Sudharshan Ravi

Post Doctoral Research Associate · Computational Biology

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Summary

- **My Profile:** Research associate in Computational biology at UZH, Zürich | Ph.D. in Chemical and bioengineering (Focus on Systems biology) | Swiss resident | Indian citizen | 8+ years in Bioinformatic research | 6+ years in Metabolic network analysis | 3+ years as lead researcher.
- **My work:** Integrative high dimensional multi-omics data analysis in understanding the biology of aging and age-related diseases | Novel workflow for the analysis and integration of omics data in genome scale metabolic models | Inferential analysis on the impact of socio-economic and other exogenous gradients on transcriptomic patterns and health outlook.

Experience

Post Doctoral Research Associate *Zürich, Switzerland*

Social Genomics, Jacobs Center for Productive Youth Development, UZH Zürich *Mar. 2021 – Present*

- Integrative analysis on the longitudinal study of adolescents in understanding the impact of socio-economic inequalities on transcriptional patterns and their consequences on metabolism, aging and disease predisposition.

Graduate Research Assistant / Doctoral Candidate *Zürich, Switzerland*

Chemical and Biological System Engineering Laboratory, ETH Zürich *Jan. 2016 – Sep. 2020*

- Bioinformatic analysis of human aging: Extensive analysis of large omics datasets in understanding the biology of human aging, particularly in its close relationship to metabolism.
- ΔFBA: Developed a novel pipeline for the analysis and integration of transcriptional data in the context of global genome-scale metabolic models using Machine Learning, Global Optimization and Parallel Computing strategies.
- Integrative analysis of ATAC-Seq and MARS-Seq data of human umbilical cord derived CD34+ cells to decipher the interplay between the chromatin configuration and gene expression changes.
- Multi-omics and metabolic network analysis of tumor microenvironment during IDO1 inhibition of human ovarian cancers.

Research Assistant *Boston, USA*

Sengupta's Lab for Nanomedicine, Harvard – MIT Health Sciences and Technology *Jan. 2012 – Aug. 2012*

- Elucidated the role of CD44v6 and EGFR scaffold kinase interaction in predisposing a subpopulation of chemotherapy tolerant breast cancer cells and serving as a putative bivalent target for refractoriness.

Education

Ph.D. in Chemical and Bioengineering *Zürich, Switzerland*

ETH Zürich *Jan. 2016 – Sep. 2020*

- Thesis: Metabolic network analysis and its application in understanding the biology of aging – Prof. Dr. Rudiyanto Gunawan
- Research Specialization: Bioinformatics | Systems Biology | Metabolism Network Analysis | Numerical Methods | Multi-omics analysis

M.Sc. in Chemical and Bioengineering *Zürich, Switzerland*

ETH Zürich *Sep. 2013 – Sep. 2015*

- Thesis: Reducing Complexity — Efficient Modeling for Biorefinery Concepts – Prof. Dr. Konrad Hungerbühler
- Research Specialization: Surrogate Modeling | Sustainable Engineering | Machine Learning | Bioprocessing Technologies | Process engineering

B.Tech. in Industrial Biotechnology *Thanjavur, India*

SASTRA University *Sep. 2008 – Oct. 2012*

- Thesis: An Induced CD44v6 – EGFR scaffold kinase interaction predisposes a subpopulation of chemotherapy tolerant breast cancer cells and serves as a bivalent target of resistance – Prof. Dr. Aaron Goldman
- Research Specialization: Molecular Biology | Genetics | Cancer Biology | Chemotherapy | Nanomedicine

Selected Publications

[1] **Sudharshan Ravi**, Michael J. Shanahan, Brandt Levitt, *et al.* Socioeconomic inequalities in early adulthood disrupt the immune transcriptomic landscape via upstream regulators. **Scientific Reports**, 2024

[2] **Sudharshan Ravi** and Rudiyanto Gunawan. ΔFBA – Predicting metabolic flux alterations using genome-scale metabolic models and differential transcriptomics data. **PLOS Computational Biology**, 2020

[3] Emelyne Teo, **Sudharshan Ravi**, Diego Barardo, *et al.* Metabolic stress is a primary pathogenic event in transgenic Caenorhabditis elegans expressing pan-neuronal human amyloid beta. **eLife**, 2019

See the complete list at Google Scholar.

Proficiencies

Programming Languages

Advanced	R	Bioconductor	MATLAB	LaTeX
Intermediate	Bash	Python	High-Performance Computing	Aspen Plus
Basic	Javascript	Perl	SPSS

Laboratory

Cell culture | Immunohistochemistry | Western Blotting | Flow cytometry | Fluorescent microscopy

Languages

English (Fluent) | German (Intermediate) | Tamil (Native) | Hindi (Beginner)

Academic Merits & Activities

Scholarships

2015	Birkigt Scholarship Award, ETH Zürich
2012	Undergraduate Research Scholarship, SASTRA University & Harvard – MIT HST

Mentoring

2016 – 2018	Tutored Bioprocess Modeling, Process Simulation and Flowsheeting and Statistical and Numerical Methods courses at ETH Zürich
2016 – 2019	Supervised 2 MS students in research projects and semester theses at ETH Zürich & University at Buffalo