# Sanjiv Kumar

Ph.D. Biotechnology

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*Molecular Biology, Biotechnology, Protein Biochemistry, Bacteriology, Bioinformatics*

## Research Interests

Highly efficient molecular biologist, with focus on Protein Biochemistry and Infection Biology • Adept at *in-silico* characterization of proteins (phylogenetic analysis, homology modeling, drug discovery, molecular docking and simulations etc.) • Knowledge and experience of Genomics, metagenomics and RNA-Seq data analyses tools and software • Efficient at the techniques in the context of drug discovery against infectious pathogens

## Technical Skills

Molecular biology techniques, Microbiology techniques, Protein biochemistry, Protein crystallography, Drug discovery, Bioinformatics (Pharmaceutical Bioinformatics, Genomic and Metagenomics data analysis), R[Intermediate], Python[Intermediate], bash. Adept user of UNIX.

## Research Experience

**Division of Glycoscience, School of Biotechnology, KTH Royal Institute of Technology** *Stockholm, Sweden*
Researcher, Oomycetes Biology *August 2017 - Present*

As a researcher with the Vaibhav Srivastava's Lab, I am responsible for the development and implementation of research strategy towards novel anti-infectives against Oomycete pathogens. Including following roles:

- Expression, purification and biochemical characterization of proteins involved in cell-wall biogenesis from Oomycete pathogens, Horizon 2020 project
- Cell wall linkage analysis of various Oomycete pathogens, Horizon 2020 project
- Identification and characterization of protein targets and inhibitors important for disease control strategies against *Saprolegnia parasitica* and their *in-vitro* assessment.

**Justin Radolf Lab at University of Connecticut Health Center** *Connecticut, USA*
Post-Doctoral Fellow, Infectious Biology *April 2015 - August 2017*

As a Post-Doctoral Fellow at UConn Health, I was involved with the characterization of rare Outer Membrane Proteins (OMPs) in *Treponema pallidum*. Including following roles:

- Consensus computational framework to identify rare OMPs in *T. pallidum*
- Biophysical and experimental characterization of BAM – complex in *T. pallidum*
- Identification and analysis of sequence variations in *T. pallidum* from clinical samples

**Vineet Sharma Lab at Indian Institute of Science Education and Research, Bhopal (IISER-B)** *Bhopal, India*
Post-Doctoral Fellow, Metagenomics and Systems Biology *December 2013 - February 2015*

As a Post-Doctoral Fellow at MetaBioSys lab, I was responsible for the Metagenomic analysis of human gut and polluted river microbiomes. Some of the roles included:

- Reconstruction of bacterial and viral genomes from multiple human gut metagenomes
- Development of prediction tool for peptidoglycan hydrolases from bacterial genomes
- De novo assembly of genomes from human gut metagenomic data

**S. Ramachandran Lab, Institute of Genomics and Integrative Biology** *New Delhi, India*
Junior Research Fellow, Genomics and Integrative Biology *December 2007 - February 2015*

As a Junior Research Fellow, I was responsible for the identification of novel adhesins from *Mycobacterium tuberculosis*, including • Identification of novel potential adhesins of *M. tuberculosis* H37RV and their experimental validation • Characterization of a novel N-acetylmuramoyl-L-alanine amidase Rv3717 from *M. tuberculosis* H37Rv

## Patent Filed

- Vaibhav Srivastava, **Sanjiv Kumar**, and Vincent Bulone (2020). "Treatment of saprolegniasis." International Patent Application No.PCT/SE2020/050468, Filing date: May 7, 2020. [Link]

## Awards

KTH Innovation Challenge Tech for the Global Goals award of 50000 SEK, jointly shared with Vaibhav Srivastava, awarded by KTH Royal Institute of Technology, Stockholm, Sweden (May 2018) • Senior Research Fellowship from CSIR, New Delhi, India (March 2009 – February 2012) • Junior Research Fellowship from CSIR, New Delhi, India, (March 2007 – February 2009) • Defense Scholarship during graduation (B. V. Sc. & A. H.) (1998-2003)

## Education

**Institute of Genomics and Integrative Biology (CSIR-IGIB)** *Delhi, India*
Ph.D. in Biotechnology *2014*

**Lala Lajpat Rai University of Veterinary and Animal Sciences** *Haryana, India*
Masters in Veterinary Sciences (M.V.Sc.), Veterinary Microbiology *2007*

