Open Source Drug Discovery (OSDD) @ ANDC





⁶ANDC's participation in OSDD has been significant in several ways. Participation in OSDD enables the college to work on a real life translational science project aimed at discovering new drugs for tuberculosis. The Mycobacterium tuberculosis (Mtb) genes cloned and expressed by ANDC students is now a part of the OSDD's open access strain repository, accessible to other scientists. The Mur pathway is an important target of Mtb and OSDD scientists regularly interact with Dr. Urmi Bajpai, Principal Investigator, to review the progress. The commitment of the faculty and the support of the institutional leadership to this programme has been remarkable which contributed to its success. 99

Message from Mr. Zakir Thomas, ex-Director (2008-14), OSDD, CSIR, New Delhi



Open Source Drug Discovery (OSDD) is a CSIR (Council of Science and Industrial Research) Team India Consortium with Global Partnership and a vision to provide affordable health-care to the developing world. This initiative has been taken to provide a platform where researchers, students and organizations from across the world can collaborate & collectively endeavor towards the conquest of tuberculosis.

OSDD, in its drive to include undergraduate students in drug discovery program, in the initial phase itself ANDC was selected amongst the eight undergraduate colleges (in 2010) from across the country. The students of B.Sc. (H) Biomedical Science have contributed towards building of a repository containing recombinant proteins and genes cloned in suitable vectors from *Mycobacterium tuberculosis* H37Rv, which are identified as potential drug targets and candidate vaccines.

Principal Investigator of the Projects: Dr. Urmi Bajpai

Project I "Cloning and Expression of a select number (20) of genes of Mycobacterium tuberculosis H37Rv". Duration: 2010-2012; Grant: Rs 16.85 Lakhs.

Thirty three students of B.Sc. (Hons) Biomedical Science participated in this project and built a repository of recombinant proteins (15) and clones of genes (19) of *Mycobacterium tuberculosis* H37Rv.

Methodology



Project II "Mur pathway enzymes: Potential candidates for multi-targeted therapy"

Duration: 2013-2015, Grant: Rs. 30.38 Lakhs.

In this project, a micro titer based in vitro assay has been developed for high throughput screening (HTS) of chemical libraries for finding new anti-mycobacterial drugs. This approach could facilitate discovery of drugs that have multiple targets in the pathogen and hence prove to be more effective in the treatment of resistant M.tb. The work is carried out by a PhD scholar.

of purified proteins

OSDD laboratory in the college has the following equipment:

- **Refrigerated Incubator Shaker**
- Electroporator
- **Deep Freezer**
- Multi-channel micropipettes
- Laminar Flow

- Western blotting
- Gel Documentaion System
- Waterbath
- Thermocycler
- **Refrigerated Centrifuge**
- Sonicator
- Cold cabinet
- Heating block
- PAGE Assembly
 - Ice Machine

Students have presented their OSDD research work at various platforms. Two of them reported their research work at the Annual Review Meetings of OSDD held at CSIR Science Centre, New Delhi in 2012 and 2013.

A student received young budding scientist award for the II Best oral presentation of her project work in a National Conference on Redefining Science Teaching: Future of Education, UDSC in 2013.

The students also worked on Gene Ontology Annotation of *M. tuberculosis* H37Rv & of Zebra Fish under the guidance of the scientists from IGIB, Delhi. The project had a micro-attribution system and four students were awarded one laptop each for their contribution. Two students were selected to participate (and lead the students' group) in a workshop on Supercomputing conducted by CDAC, Pune in December 2010.

Publications on annotation work:

Crowd Sourcing a New Paradigm for Interactome Driven Drug Target Identification in Mycobacterium tuberculosis

Rohit Vashisht^{1,3}, Anupam Kumar Mondal², Akanksha Jain¹, Anup Shah^{2,7}, Priti Vishnol², Priyanka Priyadarshini¹, Kausik Bhattacharyya³, <u>Harsha Rohita</u>, Ashvini G. Bhat³, Anurag Passi, Keya Mukherjee⁷, Kumari Sonal Choudhary⁵, Vikas Kumar³, <u>Anshula Arora</u>⁶, Prabhakaran Munusamy⁶, Ahaiya Subramaina⁷, Aparna Vankatchalam⁷, Gayath ⁵, <u>Sweety Raf</u>³, Vijaya Chitra⁸, Kaveri Verma¹⁸, Salman Zaheer¹⁷, Balaganesh ¹², Malarvizhi Gurusamy¹³, Mohammed Razeeth¹³, Ilamathi Raja¹⁷, Madhumoban Thandapan¹⁷, Vikal Mevada¹⁷, Rairaj Sondi Sangutan¹⁸, Salmat Ti, Girish Muthagadhali Ramanna¹⁸, Swetha Raghavan¹⁵, Souni Senguta²⁶, Pankaj Kumar Singh¹⁷, Naresh Arrazy²⁷, Swati Gandhi¹², Tiruvayipati Suma Avasthi^{22,35}, Solmi Senguta²⁶, Pankaj Kumar Singh¹⁷, Naresh Arrazy²⁷, Swati Gandhi¹², Tiruvayipati Suma Avasthi^{22,35}, Solmi Kengutapete Negar, ZM, Bok, Isa, Jarosh Z, Suro J Pratibha Sham²⁷, Yatha Vasathi^{22,35}, Somir K. Brahmachat^{1,24,4}, Anshu Bhardwaj¹.

n scientific and Industrial Research (CSIR), Delhi, India, **2** Institute of Genomic ¹ Science, Bangalore, Karnataka, India, **4Acharya Narendra Dev College, Uni** v. Peelamedu. Colmbatore, Tamil Nadu. India, **7** SASTRA University, Tiruevala s and Integrative Biology, CSIR, Delhi, India, 3 Dep versity of Delhi, India, 5 Goethe University, Frankl

Database tool

The Zebrafish GenomeWiki: a crowdsourcing approach to connect the long tail for zebrafish gene annotation

Meghna Singh^{12,4}, Deeksha Bhartiya^{12,4}, Jayant Maini¹, Meenakshi Sharma¹, Angom Ramcharan Singh^{15,4}, Subbartyal^{12,4}, Jayant Maini¹, Rajiv Rana¹⁴, Anikt Sabhartyal^{12,4}, Srinti Bango, Karobartyal^{12,4}, Srinti Bango, Karobartyal^{14,4}, Srinti Bango, Karobartyal^{14,4}, Srinti Bango, Karobartyal^{14,4}, Starbartyal^{14,4}, Salaki Sala^{14,4}, Salaki Sala^{14,4}, Sinti Sala^{14,4},

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