ERIC MACWAN

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RESEARCH EXPERIENCE

National Centre of Biological Sciences (NCBS), Bangalore, India

Supervisor: **Dr. Sabarinathan Radhakrishnan**

Position: Graduate Trainee August 2018 – July 2019

- Lab theme: Computational and Functional Genomics of Cancer
- Project: **Unraveling the zygosity selection and allelic expression imbalance of cancer driver mutations**
- Project summary: The products of Dominant-negative mutation (DNM) affect wild-type allele's function. DNMs in tumour suppressor genes have been reported in multiple cancers and they can drive tumour progression. My work involved fishing and understanding the nature of Dominant Negative Mutations in tumour suppressor genes across tumour types using TCGA and PCAWG datasets. We found potential candidates for Dominant Negative Mutations. The study was carried forward to understand their position and function on their respective protein structures.
- Supervisor contact: sabari@ncbs.res.in

Indian Institute of Science Education and Research (IISER), Pune, India

Supervisor: **Dr. Sudha Rajamani**

Position: Master's Thesis Student May 2017 – November 2017

- Lab theme: Chemical Origin of Life
- Project: **Binding of Nucleobases to Prebiotic Amphiphilic Assemblies; Implications for the origin of life**
- Project summary: The primitive cell-like structure, the proto-cell, is supposed to be an RNA-like genetic polymer encapsulated in amphiphilic ordered aggregates. The project involved checking the possibility of membrane (fatty acid vesicles) playing a role as a selection pressure in the selection of canonical nucleobases during the primitive time. The objective of the study was to standardize a protocol for understanding interactions between fatty acid vesicles and nucleobases. The protocol was then used to investigate the ability of different nucleobases to interact and bind with fatty acid vesicles.
- Supervisor contact: srajamani@iiserpune.ac.in

Indian Institute of Science Education and Research (IISER), Pune, India

Supervisor: **Dr. Neelesh Dahanukar**

Position: Research Intern May 2016 – July 2016

- Lab theme: Molecular Phylogenetics and Conservation Biology
- Project: **Molecular Phylogeny and phylogeography of freshwater fishes of sub-family *Danioninae* from India**
- Project summary: Project involved barcoding of *Danioninae* fish family, DNA extraction, PCR of barcoding gene (Cytochrome C oxidase), Purification of the PCR product, sequence editing,

genetic data mining, sequence alignment, phylogenetic hypothesis testing, and phylogeographical mapping**.** Analysis of more than 700 fish samples collected from all over India gives an insight into the distribution of the *Danioninae* fish family and new phylogenetically distant species.
- Supervisor contact: neelesh.dahanukar@snu.edu.in

Institute of Mathematical Sciences (IMSC), Chennai, India

Supervisor: **Dr. Rahul Siddharthan**

Position: Research Intern May 2015 – July 2015

- Lab theme: Computational Biology
- Project: **Computational prediction and characterization of regulatory sites and cis-regulatory modules**
- Project summary: Project involved understanding the working and mathematical background of different alignment software (BLAST, Cluster-Buster). Python programming language was used for scripting.
- Supervisor contact: rsidd@imsc.res.in

EDUCATION

Dr. Vikram Sarabhai Institute of Cell and Molecular Biology,
The Maharaja Sayajirao University of Baroda **Vadodara, India**

- **Bachelor of Science in Cell & Molecular Biology** 2013 – 2016
- **Master of Science in Cell & Molecular Biology** 2016 – 2018

ACHIEVEMENTS & SCHOLARSHIPS

- Selected in Summer Research Programme at IMSC Chennai, India (2015)
- Fully funded Graduate Trainee Position at NCBS, Bangalore, India (2018-1019)

RESEARCH STRENGTHS

SOFT SKILLS

- Interacted with many researchers from diverse fields while working in different research Institutions. Delivered presentations of research work during lab meetings in front of colleagues and, in front of the alma mater's professors and students.

LABORATORY SKILLS

- **Dissections** Dissection of muscle tissue and gill tissue of fish under the operculum
- **Molecular Biology Techniques** DNA isolation (animal cells), PCR, Gel Electrophoresis
- **UV Spectroscopy** Quantification of canonical and non-canonical nucleotides
- **Microscopy** Differential Interference Contrast (DIC) Microscopy

BIOINFORMATICS SKILLS

- **Operating System** — Linux/Unix, Microsoft Windows, MacOS
- **Genomics** — Big data/Genomics data management, Cancer genomics data analysis (TCGA, PCAWG), NGS Data Analysis, Variant calling workflow
- **Molecular Phylogenetic Analysis** — Multiple Sequence alignment using MEGA7 (Molecular Evolutionary Genetics Analysis software)
- **Programming Languages** — Python, R, Bash
- **Statistics** — Good understanding of biostatistical methodologies and tools

CONFERENCE PRESENTATIONS

- **Unraveling the zygosity selection and allelic expression imbalance of cancer driver mutations,** NCBS Annual Talks - The Language of Biology (2019), inStem Annual Review of Research (2019)
- **Binding of prebiotic nucleobases to prebiotic amphiphile assemblies and their implications for the origins of life,** BioConclave (2017), IISER Pune

PORTFOLIO & INTERESTS

- **Portfolio**: http://macwaneric.github.io
- **Interests**: Programming, Classical Guitar, Western Classical Music (Vivaldi, Tchaikovsky, Sarasate, Beethoven, Mozart)
- **Languages**: English, Gujarati, Hindi

EXTRACURRICULAR ACTIVITIES

- Class Representative during B.Sc. (2013-2015)
- Participated in NCBS Science Outreach program for **school students** (2018-2019)
- Volunteered in **educating children** living in slums with the Change Vadodara Campaign (NGO) (2016-2018)

REFERENCES

- **Dr. Sabarinathan Radhakrishnan**
  Reader-F at National Centre for Biological Sciences (NCBS), Bengaluru, Karnataka, India
  sabari@ncbs.res.in