Akanksha Yadav

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Education

2023 - present **Ph.D. in Bioengineering**
California Institute of Technology, Pasadena
Advisor: Prof. Mikhail Shapiro

2019-2021 **Master of Science in Molecular Biology**
International Max Planck Research School (IMPRS) Molecular Biology,
Max Planck Institute for Biophysical Chemistry (MPI-BPC), Göttingen

2015-2019 **Bachelor of Science in Chemistry**
Minor in Biosciences and Bioengineering
Indian Institute of Technology (IIT) Bombay, Mumbai

Research Experience

Sept 2023 - current **Improving performance of genetically encoded ultrasonic calcium sensor for US imaging**
Advisor: Prof. Mikhail Shapiro, CCE, Caltech
Improving non-linear signal response from sensors expressed in neurons *in vivo*, for measuring whole-brain neuronal activity at high spatiotemporal resolution using ultrasound, in mammals

Sept 2021 - July 2023 **Development of genetically encoded far-red bioluminescent calcium sensor**
Supervisor: Dr. Eric Schreiter, HHMI Janelia Research Campus
Screening rationally-designed domain insertion libraries and characterizing hits *in vitro*, and *in cellulo*, for measuring neuronal activity from tens of neurons in freely-behaving *Drosophila*

May-Aug 2021 **Improvement of photoconvertible imaging probes for super-resolution microscopy**
Guides: Prof. Stefan Hell, Prof. Stefan Jakobs, Dept. of Nanobiophotonics, MPI-BPC
Performing multi-parameter rational mutagenesis screen on green to red photoconvertible fluorescent protein and *in vitro* characterization, aiming to improve overall photon budget

Oct-Apr 2021 **Master's thesis - Developing method for finding trans-eQTLs from transcriptomic data**
Guide: Dr. Johannes Söding, Quantitative and Computational Biology group, MPI-BPC
Developing reverse logistic regression based approach for improving power to identify small effect size trans-eQTLs from transcriptomic datasets, testing on simulated data for benchmarking

May-June 2020 **Rotation III - Investigating Ubiquitin dynamics using NMR-based relaxation dispersion**
Guide: Prof. Christian Griesinger, NMR-based Structural Biology group, MPI-BPC
Analyzing effect of glycerol addition and titration on relaxation dispersion of 15N-labeled ubiquitin, fit two/three-state fast-exchange model to capture μs-scale modes of motion

Mar-Apr 2020 **Rotation II - Analyzing MD simulations of ArfB in solution and in ribosome complex**
Guide: Prof. Helmut Grubmüller, Theoretical and Computational Biophysics group, MPI-BPC
Comparing dynamics of ribosome rescue factor ArfB in explicit solvent v/s in cryo-EM derived complex with ribosome, analysing structural differences aiding peptidyl-tRNA hydrolysis

Jan-Feb 2020 **Rotation I - Prediction of gene expression using cis and newly discovered trans-eQTLs**
Guide: Dr. Johannes Söding, Quantitative and Computational Biology group, MPI-BPC
Modifying open-source pipeline to compare gene expression prediction models using cis-only or cis+novel trans-eQTLs discovered via orthogonal method, comparing predictive performance

2016-2019 **Molecular Dynamics Studies of Small Molecule Ligands with G-Quadruplex DNA**
Guide: Prof. Pradeepkumar P.I., Nucleic Acids Chemical Biology lab, IIT Bombay
Modeling potential G-quadruplex binding ligands and analyzing molecular dynamics simulation trajectories and energetics of ligand-DNA complex using AMBER 16

Summer 2018 **GUI development for a data-based chemical modelling software suite, CANDIY**
Guide: Prof. Gaurav Chopra, Dept. of Chemistry, Purdue University
Integrating 3D molecule renderer from Avogadro into Qt-based GUI of the docking module, along with function tabs to run the program from the GUI, extending accessibility of software

Publications

- Kumari, B.; **Yadav, A.**; Pany, S.P.; Pradeepkumar P.I; Kanvah, S.; Cationic red emitting fluorophore: A light up NIR fluorescent probe for G4-DNA. *J. Photochem. Photobiol., B*,2019, 190, 128-136

Scholastic Achievements

2023	Selected as first year CEMI graduate fellow, Caltech
2021	Selected as Hertha Sponer Collegian, multidisciplinary training program of MBExC, Goetingen
2019-2021	Recipient of stipend by the International Max Planck Research School, Goettingen
2019	Ranked 2nd in the 2015 batch, Department of Chemistry, IIT Bombay
2015-2019	Granted INSPIRE Scholar Award by the Dept. of Science and Technology, Govt. of India
2018	Recipient of summer stipend under Purdue Undergraduate Research Experience program
2016,2017	Awarded the Institute Academic Prize for sophomore, junior years of undergraduate
2011-2015	Scholar of the National Talent Search Examination (NTSE) and received scholarship
2013	Selected for the Indian National Mathematical Olympiad (INMO) from Mumbai zone
2009	Among top 50 scholarship holders in state-level two-tier Mathematics Prodigy Competition

Skill set

Languages	C/C++, R, Python, Bash
Software	PyMol, Chimera, Coot, GROMACS, CCP4i, CcpNmr, Autodock, Gaussian, AMBER, SnapGene

Professional Activities

Presentation -
- Chalk talk and poster on development of bioluminescent calcium sensor at James Madison Highway Corridor Chemistry Get Together among chemists from NCI Fredrich and Janelia
- Presented progress on development of bioluminescent calcium sensor at bioluminescence interest group meeting among 5 labs and collaborators at Janelia
- Invited to present Master's thesis among peers for ThesisThursday event hosted by jGBM (junior society for biochemistry and molecular biology)

Courses -
- Completed basic and advanced statistical methods course from Institute for Mathematical Statistics, Göttingen under Hertha Sponer College specialized training program
- Successfully completed the workshop Statistics for Life Scientists conducted at SIB, Basel 2018
- Qualified for finals of Bioinformatics Contest 2018 organized by Stepik and Rosalind
- Completed courses on Coursera: Introduction to genomic technologies - JHU, Bioinformatics-I UC San Diego, Machine Learning - Stanford
- Cleared level A1.1 of German language course