Nathan Mih

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Work & Research Experience

Lygos, Inc. Berkeley, CA

Software Engineer *July 2018 – January 2020*

Lygos is a chemical company focused on the sustainable production of organic acids through yeast fermentation.

- Developed web applications for scientists, focused on reducing their time spent on design within the Design-Build-Test-Learn cycle. Streamlined existing ad-hoc pipelines and databases, replacing manual entry into spreadsheets and sanitizing data for future machine learning work.
- Worked on multiple aspects of the stack, from designing the front-end for user input, creating database schemas, and deploying onto servers. Main technologies: Django (Python), Node.js, PostgreSQL, Docker.
- Assisted in programming lab automation pipelines, mentoring research assistants and technicians to understand specifications and ensure efficient operation of liquid handling robots.
- Directly involved in protein engineering projects, designing mutation libraries and running protein stability simulations.

UCSD Systems Biology Research Group (SBRG), Dr. Bernhard Palsson San Diego, CA

Graduate Student Researcher *January 2014 – June 2018*

The SBRG is a mainly computational group that researches the mathematical modeling of cell metabolism.

- Developed the Python package *ssbio* (github.com/SBRG/ssbio) for the annotation and use of metabolic models with protein structure information. Distributed with a focus on providing reproducible and interactive Jupyter notebook tutorials.
- Integrated protein-level computational chemistry tools with systems-level metabolic modelling approaches for phenotypic predictions of sequence variants.
- Mentored a team of 6 undergraduate students to develop a platform for the whole-cell visualization of *E. coli*.

UCI Tsai Lab, Dr. Shiou-Chuan Tsai Irvine, CA

Undergraduate Student Researcher *March 2010 – June 2012*

The Tsai Lab is a biochemical lab interested in characterizing polyketide synthases.

- Learned and applied protein expression, purification, and crystallization techniques to aid in the structural determination of various polyketide synthase enzymes.
- Designed primers for PCR site-directed mutagenesis to assist in a study to biochemically characterize protein-protein interactions in PKS subunits.

Matrigen Life Technologies San Diego, CA

Webmaster *June 2011 – September 2012*

- Web design and development (HTML/CSS, E-commerce) at matrigen.com.

UCI Residential Networking Services Irvine, CA

Residential Network Consultant *March 2010 – June 2012*

- Provided friendly helpdesk support (in-person and remotely) for computer networking and cable television issues to 5000+ university staff and students.
- Diagnosed networking equipment in residential halls and apartment complexes. Assisted in installing replacement switches and replacement wiring at communication closets and end-user ports.
- Involved in the hiring, training and management of new student employees.

Education

University of California, San Diego: Ph.D. in Bioinformatics & Systems Biology *2012 – 2018*

University of California, Irvine: B.S. in Biochemistry & Molecular Biology *2008 – 2012*

Skills

Languages	*Computing*	*Databases*
Python Django JavaScript Node.js Java R Bash PowerShell	Version control Git, GitLab, CI/CD Containerization Docker, Kubernetes Distributed computing Apache Spark, Hadoop Slurm, TORQUE job scheduling	PostgreSQL Neo4j XML Redis

Networking	*Bioinformatics*	*Biochemical*
RESTful APIs Apache Nginx OSI model	Structural bioinformatics Homology modeling, visualization Computational chemistry Molecular dynamics, docking NGS pipeline tools Genome assembly, variant mapping Systems biology SBOL, Constraint-based analyses, metabolic modeling	Protein purification PCR Cloning Crystallization screening SDS-PAGE

Volunteer Work & Other

UCSD GrAdvantage Leadership & Teamwork Certificate *September 2016 – June 2017*

- Planned and executed a project to create a dialogue program on the UCSD campus as part of a 5-person team. Secured a $10,000 Equity, Diversity, and Inclusion grant for future dialogue programs.
- Learned basic project management and planning skills.

UCSD Undergraduate Bioinformatics Club: Graduate student advisor *May 2013 – June 2015*

KUCI 88.9FM, KSDT @ UCSD: Radio show host, marketing director *April 2011 – September 2017*

UCISAT: Web design and development *January 2012*

UCI Medical Center: 150-hour summer internship in Neurology wing *June 2007 – September 2007*

Selected Publications

Mih N, Palsson BO. 2019. Expanding the uses of genome-scale models with protein structures. *Mol. Syst. Biol.* 15. https://onlinelibrary.wiley.com/doi/abs/10.15252/msb.20188601.

Yang L, **Mih N**, Anand A, Park JH, Tan J, Yurkovich JT, Monk JM, Lloyd CJ, Sandberg TE, Seo SW, Kim D, Sastry AV, Phaneuf P, Gao Y, Broddrick JT, Chen K, Heckmann D, Szubin R, Hefner Y, Feist AM, Palsson BO. 2019. Cellular responses to reactive oxygen species are predicted from molecular mechanisms. *Proc. Natl. Acad. Sci. U. S. A.*:201905039. https://www.pnas.org/content/early/2019/06/25/1905039116.

Mih N, Brunk E, Chen K, Catoiu E, Sastry A, Kavvas E, Monk JM, Zhang Z, Palsson BO. 2018. ssbio: A Python Framework for Structural Systems Biology. *Bioinformatics*. http://dx.doi.org/10.1093/bioinformatics/bty077.

Mih N*, Brunk E*, Bordbar A, Palsson BO. 2016. A Multi-scale Computational Platform to Mechanistically Assess the Effect of Genetic Variation on Drug Responses in Human Erythrocyte Metabolism. *PLoS Comput. Biol*. 12:e1005039. http://dx.doi.org/10.1371/journal.pcbi.1005039. *Authors contributed equally.

Brunk E*, **Mih N***, Monk J, Zhang Z, O'Brien EJ, Bliven SE, Chen K, Chang RL, Bourne PE, Palsson BO. 2016. Systems biology of the structural proteome. *BMC Syst. Biol*. 10:26. http://dx.doi.org/10.1186/s12918-016-0271-6. *Authors contributed equally.