Arvind **Iyer**

DOCTORATE IN QUANTITATIVE BIOLOGY

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"Hard-work has its own rewards."

Summary

- **Postdoctoral Researcher** at **University Health Network (UHN)**, Toronto, Canada under the mentorship of **Senior Scientist Dr. Mathieu Lupien**.
- **Computational biologist and data scientist** with a strong background in **machine learning, cancer genomics, and computational biology**.
- Holds a ***PhD in Quantitative Biology*** from the **University of Lausanne, Switzerland** received under the mentorship of **Prof. Giovanni Ciriello**, specializing in **computational oncology** and **data analysis**.
- Proficient in **Python, R,** and cloud-based bioinformatics workflows, with hands-on experience in developing **predictive models, analyzing multi-omics data, and optimizing high-throughput pipelines**.
- Passionate about applying AI and computational tools to **translational research in cancer genomics, biomarker discovery, and precision medicine,**with a strong focus on collaborative and impactful science,.
- **Experienced** in cross-functional collaboration between computational and experimental teams.

Education

University of Lausanne

Lausanne, Switzerland

DOCTORATE IN QUANTITATIVE BIOLOGY — *July. 2019 - June. 2024*

- Worked on thesis titled as ***"Tale of Cancer Evolution: Insights from Co-mutation Analysis."***
- Developed a **method** to find ***co-mutation patterns*** among **somatic cancer-causing alterations**.

Indraprastha Institute of Information Technology

New-Delhi, India

MASTER OF TECHNOLOGY IN COMPUTATIONAL BIOLOGY — *July. 2016 - June. 2018*

- Had a **7.9/10 CGPA** performance.
- Worked on master thesis titled as ***"Revealing the Dynamic Architecture of Lipidated Proteins"***
- Worked on understanding the *sequence and structural properties* of **lipidated proteins**, a class of post-translational modification.

Birla Vishvakarma Mahavidyalaya

Gujarat, India

BACHELOR OF ENGINEERING IN INFORMATION TECHNOLOGY — *July. 2012 - June. 2016*

- Had a **8.51/10 CGPA** performance.
- Developed an ***interactive system*** to assist lawyers and law enforcement agencies as part of final year project.

Research Experience

University Health Network

Toronto, Canada

POSTDOCTORAL RESEARCHER — *2024 - Present*

- Working as a **Postdoctoral Researcher** in the domain of **Computational Cancer Epigenomics**, **Single-cell Multiomics** in the lab of **Prof. Mathieu Lupien** at the Princess Margaret Cancer Centre, University Health Network, Toronto.
- Developing computational approaches to analyze **single-cell RNA-seq**, **single-cell ATAC-seq**, and **multiome datasets** to study tumor heterogeneity, cell-state plasticity, and regulatory programs in cancer.
- Working on large-scale cancer multiome datasets, with a focus on **triple-negative breast cancer**, epigenetic heterogeneity, tumor microenvironment analysis, and reproducible computational pipelines.

Center for Computational Biology, IIITD

Delhi, India

PROJECT ASSISTANT — *2018 - 2019*

- Worked in the domain of **Computational Genomics (scRNA-seq)** & **Machine Learning** in the lab of **Prof Debarka Sengupta**
- I worked on a **Machine learning problem** to identify ***circulating tumor cells using sc-RNA seq datasets***.
- For this project worked with Fluidgm corporation as Industry collabration.

CSIR-Institute of Genomics and Integrative Biology, IGIB *Delhi, India*

Research Intern *2017 - 2018*

- Worked in the domain of **Computational Structural biology** with focus on learning ***Molecular dynamic Simulations*** under the guidance of Prof Lipi Thukral
- Worked on understanding the effect of **cancer-related single nucleotide polymorphism** on *proteins* using molecular dynamics simulations and structural properties

Skills

DevOps	Docker
Back-end	fastAPI, REST API etc
Front-end	Hugo, Quatro, HTML5, CSS5, etc.
Programming	Python, C, C++, Java, C#, Javascript, SQL, NoSQL, R, Cytoscape, Openbabel, PHP, Nextflow etc.
Languages	English, Tamil, Hindi, Gujarati.

