AMRITA
VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF UGC ACT, 1956

SCHOOL OF BIOTECHNOLOGY
AMRITAPURI CAMPUS

20 YEARS OF EXCELLENCE

Inspired by Creativity;
Focused on Excellence

Table of Contents

Amma
Our Chancellor
Inspiration for the World

... We all know that the real goal of education is not to create people who can understand only the language of technology. The main purpose of education should be to impart a culture of the heart, a culture based on spiritual values.

Education is not only to help us live a comfortable life of plenty. When our plans fall apart, when we face failure and loss, when we are knocked down, education should help us get back on our feet. Education should help us regain our mental equipoise, self-confidence and positive attitude, so that we can continue forward. In fact, studying is a form of austerity. It is a process, like the bud unfolding into a beautiful flower spreading its fragrance.

Understanding this, we should approach our topic of study with love and patience. The world of knowledge is limitless; the possibilities are as vast as the universe. Therefore, before deciding whether a discovery is beneficial or detrimental, we need to contemplate with a meditative mind. Knowledge is like a river. Its nature is to constantly flow. Wherever it can flow, it does so, nourishing culture. On the other hand, the same knowledge, if devoid of values becomes a source of destruction for the world. When values and knowledge become one, there can be no more powerful instrument for the welfare of humankind. Today, physicists have even begun investigating the possibility that the essential substratum of the manifest universe and the individual are one and the same. We are standing on the threshold of a new era where material science and spirituality will move forward hand in hand…"

Excerpts from the address of our Chancellor Sri Mata Amritanandamayi Devi upon receiving the Doctorate of Humane Letters from State University of New York 25 May 2010

Swami Amritaswarupananda Puri

President
Amrita Vishwa Vidyapeetham

We, the Amrita family, welcome you with open arms and open hearts to this great institution of Amma's infinite compassion and love. To become special or extraordinary is the dream of every ambitious student. But how does one become special? Is it only through academic excellence? Of course, that is part of it, but academic brilliance alone is not enough. The most important thing in building your life is your ability to focus on your Inner self and to realize the inherent abilities within.

When you graduate and enter the practical world of opportunities and challenges, you may find yourself among thousands of competent professionals. What will you have over them? It will be your ability to tap into your inner source and let the grace you find there flow into your work. The extent to which you will be able to do this will depend entirely on how open you are to the beautiful opportunities available at Amrita.

May you ever remain open to Amma's Grace

Ever in Amma,
With Love & Prayers

Swami Amritaswarupananda Puri

Dr. P. Venkat Rangan

Vice-Chancellor
Amrita Vishwa Vidyapeetham

Amrita Vishwa Vidyapeetham is a rapidly developing world-class University, offering Undergraduate, Postgraduate and advanced Doctoral research in wide-ranging disciplines like Biotechnology, Management, Engineering, IT, Medicine and Journalism. It is both young and immensely dynamic, with a unique holistic approach to produce leaders in all of its disciplines.

At Amrita Vishwa Vidyapeetham, we have assembled some of the most well-known academicians, entrepreneurs, executives, inventors, philanthropists, researchers and scientists to guide us in this noble endeavour.

A very hearty welcome to you to this sacred temple of learning. We hope you can become a part of this exciting venture. Invoking AMMA's Grace on all of us.

Dr. Venkat Rangan

Vision

Our vision is to be an exemplary institution that thrives on its commitment to the transformative power of value-based education, providing the impetus to develop the expansiveness to harmonize both scientific knowledge and spiritual understanding, so as to utilize knowledge for societal benefit and contribute to a prosperous and sustainable future for all.

Mission

Amma's profound mission of providing education for life, and emphasis on compassion-driven research, has shaped Amrita as a unique institution:

Education for Life

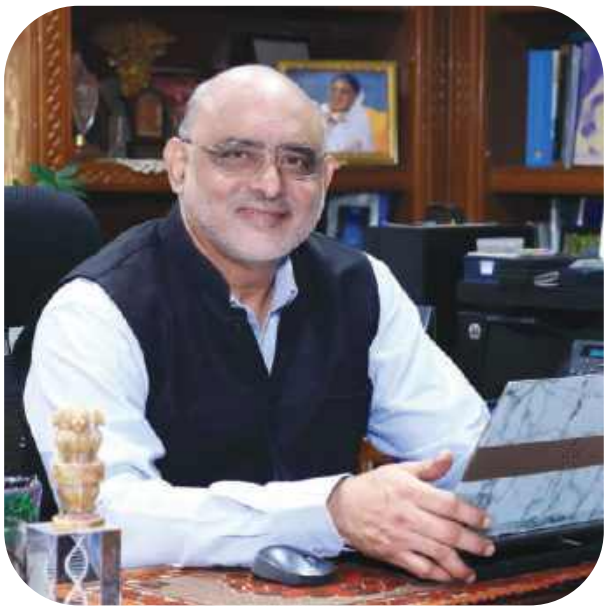
There are two types of education: education for living and education for life. Studying to become a professional is education for living, while, education for life requires an understanding of the essential human values. At Amrita, we believe that education should also impart a culture of the heart, based on enduring values and inner strength. Amrita's culture of education helps to inculcate in our students the right ethos to be rooted in the values of Dharma (Righteousness), Karuna (Compassion), and Shraddha (Mindfulness). Endowed with qualities of acceptance, patience, self-confidence, perseverance and enthusiasm, the benefit of humanity will become uppermost in the students' thoughts, words and actions. They will then pioneer innovative solutions for the benefit of all humankind, leading to sustainable health and prosperity for all. This resonates with the ancient Sanskrit prayer 'Lokah Samastah Sukhino Bhavantu'. It is a reminder of our deeper connection to the entire world around us. "May our work contribute to the happiness of all beings."

Compassion Driven Research

Our motivation to pursue research is focused on alleviating major global problems related to poverty, starvation, sickness, environmental pollution and contamination. We believe that if we could transform compassion from a mere word into a path of action, we would be able to address most of the world's problems. If we take this step courageously, then our research and its outcomes will have a special impact, spontaneity, and power. This has translated into many latest advancements and innovations that have culminated in greater societal benefit.

Global Impact

At Amrita, we stand united in our mission towards solving globally recognized scientific and societal challenges, including environment, development, and health. Amrita stands at the strategic juncture of two streams of cultures: East and West. It is our vision to bring the two together to bridge the divide through meaningful collaboration with world-class universities and innovative approaches that will benefit the entire planet.



Prof. Bipin Nair, Ph.D.
Dean
Amrita School of Biotechnology

A Trailblazer in the Biotechnology arena since its inception in 2004, the Amrita School of Biotechnology, part of Amrita Vishwa Vidyapeetham, has established UG and PG programmes in Biotechnology, Microbiology, and Bioinformatics. The School is accredited with the highest grade of A++ by NAAC and UGC and recognized as a TIFAC Centre of Relevance and Excellence (CORE) in Biomedical Technology under the DST Mission REACH programme.

The School boasts a strong placement record, with M.Sc. graduates placed in leading biotechnology institutions and companies across India and abroad. Its dedicated faculty, with extensive research experience in laboratories across the USA and Europe, are now engaged in projects of immediate societal impact, supported by substantial funding from government agencies (DST, DBT, ICMR), as well as the Bill & Melinda Gates Foundation, Unilever Research, GAMRIF UK, and other international collaborators.

The School has a large number of students enrolled in its Ph.D. programme, supported by fellowships (JRF, SRF) from DBT, CSIR, and ICMR, under the mentorship of leading experts in diverse research areas. A key strength of the School is its state-of-the-art infrastructure and research facilities, complemented by strong industry collaborations that facilitate student internships and successful placements. Partnerships with Unilever Research, Bangalore, and Agilent Technologies, Germany have enabled flagship projects in significant research domains.

A major milestone for the School has been its induction into the SPARK Global programme at Stanford University, USA, opening doors for cutting-edge collaborative research with premier universities and institutions worldwide. Another testimony to its progressive initiatives is its recognition by the Department of Science and Technology, Government of India, as a Centre of Excellence for Antimicrobial Resistance (AMR) Research, in collaboration with IIT Kanpur and the Central Drug Research Institute (CDRI), Lucknow.

In another unique step, Amrita Vishwa Vidyapeetham has also partnered with the University of Arizona, USA (Department of Immunobiology) for a dual degree programme.

In a pioneering initiative, Amrita Vishwa Vidyapeetham, through the School of Biotechnology, has launched a Dual Degree M.Sc. programme with the University of Bath, UK, where students complete their first year at Amrita and the second year at Bath, receiving an M.Sc. degree from the University of Bath and qualifying for a two-year work opportunity in the UK.

With Amma's grace, these initiatives promise abundant opportunities for students and faculty to be part of transformative global collaborations and impactful research.

I wish you the very best in all your efforts.

Prof. Bipin Nair, Ph.D

About **Amrita Vishwa Vidyapeetham**

Amrita University is a multi-disciplinary, research-intensive, private university, educating a vibrant student population of over 24,000 by 1700+ strong faculty. Accredited with the highest possible 'A^{++}' grade by NAAC, Amrita offers more than 250 UG, PG, and Ph.D. programmes in Engineering, Management, and Medical Sciences including Ayurveda, Life Sciences, Physical Sciences, Agricultural Sciences, Arts & Humanities, and Social & Behavioral Sciences. With seven campuses at Amaravati, Amritapuri, Bengaluru, Chennai, Coimbatore, Kochi, Mysuru and NCR Delhi (Faridabad) and spread over 1,200+ acres with 10 million square feet of built-up space, Amrita is one of India's top-ranked private universities.

