Master of Science**, Biological Sciences, Western Michigan University April 2009
Thesis: Peripheral neuronal regeneration and partial deafferentation-induced changes to the olfactory bulb following chemical ablation of adult zebrafish
- Bachelor of Arts**, Major: Biology Minor: Psychology, Kalamazoo College June 2005
Thesis: Angiotensin II stimulation of NADPH oxidase activity and secretion of Cyclophilin-A in adventitial fibroblasts; Potential role in the paracrine mediation of vascular smooth muscle cell hypertrophy

TEACHING EXPERIENCE

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- 2015 **Guest Lecturer**, Neurobiology of Disease, Michigan State University
 - Lecture presented: Neurogenic inflammation
- 2014 **Guest Lecturer**, Neurobiology of Disease, Michigan State University
 - Lecture presented: Neurodevelopmental Disabilities
- Spring 2013 **Mentored Teaching experience**; Neurobiology of Disease, Michigan State University
 - Assessment and curriculum building: designed writing assignments and rubrics to teach good science writing skills and critical thinking to undergraduate science students
 - Curriculum building: wrote class syllabus, invited guest lecturers, organized class schedule
 - Student assessment: assessed student learning through writing assignments, presentations, and class participation
 - Lessons presented: Science Writing
- Spring 2012 **Course Assistant**; Neurobiology of Disease, Michigan State University
 - Student assessment: assessed student learning through writing assignments, presentations, and class participation
 - Managing a diverse classroom: the majority of students in this course spoke English as a second language, and received their earlier education outside of the US. Thus, I had to think about my expectations to cultivate good writing and speaking skills
 - Lessons presented: Olfaction and Neurodegenerative Diseases; Sensorineural Deafness.
- Fall 2010 **Teaching Assistant**; Learning and Memory, Michigan State University
 - Initiated, stimulated, and directed discussions on primary literature

- Lead students to think and write critically
 - Student assessment: assessed student learning through poster presentations, writing assignments, and class participation
 - Lessons presented: Long-term habituation; Neural representation of habits; Hippocampal damage and memory; Hippocampus and spatial memory; Amygdala and emotional memory
- 2007- 2009 **Laboratory Instructor of Record**; Human Physiology, Western Michigan University
- Independently managed 2 sections of 24 students each, per semester, for 6 semesters
 - Student Assessment: wrote and evaluated quizzes, assignments, and exams
 - Guided students through laboratory exercises
 - Lessons presented: Intro/lab math; Passive Membrane Transport; Sensory Systems; Skeletal Muscle Physiology; Human Cardiac Physiology; Blood & Immune System; Respiratory Physiology; Renal Physiology; Digestion & Metabolism
- Winter 2005 **Teaching Assistant**; Physiological Ecology, Kalamazoo College
- Guided students through laboratory exercises
 - Student Assessment: assessed student learning through writing assignments

TRAINING AND DEVELOPMENT IN TEACHING

Fellowship in Scientific Communication, Portal to the Public, Detroit Zoological Society; Fall 2014

- A program funded through National Science Foundation that builds the framework for scientists and science education centers to combine and engage public audiences in face-to-face interactions that connects the public to the work of scientists
- Developed professional skills and activities in workshops with educational center staff
- Interactive presentation of research interests to members of public attending 'Scientists Day' at the Detroit Zoo (12/13/14 and 2/7/15)

Presenter at Inside Teaching Lounge, The Graduate School, Michigan State University

- **TR Iqbal** and CM Ragan, "Creating Critical Thinkers in the Classroom" (December 2014)

Fellow of Preparing Future Faculty in the Assessment of Student Learning, 2013-2014

- A program funded by the Council of Graduate Schools and the Teagle and Sloan Foundations to provide graduate students interested in teaching with proven skills and methods for effective classroom instruction
- Actively applied teachings to designing assessments and classroom instruction that aligned with our course and topic learning objectives
- Participation in the Spring Institute on College Teaching and Learning workshops, listed below

Spring Institute on College Teaching and Learning Workshops, Michigan State University, 2013:

