Tyler McCray

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Education

Doctor of Philosophy in Medical Neuroscience ***August 2018 to Current***

Indiana University School of Medicine, Indianapolis, IN (Dr. Bruce Lamb's Lab)

- ***Current GPA:*** 3.89

Bachelor of Science in Chemistry, A.C.S. Certified ***May 2015***

Purdue University Indianapolis (IUPUI), Indianapolis, IN

- ***Relevant Courses:***
  - Biomolecules and Catabolism
  - Biosynthetic Pathways and Central Metabolism
  - Principles of Chemical Instrumentation
  - Molecular Basis of Neurodegenerative Diseases

Bachelor of Science in Biology ***May 2015***

Purdue University Indianapolis (IUPUI), Indianapolis, IN

- ***Relevant Courses:***
  - Biological Chemistry
  - Genetics and Molecular Biology
  - Immunology
  - Microbiology

Work and Research Experience

Laboratory Technician ***August 2016 to August 2018***

Stark Neurosciences Research Institute, Indianapolis, IN (Dr. Bruce Lamb's Lab)

- Aided in planning and investigation of role of specific genes (TREM2 and CCR2) in tau mouse model resulting in a publication and poster at a national conference
- Maintained several mouse lines; husbandry, genotyping, and records of mouse colonies
- Conducted perfusions and subsequent microdissections of mouse brains
- Performed immunohistochemistry and Western blot on brain tissue
- Imaged and characterized varying brain regions with tau pathologies
- Analyzed images quantitatively and qualitatively based on morphological parameters and staining via ImageJ/Ilastik

Laboratory Research Assistant ***August 2014 to May 2015***

Biology Department, IUPUI, Indianapolis, IN

- Performed immunocytochemistry on treated retinal neuroglial cells
- Researched and developed standardized image analysis protocol for in vitro and in vivo glial cell studies
- Characterized morphological parameters of imaged cells via ImageJ software
- Analyzed data and interpreted results to ascertain if gliosis was induced

Chemistry and Biology Tutor ***October 2012 to May 2013***

Student Support Services, IUPUI, Indianapolis, IN

- Tutored chemistry and biology students one-on-one on a regular basis throughout semester
- Planned and organized weekly study sessions
- Maintained consistent contact with students to ensure adequate performance

Abstracts, Presentations, and Conference Proceedings

McCray TJ, Jadhav VS, Miller CM, Landreth GL, Lamb BT, Bemiller SM. CCR2-mediated peripheral macrophage recruitment is essential for regulating tau pathological outcomes. *MODEL-AD Symposium* 2018

McCray TJ, Jadhav VS, Miller CM, Landreth GL, Lamb BT, Bemiller SM. CCR2-mediated peripheral macrophage recruitment is essential for regulating tau pathological outcomes. *Society for Neuroscience* 2017

Jadhav VS, **McCray TJ**, Xu G, Greve H, Swinford C, Landreth GL, Lamb BT, Bemiller SM. The role of TREM2 in regulating neurogenesis in a mouse model of tauopathy. *Society for Neuroscience* 2017.

Bemiller SM, **McCray TJ**, Formica SV, Allan K, Paul J Cheng-Hathaway, Oblak AL, Wilson G, Xu G, Kokiko-Cochran ON, Ransohoff RM, Landreth GL, Lamb BT. Early exacerbation of tau pathology leads to enhanced neurodegeneration and cognitive deficit in a mouse model of tauopathy. *Society for Neuroscience.* 2017

Puntambekar SS, Bemiller SM, **McCray TJ**, Xu G, Landreth GE, Lamb BT. Fractalkine (CX3CL1) mediated control of TREM2+ macrophages in a mouse model of Alzheimer's disease. *Society for Neuroscience.* 2017

Chopra N, Bemiller SM, Kokiko-Cochran ON, Katsumoto A, **McCray TJ**, Xu G, Lamb BT. TREM2 deficiency results in exacerbated traumatic injury induced tau pathology in a mouse model of tauopathy. *Society for Neuroscience.* 2017

McCray TJ, Dharmarajan S, Belecky-Adams TL. Morphological analysis of BMP7-treated retinal glia *IUPUI Research Day.* 2015

Publications

Bemiller S.M., **McCray TJ**, Allan K., Formica S.V., Xu G., Wilson, G., Kokiko-Cochran O.N., Landreth G.E., Ransohoff, R.M., Crish, S.D., Lamb B.T.; (2017) "TREM2 deficiency exacerbates tau pathology through dysregulated kinase signaling in a mouse model of tauopathy" *Mol. Neurodegener* Oct. 16; 12(1):74. doi: 10.1186/s13024-017-0216-6

Mlodzianoski MJ, Cheng-Hathaway PJ, Bemiller SM, **McCray TJ**, Liu S, Miller DA, Lamb BT, Landreth GE, Huang F.; (2018) "Volumetric Single Molecule Super-Resolution Imaging through Large Depth and Brain Sections." *Nature Methods* 15(8), 583–586. doi:10.1038/s41592-018-0053-8

Awards and Honors

Dean's List, IUPUI (5 Semesters)
Alpha Lambda Delta – National Academic Honor Society (2011-2015)
Phi Eta Sigma – National Academic Honor Society (2011-2015)

Professional Activities

Students Mentored

2019: Alyssa Walker (Summer undergraduate student), IU School of Medicine
- Devised and supervised project along with instruction of lab techniques

2018: Briana Mork (Doctoral student), IU School of Medicine
- Instructed and mentored lab techniques

2017: Nipun Chopra (Postdoctoral student), IU School of Medicine
- Instructed and mentored lab techniques

2017: Vaishnavi Jadhav (Doctoral student), IU School of Medicine
- Instructed and mentored lab techniques

2017: Cecily Swinford (Rotating student), IU School of Medicine
- Supervised rotation project along with instruction of lab techniques

2016: Ruizhi Wang (Rotating student), IU School of Medicine
- Supervised rotation project along with instruction of lab techniques

Teaching Experience

CHEM-C496 Special Topics (Fall '11 and Summer '12): Chemistry Mentor
- Instructed a weekly, two-hour classroom workshop for chemistry students
- Developed lesson plans for each session's content and topics

Technical Experience

Microscopy: Confocal, fluorescence, and light microscopy

Animal work: rodent handling, husbandry, colony management, genotyping, intraperitoneal and subcutaneous injections, perfusions, neuroanatomy, brain microdissections

Molecular/Biochemistry: Maxi- and midi-prep, transfections, protein (soluble and insoluble) and RNA extractions/isolations, Western blot, PCR, ELISA, flow cytometry and analysis, cell culture

Histology: tissue sectioning (eyes, brain, spleen), immunohistochemistry, immunocytochemistry, immunofluorescence (3 color)

Chemistry: Titrations, FTIR, UV-vis, HPLC

Software: GraphPad Prism, Microsoft Excel, ChemBioDraw, FIJI (ImageJ), Ilastik, FlowJo, SnapGene, LI-COR Image Studio, Adobe Photoshop