Amrita has emerged as the fifth best university in the National Institutional Ranking Framework (NIRF) Rankings 2021.

In The University Impact Rankings 2022, a pioneering initiative to recognise universities around the world for their social and economic impact for sustainable future, Amrita has been ranked among the Top 50 in the world.

In a short span of less than 20 years, Amrita has established 180+ collaborations with Top 500 world-ranked universities as Amrita is emerging as one of the fastest-growing institutions of higher learning in India

World-renowned humanitarian and spiritual leader, Sri Mata Amritanandamayi Devi, AMMA, is the founding Chancellor and guiding light of Amrita Vishwa Vidyapeetham.

Our motivation to pursue research is focused on alleviating major global problems related to poverty, starvation, sickness, environmental pollution, and contamination. We believe that if we could transform compassion from a mere word into a path of action, we would be able to address most of the world's problems. If we take this step courageously, then our research and its outcomes will have a special impact, spontaneity, and power. This has translated into many latest advancements and innovations that have culminated in greater societal benefit.

At Amrita, we stand united in our mission towards solving globally recognized scientific and societal challenges, including environment, development, and health. Amrita stands at the strategic juncture of two streams of cultures: East and West. It is our vision to bring the two together to bridge the divide through meaningful collaborations with world-class universities and innovative approaches that will benefit the entire planet.

NAAC A++ ACCREDITED

CATEGORY 1 GRADED AUTONOMY UGC, GOVT. OF INDIA

No.1 IN INDIA THE IMPACT RANKINGS 2023

nirf GOVT. OF INDIA

7TH BEST UNIVERSITY IN INDIA 2023

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SCHOOL OF BIOTECHNOLOGY

20 YEARS OF EXCELLENCE

INSPIRED BY **CREATIVITY** FOCUSED ON **EXCELLENCE**

The Amrita School of Biotechnology, with qualified faculty including several Ph.D.s recruited from academia and industry around the world, is perfectly poised to offer students an opportunity to develop expertise and succeed in building a career in the exciting areas of Biotechnology and related fields. Our cutting-edge curricula with state-of-the-art facilities for teaching and research provide a solid foundation in the biological sciences. With a vibrant academic environment and a unique approach to learning that involves thought-provoking discussions and constant interaction among students and faculty, the Amrita School of Biotechnology provides an ideal setting for all-round development of students to become well-trained in all aspects of the Life Sciences. The excellent placement record of the School stands testimony to our laudable standards of excellence. The School offers undergraduate and postgraduate studies in Biotechnology, Microbiology and Bioinformatics. It is approved by TIFAC (Government of India) as a Centre of Relevance and Excellence (CORE) in Biomedical Technology. The School's research programme concentrates on preventive and therapeutic innovations.

- A trailblazer in the Biotechnology arena since its inception in 2004.
- Well-established UG, PG, and Ph.D. programmes in Biotechnology, Microbiology, and Bioinformatics.
- Re-accredited in 2021 by National Assessment and Accreditation Council (NAAC), University Grants Commission (UGC) with "A^{++}" Grade.
- Established as a Technology Information, Forecasting & Assessment Council-Centre of Relevance and Excellence (TIFAC-CORE) in Biomedical Technology under the DST Mission REACH programme.
- Dedicated faculty with extensive research experience in labs across the USA and Europe, now pursuing research projects of immediate societal impact.
- Strong placement record for M.Sc. graduates at all major Biotechnology institutions and companies across the country and globally.
- Large number of students enrolled in the Ph.D. programme with research fellowships (JRF, SRF) from CSIR, DBT, ICMR and guidance from established experts in their respective fields of research.
- State-of-the-art infrastructure and research facilities with strong industry collaboration facilitating student project internships and subsequent placements (e.g. Agilent Technologies, Biocon Limited, Sun Pharmaceutical Industries Limited).
- Research focus spanning a wide spectrum of areas including Antimicrobial Resistance (AMR), Cell Biology, Cancer Biology, Proteomics, Neurophysiology, Phytochemistry, Analytical Chemistry, Phage Biology, RNAi.
- Selected for the Bill & Melinda Gates Foundation-DBT-BIRAC (Biotechnology Industry Research Assistance Council) Grand Challenge India Award for the project to explore novel approaches to sanitation solutions in India.
- Amrita Vishwa Vidyapeetham, in a pioneering initiative through the School of Biotechnology, has introduced a Dual Degree M.Sc. programme in collaboration with the University of Bath, UK. Under this programme, students spend their first year at Amrita and their second year at Bath, earning an M.Sc. degree from the University of Bath and becoming eligible for a two-year work opportunity in the UK.

TESTIMONIALS

"The students and faculty are extraordinary at Amrita and leaders for the future. Look forward to welcoming many to San Diego and returning in future."

Dr. Victor Nizet
Professor & Vice Chair
UC San Diego School of Medicine, San Diego, USA

"A truly inspirational visit to this great conglomerate. I look forward to a meaningful & enduring partnership. My salutation to this great effort."

Kiran Mazumdar Shaw
Chairman, Biocon Ltd.
Bengaluru, India

"The path chosen by Amrita School of Biotechnology…..to be one of the best academic centres for Biotechnology in the country as well as globally is remarkable. It exemplifies extraordinary vision, strong leadership, excellent faculty, well-recognized curriculum, research infrastructure and global outreach that offers the best for its students."

Dr. Rustom Mody
Senior VP, Sun Pharmaceuticals
Ahmedabad, Gujarat

"Collaborating with Amrita School of Biotechnology to build a Dual Degree MS programme is a highlight of my career. The leadership, faculty, as well as students are outstanding and they are all committed to excellence."

Dr. Carol Gregorio
Professor, Icahn School of Medicine at Mount Sinai. Director and Founder, Centre for Cardiac Muscle Biology, Cardiovascular Research Institute.
New York, USA

"I've been deeply impressed by the Management, staff and students at Amrita School of Biotechnology. The overall pedagogy, the values-based approach to imparting knowledge, the industry-relevance built into the programme and high quality products/publications that are coming from this department, make it a standout department and biotech programme in all of India!"

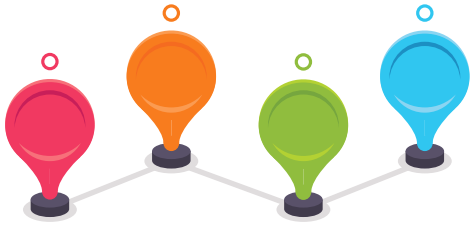
Dr. Anand Anandkumar
Founder and CEO,
BUGWORKS Research India Pvt. Ltd
Bellary Road, Bangalore

"RGCB has been attracting students from Amrita School of Biotechnology. We are delighted to welcome them year after year. The faculty and students of Amrita School of Biotechnology are a great conglomerate. My respects for establishment of such an institution."

Dr. Chandrabhas Narayana
Director,
Rajiv Gandhi Centre for Biotechnology
Poojappura, Thiruvananthapuram

AMRITA VISHWA VIDYAPEETHAM
SCHOOL OF BIOTECHNOLOGY

MILESTONES



2004

SEPTEMBER

- Amrita Vishwa Vidyapeetham establishes Centre for Biotechnology under the School of Applied Sciences
- The Centre initiates B.Sc. Biotechnology, M.Sc. Biotechnology, M.Sc. Bioinformatics programmes with total of 75 Students and 8 Faculty Members

NOVEMBER

- Centre for Biotechnology is identified as a TIFAC Centre of Relevance and Excellence (CORE) in Biomedical Technology under the Mission REACH (Relevance and Excellence in Achieving new heights in educational institutions) programme of the DST, Government of India ₹3.41 crore

2005

JANUARY

- Several senior faculty members from the USA & Europe join the Centre and initiate active academic and research programmes.

JULY

- MoU with Biocon Limited.
- MoU with MDS Pharma Services, USA that provides $250,000 worth of laboratory equipment to jump-start research activities at the School.
- Initiated a new undergraduate programme in Microbiology.

2006

AUGUST

- Mascon Global Limited, Delhi recruits all 26 students in the M.Sc. Bioinformatics batch recording 100% placement of the first batch since the inception of the Centre.

2007

APRIL

- Amrita Vishwa Vidyapeetham receives approval from UGC to establish Centre for Biotechnology as an independent school. The Amrita School of Biotechnology is born!

2008

NOVEMBER

- First evaluation by the NAAC Evaluation team awards an A grade.
- Research fund from Defence Institute of Physiology & Allied Sciences (DIPAS)-Ministry of Defence, Government of India for Studies on bioactive tannoids and flavonoids of seabuckthorn leaves.

2009

AUGUST

- School starts a new postgraduate programme in Microbiology.
- Research fund from DBT, Government of India on "Value addition to seabuckthorn through isolation & characterisation of pharmacologically active compounds" ₹**46.25** lakhs.

