Jewel Banik

Contact

4601 West Markham Street,
Apt 2011, Little Rock, AR 72205

jbanik@uams.edu

@jewelbanik1

linkedin.com/in/jewel-banik

jbanik.owlstown.net

Education

University of Arkansas for Medical Sciences, Little Rock, AR
PhD candidate in Biomedical Sciences (Aug. 2018-Present)
Thesis: *"The role of Musashi and regulated mRNA translation in pituitary development and function"*
Advisor: Dr. Angus M. MacNicol
Committee: Dr. Gwen V. Childs, Dr. Rosalia C.M. Simmen
Dr. Robert L. Eoff, Dr. Melanie C. MacNicol

North South University, Dhaka, Bangladesh
Bachelor of Science in Pharmacy (Sep. 2012-Dec. 2016)
Project: *"Neuroprotective Effects of Entada scandens in a Mouse Model of Stroke or Cerebral Ischemia"*
Advisor: Dr. Md. Mahbubur Rahman
Graduated *Summa Cum Laude*

Research Experience

MacNicol Lab (Jan. 2019-Present)
University of Arkansas for Medical Sciences, Dept. of Neurobiology and Developmental Sciences

Lab Focus: The regulation of cell differentiation during embryonic and adult development; sequence-specific RNA binding protein (RBP)-mediated mRNA translational control; characterization of the role of regulated mRNA translation in stem cell function and cellular differentiation during cellular plasticity in mammalian anterior pituitary gland.

- Investigating *in vivo* roles of RNA-binding protein Musashi in pituitary cell plasticity and fate determination via a transgenic mouse model.
- Performing single-cell RNA sequencing (scRNA-seq) to develop a comprehensive Musashi-null transcriptomic profile in the pituitary.
- Characterizing mRNAs in the pituitary via unbiased Musashi-target RNA immunoprecipitation and high-throughput sequencing.
- Identifying Musashi co-associated proteins involved in the pituitary mRNA translation using mass spectrometry.
- Incorporating bioinformatics tools to explore human and mouse scRNA-seq datasets to identify novel transcripts in the pituitary.

Research Experience cont'd

Rahman Lab (Jun. 2016-Sep.2017)
North South University, Dept. of Pharmaceutical Sciences

Lab Focus: Neuroinflammation in cerebral ischemia, the impact of food habits on neurodegenerative diseases, and drug delivery via nanoparticle lipid vehicles.

- Studied in vivo effects of *Entada scandens* on cerebral ischemia where *E.scandens* decreased cerebral infarct volume by 44% in mice.
- Designed and executed biochemical and behavioral experiments to study the neuroprotective effects of Pamoic acid on stroke.

Data Analysis Skills

- R Programming for statistical and genomic data analysis: Routinely load `Tidyverse`, `Seurat`, `CellChat`, and `RMarkdown` packages for bulk and Single-cell RNA sequencing data importing, transforming, modeling, reproducing, and reporting.
- 10X Genomics Cloud Analysis: Built a custom mouse reference genome to add an unannotated lncRNA gene using the Cell Ranger pipeline and aligned scRNA-seq reads to the custom reference using 10X Genomics cloud platform.
- Machine Learning using Python: Developed a machine learning model using Logistic Regression to detect heart diseases. Testing accuracy (86.81%) surpassed the training accuracy (86.79%) in our model. (https://github.com/JewelBanik/ML-in-Healthcare)
- Comparative Bacterial Genomics Analysis: Imported complete genomes from the GenBank and compared genomes of hundreds of strains from different bacterial species using `RBiotools`.