**Veterinary College, KVAFS University** *Bangalore, Karnataka, India*
Bachelor of Veterinary Sciences & Animal Husbandry (B.V.Sc. & A.H.) *2004*

## Training

**Pharmaceutical Bioinformatics**, Grade: **VG**, Uppsala University, *Uppsala, Sweden*, *Aug. 31 - Nov. 01, 2020* [Credential] • **Applied Pharmaceutical Structural Bioinformatics**, Grade: **VG**, Uppsala University, *Uppsala, Sweden*, *Aug. 31 - Oct.r 15, 2020* [Credential] • **RNA-Seq Data Analysis**, Workshop by National Bioinformatics Infrastructure Sweden (**NBIS**) and **SciLifeLab**, *Uppsala, Sweden*, *May 13 - 15, 2019* [Credential].

## Independent Coursework

**Intro to Machine Learning**, Kaggle, *Mar. 2021* [Credential] • **Python**, Kaggle, *Mar. 2021* [Credential] • **Automate the Boring Stuff with Python Programming**, Udemy, *Jun. 2019* [Credential] • **Python Programming Bootcamp**, Udemy, *Jun. 2019* [Credential] • **Python for Absolute Beginners**, Udemy, *Jun. 2019* [Credential] • **Introduction to Python**, DataCamp, *April 2019* [Credential] • **Introduction to R Course**, DataCamp, *Nov. 2017* [Credential].

## Publications (Since 2018)

For a complete list of publications please see *My Google Scholar Profile*.

First Author Peer-Reviewed Publications – **6** • Total Peer-Reviewed Publications – **19** • Popular Science Articles – **1**.

1. Srivastava, A., Biswas, S., Yadav, S., **Kumar, S**., Srivastava, V., & Mishra, Y. (**2021**). Acute cadmium toxicity and post-stress recovery: Insights into coordinated and integrated response/ recovery strategies of *Anabaena sp.* PCC 7120. ***Journal of Hazardous Materials***. [ScienceDirect]
2. **Kumar, S.**, Mandal, R.S., Bulone, V. & Srivastava, V. (**2020**). Identification of growth inhibitors of the fish pathogen *Saprolegnia parasitica* using in silico subtractive proteomics, computational modelling, and biochemical validation. ***Frontiers in Microbiology*** 11, 2533. [PubMed]
3. Murugan, N.A., **Kumar, S.**, Jeyakanthan, J. & Srivastava, V. (**2020**). Searching for target-specific and multi-targeting organics for COVID-19 in the Drugbank database with a double scoring approach. ***Scientific Reports*** 10(1), 19125. [Scientific Reports]
4. Yadav, S., Srivastava, A., Biswas, S., Chaurasia, N., Singh, S.K., **Kumar, S.**, Srivastava, V. & Mishra, Y. (**2020**) Comparison and optimization of protein extraction and two-dimensional gel electrophoresis protocols for liverworts. ***BMC Research Notes*** 13, 60. [PubMed]
5. Mittal, P., PK, V.P., Dhakan, D.B., **Kumar, S.** & Sharma, V.K. (**2019**) Metagenome of a polluted river reveals a reservoir of metabolic and antibiotic resistance genes. ***Environmental Microbiome***, 14: 5. [BioMed Central]
6. Kaur, S., Srivastava, A., **Kumar, S.**, Srivastava, V., Ahluwalia, A.S. and Mishra, Y., (**2019**). Biochemical and proteomic analysis reveals oxidative stress tolerance strategies of *Scenedesmus abundans* against allelochemicals released by *Microcystis aeruginosa*. ***Algal Research***, 41, p.101525. [ScienceDirect]
7. **Kumar, S.**, Caimano, M. J., Anand, A., Dey, A., Hawley, K. L., LeDoyt, M., La Vake, C., Cruz, A. R., Ramirez, L. G., Pastekova, L., Bezsonova I, Smajs D, Salazar J. C., & Radolf J. D. (**2018**) Sequence variation of rare outer membrane protein β-barrel domains in clinical strains provides insights into the evolution of *Treponema pallidum* subsp. pallidum, the syphilis spirochete. ***mBio*** 9(3): e01006-18.[PubMed]

## References

References will be provided upon request.