2011

SEPTEMBER

- MoU with Agilent Technologies, Germany.
- New Amrita Agilent Research Centre, Molecular Biology Lab and Lentiviral Lab inaugurated.
- New research grant from DST, Government of India for Bio-inspired processor design for cognitive functions via detailed computational modeling of cerebellar granular layer ₹**39.44** lakhs.

NOVEMBER

- School receives first US patent awarded to Amrita Vishwa Vidyapeetham for "Development of a prototype of Automated Insulin Pump".

2012

SEPTEMBER

- New Computational Neurobiology & Neurophysiology lab & e-learning lecture theater inaugurated.
- School receives funds from numerous government agencies like DST, DBT & CSIR ₹2.25 crore.

2013

JANUARY

- School receives funding from FIST (Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions) DST, Government of India / ₹80 lakhs.
- New research fund from DST, Government of India for Paratopsis: a newer approach to target cancer / ₹22 lakhs.

MAY

- School receives funding from CSIR for research on Anacardic acid ₹24.37 lakhs.

AUGUST

- Amrita BioQuest 2013, An International conference on Biotechnology for Innovative Applications hosted at the Amritapuri Campus.

2014

MARCH

- School of Biotechnology selected to develop next generation sanitation solutions in India.

JUNE

- School initiates a new scholarship programme for postgraduate students.

JULY

- MoU with Translational Health Science & Technology Institute (THSTI)-Delhi to work jointly on the sanitation project.
- New research grant from DST, Govt. of India for Identification & characterization of the role of Allium sativum microbiome on the production of therapeutic metabolites ₹70 lakhs.

BILL & MELINDA GATES foundation

2015

JANUARY

- BioCrest 2015 - An International Symposium on Biotechnology-The Path Ahead commemorating the tenth anniversary of the school.
- Footprints 2015 - School organizes the first ever Alumni Meet.
- Amrita Vishwa Vidyapeetham re-accredited with “A’ Grade by NAAC.
- MoU with Oxford University, UK.

UNIVERSITY OF OXFORD

FEBRUARY

- Inaugurated new state-of-the-art research labs for Cell Biology & Phage Biology.

MARCH

- Induction of Q-TOF MS & Nano-LC for cutting edge Proteomics research.

2016

MARCH

- Amrita research "From Waste to Wealth: Traditional Medicine, Natural Products & the Molecular Basis of Therapeutics", has been featured on the United Nations Academic Impact (UNAI) website.

MAY

- MoU with National Ilan University, Taiwan.

2017

JANUARY

- BioCrest 2017, an International Symposium on Microbial Pathogenesis.

FEBRUARY

- Amrita Vishwa Vidyapeetham & Wipro Limited, a leading global information technology, consulting and business process services company, jointly won the Aegis Graham Bell Awards (AGBA) 2017 in the Innovation in Health category.

JULY

- A cancer labeling fluorescent probe was designed by Amrita
- Ramalingasamy Fellowship from the Department of Biotechnology (DBT) Ministry of Science &Technology, Govt. of India, awarded to Dr. Indulekha C. L. Pillai

2018

MARCH

- Amrita's Virtual Laboratories & its deployment outcomes won the GOLC Online Lab Award 2018 for visualized experiment category in Germany.

MAY

- MoU with ID Genomics with ARMADA

NOVEMBER

- Collaboration with Tata Institute of Genetics & Society (TIGS) will focus on developing new tools to reverse antibiotic resistance in pathogens like Pseudomonas aeruginosa

TIGS
Tata Institute for Genetics and Society

2019

JANUARY

- Inaugurated new lab for Antimicrobial Resistance Research [AMR]
- Amrita is partnering with 14 other institutions from EU, UK, China, Mexico, Mongolia, Paraguay in the 'WeNet-The internet of Us'
- DataScientia consortium of founding members includes Italy's University of Trento, the National University of Mongolia, India's Amrita Vishwa Vidyapeetham, China's Jilin University, Paraguay's Catholic University of Asuncion, South Africa's Tshwane University of Technology & UK's Heriot-Watt University
- MoU with Indriyam

AUGUST

- MoU with NCBS

2020

JANUARY

- School initiates first of its kind dual degree programme in life science in collaboration with The University of Arizona.

JUNE

- School receives funding from DST-SERB ₹88.45 lakhs

2021

US 20190219591A1

(19) United States

(12) Patent Application Publication

NAIR et al.

(10) Pub. No.: US 2019/0219591 A1

(43) Pub. Date: Jul. 18, 2019

(54) DETERGENT COMPATIBLE ASSAY FOR PROTEIN ESTIMATION

(71) Applicant: AMRITA VISHWA VIDYAPEETHAM, KOLLAM (IN)

(72) Inventors: SOBHA VIJAYAN NAIR, KOLLAM (IN); PRAKASH CHANDRAN RAMACHANDRAN NAIR, KOLLAM (IN); BIPIN NAIR, REDMOND, WA (US); KALYANI AJAYAN, KOLLAM (IN)

(21) Appl. No.: 16/366,861

(22) Filed: Mar. 27, 2019

(30) Foreign Application Priority Data

Apr. 4, 2018 (IN) 201841012852

Publication Classification

(51) Int. Cl.

G01N 33/68 (2006.01)

(52) U.S. Cl.

CPC G01N 33/6842 (2013.01)

(57) ABSTRACT

The invention discloses a detergent-compatible protein assay method, composition and kit based on bio-conjugation reaction between protein and Meldrum's acid activated furfural. The method includes adding MAF in dimethyl sulfoxide (DMSO) to a protein sample solution. The amino functionalities present on the amino acid residues reacts with the MAF instantaneously at room temperature to yield deep purple colored solutions of the corresponding conjugated proteins. The reagent composition added to protein may be in the range of 90-450 mM. The intensities of purple colored solutions were proportional to the protein concentration captured by spectrophotometric measurements. The assay is sensitive in the range of 0.125-15 mg/mL, is compatible with commonly used detergents and reducing agents in protein solutions and may be employed for estimation of protein samples in the presence of detergents and reducing agents.

FEBRUARY

- School organized international symposium called BioCrest 2021

MARCH

- School receives funding from DST-SERB (₹44.8 lakhs)

JULY

- Awarded A++ by NAAC

AUGUST

- Research collaboration with GangaGen Biotechnologies Private Ltd.

SEPTEMBER

- USA Patent on Detergent compatible assay for protein estimation was awarded to School of Biotechnology Professors

NOVEMBER

- School organized Amrita Legion for Antimicrobial Resistance Management (ALARM 2021)

DECEMBER

- Research collaboration with Vitalis Phage Therapy
- DBT-Skill Vigyan nodal centre
- Dr. Asoke Banerji has joined Amrita in 2006 & was active till his passing on 1st July 2021.
- He was awarded senior research fellowship by the International Atomic Energy Agency to work with Professor D.H.R. Barton & Professor E.B. Chain, both Nobel Laureates, at the Imperial College of Science & Technology, London.
- Dr. Banerji joined Bhabha Atomic Research Centre, in 1967 & was Head of the Bioorganic Division from 1989-98.

2022

FEBRUARY

- Dr. Muralidharan V., received the Young Scientist fellowship Award from Dept. of Health Research, Indian Council of Medical Research, Govt. of India.

MAY

- Dr. Bipin Nair and Dr. Geetha Kumar were invited speakers at the International AMR conference - CARPE DIEM in Berlin, (May 2022) hosted by Indo-German Science & Technology Centre (IGSTC)

SEPTEMBER

- Dr. Muralidharan V., received extramural funding from DHR-ICMR, Government of India - ₹**44.3** lakhs

OCTOBER

- Department of Biotechnology, DBT, Govt. of India awarded the Biotechnology Skill Vigyan State Partnership Programme (₹**6.2** crore) to the school in Collaboration with Kerala Biotechnology Commission.
- Conducted World Phage Week on 28th October 2022
- Dr. Vandana Sankar received extramural funding from DST-SERB Power Research Grant (₹30 lakhs)

NOVEMBER

- Dr. Bipin Nair, Dean, School of Biotechnology, appointed as Vice Chair of India AMR Innovation Hub's Special Interest Group on AMR in the Environment.
- Organized Hybrid International Symposium - Amrita Legion for Antimicrobial Resistance Management (ALARM) on 23rd & 24th November 2022.

2023

FEBRUARY

- Sree Padmavathi Venkateswara Foundation award (₹**1.5** crore) for collaborative project with Indian Institute of Science & Madras Diabetes Research Foundation (MDRF)

- Dr. Aravind Madhavan received the Young Scientist award from Kerala State along with Chief minister's Gold Medal, cash awards, funding support (₹50 lakhs & a travel grant).
- Dr. Aravind Madhavan received extramural funding from DST-SERB under the State University Research Excellence-SURE scheme (₹30 lakhs)
- Dr. Nandita Mishra received extramural funding (ICMR-ADHOC-₹30 lakhs)
- Dr. Geetha Kumar invited to join ICMR special Task Force on bacteriophage therapy for Antimicrobial Resistance.