- Why Assessment of Student Learning is so Important
- Moving Forward using Backward Design: alignment of outcomes, instructional activities, and assessments
- Beginning at the End: Writing Effective Learning Outcomes and Objectives
- Student Learning Assessments: Purposes, Methods, and Decisions
- Aligning Assessments with Institutional and Programmatic Learning Goals

Certification in College Teaching Workshops, Michigan State University, May 2012:

- Creating and Assessing Effective Writing Assignments across the Curriculum
- Developing Your Teaching Presence and Philosophy

- Technology in the Classroom
- Improving Teaching and Learning through Assessment

Additional Teaching Workshops and Seminars:

- Creating an inclusive classroom (Erik Skogsberg of MSU Inside Teaching Lounge) (Sept 11, 2014)
- Active Shooter and Violence Response in the Classroom (MSU Police Captain Kelly Roudebush- September 10, 2014)
- Assessment Leaders Colloquium (Dr. Amy Driscoll of Carnegie Foundation for the Advancement of Teaching- Feb. 11, 2014)
- What it Costs to Change Your Mind (Dr. Robert Duke, Cornell- Jan. 24, 2014)
- Neuroscience for All (Dr. Eric Chudler, U-Wisconsin- November 21, 2013)
- Enhanced Learning in Neuroscience Courses: video guides and collaborative writing (Dr. Richard Olivo of Smith College- September 19, 2013)
- Introduction to Constructive Controversy: The Art of Arguing to Enhance Learning with Dr. Karl A. Smith; MSU Lilly Teaching Seminar (April 11, 2013)
- How People Learn: The Cognitive Science Perspective (Drs. Ravizza, Hambrick, Altmann, and Mix of MSU- April 27, 2012)
- Neuroscience Education (Dr. Bill Grisham of UCLA- February 9, 2012)

Coursework

- An Introduction to Evidence-based Undergraduate STEM teaching, a massive open online course from Vanderbilt University and the Center for Integration of Research, Teaching, and Learning. Fall semester 2014, with Statement of Accomplishment with Distinction
- Teaching College Science and Mathematics, Michigan State University, with Dr. Joyce Parker, Spring semester 2013

RESEARCH EXPERIENCE

July 2015-present	<p>Postdoctoral Researcher, Ma lab, Thomas Jefferson University, Philadelphia, PA</p> <ul style="list-style-type: none"> ▪ Studying mechanisms of dendritic branching of murine cerebellar Purkinje cells ▪ Skills in molecular cloning, AAV genome editing, immunolabeling, brain tissue clearing, microscopy, polymerase chain reaction, Neurolucida, western blotting
January 2010-May 2015	<p>Graduate research, Hegg lab, Michigan State University, East Lansing, MI</p> <ul style="list-style-type: none"> ▪ Studied mechanisms of regeneration, neuromodulation, and inflammation in the olfactory system ▪ Skills in confocal imaging, live cell imaging, tissue digestion and DNA extraction, polymerase chain reaction and reverse-transcriptase PCR, gel electrophoresis, immunohistochemistry, immunofluorescence, enzyme-linked immunoassays, olfactory behavioral testing, cell culture, metamorph image analysis, transgenic animal colony management, small animal surgery, statistical analyses, scholarly writing, and presentations
March 2007-June 2009	<p>Graduate research, Byrd-Jacobs lab, Western Michigan University, Kalamazoo, MI</p> <ul style="list-style-type: none"> ▪ Studied adult plasticity and regeneration of the olfactory system ▪ Skills in immunohistochemistry, histology, axonal tract tracing, small animal surgery, ImageJ morphometric analysis, scholarly writing, and presentations
August 2005-June 2006	<p>Research Technician, Pagano lab, Henry Ford Hospital, Detroit, MI</p> <ul style="list-style-type: none"> ▪ Studied the role of adventitial fibroblasts in the initiation of hypertension ▪ Skills in cell culture, pharmacological treatments, western blotting, luminometry based activity assays
June- Sept	<p>Research Assistant, Pagano lab, Henry Ford Hospital, Detroit, MI</p>

- 2004
- Studied the role of adventitial fibroblasts in the initiation of hypertension
 - Skills in western blotting, scholarly writing, and presentations

PUBLICATIONS

Peer- Reviewed Manuscripts:

