

# 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 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

ETH ZÜRICH

Zürich, Switzerland

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

SASTRA UNIVERSITY

Thanjavur, India

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.  $\Delta$ FBA – 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**  | Bioconductor | MATLAB |  $\text{\LaTeX}$   
**Intermediate** Bash | Python | High-Performance Computing | Aspen Plus  
**Basic** Javascript | Perl | SPSS

### LABORATORY

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

### LANGUAGES

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