2024

FEBRUARY

- Amrita awarded National Centre of Excellence for Antimicrobial Resistance research by DST in collaboration with IIT Kanpur & CDRI Lucknow
- Dr. Aravind Madhavan received Chancellor's research excellence award for being included in the top 2% researcher's list of Stanford University & Elsevier.
- Dr. Muralidharan V., received extramural funding from ICMR on the project titled: Role of an Ayurvedic treatment protocol as a prerequisite for in vitro fertilization in women with Diminished Ovarian Reserve: elucidating mechanistic insights incorporating multi-omics approaches- ₹96 lakhs

MARCH

- **Indian Patent Granted:** Detergent Compatible Assay for Protein Estimation, enabling efficient protein analysis in complex samples.
- **Indian Patent Granted:** Process for Obtaining Phytoecdysteroid Rich Extract, contributing to advancements in natural product research.

SEPTEMBER

- Amrita becomes 1st Indian Institution to be inducted into the SPARK GLOBAL Consortium at Stanford University School of Medicine.

2025

MARCH

- **GAMRIF (UK) – C-CAMP AMR Challenge Award 2025:** Recognition for the development of affordable point-of-testing devices for monitoring AMR in the environment.

APRIL

- **US Patent Granted:** Meldrum's acid activated furan (MAF) – a novel mass spectrometry compatible staining agent for proteins in polyacrylamide gels. (April)

FACULTY MEMBERS

The Faculty Members at Amrita School of Biotechnology are well known and highly respected in their academic domains. This provides the school with an extensive network that is instrumental in securing collaborative research opportunities, live student projects and industry inputs, which is essential for quality biotechnology education.

Dr. Bipin Nair
Professor & Dean, School of Biotechnology, Dean, Life Sciences

Ph.D. Microbiology,
M.S. University of Baroda 1986

Formerly at MDS Pharma Services,USA,
as the Research Manager in the Lead Discovery Group.

Areas of Interest: Pharmacology,
Lead Discovery, Cell Signaling

bipin@am.amrita.edu

Dr. Geetha Kumar
Professor

Ph.D. Biochemistry, University of Tennessee, Memphis, USA 1992.

Formerly at Ceptyr Inc., USA.

Areas of Interest: Drug discovery, molecular mechanisms in diabetes and wound-healing, natural products for wound-healing

Additional Role: Dean, School of Physical Sciences, Amrita Vishwa Vidyapeetham

gkumar@am.amrita.edu

Dr. Sudarslal S.
Professor

Ph.D. in Biophysics, School of Biosciences, M.G.University, Kerala

Formerly Manager at Mass Spectrometry Core Facility, NCBS, Bangalore, India

Areas of Interest: Mass spectrometric characterization of medicinally important peptides and proteins

sudarslal@am.amrita.edu

Dr. Sanjay Pal
Professor

Ph.D. in Biotechnology, IIT, Kharagpur, 2004

Formerly at University of Texas Health Science Centre, San Antonio, USA.

Areas of Interest: Sanitation, Microbiome Engineering, Bacteriophage, Matrix biology, Vertical Garden

sanjaypal@am.amrita.edu

Dr. Nandita Mishra
Professor

Ph.D. in Biotechnology, IIT Kharagpur, 2005

Formerly at University of Texas Health Science Centre, San Antonio, USA

Areas of Interest: Cell Death Pathways, Proteasomal Inhibition, Mechanism of targeted drug delivery to cancer cells, Toxicity study of Bio-materials

nanditamishra@am.amrita.edu

Dr. Sobha V. Nair
Associate Professor

Ph.D. in Chemistry (Polymer Technology), MG University, 2006.

Formerly at POSTECH, South Korea

Areas of Interest: Biopolymers/Biomaterials

sobhavn@am.amrita.edu

Dr. Nidheesh M.
Associate Professor

Ph.D. in Neuroinformatics, Amrita Vishwa Vidyapeetham, Amritapuri, 2019

Areas of Interest: Neuroinformatics, Deep Learning, BioNLP, Bioinformatics

Additional Role: Principal, School of Physical Sciences, Amrita Vishwa Vidyapeetham

nidheesh@am.amrita.edu

Dr. Ajith M.
Associate Professor

Ph.D. in Microbiology, Bharathiar University, Coimbatore, 2021

Areas of Interest: Bacteriophage, Sanitation, Wastewater, Microbiome, Enzymology, Microbial Fuel Cell

ajithm@am.amrita.edu

Dr. Vipin A. Nair
Associate Professor

Ph.D. in Organic Chemistry, University of Kerala, 2002

Formerly: Postdoctoral Fellow, University of Tennessee, Memphis, USA. Associate Professor, National Institute of Pharmaceutical Education & Research (Government of India), Mohali, India. Senior Scientific Manager, Anthem Biosciences, Bangalore, India.

Areas of Interest: Organic Synthesis, Natural Products, Medicinal Chemistry, Chemical Biology

vipinanair@am.amrita.edu

Dr. Jayalekshmi H.
Associate Professor

Ph.D. in Biotechnology, Amrita Vishwa Vidyapeetham, Amritapuri, 2018

Areas of Interest: Medical Bacteriology

jayalekshmih@am.amrita.edu

Dr. Jayashree G.
Assistant Professor

Ph.D. in Biochemistry, M.G. University, 2001

Formerly at the Indian Institute of Science, Bangalore

Areas of interest: Mycobacterial proteins, identification and characterization of novel lectins, Protein-Protein interactions, isothermal titration calorimetry

jayashreeg@am.amrita.edu

Dr. Indulekha C. L. Pillai
Assistant Professor

Ph.D. in Biotechnology, Rajiv Gandhi Centre for Biotechnology, India, 2010

Formerly Postdoctoral Scientist, Cedars Sinai Medical Centre, Los Angeles, USA

Areas of interest: Stem cell Biology and Tissue repair, Fibrosis and Calcification, Wound Healing, Notch and Wnt Signaling, Innate Immunity

indulekhacl@am.amrita.edu

Dr. Dalia Vishnudasan
Assistant Professor

Ph.D. in Plant Molecular Biology, Delhi University, 2004

Areas of interest: Plant Biotechnology, Nanobiotechnology

daliav@am.amrita.edu

Dr. Rajaguru Aradhya T. C.
Assistant Professor.

Ph.D. in Development Biology and Genetics, University of Auvergne, France, 2014

Formerly Post-Doctoral Fellow at MSKCC, Rockefeller University, New York, USA

Areas of interest: Developmental Genetics and Cellular Differentiation

rajagurua@am.amrita.edu

Dr. Parvathy Venugopal
Assistant Professor

Ph.D. in Development Biology and Genetics, University of Auvergne, France, 2014

Areas of interest: Epithelial growth and Morphogenesis

parvathyv@am.amrita.edu

Dr. Sindhu Shetty K.
Assistant Professor

Ph.D. in Microbiology, Bharathiar University, Coimbatore, 2019

Areas of Interest: Enzymology, Actinomycete, Programmable probiotics, Synbiotics, Bacteriophage

sindhushettyk@am.amrita.edu

Dr. Chinchu Bose
Assistant Professor

Ph.D. in Life Sciences, Amrita Vishwa Vidyapeetham, Amritapuri, 2019

Areas of Interest: Phytochemistry, Bio-prospection of active principles from Natural Products

chinchubose@am.amrita.edu

Dr. Vidhya Prakash
Assistant Professor

Ph.D. in Life Sciences, Amrita Vishwa Vidyapeetham, Amritapuri, 2023

Area of interest: Probiotics and Prebiotics, Gut Microbiome Interactions, Bacteriocins and Antimicrobial Peptides.

vidhyaprakash@am.amrita.edu

Dr. Suja Subhash
Assistant Professor

Ph.D in Life Sciences, Amrita Vishwa Vidyapeetham, Amritapuri, 2023

Areas of Interest: Plant growth promotion and resilient agriculture, Cancer microbiome and pathogenesis, Fungal biology, Antimicrobial and antiparasitic agents, and Sustainable Wastewater treatment.

sujasubhash@am.amrita.edu

Dr. Aswathy Alangode
Assistant Professor

Ph.D. in Biotechnology, Amrita Vishwa Vidyapeetham, Amritapuri, 2021

Areas of Interest: Snake venom biochemistry; Biomedical applications of snake venom.

aswathya@am.amrita.edu

Dr. Muralidharan V.
Assistant Professor

Ph.D. in Biotechnology, Amrita Vishwa Vidyapeetham, Amritapuri, 2021

Areas of Interest: Snake venomics & antivenomics, Multi-omics approaches in disease biology

muralidharanv@am.amrita.edu

Dr. Vandana Sankar
Assistant Professor

Ph.D. in Biological Sciences, Sree Chitra Tirunal Institute for Medical Sciences and Technology, 2009

Formerly SERB-Young Scientist, CSIR-National Institute for Interdisciplinary Science and Technology(NIIST), Thiruvananthapuram

Areas of Interest: Cardiovascular disease biology

vandanasankar@am.amrita.edu

Dr. Aravind Madhavan
Assistant Professor

Ph.D. in Biotechnology, CSIR-National Institute for Interdisciplinary Science and Technology, India, 2016