- Jia C, Hayoz S, Hutch C, **Iqbal T**, Pooley A, and Hegg CC. An IP3R3- and NPY-expressing microvillous cell mediates tissue homeostasis and regeneration in the mouse olfactory epithelium. PLOS ONE, March 2013
- Paskin TR, **Iqbal TR**, Byrd-Jacobs CA. Olfactory bulb recovery following reversible deafferentation with repeated detergent application in the adult zebrafish. Neuroscience, Nov 2011; 196:276-84
- Jia C, Sangsiri S, Belock B, **Iqbal T**, Pestka JJ, and Hegg CC. ATP mediates neuroprotective and neuroproliferative effects in mouse olfactory epithelium following exposure to satratoxin G in vitro and in vivo. Toxicological Sciences, August 2011, 124(1): 169-178
- **Iqbal T** and Byrd-Jacobs CA. Rapid degeneration and regeneration of the zebrafish olfactory epithelium following Triton X-100 application. Chemical Senses, June 2010; 35(5):351-61

Abstracts:

- **Iqbal TR**, Turley A, Hayoz S, Hegg CC. Environmental irritant-initiated substance P and cytokine release in the mouse olfactory epithelium preceding processes of neuronal regeneration. Program No. 259.24. 2012. Neuroscience Meeting Planner. New Orleans, LA: Society for Neuroscience, 2012. Online
- **Iqbal TR**, Hegg CC. Nickel sulfate inhalation causes deficits in sense of smell, possibly through irritation signaling via TRPA1, TRPV1, and NK-1 receptors. Program No. 375.18.2011. Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2011. Online
- **Iqbal TR**, Hegg CC. Signal transduction pathways of IP3R3-containing microvillous cells. Chemical Senses v36(9): A1-A123, Oxford University Press, 2011
- Paskin TR, **Iqbal TR**, Byrd-Jacobs CA. Reversible partial deafferentation of the zebrafish olfactory bulb with repeated detergent application. AChemS abstracts. Chemical Senses, 2010, 35(7):639
- **Iqbal TR** and Byrd-Jacobs CA. Persistent recovery of the adult olfactory epithelium following chemical lesion. Program No. 65.11, Society for Neuroscience, Washington, DC, 2008. Online
- **Iqbal TR** and Byrd-Jacobs CA. Triton X-100 treatment in zebrafish alters olfactory epithelium morphology. ISOT Abstracts. Oxford University Press, Chemical Senses, 2008, 33(8), S94

PRESENTATIONS

Oral Presentations:

Neuroscience Program Seminar Series, Michigan State University, April 17, 2015

The environment and inflammation: elucidating mechanisms of neurogenic inflammation in the mouse olfactory epithelium

Bowdoin Neuroscience Program Seminar, Brunswick, ME January 29, 2015

The environment and Inflammation: mechanisms of neurogenic inflammation in the mouse olfactory epithelium

Grinnell Department of Biology Seminar, Grinnell, IA. January 26, 2015

The environment and Inflammation: mechanisms of neurogenic inflammation in the mouse olfactory epithelium

- MSU Graduate Academic Conference. East Lansing, MI, March 27, 2014
Activation of trigeminal nerve fibers and macrophages in response to irritants of the olfactory epithelium.
- MSU Graduate Academic Conference. East Lansing, MI, February 15, 2013
Inflammation of the nose caused by environmental irritants: implications for neuroregeneration
- Neuroscience Program Seminar Series, Michigan State University, October 25, 2012
Environmental irritant-induced inflammation and neurogenesis in olfactory system
- Biological Sciences Seminar, Western Michigan University, April 2009
Chemical lesioning of the adult zebrafish olfactory epithelium allows for analysis of peripheral neuronal turnover and partial deafferentation-induced changes to the olfactory bulb

Poster Presentations:

- Society for Neuroscience 2014, Washington D.C. November 2014.
Iqbal TR and Hegg CC. Trigeminal nerve activation and initiation of neurogenic inflammation through irritant-sensing channels and secondary chemosensory cells in the mouse olfactory epithelium
- 41st Annual Pharmacology Research Colloquium, East Lansing, MI June 6, 2014
Iqbal TR and Hegg CC. Signal transduction pathways of IP3R3-containing microvillous cells
- Michigan Chapter Society for Neuroscience, Kalamazoo, MI, May 30, 2014
Iqbal TR and Hegg CC. Elucidating mechanisms of neurogenic inflammation in the mouse olfactory epithelium
- Association for Chemoreception Sciences. Fort Meyers, FL, April 2014
Iqbal TR, Hegg CC. Activation of Trigeminal Nerve Fibers and Macrophages in Response to Irritants of the Olfactory Epithelium
- Society for Neuroscience 2012, New Orleans, LA, October 2012
Iqbal TR, Turley A, Hayoz S, Hegg CC. Environmental irritant-initiated substance P and cytokine release in the mouse olfactory epithelium preceding processes of neuronal regeneration
- Society for Neuroscience 2011, Washington D.C., November 2011
Iqbal TR, Hegg CC. Nickel sulfate inhalation causes deficits in sense of smell, possibly through irritation signaling via TRPA1, TRPV1, and NK-1 receptors
- National Directors of Graduate Studies in Pharm. and Physiology Meeting, E Lansing, MI, July 2011
Iqbal TR, Hegg CC. Signal transduction pathways of IP3R3-containing microvillous cells
- Association for Chemoreception Sciences XXXIII, St. Pete Beach, FL, April 2011
Iqbal TR, Hegg CC. Signal transduction pathways of IP3R3-containing microvillous cells
- Association for Chemoreception Sciences XXXI, St. Pete Beach, FL, April 2010
Paskin TR, **Iqbal TR**, Byrd-Jacobs CA. Reversible partial deafferentation of the zebrafish olfactory bulb with repeated detergent application
- Michigan Chapter Society for Neuroscience, Kalamazoo, MI, May 2009
(a) **Iqbal TR** and Byrd-Jacobs CA. Repeated chemical lesioning produces partial deafferentation and allows for recovery of the olfactory bulb
(b) Paskin TR, **Iqbal TR**, and Byrd-Jacobs CA. Retrograde tract tracing as a method to reveal regeneration of epithelial sensory neurons following chemical ablation
- Society for Neuroscience, Washington DC, November 2008
Iqbal TR and Byrd-Jacobs CA. Persistent recovery of the adult olfactory epithelium following chemical lesion.
- International Symposium on Olfaction and Taste XV, San Francisco, CA, July 2008
Iqbal TR and Byrd-Jacobs CA. Triton X-100 treatment in zebrafish alters olfactory epithelium morphology
- Michigan Chapter Society for Neuroscience, Detroit, MI, May, 2008

Iqbal TR and Byrd-Jacobs CA. Time course of changes in olfactory epithelium following Triton X-100 application

Kalamazoo Community Medical Health & Sciences Research Day. Kalamazoo, MI, April 16, 2008

Iqbal TR and Byrd-Jacobs CA. Changes in olfactory epithelium thickness after Triton X-100 treatments: a novel approach to adult zebrafish olfactory bulb deafferentation.

Kalamazoo College Diebold Symposium, Kalamazoo, MI, April 25, 2005

Iqbal TR and Pagano PJ. Angiotensin II stimulation of NADPH oxidase activity and secretion of Cyclophilin-A in adventitial fibroblasts; Potential role in the paracrine mediation of vascular smooth muscle cell hypertrophy

