ALISA OMELCHENKO

347-570-5722 | User ID: aomelchenko@vt.edu | Github.com/AlisaOmel

EDUCATION

CMU-Pitt Joint Computational Biology: Pittsburgh, Pennsylvania *Sept 2022- Present*
PhD in Computational Biology

NYU Tandon School of Engineering: Brooklyn, New York *Graduated May 2018*
M.S. Biotechnology *GPA:3.94*
B.S. BioMolecular Sciences (Magna Cum Laude) *GPA: 3.61*

SKILLS

Computer Languages: Python, R, Bash, Matlab (beginner)
Laboratory Skills: Electrophoresis, PCR, ELISA, Western blot, flow cytometry, calcium imaging, immunostaining, and molecular cloning
Computer Laboratory Skills: RNA-seq data analysis, ImageJ/FIJI, fMRI analysis and data visualization, BLAST, ICM Pro (protein modeling), Prism, Excel, and visual basic

RESEARCH EXPERIENCE

Virginia Tech School of Neuroscience Ni Lab: Laboratory Manager *July 2019-Present*
Advised by: Lina Ni
- Developed an ImageJ plugin to automate data extraction and processing of experiments.
- Identify the function, molecular components, and properties in the thermosensory pathway of *Drosophila* larvae.
- Create new fly strains for analysis of gene function through molecular cloning and recombination.

Landos Biopharma: Laboratory Technician July *2018- July 2019*
Advised by: *Josep Bassaganya-Riera*
- Identified the mechanism of action for drugs through evaluation of differentially expressed gene (DEG) patterns.
- Collected and analyzed data from necropsies, cell cultures, flow cytometry, ELISA, and western blots.
- Handled, monitored, and performed routine medical treatments on mice, rats, and pigs.

NYU Langone Health: Volunteer Researcher *April 2018-June 2018*
Advised by: Timothy J. Cardozo
- Designed structure and evaluated stability of antibody eliciting epitopes for staph database and future staph vaccines.
- Analyzed sequences and alignments to predict protein structures through homology modeling of proteins not in the PDB.

Nathan Kline Institute: Research Assistant *September 2016- May 2018*
Advised by: Cameron R. Craddock
- Determined functional similarities of the brain between healthy individuals with comparable personality traits.
- Mapped cluster differences of fMRI data on brain templates visualize subgroup differences in brain activation.
- Assessed the quality of 225 skull-stripped brain images and manually edited them.

Child Mind Institute: Volunteer Research Assistant *September 2016-May 2018*
Advised by: Steven Giavasis
- Improved the speed, usability, and statistical implementation of Python scripts used by the institute.
- Enhanced a Python script to utilize a Docker container and parallelize the data processing increasing the speed by 30%. The script is included in the current version of C-PAC software.

NYU Tandon Biochemistry Laboratory: Undergraduate Researcher *September 2016-May 2018*
Advised by: Charles Martucci
- Investigated the anti-microbial effects of new iron chelator compounds created by the lab on yeast cultures to understand viability for anti-tumor and anti-bacterial effects.
- Demonstrated the effects of these compounds as tannin stain removers on porous beads and determined the new compounds effect on human teeth to replace current detrimental therapies.

BODy Lab at NYU Langone Medical Center: Research Assistant *August 2015-September 2017*
Advised by: Po Lai Yau

- Collaborated with a team of 2 researchers to investigate the effects of obesity on the connectivity of the brain.
- Detected significant cluster differences in brain architecture.
- Identified the correlation of BMI and brain integrity using tract based spatial statistics (TBSS) and diffusion tensor imaging (DTI) voxel-based analyses.

ACHIEVEMENTS

Publications:

Omelchenko, A. A., Bai, H., Spina, E. C., Tyrrell, J. J., Wilbourne, J. T., & Ni, L. (2022). Cool and warm ionotropic receptors control multiple thermotaxes in Drosophila larvae. *Frontiers in Molecular Neuroscience*.

Omelchenko, A. A., Bai, H., Hussain, S., Tyrrell, J. J., & Ni, L. (2022). TACI: an ImageJ plugin for 3D calcium imaging analysis. *bioRxiv*, 2021-09.

Omelchenko, A. A., Huda, A., Vaden, T. J., Castaneda, A. N., & Ni, L. (2022). Responses of different Drosophila species to temperature changes. *Journal of Experimental Biology*, *225*(11), jeb243708.

Tyrrell, J. J., Wilbourne, J. T., Omelchenko, A. A., Yoon, J., & Ni, L. (2021). Ionotropic Receptor-dependent cool cells control the transition of temperature preference in Drosophila larvae. *PLoS genetics*, *17*(4), e1009499. https://doi.org/10.1371/journal.pgen.1009499

Wang, X., Li, X. H., Cho, J. W., Russ, B. E., Rajamani, N., Omelchenko, A., Ai, L., Korchmaros, A., Sawiak, S., Benn, A.R., Garcia-Saldivar, P., Wang, Z., Kalin N.H., Schroeder, C.E., Craddock, R.C., Fox, A.S., Evans, A.C., Messinger, A., Milham, M.P, Xu, T. (2021). U-Net Model for Brain Extraction: Trained on Humans for Transfer to Non-human Primates. *NeuroImage*, 118001. https://doi.org/10.1016/j.neuroimage.2021.118001

Poster's and Presentations:

Omelchenko, A. A, Tyrrell, J. J., Wilbourne, J. T., & Ni, L. Ionotropic Receptor-dependent dorsal organ warm cells mediate warm sensing in Drosophila larvae. Poster presented at: SfN, November 2021; Virtual

Tyrrell, J. J., Wilbourne, J. T., Omelchenko, A. A., Yoon, J., & Ni, L. Ionotropic Receptor-dependent cool cells control the transition of temperature preference in flies. Poster presented at: VT Molecular and Cellular Biology Summer Event, August 2021; Blacksburg, Virginia.

Ionotropic Receptor-dependent warm cells in *Drosophila* larvae, Oral Presentation at: VT School of Neuroscience: Summer Research Retreat, August 2020

Relevant Coursework:

- Computation for Data Science I (Virginia Tech)
- Problem Solving in Genetics, Bioinformatics, and Computational Biology (Virginia Tech)
- Computer aided Drug design
- Protein Engineering
- Biocatalysts
- Advanced Biology I & II
- Biosensors and Biochips
- Immunology
- Biotechnology in the Pharmaceutical Industry
- Biotechnology in the Healthcare Industry

Recognition:

Dean's List- Awarded for academic achievement 3 years in a row 2015-2018
Trio Scholar—2013-2018
STEM Women in Engineering Scholarship—2013-2018

Extracurricular Activities:

Baking Blog (@doughntworrybakehappy, doughntworry.com) – September 2018-Present
All Together Now Community Theater Cast Member – September 2021-Present
VT Ballroom Dance Club Member – September 2019-January 2020, September 2021-Present
NYU Ballroom Dance Team – 2013-2015