Formerly: ICMR-DHR Scientist at Rajiv Gandhi Centre for Biotechnology

Post-doctoral fellow at Rajiv Gandhi Centre for Biotechnology

Area of interest: Host-pathogen interaction in infectious disease, Host-directed therapy, Cell-factory development

aravindmi@am.amrita.edu

Dr. Pradeesh Babu
Assistant Professor

Ph.D. in Life Sciences, Amrita School of Biotechnology, Amritapuri, 2022

Areas of Interest: Antimicrobial Resistance, Phage biology, Metagenomics, Next-generation sequencing, Artificial Intelligence and Bioinformatics

pradeeshbabu@am.amrita.edu

Dr. Anu Rohit Melge
Assistant Professor

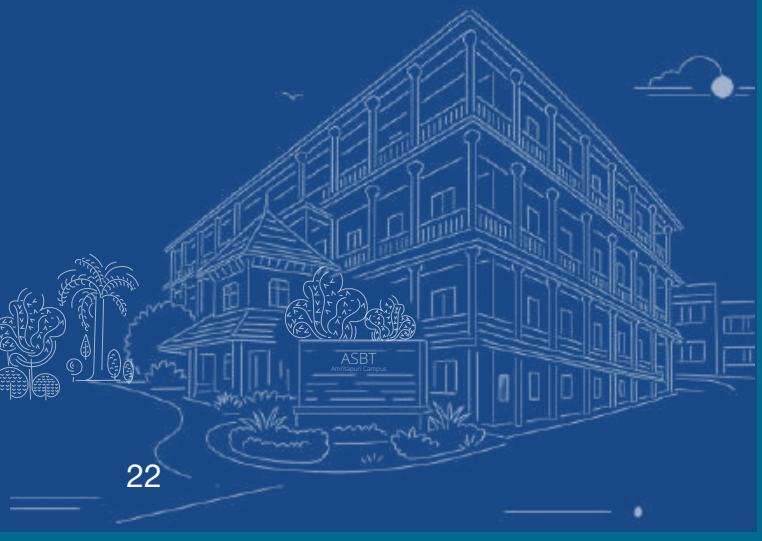
Ph.D. in Life Sciences, Amrita Centre for Nano Sciences and Molecular Medicine, Amrita Institute of Medical Sciences, Kochi, Kerala, 2022

Areas of Interest: Computational Biology, Structure-Based Drug Design, Chemoinformatics, Nanoinformatics

anurm@am.amrita.edu

VISITING/ADJUNCT PROFESSORS

The Academic programmes at Amrita School of Biotechnology are greatly enhanced through the active involvement of reputed scientists as Adjunct Faculty from across the globe



Dr. Victor Nizet
Professor & Vice Chair for Basic Research, Department of Pediatrics

Chief, Division of Host-Microbe Systems & Therapeutics

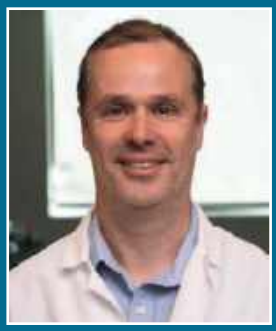
Professor, Skaggs School of Pharmacy & Pharmaceutical Sciences, University of California, San Diego, USA

Areas of Interest: Antimicrobial Resistance, Pathogenesis

Dr. Aarohi Zokarkar
Director of Insights and Analytics at Revolution Medicines

Ph.D. in Molecular Biosciences, Northwestern University, Weinberg School of Arts and Sciences (Howard Hughes Medical Institute Lab), Evanston, IL, USA

Areas of Interest: Immuno-oncology, targeted oncology, Translational science and drug development, Research in Ayurveda and traditional healing



Dr. Jeff Perry
Assistant Professor

The City of Hope Medical Centre, California, USA
Ph.D. Natural Science, University of Cambridge, UK, 2000

Areas of Interest: Structural Biology

Dr. Carol C. Gregorio
Professor, Icahn School of Medicine at Mount Sinai Cellular and Molecular Medicine

Director and Founder, Centre for Cardiac Muscle Biology, Cardiovascular Research Institute, New York, USA

Areas of Interest: Cardiovascular Research

Dr. Taslimarif Saiyed
(Director and COO of C-CAMP, Centre for Cellular and Molecular Platforms), Bengaluru

Ph.D. in Neuroscience from Max-Planck Institute for Brain Research, Germany

Areas of Interest: Translation Biology, Breakthrough Innovations, Life Science Entrepreneurship

Dr. Shabarinath Subramaniam
Director of Business Development, Phoenix Bioinformatics, Newark, CA, USA

M.Sc. Computational Biology, University of Southern California, USA 2002, M.Sc. Psychiatry, McGill University, Montreal, Canada, 2000

Areas of Interest: Comparative Genomics, Computational Modeling of Biological systems

Dr. Avinash K. Shah
Professor of Biochemical Engineering, M.S. University, Baroda

Ph.D. Microbiology

Areas of Interest: Research in Product Development, Environment Protection, Effluent treatment, Biological Control of Plant Pathogens, Biodegradable Polymers

Dr. Praveen Nair
Vice President, Translational Pharmacology, Immuneering Corporation, USA

Ph.D. in Medical Microbiology, University of Georgia, USA

Areas of Interest: In Vitro Assay Development, Translational Research

Dr. Prashanth Athri
DGM, Reliance Digital Health / CEO of Bio-Cube, Bengaluru

Ph.D. in Computational Chemistry (major) and Bioinformatics (minor) from Georgia State University, Atlanta, Georgia, USA

Areas of Interest: Application of statistical pattern recognition /machine learning and genetic algorithms to the field of structure-based molecular design and bioinformatics.

ACADEMIC
PROGRAMMES OFFERED

The School follows a credit-based system, which is a systematic way of pursuing an educational programme by attaching credits to its components. When enough credits are accrued or earned, the programme is completed successfully. The credit-based system makes educational programmes easy to understand, comparable and competitive both nationally and internationally. It facilitates mobility, academic flexibility and universality and helps universities to organize as well as recognize their study programmes quickly.

UNDERGRADUATE PROGRAMMES

Duration - Four Years (Eight Semesters)

B.Sc. Honours Microbiology Curriculum

SEMESTER 1

Sl. No.	Course Name
1	INTRODUCTORY BIOLOGY
2	CHEMISTRY
3	ENGLISH
4	INTRODUCTORY MICROBIOLOGY
5	PHYSICS
6	FOUNDATIONS OF INDIAN HERITAGE
7	MASTERY OVER MIND (MAOM)
8	INTRODUCTORY MICROBIOLOGY LAB

SEMESTER 2

Sl. No.	Course Name
1	MICROBIAL ECOLOGY, DIVERSITY & CLASSIFICATION
2	BIOCHEMISTRY
3	ENGLISH-CREATIVE WRITING & SOFT SKILLS
4	INFORMATION SYSTEMS
5	MATHEMATICS
6	GLIMPSES OF GLORIOUS INDIA
7	PHYSICAL SCIENCES LAB
8	BIOCHEMISTRY LAB

SEMESTER 3

Sl. No.	Course Name
1	MOLECULAR BIOLOGY
2	MYCOLOGY
3	BIOSTATISTICS
4	ANALYTICAL BIOCHEMISTRY
5	VIROLOGY
6	INTRODUCTORY BIOINFORMATICS
7	STRATEGIC LESSONS FROM MAHĀBHĀRATA
8	GENERAL MICROBIOLOGY LAB
9	CELL AND MOLECULAR BIOLOGY LAB

SEMESTER 4

Sl. No.	Course Name
1	CELL BIOLOGY
2	MICROBIAL PHYSIOLOGY & METABOLISM
3	IMMUNOLOGY
4	ENZYME TECHNOLOGY
5	HUMAN PHYSIOLOGY
6	FOOD MICROBIOLOGY
7	SOFT SKILLS-I
8	LEADERSHIP FROM RĀMĀYANA(AVP)
9	IMMUNOLOGY LAB
10	FOOD MICROBIOLOGY LAB

SEMESTER 5

Sl. No.	Course Name
1	PYTHON FUNDAMENTALS FOR BIOLOGISTS
2	INDUSTRIAL MICROBIOLOGY
3	MEDICAL BACTERIOLOGY
4	ENVIRONMENT & AGRICULTURAL MICROBIOLOGY
5	RESEARCH METHODOLOGY
6	SOFT SKILLS-II
7	LIVE-IN-LABS/OPEN ELECTIVE
8	INDUSTRIAL MICROBIOLOGY LAB
9	MEDICAL BACTERIOLOGY LAB

SEMESTER 6

Sl. No	Course Name
1	INHERITANCE BIOLOGY
2	PHARMACOLOGY
3	PARASITOLOGY
4	MICROBIAL PATHOGENESIS
5	RECOMBINANT DNA TECHNOLOGY
6	GENETIC ENGINEERING LAB
7	ARTIFICIAL INTELLIGENCE FOR BIOLOGY

SEMESTER 7

Sl. No	Course Name
1	METABOLIC ENGINEERING
2	RESEARCH ETHICS, SCIENCE COMMUNICATION AND IPR MANAGEMENT
3	APPLIED BIOANALYTICAL METHODS
4	ELECTIVE 1*
5	ADVANCED MOLECULAR GENETICS AND GENE EXPRESSION LAB
6	ADVANCED PHARMACEUTICAL BIOSCIENCES

SEMESTER 8

Sl. No.	Course Name
	B.Sc. Honours By Research
1	PROJECT
	B.Sc. Honours Regular
1	MINI PROJECT
2	ELECTIVE 2*
3	ELECTIVE 3*