MENTORING EXPERIENCES

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| Summer
2016 | <p>Laura Beebe (Pennsylvania State University) Summer Undergraduate Research Program</p> <ul style="list-style-type: none"> ▪ I provided training in a variety of experimental methods and scientific communication (oral and written). |
| Summer
2014 | <p>Charlene Rivera Bonet (University of Puerto Rico- Cayey); Bridge to Neuroscience Program</p> <ul style="list-style-type: none"> ▪ 1st Place Award in RISE Poster Presentations (awarded Certificate of Scholarship from UPR-Cayey) ▪ Trained by me in a variety of experimental methods, protocol writing, and scientific communication (oral and written). ▪ Presented her research at the (1) Mid-Michigan Symposium for Undergraduate Research Experiences in East Lansing Michigan; (2) Research Symposium in Microbiology at Mayagüez, Puerto Rico October 2014; (3), URGREAT-MBRS-RISE XII Undergraduate Research Symposium, Carolina, Puerto Rico, October 2014; (4) and, Annual Biomedical Research Conference for Minority Students, San Antonio, Texas. November 2014 (Full Travel Award Winner) |
| Summer
2013 | <p>Stephanie Romero Rosa and Dianarys Hernandez-Aquino (both University of Puerto Rico-Areciebo); Bridge to Neuroscience Program</p> <ul style="list-style-type: none"> ▪ Trained in reverse transcriptase polymerase chain reaction, protocol writing, scientific communication (written and oral) |
| Summer
2011 | <p>María Elena Castelló Toro (University of Puerto Rico- Cayey); Summer Research Opportunities Program (SROP).</p> <ul style="list-style-type: none"> ▪ Trained in experimental methods and scientific communication (written and oral). ▪ Presented data in a talk at the MSU Undergraduate Research Symposium and at the Committee on Institutional Cooperation SROP Conference (Columbus, OH, July 15-17). ▪ Earned National Center for Institutional Diversity Exemplary Summer Research Citation, an award given to promote the very best scholarly work by 2011 SROP participants. |
| Summer
2007 | <p>Robin Franklin; Research Experiences for Undergraduates (REU) program</p> <ul style="list-style-type: none"> ▪ Trained in immunohistochemistry ▪ Listed as an acknowledgement on publication (Iqbal and Byrd-Jacobs, 2010) |

HONORS AND AWARDS

- Michigan State University Dissertation Completion Fellowship, Summer 2014
- Michigan State University Dissertation Continuation Fellowship, Summer 2012
- Outstanding Graduate Research Award, MPI Research Corporation, April 2009

- Graduate Research and Creative Scholars Award in Biological Sciences Department, Western Michigan University, April 2009
- Graduate Teaching Effectiveness Award in Biological Sciences Department, Western Michigan University, April 2009
- Western Michigan University Graduate Student Travel Award, September 2008
- AChemS Student Housing Award, International Symposium on Olfaction & Taste, July 2008
- Best W. Michigan University Student Presentation, Kalamazoo Community Medical and Health Sciences Research Day, April 16, 2008
- 2nd Place Poster Presentation, Kalamazoo Community Medical and Health Sciences Research Day, April 16, 2008
- Kalamazoo College Honors Scholarship, 2001-2005

LEADERSHIP AND SERVICE ACTIVITIES

Sigma Xi Research Day, Thomas Jefferson University, April 13, 2016

- Assessed student poster presentations

Neuroscience Fair, Michigan State University, 2014

- Ran a booth with activities highlighting receptive fields and touch in an outreach event geared toward children of the greater Lansing area

Brain Awareness Weeks, 2010-2014

- Prepared and delivered presentations to Okemos High School, Mason High School, Eastern Lansing High School, and Lewton Elementary classrooms to get students excited about science and the brain

MSU Take Your Child to Work Day activities, April 25, 2013

- Participated with the Neuroscience Program's activities, which included looking at real brain specimens, identifying lab equipment, and brain related crafts

University Undergraduate Research and Arts Forum, April 8, 2011

- Judged student oral presentations

GWIS graduate school preparation workshops, 2011

- Developed and presented workshops about graduate school expectations and the application process to MSU undergraduates interested in graduate school in the sciences

2010 Girls Math and Science Conference

- Served as a Event Coordination volunteer

2010 MSU Brain Bee Camp

- Prepared and delivered a presentation on *Brain Facts* material to area high school students in order to prepare them for the local and national Brain Bee competitions

MI SFN Conference Organizing Committee for 40th annual meeting

- Created the abstract booklet for the conference

2009 Michigan Brain Bee

- Wrote questions for use in the competition

2008 Regional Michigan Science Olympiad

- Designed an activity station for the competition

Chemistry Day at the Kalamazoo Valley Museum 2006

- Lead a booth about germs and health

Volunteer for Autism Society of Kalamazoo, 2001-2005

- Along with other students, we watched and played with the children while parents were in the society meeting. Dr. Mills of Kalamazoo College also organized fun-filled days at the College for children with autism and their families, especially their siblings, which I participated in. I also volunteered at the local Walk for Autism.