Publications

Published

Lambuta, Ruxandra A., Luca Nanni, Yuanlong Liu, Juan Diaz-Miyar, **Arvind Iyer**, Daniele Tavernari, Natalya Katanayeva, Giovanni Ciriello, and Elisa Oricchio. ***"Whole-genome doubling drives oncogenic loss of chromatin segregation."*** **Nature (2023)** Paper link

Mina, Marco, **Arvind Iyer**, and Giovanni Ciriello. ***"Epistasis and evolutionary dependencies in human cancers."*** **Current Opinion in Genetics & Development (2022)** Paper link

Mina, Marco, **Arvind Iyer**, Daniele Tavernari, Franck Raynaud, and Giovanni Ciriello. ***"Discovering functional evolutionary dependencies in human cancers."*** **Nature Genetics, (2020)** Paper link

Arvind Iyer*, Krishan Gupta*, Shreya Sharma, Kishore Hari, Yi Fang Lee, Neevan Ramalingam, Yoon Sim Yap, Jay West Ali Asgar Bhagat, Balaram Vishnu Subramani, Burhanuddin Sabuwala, Tuan Zea Tan, Jean Paul Thiery, Mohit Kumar Jolly, Naveen Ramalingam, and Debarka Sengupta.***"Integrative analysis and machine learning based characterization of single circulating tumor cells."** **Journal of Clinical Medicine (2020)** Paper link

Divyanshu Srivastava*, **Arvind Iyer***, Vibhor Kumar, Debarka Sengupta; ***"CellAtlasSearch: a scalable search engine for single cells"*** **Nucleic Acids Research, (2018)** Paper link

Neelansh Garg*, Apuroop Sethupathy*, Rudraksh Tuwani*, Rakhi NK*, Shubham Dokania*, **Arvind Iyer***, Ayushi Gupta*, Shubhra Agrawal*, Navjot Singh*, Shubham Shukla*, Kriti Kathuria*, Rahul Badhwar, Rakesh Kanji, Anupam Jain, Avneet Kaur, Rashmi Nagpal, Ganesh Bagler; ***"FlavorDB: a database of flavor molecules"***, **Nucleic Acids Research (2018)** Paper link

*** Denotes first authorship**

In Submission

Arvind Iyer*, Miljan Petrovic, Debora Sesia, Luca Nanni, Maro Mina, and Giovanni Ciriello, ***"Evolving patterns of co-mutations from tumor initiation to metastatic progression"*** **(Accepted Nature Genetics 2026)**

Honors & Awards

2023	**Best Poster Award**, Basel Computational Biology Conference (BC2)	*Basel, Switzerland*
2018	**Best Poster Award**, EMBO-INDIA Symposia	*New Delhi, India*
2017	**Best Teaching Assistant**, Algorithms in Computational Biology Course at IIITD	*New Delhi, India*
2016	**Qualified GATE**, Graduate Engineering Examination in Computer Science	*India*

Conference & Talks

Conference

2024: I presented a **poster** at **EMBO Workshop** on The Many Faces of Cancer Evolution held in Rimini, Italy

2023: I presented a **poster** and gave a **flash talk** at the **Basel Computational Biology Conference (BC2)** on Big Data in Biology held in Basel, Switzerland

2022: I presented a **poster** at the **ISREC-SCCL** on Horizons of Cancer Biology and Precision Oncology held in Lausanne, Switzerland.

2022: I presented a **poster** at **EMBO Workshop** on The Many Faces of Cancer Evolution held in Rimini, Italy

2018: I presented a **poster** at the **EMBO-INDIA Symposia** on Big Data in Biomedicine, which was held in New Delhi

Invited Talks

2023: I gave a **flash talk** at **Basel Computational Biology Conference (BC2)** on Big Data in Biology held in Basel, Switzerland.

2020: I recorded a **video tutorial** for performing scRNA seq analysis as part of **KeepScienceGoing** Initiative during the *COVID times* for others to learn doing *analysis of scRNA seq data from scratch*.

2018: I gave a **hands on session** on using Principal Componet Analysis (PCA) for performing dimensionality reduction of data in R.

Teaching & Mentorship Experience

Teaching

2019-2024	**Network Biology**, Bachelor's Course	*UNIL, Switzerland*
2017-2018	**Algorithms in Computational Biology**, Advanced Course	*IIITD, India*
2017-2018	**Design and Analysis of Algorithms**, Bachelor's Course	*IIITD, India*
2016-2017	**Data Structures and Alogirthms**, Bachleor's Course	*IIITD, India*
2016-2017	**System Programming**, Bachleor's Course	*IIITD, India*

Mentorship & Supervison

2020-2021	**Master Thesis**, "Compute **gene signatures** from the scRNA seq dataset"	*EPFL, Switzerland*
2019-2020	**Internship Mentor**, "Effect of **anti-cancer treatment** on lymphoma cells"	*EPFL, Switzerland*
2017-2018	**Capstone Project**, "Web service for **data analysis** of scRNA seq dataset"	*IITD, India*

References

1	**Prof Giovanni Ciriello**, Computational Systems Oncology Lab, University of Lausanne	*Switzerland*
2	**Dr. Marco Mina**, Director of Data Science and Computational Biology, HAYA Therapeutics	*Switzerland*
3	**Prof. Debarka Sengupta**, Indraprastha Institute of Information Technology	*India*
4	**Dr. Lipi Thukral**, Computational Structural Biology, CSIR-IGIB	*India*
5	**Prof. Elisa Oricchio**, ISREC, EPFL	*Switzerland*