B.Sc. Honours Biotechnology Curriculum

SEMESTER 1

Sl. No	Course Name
1	INTRODUCTORY BIOLOGY
2	CHEMISTRY
3	ENGLISH
4	INTRODUCTORY MICROBIOLOGY
5	PHYSICS
6	FOUNDATIONS OF INDIAN HERITAGE
7	MASTERY OVER MIND (MAOM)
8	INTRODUCTORY MICROBIOLOGY LAB

SEMESTER 2

Sl. No	Course Name
1	PRINCIPLES OF ECOLOGY AND EVOLUTION
2	BIOCHEMISTRY
3	ENGLISH-CREATIVE WRITING & SOFT SKILLS
4	INFORMATION SYSTEMS
5	MATHEMATICS
6	GLIMPSES OF GLORIOUS INDIA
7	PHYSICAL SCIENCES LAB
8	BIOCHEMISTRY LAB

SEMESTER 3

Sl. No	Course Name
1	MOLECULAR BIOLOGY
2	BIOSTATISTICS
3	PLANT BIOLOGY
4	ANALYTICAL BIOCHEMISTRY
5	VIROLOGY
6	INTRODUCTORY BIOINFORMATICS
7	STRATEGIC LESSONS FROM MAHĀBHĀRATA
8	GENERAL MICROBIOLOGY LAB
9	CELL AND MOLECULAR BIOLOGY LAB

SEMESTER 4

Sl. No	Course Title
1	HUMAN PHYSIOLOGY
2	GENETICS
3	IMMUNOLOGY
4	ENZYME TECHNOLOGY
5	CELL BIOLOGY
6	INTRODUCTORY BIOPHYSICS
7	SOFT SKILLS - 1
8	LEADERSHIP FROM RĀMĀYANA(AVP)
9	IMMUNOLOGY LAB
10	ENZYMOLOGY LAB

SEMESTER 5

Sl. No	Course Name
1	PYTHON FUNDAMENTALS FOR BIOLOGISTS
2	OMES AND OMICS
3	BIOENERGETICS AND METABOLISM
4	INDUSTRIAL & ENVIRONMENTAL BIOTECHNOLOGY
5	RESEARCH METHODOLOGY
6	INDUSTRIAL BIOTECHNOLOGY LAB
7	SOFT SKILLS - II
8	LIVE-IN-LABS/OPEN ELECTIVE

SEMESTER 6

Sl. No	Course Name
1	PHARMACOLOGY
2	DEVELOPMENTAL BIOLOGY
3	GENETIC ENGINEERING
4	PLANT AND ANIMAL TISSUE CULTURE
5	PLANT AND ANIMAL TISSUE CULTURE Lab
6	ARTIFICIAL INTELLIGENCE FOR BIOLOGY
7	GENETIC ENGINEERING LAB

SEMESTER 7

Sl. No	Course Name
1	METABOLIC ENGINEERING
2	RESEARCH ETHICS, SCIENCE COMMUNICATION AND IPR MANAGEMENT
3	APPLIED BIOANALYTICAL METHODS
4	ELECTIVE 1*
5	ADVANCED MOLECULAR GENETICS AND GENE EXPRESSION LAB
6	ADVANCED PHARMACEUTICAL BIOSCIENCES

SEMESTER 8

Sl. No.	Course Title
	B.Sc. Honours By Research
1	PROJECT
	B.Sc. Honours (Regular)
1	MINI PROJECT
2	ELECTIVE 2*
3	ELECTIVE 3*

List of Electives

ELECTIVES I - SEMESTER 7

Sl. No	Course Title
1	EMBRYOLOGY
2	HOST-PATHOGEN INTERACTION AND HUMAN MICROBIOME
3	MOLECULAR FLUORESCENCE: APPLICATIONS IN CHEMICAL BIOLOGY

ELECTIVES II & III - SEMESTER 8

Sl. No	Course Title
1	CANCER BIOLOGY
2	PHAGE BIOLOGY
3	CELL SIGNALLING
4	BIOMIMICRY
5	NEUROSCIENCE
6	REGENERATIVE BIOLOGY & STEM CELLS

POSTGRADUATE PROGRAMMES

Duration - Two years (four semesters)

M.Sc. Biotechnology Curriculum

SEMESTER 1

Sl. No	Course Name
1	CELL BIOLOGY & STEM CELL BIOLOGY
2	MOLECULAR BIOLOGY
3	BIOCHEMISTRY
4	ETHICS IN RESEARCH & INTELLECTUAL PROPERTY RIGHTS
5	MICROBIOLOGY
6	BIOSTATISTICS
7	CULTURAL EDUCATION
8	SOFT SKILLS
9	MICROBIOLOGY - LAB
10	BIOCHEMISTRY - LAB

SEMESTER 2

Sl. No	Course Name
1	MOLECULAR GENETICS
2	RESEARCH METHODOLOGY
3	RECOMBINANT DNA TECHNOLOGY
4	ADVANCED PHARMACEUTICAL BIOTECHNOLOGY
5	INDUSTRIAL BIOTECHNOLOGY
6	BIOANALYTICAL TECHNIQUES
7	RECOMBINANT DNA TECHNOLOGY - LAB
8	INDUSTRIAL BIOTECHNOLOGY - LAB
9	BT ELECTIVE - 1
10	AMRITA VALUES PROGRAMME
11	SOFT SKILLS - II

BT ELECTIVE 1

1	CANCER BIOLOGY
2	PHAGE BIOLOGY
3	CELL SIGNALING
4	BIOMIMICRY
5	MOLECULAR & CELLULAR BIOPHYSICS
6	NEUROSCIENCE
7	ADVANCED BIOCHEMISTRY
8	REGENERATIVE BIOLOGY AND STEM CELLS

SEMESTER 3

Sl. No	Course Name
1	MOLECULAR & CELLULAR IMMUNOLOGY & BIOLOGY OF VACCINES
2	ADVANCED DISCOVERY BIOLOGY
3	PLANT & ANIMAL BIOTECHNOLOGY
4	MASS SPECTROMETRY & PROTEOMICS
5	BIOINFORMATICS
6	BT ELECTIVE - 2
7	IMMUNOLOGY - LAB
8	CELL & MOLECULAR BIOLOGY - LAB
9	OPEN ELECTIVE

BT ELECTIVE 2	
1	NANOBIOTECHNOLOGY
2	DEVELOPMENTAL BIOLOGY
3	MOLECULAR & CELLULAR NEUROSCIENCE
4	RECENT TRENDS IN RNA BIOLOGY
5	ECOLOGY & EVOLUTION
6	GLYCOBIOLOGY
7	MATRIX BIOLOGY AND BIOMATERIALS
8	CARDIAC BIOLOGY
9	IMMUNOTHERAPEUTICS IN INFECTIOUS DISEASE

M.Sc. Microbiology Curriculum

SEMESTER 1	
Sl. No	Course Name
1	CELL BIOLOGY & STEM CELL BIOLOGY
2	MOLECULAR BIOLOGY
3	BIOCHEMISTRY
4	ETHICS IN RESEARCH & INTELLECTUAL PROPERTY RIGHTS
5	MICROBIOLOGY
6	BIOSTATISTICS
7	CULTURAL EDUCATION
8	SOFT SKILLS
9	MICROBIOLOGY - LAB
10	BIOCHEMISTRY - LAB

SEMESTER 2	
Sl. No	Course Name
1	MOLECULAR GENETICS
2	RESEARCH METHODOLOGY
3	RECOMBINANT DNA TECHNOLOGY
4	ADVANCED PHARMACEUTICAL BIOTECHNOLOGY
5	INDUSTRIAL BIOTECHNOLOGY
6	BACTERIAL & VIRAL PATHOGENESIS
7	RECOMBINANT DNA TECHNOLOGY - LAB
8	INDUSTRIAL BIOTECHNOLOGY - LAB
9	MB ELECTIVE - 1
10	AMRITA VALUES PROGRAMME
11	SOFT SKILLS - II

MB ELECTIVE 1	
1	CANCER BIOLOGY
2	PHAGE BIOLOGY
3	CELL SIGNALING
4	BIOMIMICRY
5	BIOANALYTICAL TECHNIQUES
6	MOLECULAR & CELLULAR BIOPHYSICS
7	NEUROSCIENCE
8	ADVANCED BIOCHEMISTRY
9	REGENERATIVE BIOLOGY & STEM CELLS

SEMESTER 4	
Sl. No	Course Name
1	DISSERTATION/THESIS

SEMESTER 3	
Sl. No	Course Name
1	MOLECULAR AND CELLULAR IMMUNOLOGY & BIOLOGY OF VACCINES
2	MICROBIAL PHYSIOLOGY
3	FOOD MICROBIOLOGY
4	MYCOLOGY
5	PARASITOLOGY
6	ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY
7	MB ELECTIVE - 2
8	IMMUNOLOGY - LAB
9	FOOD MICROBIOLOGY - LAB
10	OPEN ELECTIVE

