

Narmada Sambaturu

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Research Interests

Computational Biology, Systems Biology, Cancer Genomics, Cancer therapy including immunotherapy, Immunity, Host-pathogen interactions, Epidemiology, Network approaches to systems biology.

I am interested in developing methods to solve biological questions both at a fundamental and a translational level. Some of the questions I am interested in are:

- Understanding the interplay between tumor cells and their microenvironment, including immune response and the mechanisms used by the tumor to evade it. Studying the evolution of heterogeneous tumor cells in this complex environment.
- Stratification of patients and matching them with the most appropriate therapy, including potential combination therapies. This could be for cancer or for any other disease.
- Tackling emerging resistance to therapy, or recurrence of disease.
- Rational vaccine design.
- Rational approaches for finding synergistic drug combinations.
- Studying the mechanism of action of any perturbation, including drugs, pathogens or tumors, and the response of the host to these perturbations.

Education

Doctor of Philosophy, Mathematical Biology Program, 2015 - ongoing
National Mathematics Initiative,
Indian Institute of Science, Bangalore, India.
Supervisors: Prof. Nagasuma Chandra, Prof. N. Srinivasan.

Master of Science, School of Computing, 2012 - 2015
National University of Singapore, Singapore.
Supervisor: Prof. Wing-Kin Sung.

Bachelor of Engineering, Computer Science and Engineering, 2005 - 2009
M.S.Ramaiah Institute of Technology, Bangalore, India.
affiliated to Visvesvaraya Technological University.

Research Experience

• **PhD student,** 2015 - ongoing
Mathematical Biology Program, National Mathematics Initiative,
Indian Institute of Science, Bangalore, India.
Supervisors: Prof. Nagasuma Chandra, Prof. N. Srinivasan.

• **Visitor,** Oct 2016 - Dec 2016
Department of Applied Mathematics,
School of Mathematics,
University of Leeds, Leeds, UK
Research advisors: Prof. Carmen Molina-París, Prof. Grant Lythe.

• **Junior Research Fellow,** Mar 2015 - Jul 2015
Indian Institute of Science, Bangalore, India.
Research advisor: Prof. Nagasuma Chandra.

	<ul style="list-style-type: none"> • Intern, Aug 2006 Bioinformatics Centre, Indian Institute of Science, Bangalore, India. Research advisor: Prof. K. Sekar. 	
Work Experience	Developer, Tata Consultancy Services Technology Excellence Group, Bangalore, India.	2009 - 2011
Teaching Experience	<ul style="list-style-type: none"> • Teaching Assistant for course <i>Current trends in drug discovery</i>. Jan 2018 - Mar 2018 Indian Institute of Science, Bangalore, Karnataka, India. • Learning Enabler, Tata Consultancy Services. Jan 2010 - Feb 2010 Common Initial Learning Program. Bidadi, Karnataka, India. 	
Publications	<ol style="list-style-type: none"> 1. Narmada Sambaturu, Sumanta Mukherjee, Martín López-García, Carmen Molina-París, Gautam I. Menon, and Nagasuma Chandra. <i>Role of genetic heterogeneity in determining the epidemiological severity of H1N1 influenza</i>. PLOS Computational Biology 14(3) (2018): e1006069. 2. Narmada Sambaturu, Madhulika Mishra, and Nagasuma Chandra. <i>EpiTracer - An Algorithm for Identifying Epicenters in Condition-specific Biological Networks</i>. BMC genomics 17.4 (2016): 543. 3. Narmada Sambaturu, Madhulika Mishra, and Nagasuma Chandra. <i>EpiTracer - An Algorithm for Identifying Epicenters in Condition-specific Biological Networks</i>. Proceedings of the 2015 IEEE International Conference on Bioinformatics and Biomedicine (BIBM). IEEE Computer Society, 2015. (Best Student Paper) 4. Narmada Sambaturu <i>Towards Handling Repeats in Genome Assembly</i>. MSc dissertation, 2014. 5. Jayavel Sridhar, Narmada Sambaturu, Radhakrishnan Sabarinathan, Hong-Yu Ou, Zixin Deng, Kanagaraj Sekar, Ziauddin Ahamed Rafi, and Kumar Rajakumar. <i>sRNAsScanner: A Computational Tool for Intergenic Small RNA Detection in Bacterial Genomes</i>. PLOS ONE 5, no. 8 (2010): e11970 6. Annapurna P Patil, Narmada Sambaturu, Krittaya Chunhaviyakul. <i>Convergence Time Evaluation of Algorithms in MANETs</i> International Journal of Computer Science and Information Security, IJCSIS 2009, Vol. 5, No. 1, pp. 144-149, September 2009 	
Workshop and conference presentations	<ul style="list-style-type: none"> • Narmada Sambaturu and Nagasuma Chandra. Poster. <i>OptiNeo - an algorithm to optimise the number of neo-antigenic peptides for cancer immunotherapy</i>. Nature Big Data and Cancer Precision Medicine, Boston, Massachusetts, Oct 1 - 2 2018. • Narmada Sambaturu, Sridhar Hannenhalli, and Nagasuma Chandra. Poster. <i>Cutting through the complexity of genomic data: A general method to identify candidate genes</i>. 	

RECOMB/ISCB Conference on Regulatory and Systems Genomics with DREAM Challenges, New York, NY, Nov 19 - 21 2017.

- **Narmada Sambaturu**, Sumanta Mukherjee, Martín López-García, Carmen Molina-París, Gautam I. Menon, and Nagasuma Chandra.

Talk. *Role of genetic heterogeneity in determining the epidemiological severity of H1N1 influenza.*

Discussion meeting on Mathematical Models of Infection, Immunity and Inflammation, Indian Institute of Science, Bangalore. In association with the EPSRC-DST Indo-UK Initiative in Applied Mathematics and the EU-FP7 supported Indo-European Research Network in Mathematics for Health and Disease. April 2017.

Graduate Coursework

MSc (NUS): Advanced Combinatorial Methods in Bioinformatics, Advanced Algorithms, Knowledge Discovery and Data Mining, Modeling and Analysis Techniques in Systems Biology, Advanced Topics in Data Mining.
PhD (IISc): Current Trends in Drug Discovery, Special Topics in Theoretical Biology.

Awards

- Best Student Paper Award, 2015 IEEE International Conference on Bioinformatics and Biomedicine (BIBM).
- One of 50 students selected from all over India for participation in a summer camp in Biotechnology at M.S.Swaminathan Research Foundation, Chennai, India (April 2013).
- All India Rank 25 in Secondary School Certificate (Std X) (2003).