

# AKHIL R

PhD student, Interdisciplinary research program,  
Department of Biotechnology & Department of Chemistry,  
Indian Institute of Technology -Madras, Chennai, India.

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## Education

Degree	Institute/University	CGPA/CPI	Year
PhD (Interdisciplinary)	Indian Institute of Technology, Madras, Chennai, India.	8.75	2019 (January) - Ongoing
M.Tech Biotechnology	Indian Institute of Technology, Guwahati, India.	8.98	2016 -2018
B.Tech Biotechnology	Anna University, Chennai , India.	8.70	2012-2016

## Research Interests

- Drug delivery, Self -assembly, Biomaterials, Tissue engineering
- Computational biology, Molecular modelling, Molecular dynamics simulations

## Academic Projects

- Novel self-assembled dendritic structures for biomedical applications..... January 2019 – Ongoing.  
Mentors: Dr. Vignesh Muthuvijayan, Associate Professor, Dept. of Biotechnology, IIT Madras and Dr. Edamana Prasad, Professor, Dept. of Chemistry, IIT Madras.

Description: To develop novel self-assembled dendritic structures that can be used for various biomedical applications such as drug delivery, tissue engineering, and bioimaging. The project will apply fundamentals from chemical sciences to prepare these self-assembled structures and then test these materials for their biological properties.

- Mechanistic Investigation of Peptide-membrane Interactions..... June 2017-July 2018.  
Mentor: Dr. Vibin Ramakrishnan, Professor, Department of Biosciences & Bioengineering, IIT Guwahati.

Description: This project focused on two domains. (a) Mechanistic study of Antibacterial peptides and its impact on model bacterial membranes. (b) Studies on tumour homing peptides and its action on specific receptors and bilayer membranes.

- Molecular Characterisation of efflux pump genes in mec-A negative Methicillin Resistant *Staphylococcus aureus* isolates ..... June 2015-May 2016.  
Mentor: Dr. V. Karthikeyan, Professor and Head, Department of Biotechnology, Karpaga Vinayaga College of Engineering and Technology, Anna University, India.
  - Development of non-invasive diagnostic toolkit (as part of the 'peer project') .....June 2015 – May 2016.  
Mentor: Dr. V. Karthikeyan, Professor and Head. Department of Biotechnology, Karpaga Vinayaga, College of Engineering and Technology, Anna University, India.
- Description: Developing non-invasive techniques to detect pathological biomarkers, using saliva as an alternative to blood samples
- “Analysis of Microbial diversity & characterization of various commercial milk brands”, July ‘14.  
Mentor: Dr. V. Karthikeyan, Professor and Head, Department of Biotechnology, Karpaga Vinayaga College of Engineering and Technology, Anna University, India.

## Publications

- Hazam P.K<sup>1</sup>, **Akhil R<sup>1</sup>**, Jerath G., Saikia J., Ramakrishnan V. Topological effects on the designability and bactericidal potency of antimicrobial peptides, (2019) Biophysical Chemistry, 248 , pp. 1-8. (\*<sup>1</sup> **Joint first authors**).
- Hazam, P.K<sup>1</sup>, **Akhil, R<sup>1</sup>**. Phukan, C., *et al.* Antimicrobial effects of syndiotactic polypeptides. (2021). *Scientific Reports* **11**, 1823 (\*<sup>1</sup> **Joint first authors**).
- Goyal R, Jerath G, **Akhil R**, Chandrasekharan A, Puppala E, Ponneganti S, Sarma A, Naidu V.G.M., Santhoshkumar T.R., Ramakrishnan V, (2021) Geometry encoded functional programming of tumor homing peptides for targeted drug delivery, Journal of Controlled Release, 333, pp 16-27
- (Book chapter) Vasudha T K, **Akhil R**, Aadinath W, and Vignesh Muthuvijayan. “Surface modification strategies to control the nanomaterial-microbe interplay” in the book “Microbial Interactions at Nano-Bio Interfaces”, Wiley. (accepted).

## Conference abstracts and participation

- Participated in Biological engineering society conference at Department of Biotechnology, Indian Institute of Technology, Madras, Chennai, October 2019.
- **Akhil R** and Dr. V. Karthikeyan, “Diabetic Autonomic neuropathy as complications of Diabetes Mellitus”. International Conference on Advances in Biomedical Engineering, Cancer Biology, Bioinformatics and Applied Biotechnology, July 25 & 26, 2015, Jawaharlal Nehru University, New Delhi. [Oral Presentation].
- **Akhil R**, Karthik N and Dr. V. Karthikeyan, “Assessment of water quality parameters in drinking water sources collected from Kanchipuram district’. Recent Advances in Biomedical Technology. February 26, 2015, Thiruvalluvar University, Vellore, India [Poster Presentation].

## Achievements

- Fellowship for PhD degree from Indian Institute of Technology Madras, Chennai after clearing the institute level entrance exam, (January 2019 to present)
- MTech degree scholarship from Indian Institute of Technology, Guwahati, for clearing Graduate aptitude test in engineering, July 2016 – June 2018
- Graduate Aptitude test in Engineering GATE-2016 (BT): **99.1 percentile** and **AIR 91**, conducted by Indian Institute of Science, Bangalore.
- University rank – **21** for the Btech Biotechnology Programme under Anna university, Chennai, India (among affiliated colleges).
- Best presenter award at the ‘Presentation skills’ program conducted by the Placement wing. Karpaga Vinayaga college of engineering and technology, Anna University, India.
- Second place in the “Bio-Chem Elite- 2011” competition held at SRM University, Ramapuram, Chennai.

## Key courses taken

### PhD coursework

- |                       |                                     |
|-----------------------|-------------------------------------|
| • Medical materials   | • Biomedical Nanotechnology         |
| • Medicinal Chemistry | • Experimental methods in chemistry |

### **Mtech course work**

- Tissue Engineering
- Stem cells and Cancer therapy
- Biotechniques
- Molecular Virology
- Microbial Biotechnology
- Quantitative biology

### **Undergraduate Course work**

- Biochemistry
- Microbiology
- Environmental science
- Immunology

### **Other Courses**

- Medical Anatomy, Physiology, Pathology
- Forensic Science
- Behaviour Science

## **Positions of Responsibility**

- Teaching Assistant for the course BT1010 – ‘Life Sciences’ and BT2041 Biological rate processes at Indian Institute of technology, Madras. (July 2019 to May 2020).
- Teaching Assistant for the course BT1020 – ‘Material and Energy Balances’ at Indian Institute of technology, Madras. (January 2019 to April 2019).
- Teaching Assistant for the course CL205 – ‘Mass transfer Operations’ at Indian Institute of technology, Guwahati. (January 2018 to April 2018).
- Teaching Assistant for the course BT301 – ‘Computational Biology’ at Indian Institute of technology, Guwahati. (July 2017 to December 2017).
- Editor-in-Chief of ‘Biogzine’, (Biotechnology – Departmental magazine) at Karpaga Vinayaga College of Engineering and Technology, Chengalpattu, T.N, India (June 2015 to May 2016).

## **Co-curricular activities**

- Forensic workshop: Attended a 2-day workshop on Forensic Science at Indian Institute of Technology, Madras, Chennai. (2015)
- Forensic Challenge 2015 – Runners up in the national level event held at Indian Institute of Technology, Madras, Chennai