MB ELECTIVE 2	
1	NANOBIOTECHNOLOGY
2	DEVELOPMENTAL BIOLOGY
3	MOLECULAR & CELLULAR NEUROSCIENCE
4	RECENT TRENDS IN RNA BIOLOGY
5	MASS SPECTROMETRY & PROTEOMICS
6	ECOLOGY & EVOLUTION
7	GLYCOBIOLOGY
8	MATRIX BIOLOGY AND BIOMATERIALS
9	BIOINFORMATICS
10	ADVANCED DISCOVERY BIOLOGY
11	CARDIAC BIOLOGY
12	IMMUNOTHERAPEUTICS IN INFECTIOUS DISEASE

SEMESTER 4	
Sl. No	Course Name
1	DISSERTATION/THESIS

M.Sc. Bioinformatics Curriculum

SEMESTER 1

Sl. No	Course Name
1	INTRODUCTION TO BIOINFORMATICS
2	MOLECULAR BIOLOGY
3	CELL BIOLOGY AND STEM CELL BIOLOGY
4	DATA ENGINEERING AND ADMINISTRATION
5	APPLIED MATHEMATICS FOR BIOINFORMATICS
6	PROGRAMMING LANGUAGE CONCEPTS
7	BIOINFORMATICS TOOLS (LAB)
8	DATA ENGINEERING AND ADMINISTRATION (LAB)
9	PROGRAMMING FOR BIOINFORMATICS (LAB)
10	CULTURAL EDUCATION
11	SOFT SKILLS L
12	ER&IPR

SEMESTER 2

Sl. No	Course Name
1	STRUCTURAL BIOINFORMATICS
2	MOLECULAR SEQUENCE ANALYSIS
3	PYTHON FOR BIOINFORMATICS
4	R FOR BIOINFORMATICS
5	CHEMISTRY OF BIOMOLECULES
6	BIOLOGICAL DATA SCIENCES AND MACHINE LEARNING
7	BIOSTATISTICS AND RESEARCH METHODOLOGY
8	BASICS OF BIOLOGY (LAB)
9	PYTHON FOR BIOINFORMATICS (LAB)
10	R FOR BIOINFORMATICS (LAB)
11	AMRITA VALUES PROGRAMME
12	SOFT SKILLS LI

SEMESTER 3

Sl. No	Course Name
1	EVOLUTION AND COMPARATIVE GENOMICS
2	MATHEMATICAL MODELING FOR BIOLOGICAL SYSTEMS
3	BIOINFORMATICS OF HIGH THROUGHPUT ANALYSES
4	WEB PROGAMMING USING OBJECT-ORIENTED LANGUAGES
5	CADD & PHARMACOINFORMATICS
6	SYSTEMS BIOLOGY
7	BIOINFORMATICS OF HIGH THROUGHPUT ANALYSES (LAB)
8	WEB PROGAMMING USING OBJECT-ORIENTED LANGUAGES (LAB)
9	OPEN ELECTIVE / LIVE-IN-LABS
10	NEXT-GENERATION SEQUENCING ANALYSIS
	ELECTIVE 1

SEMESTER 4

Sl. No	COURSE NAME
1	DISSERTATION/THESIS

Ph.D.
LIFE SCIENCES

A Ph.D. in Life Sciences provides students with advanced training in Biotechnology and related disciplines along with investigative research experiences. The programme typically takes four to five years to complete and involves intensive research, coursework, presentations and components for analytical skill development.

During the coursework phase, students learn diverse topics in life sciences, biostatistics, research ethics and experimental design. They also participate in seminars, conferences, journal clubs, and laboratory rotations to develop their research skills.

To be admitted into a Ph.D. in Life Sciences programme at the Amrita Vishwa Vidyapeetham, applicants are required to have a master's degree or equivalent in a related field, as well as a solid academic record, and letters of recommendation.

Overall, a Ph.D. in Life Sciences is an excellent option for students interested in pursuing a career in the life sciences and making significant contributions to the field through research and innovation.

RESEARCH

The Amrita School of Biotechnology is at the forefront of cutting-edge biotechnology research. Its multidisciplinary approach encompasses fields such as molecular biology, bioinformatics, and synthetic biology. With state-of-the-art laboratories and expert faculty, the school focuses on diverse research areas, including antimicrobial resistance, drug discovery, cancer biology, stem cells and regenerative biology, cardiovascular diseases, disease diagnostics, and sanitation biotechnology, fostering innovation and addressing global challenges in healthcare and sustainability.

09+ Patents | **53+** Funded Projects | **$2+** Million Research Funding | **335+** International Publications

Biotechnological Innovations | Next-Generation Technologies | Translational Research Excellence

Immune Modulation for Cardiac Regeneration

Stem Cells and Regeneration

Heart diseases are the leading global cause of morbidity and mortality, with myocardial infarction (MI) causing substantial damage to cardiac tissue. MI leads to an irreversible loss of functional myocytes, which results in the formation of non-functional scar tissue (fibrosis) rather than regeneration. This project aims to uncover strategies for modulating the immune milieu to promote myocardial regeneration while mitigating pathological fibrosis. Thus, we aspire to pioneer novel therapeutic interventions that restore cardiac function by enhancing regeneration and reducing pathological fibrosis to improve patient outcomes.

PI(s): **Dr. Indulekha Pillai,** School of Biotechnology

Bioconjugation of Activated Heterocycles

Protein Quantitation and Visualisation

The accurate detection and quantitation of proteins is a vital part of biological research. Our research group has recently developed a detergent compatible protein quantitation assay based on the chemistry of activated furans with proteins (US Patent 11,125,754 B2). These versatile molecules were also proved to be potential mass spectrometry compatible staining agents for proteins in gel electrophoresis (US Patent 12,287,308 B2). Currently we are exploring these molecules as ligands for protein purification

PI(s): **Dr. Sobha Vijayan Nair,** School of Biotechnology;
Collaborator(s): **Dr. Bipin Nair,** School of Biotechnology; **Dr. R. Prakash Chandran,** MMNSS College, Kottiyam, Kerala.

Epigenetic Role of Macrophage Proteins in TB

Infectious Disease Biology

Mycobacterium tuberculosis (MTB) alters macrophage gene expression via histone modifications. Post-MTB infection, a significant increase in phosphorylated HDAC1 levels are observed, alongside reduced histone H3 acetylation and increased HDAC1 recruitment to IL-12B and ATG5 promoters. This study aims to identify host proteins associated with epigenetic modifiers during infection and understand their roles in bacterial survival and macrophage polarization.

PI(s): **Dr. Aravind Madhavan**, School of Biotechnology;
Collaborator(s): **Dr. Binod Parameswaran**, National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram; **Dr. Lekshmy K Edison**, University of Florida, USA.

Mycobacterial secretory proteins Role in TB Immune Evasion

Infectious Disease Biology

Tuberculosis, caused by Mycobacteria is a leading global cause of death, particularly in tropical regions. Despite the long-term use of anti-TB drugs and the BCG vaccine, TB remains a pervasive issue. Identifying antigens that enable the pathogen to survive intracellularly by evading host defenses is critical. Recent studies highlight autophagy as a key mechanism disrupting mycobacterial survival within cells, making it a target for enhancing host-directed therapies. Identifying antigens that inhibit autophagy and understanding their mechanisms could significantly advance TB drug discovery. This study aims to identify HDAC1's interacting mycobacterial partners in mycobacterial survival within macrophages, potentially leading to novel therapeutic strategies against TB.

PI(s): **Dr. Aravind Madhavan**, School of Biotechnology;
Collaborator(s): **Dr. Sabu Thomas**, Centre for Excellence in Microbiome, Govt. of Kerala;
Dr. Binod Parameswaran, Microbial Processes and Technology Division, NIIST;
Dr. Lekshmy K Edison, University of Florida, USA.

Scaffolds to Treat Diabetic Wounds

Nitric Oxide Releasing Multifaceted Biomaterials

The advancement in treating diabetic wounds hinges on the development of multifunctional scaffolds which integrate cutting-edge technologies. One such approach involves the combination of a Nitric Oxide (NO) releasing electrospun mat with an oxygen-releasing cryogel. These synergistic materials offer a promising avenue for enhancing wound healing efficacy by addressing key physiological challenges associated with diabetic wounds. Additionally, the incorporation of phage cocktails into these scaffolds presents a novel strategy to combat microbial infections commonly complicates diabetic wound healing. By harnessing the therapeutic potential of NO and phage therapy within a single platform, these innovative scaffolds hold the potential to revolutionize diabetic wound care, offering a holistic and efficacious treatment approach.

PI(s): **Dr. Geetha Kumar**, and **Dr. Bipin Nair**, School of Biotechnology;
Collaborator(s): **Prof. Sandeep Verma**, and **Prof. Ashok Kumar**, IIT Kanpur.

Inhibit and Reverse Cardiac Calcification

Modulating Macrophage Phenotype

Calcification refers to the abnormal mineralization in soft tissue that occurs in response to injury, ageing, kidney disease, and diabetes. Calcification in the cardiovascular system causes mechanical and electrical conduction blocks that increase the morbidity and mortality of heart disease. Understanding the precise molecular mechanisms and effective treatment strategies for calcification is an unmet clinical need. We are investigating the molecular mechanisms of cardiac fibroblast-mediated calcification and methods to inhibit and reverse cardiac calcification by modulating the macrophages in an injury niche.

