Kunjulakshmi R

PhD Applicant

KunjulakshmiR | KunjulakshmiR | Personal Website | kunjulakshmiperumal@gmail.com

- Bioinformatics
- Computational Genomics
- Aging Studies
- Database & Prediction Server

Impact: Developed databases and prediction tools in computational genomics and transcriptomics, driving breakthroughs in anti-aging research, cancer biology, and multi-omics integration. Contributions to projects resulted in scientific publications, fostering advancements in the field.

Education

Bachelor of Science - Master of Science (BS-MS), Major in Biology **GPA: 7.7/10.00**
Indian Institute of Science Education and Research (IISER) Berhampur, India 2018 — 2023

Class XII, Science stream **92.2%**
Central Board of Secondary Education (CBSE), India 2015 — 2017

Experience

Intern (Computational Genomics & Transcriptomics Lab) **Apr 2022 — Present**
Department of Biotechnology, IIT Hyderabad India

- Led the development of AagingBase and AagingPEPred, advancing anti-aging research. Collaborated closely, contributing essential insights to ensure project success.
- Significantly contributed to MyeloDB and AMLdb, demonstrating proficiency in database development and multi-omics integration
- Co-authored influential book chapters, enriching scientific literature and emphasizing collaborative research dissemination

Expertise acquired: *Database, Prediction server, Anti-aging studies, Multi-omics resource*

Projects

A supervised ML based classification model for anti-aging peptides **GitHub**
Under Dr.Rahul Kumar, Assistant Professor, Department of Biotechnology, IIT Hyderabad Jul 2023 — Present

- Engineered a supervised ML-based server for predicting anti-aging peptide efficacy, employing bioinformatics tools and curated datasets
- Achieved an 81% prediction accuracy through training various ML models
- Instigated the development of a user-friendly web interface, facilitating peptide design and identification of anti-aging peptide fragments, thus driving progress in anti-aging interventions

Skills acquired: *Feature calculation, Feature ranking, ML algorithms, Bash scripting*

AagingBase: A comprehensive database of anti-aging peptides **GitHub**
Under Dr.Rahul Kumar, Assistant Professor, Department of Biotechnology, IIT Hyderabad Jun 2022 — Jun 2023

- Proficiently utilized Linux command line operations in developing AagingBase, enabling efficient data processing, automation, and system management
- Spearheaded the development of "AagingBase," a comprehensive database housing 282 experimentally validated anti-aging peptides, leveraging expertise in database management
- Significantly contributed to anti-aging research by providing AagingBase as a valuable resource, advancing geriatric medicine

Skills acquired: *Peptide sequence analysis, Protein structure prediction, Front-end, and back-end development*

Exosomal gene expression in pancreatic cancer: Uncovering biomarker potential **GitHub**
Under Dr.Rahul Kumar, Assistant Professor, Department of Biotechnology, IIT Hyderabad Apr 2022 — May 2022

- Conducted robust exosomal gene expression analysis for pancreatic cancer using RNA-seq data, leveraging bioinformatics skills
- Led batch effects mitigation using the PyCombat library, ensuring data integrity
- Developed visualization techniques, revealing downregulation of *HIST1H4A* and *HIST1H4B* exosomal genes in pancreatic cancer

Skills acquired: *Python & R programming*

Technical Skills & Tools

Bioinformatics	PyMol, MEME Suite, I-TASSER, DSSP, Biopython, BEDTools, SAMtools, AlphaFold
Genomics	Sequence alignment, variant calling
Programming	Python, R
Command Line Proficiency	Unix/Linux, Bash scripting
Data Analysis and Visualization	Pandas, matplotlib, seaborn, ggplot2
Machine learning	Scikit-learn
Web development	HTML5, PHP, CSS, Javascript
Database Management	MySQL
Version Control	Git
Document Typesetting	LaTeX

Publications

Articles

1. **R**, **K.**, Kumar, A., Vinod Kumar, K. & et.al. AagingBase: A comprehensive database of anti-aging peptides. *Database.* DOI (2024).
2. Kumar, A., Vinod Kumar, K., Kundal, K., Sengupta, A., Sharma, S., **R**, **K.** & Kumar, R. MyeloDB: A multi-omics resource for Multiple Myeloma. *Functional & Integrative Genomics.* DOI (2024).
3. Vinod Kumar, K., Kumar, A., Kundal, K., Sengupta, A., **R**, **K.**, Sharma, S., Nishana, M. & Kumar, R. AMLdb: A comprehensive multi-omics platform to understand the pathogenesis and discover biomarkers for acute myeloid leukemia. *Briefings in Functional Genomics.* Under_revision (2024).

Book Chapters (Co-first author)

4. **R**, **K.**, Kumar, A., Vinod Kumar, K., Kundal, K., Sengupta, A. & Kumar, R. in *Computational Biology for Stem Cell Research* (eds Kumar Raghav, P., Kumar, R., Lathwal, A. & Sharma, N.) DOI, 3–16 (Academic Press, 2024).
5. **R**, **K.**, Korra, B. T., Subashani, Kar, S. S., Kundal, K., Sengupta, A. & Kumar, R. in *Springer Handbook of Chem- and Bioinformatics* (ed Jerzy, L.) (Springer Handbooks, 2024). (In_review).

Blogs

6. **R**, **K.** *The Shedded Cells* NGSF Intern's Article. (Under_review).
7. **R**, **K.** *The Brightly Colored Warning* The Qrius Rhino (LINK).
8. **R**, **K.** *In silico Platforms* Syntillate: Blog of iGEM IISER Berhampur (LINK).
9. **R**, **K.** *Tiny Plant Wanderers* EPISTEME, Volume 2 (LINK).

Awards & Honors

2023 GATE (**Life Sciences**)
2023 NGSF internship and dissertation program fellow (**Next Generation Scientist's Foundation India**)

Responsibilities & Volunteering

2022 Advisory board memeber (**LaVida-Biology Club: IISER BPR**)
2022 Coordinator (**Brain awareness week 2022: IISER BPR**)
2021 Organizer (**BiOlympics 2021 - The biology olympiad**)
2019 Volunteer (**STREAM-The annual science outreach (IISER BPR)**)

English Proficiency

TOFEL iBT Total (**99/120**); Speaking (**25**); Listening (**25**); Writing (**22**); Reading (**27**)

References

Dr. Rahul Kumar
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Visiting Scientist
Department of Biological Sciences
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