

Project title: Integrating Genome scale metabolic analysis of model plant pathogen *Ralstonia solanacearum* with RNAseq and fluxomics

Collaboration between

Dr. Siddhartha Sankar Satapathy

Associate Professor

Dept. of Computer Science and Engineering, Tezpur University, Napaam, Assam
and

Dr. Shyam Masakapalli

Associate Professor

School of Basic Sciences, Indian Institute of Technology Mandi, Himachal Pradesh

Start and end date: 18th October, 2016 and 17th April, 2020

Nature of collaboration

The collaboration is on a DBT, Govt. of India funded research project entitled “Integrating Genome scale metabolic analysis of model plant pathogen *Ralstonia solanacearum* with RNAseq and fluxomics” between Dr. S.S. Satapathy and Dr. Shyam. The collaborative project was about understanding pathogenicity of one of the leading bacteria *R. solanacearum* responsible of wilting disease across many plant. In this project we used both bioinformatics approach and biotechnology experiments to analyze central carbon metabolic network of the bacteria.

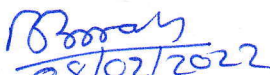
List of year wise activities and exchanges

Year 2016-2017: Dr. S. S. Satapathy visited IIT Mandi for seven days along with the Co-PI Prof. S. K. Ray, Dept of MBBT from 12th July to 18th July, 2017.

Year 2017-2018: Ms. Poonam (JRF, IIT Mandi) visited Tezpur University during 7th to 23rd, December 2017 and Ms. Annushree Kurmi (JRF, Tezpur University) worked in Dr. Shyam’s lab in IIT Mandi during 10th April to 10th June 2018.

Year 2019-2020: The following article was published in journal mSystems published by American society of microbiology with impact factor 6.496.

Jyoti P, Shree M, Joshi C, Prakash T, Ray SK, Satapathy SS, Masakapalli SK (2020) The Entner-Doudoroff and nonoxidative pentose phosphate pathways bypass glycolysis and the oxidative pentose phosphate pathway in *Ralstonia solanacearum*. mSystems 5:e00091-20.


08/02/2022
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Winter School on Molecular Evolution in Bacteria Under Global Initiative of Academic Networks (GIAN)



Overview

Evolution is an integral part of biology. So there is a major thrust in molecular evolution in the genomic era. However, this subject has mainly considered by scientist as too mathematical, which therefore discourage biologists to venture into it. This also affects students of biology to avoid this course. Learning molecular evolution is a fun. It needs a proper way to be taught to young investigators. Keeping this in minds and to share with scientists of India the recent developments in molecular evolution, this winter school is being proposed.

The participants of the school will be introduced to the different topics such as theories of molecular evolution, nucleotide composition in genome, strand asymmetry in chromosome, codon usage bias, selection using dN/dS and co-translational protein folding. In this school there will be both theory classes and computer laboratory demonstrations on compositional analysis, measuring codon usage bias, compute dN/dS.

Evolution study in bacteria gives insight into our basic understanding of evolutionary mechanisms. Its genome is simple. Genome G+C composition in bacteria varies from 15 to 75 %. What determines genome composition is an interesting question to understand molecular evolution in bacteria. The genome in bacteria is well organized with respect to gene distribution between the strands as well as along the ori to terminus. Bacteria also have been a model for experimental evolution in some laboratories. Recent studies on bacterial evolution will be discussed in the winter school.

Course participants will learn these topics through lectures and hands-on practical sessions. Also case studies and assignments will be shared to stimulate research motivation of participants.

Modules	Molecular evolution in bacteria : December 05–December 15, 2016 Number of participants for the course will be limited to THIRTY.
You Should Attend If...	<ul style="list-style-type: none">You are college/university faculty member or scientist from research institutions and interested in genetics, molecular biology and evolution.You are a Post doc or PhD student pursuing research in molecular evolution, comparative genomics, computational biology or similar field.
Fees	The participation fees for taking the course is as follows: Participants from abroad : US \$100 Faculty Members/Scientists/Post docs: Rs. 3000.00 (Three thousand only) PhD students: Rs. 1500.00 (Fifteen hundred only) The above fee includes registration fees, lunch/dinner, all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hour free internet facility. Accommodation on payment basis will be provided in Tezpur University guest house for Rs 500.00 per day. PhD Student participants may avail accommodation in University hostel by paying Rs 50.00 per day.

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The Faculty



Professor Edward Feil is a member of faculty at The Milner Centre for Evolution, Department of Biology and Biochemistry, University of Bath, UK. His research interests focus on short-term evolutionary processes in bacteria, the strength of purifying selection, rates of recombination, and mutation profiles. He also has a strong focus in using whole genome sequencing for understanding the emergence and transmission of bacterial pathogens of humans and animals.



Dr. Suvendra Kumar Ray is an Associate professor in the department of Molecular Biology and Biochemistry, Tezpur University, Tezpur. His areas of research are molecular plant microbe interactions and molecular evolution.



Dr. Siddhartha Sankar Satapathy is an Associate Professor in the department of Computer Science and Engineering, Tezpur University, Tezpur. His research interests include computational biology and bioinformatics.

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Course Co-ordinator

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<http://www.tezu.ernet.in/dmbbt/>

REGISTRATION CUM ACCOMODATION REQUEST FORM
(To be sent over e-mail/speed post to the course coordinators by 15th November 2016)

**WINTER SCHOOL
ON
MOLECULAR EVOLUTION IN BACTERIA
Under Global Initiative of Academic Networks (GIAN)
December 5-15, 2016**

Department of Molecular Biology and Biotechnology and Computer Science and
Engineering
Tezpur University, Tezpur-784028, Assam, India

Name (Block Letters): M/F:

Designation/ Professional Title:

Organization:

Address:

Tel.: Mobile:

E- mail:

Accommodation Required (Yes/ No): (If YES, please select the option below)

In University Guest House

In University Hostel

The Registration fee of Rupees has been
paid via Demand Draft No....., date.....infavour of **The
Registrar, Tezpur University** through SBI online/offline banking bearing Transaction
No. to SBI Tezpur Main Branch (RTGS/IFSC code: SBIN0000195) Ac.
No. 10501585452 of Tezpur University. Demand Draft/ Fee Receipt have been
enclosed herewith.

Date:

Signature

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