NAVNEET RAI, PH.D.

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Education History

- **Post-Doctoral Research Associate** at University of California Davis since September 2012.
- **Ph.D. in Synthetic Biology** jointly from Indian Institute of Technology Bombay and National Centre for Biological Sciences, Bangalore, India, 2006-2012. **CPI of course work: 8.8**
- **M.Sc. Biotechnology** from Guru Nanak Dev University, Amritsar, Punjab, India, 2003-2005. **First class with 74.5 %.**

Scholarships

1. Qualified All India M.Sc. Biotechnology research fellowship programme through combined Biotechnology Entrance Test conducted by JNU (2003-2005).
2. Qualified Joint CSIR-UGC National Eligibility Test (Junior Research Fellowship), December 2004.
3. Qualified All India Graduate Aptitude Test in Engineering (GATE), 2005. **Percentile: 97.87**.
4. Qualified All India DBT-JRF programme conducted by Department of Biotechnology, Govt. of India, 2005.

Research Experience

- Ph.D. under the supervision of Prof. K.V. Venkatesh (Indian Institute of Technology, Bombay), and Dr. Mukund Thattai (National Centre for Biological Sciences, Bangalore). The main focus of research work is to design and characterization of synthetic transcriptional feedback loops.
- Underwent one month training at Dr. G. S. Khush Laboratories, Punjab Agricultural University, Ludhiana, India under the supervision of Prof. S. S. Gosal. Worked on project entitled *"Particle Gun Mediated Genetic Transformation of Rice (Bt-gene)"*.
- Carried out six month project entitled *"Effect of abiotic stress on the expression of phosphatidylglycerol phosphate in wheat"* under supervision of Dr. Prabhjeet Singh at Guru Nanak Dev University, Amritsar, India.

Laboratory Techniques

1. **Microbiology Techniques**
   All commonly used microbiological lab procedures. Handling of various microbial strains including *E. coli*, *B. subtilis*, *V. harveyi*, *C. glutacicum*, and *S. cerevisiae*. Chemostat and batch cultures.
2. **Molecular Biology techniques**
   Genomic DNA isolation from bacteria and plant, Plasmid isolation, Agarose gel electrophoresis, PCR, Molecular cloning, RNA isolation from plant tissue, Southern blot, Northern blot, qPCR.
3. **Biochemical Techniques**
   HPLC, Paper chromatography, Thin layer chomatography, HP-TLC, SDS-PAGE, Native-PAGE, Bradford and Lawry methods for protein quantification.
4. **Plant tissue culture techniques**
   Clonal propagation, Callus development and differentiation, Transformation of callus using particle gun.
5. **Imaging and Flow Cytometry Techniques**
   Zeiss Axiovert 200M, Olympus live cell imaging station (IX81 ZDC), Olympus

total internal reflection fluorescence microscope (IX71), CyAn ADP-Beckman Coulter flow cytometer.

6. **Imaging Processing Techniques**
   Matlab image processing toolbox, Fiji, ImageJ.

7. **Hands-on Training**
   Gas chromatography, Western Blot, H^1-NMR, Mass spectroscopy, Fluorimetry, Animal cell culture, Dot blot, ELISA, Column chromatography, Infrared spectroscopy, Fractional distillation.

Computer Skills

Internet and web based bioinformatics tools like Clustal W and BLAST, Primer designing softwares, Vector designing softwares, Microsoft Office products, Origin, Sigma plot, Photoshop, CorelDraw, ChemDraw, SwishMax, Flash MX professional. Basic HTML. Windows based webhosting (inter and intranet).

Publications

1. Rajat Anand, **Navneet Rai**, Mukund Thattai. Promoter reliability in modular transcriptional networks. Methods in Enzymology. 2011; 497:31-49.
2. **Navneet Rai**, Rajat Anand, Krishna Ramkumar, Varun Sreenivasan, Sugat Dabholkar, K. V. Venkatesh, Mukund Thattai. Prediction by promoter logic in bacterial quorum sensing. PLoS Comput Biol. 2012 January; 8(1): e1002361.
3. Rajat Anand, **Navneet Rai**, Mukund Thattai. Interactions among quorum sensing inhibitors. Accepted (PLoS One 2013).
4. Design and characterization of synthetic transcriptional multiple feedback systems (Manuscript under preparation).

Conferences/Workshop

1. Advisor of several iGEM teams including NCBS Bangalore-2007, Arts Science Bangalore-2009, and IIT Bombay-2009. Work experience with other teams including IIT Madras-2008, IIT Madras-2009, and Art Science Bangalore-2011.
2. Oral and Poster presentation at IET-BioSysBio-2008 conference, held at Imperial College, London.
3. Oral and Poster presentation (part of Indo-Swedish collaborative meet of systems biologists) at International Conference on Systems Biology, Gothenburg, Sweden, 2008.
4. Poster presentation at Theoretical and Mathematical Biology Symposium, Pune, India, 2009.
5. Attended WHO-Good laboratory practice workshop, NCBS, India, 2010.
6. Oral presentation at Biodesign India 1.0. Trivandrum, India, 2010.

Travel Grants

1. Travel grant from Chalmers University Sweden to attend the International Conference on Systems Biology, in Gothenburg, Sweden (August 2008).
2. Travel grant from IET-BioSysBio London to attend the IET-BioSysBio conference at Imperial College, London (April 2008).
3. Travel grant from IIT Bombay to attend the IET-BioSysBio conference at Imperial College, London (April 2008).

Other Activities

1. Teaching assistant for basic molecular biology course, IIT Bombay, 2006-2007.
2. Maintenance Secretory of Hostel-1, IIT Bombay, 2006-2007.
3. General Secretory of Department of Biosciences and Bioengineering, IIT Bombay, 2007.
4. Designed and hosted several websites.