NATESAN MANI

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SUMMARY

Computational Scientist with expertise in the application of Molecular Dynamics to analyze protein systems. I possess the ability to lead cross-functional projects in collaboration with biotech leaders like Amgen and Genentech and I am passionate about translating scientific insights into real-world therapeutic solution. Eager to work in roles in the biotech/tech domain leveraging my technical expertise and decision making!

EDUCATION

Northeastern University — Boston, MA
Ph.D. Candidate — Expected 2025

University of Houston — Houston, TX
M.S. Chemical Engineering — 2020

Osmania University — Hyderabad, India
B.S. Chemical Engineering — 2019

RESEARCH EXPERIENCE

Northeastern University – *SimBioSys Lab* — Boston, MA
Doctoral Researcher – Protein Dynamics — January 2022 – Current

- Spearheading a project in collaboration with Amgen to design high-affinity antibodies using computational strategies.
- Investigated the dynamics of viral spike proteins such as SARS CoV-2 and HIV whose results contribute to potential therapeutics.
- Implemented custom analysis methods using Python, TCL and Bash to interpret simulation data.
- Utilized visualization tools such as VMD and PyMOL to analyze trajectories and structures.
- Developed expertise in utilizing software packages such as GROMACS, NAMD, or AMBER for molecular dynamics simulations and analysis.
- Presented posters and talks at several posters and talks at both national and regional conferences.
- Mentored undergraduate students in computational methods and molecular dynamics simulations.

WORK EXPERIENCE

Prescient Design, Genentech — **South San Francisco**
Structural and Computational Biology Intern — June 2025-present

- Using Physics based modelling and Machine learning towards application in Large Molecule Drug Discovery.
- Developing an in-silico workflow to predict high concentration properties of complex antibody formats, relevant to several high-profile portfolio projects
- Using coarse grained Molecular Dynamics and design high concentration systems to help predict antibody viscosity and aggregation
- Integrating ML models with physics-based predictions to accelerate therapeutic antibody developability assessment.

Amgen — **Cambridge, MA**
Process Development Intern – Antibody modelling — September 2023 - April 2024

- Modelled the antibody and NK receptor interface, with a focus on glycans in the Fc region of the antibody
- Calculated binding affinities using rigorous energy methods to train machine learning models for binding affinity prediction.
- Programmed analytical tools in Python to analyze simulation data and extract key interface dynamics that were used to gain molecular insight into the observed energy predictions
- Developed and optimized code for GPU-accelerated simulations and data analysis on high-performance computing clusters.
- Collaborated with experimental researchers from the Pivotal Attribute Sciences department and presented extensively at both Amgen and Northeastern.

TEACHING EXPERIENCE

Northeastern University — Boston, MA
Graduate Teaching Assistant — Sept 2021 – Dec 2021

- Advised approximately 40 graduate students on the topics of transport phenomena and fluid dynamics
- Graded exams, quizzes and projects and assisted in teaching the ANSYS software.

PUBLICATIONS

Natesan Mani, Raghavendran Suresh and Srirupa Chakraborty "Investigating the impact of Furin cleavage on SARS CoV-2 Spike structure and allostery with Molecular Dynamics simulations" **under review,** *Protein Science, Wiley.*

Xiaoling Shi, Pardis Sadeghi,…**Natesan Mani** et al. " Novel, accurate pathogen sensors for fast detection of SARS-CoV-2 in the aerosol in seconds for a breathalyzer platform", *Biosensors and Bioelectronics,* **2023, 14**

SELECT CONFERENCE PROCEEDINGS

Natesan Mani, Alla Polozova, Srirupa Chakraborty, "Glycan-mediated regulation of IgG1 Fc-CD16a interactions: Insights from all-atom simulations, Biophysical Journal, Vol 124, Issue 3, p428a.

Natesan Mani, Raghavendran Suresh, Srirupa Chakraborty, "Elucidating the role of Furin cleavage in SARS CoV-2 spike allostery using molecular dynamics simulations.", Biophysical Journal, Vol. 122, Issue 3, p188a.

Natesan Mani, Srirupa Chakraborty "Investigating the impact of Furin cleavage on SARS CoV-2 Spike structure and allostery with Molecular Dynamics simulations" Invited Talk, ACS Northeast Regional Meeting, June 2023

LEADERSHIP AND SERVICE

ChemE Graduate Student Council (GSC) — Boston, MA
Treasurer — January 2024 – Current

- Budgeted for several academic and social events and acted as a liaison between the department and the graduate students
- Organized academic and social events such as Thesis Karaoke, Fall Formal and ChemE Jeopardy.
- Kickstarted the mentoring program and helped in matching incoming PhD students with mentors

Northeastern Biophysical Society — Boston, MA
President — January 2025 (expected)

- Founded the Biophysical Society student chapter at Northeastern University to promote collaboration and engagement of graduate students and faculty performing biophysics-based research.
- Organized multiple research talks given by Doctoral and Postdoctoral students across multiple departments.
- Organized workshops on softwares such as VMD and PyMOL

HONORS AND AWARDS

- Awarded the prestigious BPS Travel Award 2025 to present research findings in the form of a talk and a poster.
- Secured the prestigious LEADERs Fellowship, recognizing my exceptional leadership and project management capabilities
- Awarded the PhD Network Travel Grant to present research findings at Biophysical Society (BPS) Annual Meeting 2023
- Selected for American Chemical Society (ACS) Travel Grant for research presentation at ACS Northeast Regional Meeting 2023
- Granted NSF ACCESS award, providing 10,000 GPU hours of high-performance computing resources across U.S. facilities
- Received the Outstanding Service Award for significant contributions to departmental initiatives and community engagement

SKILLS

Programming Languages: Python, R, TCL, Shell Script, Bash, Linux, LaTeX, WolframScript, MATLAB, SQL
Software: CHARMM, AMBER, GROMACS, Schrodinger, VMD, PyMOL, UCSF ChimeraX, SLURM, Git, VSCode, Rosetta, Tableau, COMSOL, ANSYS, Illustrator. **Engineering Leadership:** Project Management, Grant Writing, Budget Planning, Mentoring, ROI analysis, Timeline Development.