Awards and Honors

- Endocrine Society: *Early Career Forum Travel Award, ENDO2022*   Jun. 2022
  Outstanding Abstract Award, ENDO 2022
- Algorizin Industry Exposure Writing Series: *Cohort Champion*   May 2022
- Endocrine Society: *Neuroendocrinology Oral Presenter*   Mar. 2021
- NSU Pharmaceutical Club: *President*   Fiscal Year 2015-16
- North South University: *Merit-Based Scholarship*   2014-16

Publications

- Lim J*, **Banik J***, Urbaniak A*, Tomlinson S, Bronson K, Moriera ARS, Lagrasse A, Hardy LL, Gies A, Byrum SD, Wilczynska A, Odle A, MacNicol MC, Childs GV and MacNicol AM., Analysis of Musashi target mRNAs predicts integrated post-transcriptional control of pituitary cell differentiation and function (Manuscript under review)
- Allensworth-James M*, **Banik J*,** Odle A, Hardy L, Lagasse A, Moreira ARS, Bird J, Thomas CL, Avaritt N, Kharas MG, Lengner CJ, Byrum SD, MacNicol MC, Childs GV, MacNicol AM. Control of the anterior pituitary cell lineage regulator POU1F1 by the stem cell determinant musashi. Endocrinology. 2021 Mar 1;162(3):bqaa245. doi: 10.1210/endocr/bqaa245. PMID: 33373440; PMCID: PMC7814296.
- Sharmin O, Abir AH, Potol A, Alam M, **Banik J,** Rahman AFMT, Tarannum N, Wadud R, Habib ZF, Rahman M. Activation of GPR35 protects against cerebral ischemia by recruiting monocyte-derived macrophages. Sci Rep. 2020 Jun 10;10(1):9400. doi: 10.1038/s41598-020-66417-8. PMID: 32523084; PMCID: PMC7287103.
- ***Contributed as co-first author**

Selected Presentations

Oral

- **Banik* J.,** Lim J., Urbaniak A., et al. Regulation of the Pituitary Cell Lineage Regulator Prop1 by the Stem Cell Determinant Musashi. J Endocr Soc. 2022 (Rapid Fire oral presentation at ENDO 2022)
- Bronson KL., **Banik J.,** MacNicol* AM., et al. Functional Association of the Stem Cell Protein Musashi with LSM14B in Control of mRNA Translation J Endocr Soc. 2022 (Oral Presentation, contributed as co-author 2)
- **Banik* J.,** Lim J., Linda HL., et al. The Musashi1 RNA-Binding Protein Functions as a Leptin-Regulated Enforcer of Pituitary Cell Fate and Hormone Production. J Endocr Soc. 2021;5(Suppl 1):A654. Published 2021 May 3. doi:10.1210/jendso/bvab048.1333 (Oral presentation at ENDO 2021, virtual)

*Presenting author

Poster

- **Banik* J.,** Lim J., Urbaniak A., et al. Regulation of the Pituitary Cell Lineage Regulator Prop1 by the Stem Cell Determinant Musashi. J Endocr Soc. 2022
- Tomlinson* S., **Banik J.,** et al., Comparative Analysis of Musashi-Dependent Control of Mouse and Human Pituitary mRNA Translation. ENDO 2022, J Endocr Soc. 2022
- Allensworth*, M. L., Odle, A. K., Moreira, A., Lim, J., **Banik, J.,** et al. (2020). Musashi Exerts Translational Control Within Anterior Pituitary Cells of the POU1F1 Lineage. Journal of the Endocrine Society, 4(Suppl 1), https://doi.org/10.1210/jendso/bvaa046.1909

*Presenting author

Mentorship

- Haley Lowe
  UAMS graduate student, Fall 2019
  Trained and guided to carry out experiments based on her rotation project.

Volunteer and Community Services

- Science Fair Judge
  Little Rock Central High School Science Fair, Feb. 2022
  Evaluated behavioral sciences projects at the Little Rock Central High School STEM Expo 2022 and served as a panel member on the Behavioral Sciences Committee. Engaged with the young scientists with an amiable attitude while observing and scoring their scientific acumen, analytical skills, and experimental demonstrations.

- Annual Event Volunteer
  Tinkerfest at the Museum of Discovery, Arkansas, Sep. 2019
  Assisted participants in taking apart and building toy vehicles and coordinated toy car races for participants.