PI(s): **Dr. Indulekha Pillai**, School of Biotechnology;
Collaborator(s): **Dr. Bipin Nair**, School of Biotechnology.

Venomics and Antivenomics of Medically Important Snake Species

Snake Venom Research

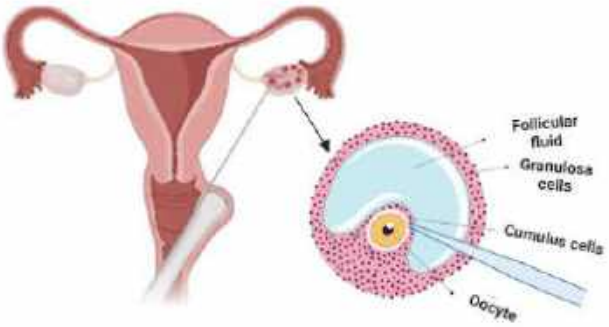
Snake venom is a complex mixture of proteins, metal ions, and other components, showing considerable variation across species, and this poses challenges for antivenom efficacy. Considering these factors, the current project focuses on characterizing the venom proteome of medically significant snake species from various geographical locations in India. This research aims to investigate the venom composition and identify the functional roles of the venom components using a multi-omics approach. Additionally, we aim to assess the immunological cross-reactivity of existing antivenom and develop diagnostic kits for snake species identification.

PI(s): **Dr. Muralidharan V**, School of Biotechnology;
Collaborator(s): **Kerala Forest Department** and **MVR Snake Park & Zoo**, Kannur.

Multi-Omics of Follicular Fluid in Diminished Ovarian Reserve

Omics for Disease Biology

Standard-of-care options for treating Diminished Ovarian Reserve (DOR) are lacking, with most patients relying on Dehydroepiandrosterone (DHEA) and various stimulation protocols, ultimately resorting to IVF with donor eggs. Identifying alternative treatments is clinically crucial. Ayurvedic treatments, with their holistic approach, may offer potential avenues for achieving this goal by targeting various aspects of reproductive health and hormonal balance. This project aims to determine the efficacy of an Ayurvedic treatment protocol before IVF in women with DOR to enhance ovarian reserve, thereby improving conception chances with their ovum. Patients with DOR will undergo Ayurvedic treatment to improve AMH and AFC levels. Therapeutic targets will be identified using proteomics, metabolomics, and transcriptomics approaches on follicular fluid from patients before and after treatment. This research aims to investigate the role of Ayurvedic treatment protocols as a prerequisite for IVF in women with DOR, utilizing multi-omics approaches to elucidate underlying mechanisms.



PI(s): **Dr. Muralidharan V**, School of Biotechnology;
Collaborator(s): **Dr. Anjaly M. V.**, School of Ayurveda; **Dr. Avani Pillai**, School of Medicine.

Intelligent Artificial Pancreas

with Cost-effective Insulin Pump

The development of closed-loop artificial pancreas (AP) system for the delivery of a specific dose of insulin depends on current and predicted blood glucose and insulin levels. This will include the application of commercially available continuous glucose monitoring systems, along with a central computing device called the AP Hub and an automated insulin pump for delivery of insulin in a programmable and automated manner.

PI(s): **Dr. Bipin Nair**, School of Biotechnology;
Collaborator(s): **Prof. Radhakant Padhi,** IISc, Bangalore; **Dr. V Mohan** and **Dr. RM Anjana**, Madras Diabetes Research Foundation, Chennai; **Dr. Pramila Kalra** and **Dr. Chitra Selvan**, M S Ramaiah Medical College, Bengaluru.

Bacteriophages in Home Care

Sanitation Biotechnology

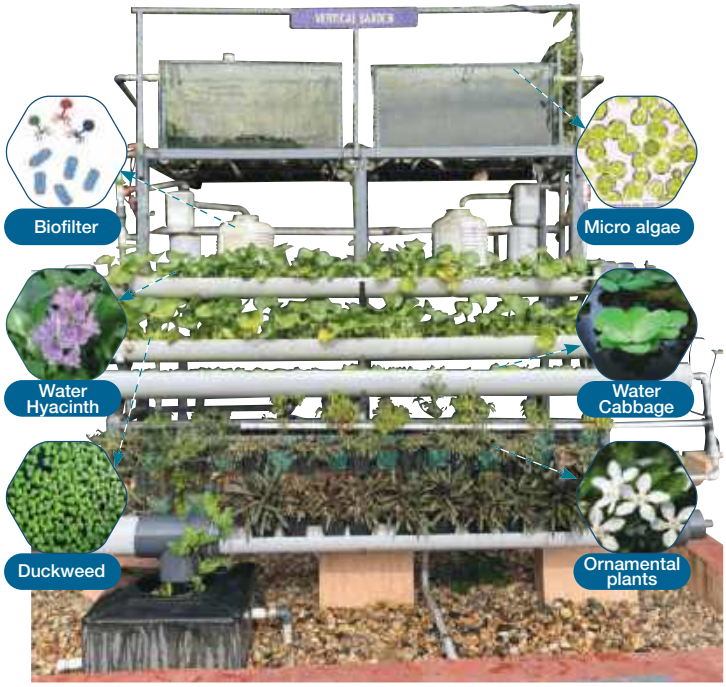
Efforts focus on controlling biogenic smell and infection in waste management for domestic households using ecological and microbiome engineering principles. Techniques include bacteriophages, probiotics, and prebiotics/selective media to target bacteria, alongside managing physicochemical parameters to establish a desirable microbiome.

PI(s): **Dr. Sanjay Pal,** School of Biotechnology;
Collaborator(s): **Dr. Ajith Madhaban**, and **Dr. Bipin Nair**, School of Biotechnology; **Dr. Sandeep Varma**, Unilever, Bengaluru, India.

Vertical Garden for Wastewater Treatment

Sustainable Solutions

A vertical garden system (500 litre per day pilot plant) with five biofiltration units, along with suitable plants, was developed to control infection and smell in domestic wastewater. The system achieved a 4-log reduction in coliform count and a ~60% decrease in total bacterial and nutrient load (biochemical oxygen demand), with final BOD less than 10 mg/L. This system offers an effective solution for addressing urban air and water pollution while also providing the prospect of carbon sequestration and urban agriculture in most sustainable manner.



PI(s): **Dr. Sanjay Pal**, School of Biotechnology;
Collaborator(s): **Dr. Ajith Madhavan**, **Amrita Salim**, **Dr. Bipin Nair**, School of Biotechnology.

Malodor Mitigation By Bacteriophages

Decentralized Wastewater Treatment

The project focuses on developing a novel, cost-effective, and environmentally friendly biological strategy to mitigate malodor from decentralized wastewater treatment systems in India. These systems, handling close to 50% of municipal wastewater, often suffer from malodor issues due to compounds like hydrogen sulfide, methanethiol, and ammonia, with Methanethiol having the highest odor threshold and causing significant health issues. Traditional odor removal methods, while effective, are costly and complex. The project aims to utilize bacteriophages (phages), viruses that specifically infect and kill odor-causing bacteria, as a targeted solution. By selecting suitable phages to reduce these bacteria, the objective is to address malodor issues efficiently, enhancing the usability and acceptance of decentralized wastewater systems and contributing to the circular economy.

PI(s): **Dr. Ajith Madhavan**, School of Biotechnology.

Solutions Against Candida Infections

Antimicrobial Resistance

The emergence of multidrug-resistant pathogenic microbes is a major threat to public health. The WHO has categorized these pathogens into critical, high, and medium priority based on the urgency for new treatment modalities. This emphasizes the need to identify new strategies to treat microbes. An anti-virulent strategy is promising as it targets virulence factors and their regulators, including quorum sensing pathways. In 2022, The WHO published the first-ever fungal priority pathogens based on the risk of infection and the urgent need for interventions. Studies in our lab mainly focus on the fungal pathogen C. albicans. Our work aims to develop natural and synthetic modulators of virulence traits of microbes and their impact on hosts.

PI(s): **Dr.Jayalakshmi H**, School of Biotechnology;
Collaborator(s): **Dr. Peralam Yegneswaran Prakash**, Manipal University;
Origin Diagnostics and Research, India.

Biogenic Nanoparticles for Climate-Resilient Crops

Natural Products Lead Discovery and Green Chemistry

The project addresses the agricultural impacts of global warming, such as micronutrient deficiencies and soil degradation, using biogenic iron oxide nanoparticles (FeNp) synthesized from seaweed Chaetomorpha spp. These nanoparticles are employed as nanofertilizers to enhance millet plant growth and alleviate abiotic stress. (BRITE project 2017-2019). Subsequent studies explored nano-phytoremediation with FeNp for removing arsenic and other contaminants from wastewater and adsorbing microplastics, presenting a novel method (BRITE project 2019-2020). The current focus of the project assesses the impact of microplastic on azolla in aquatic systems and evaluates FeNp's efficacy in removing microplastics without harming the environment or aquatic plants (BRITE project 2021-2024). The goal is to develop sustainable nanotechnology solutions to address for agricultural and environmental challenges.

PI(s): **Dr. Dalia Vishnudasan**, School of Biotechnology;
Collaborator(s): **P K Manoj**, TKM College of Arts and Science

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Inhibition of Biofilm Formation

Combating Microbial Pathogenesis and Infections

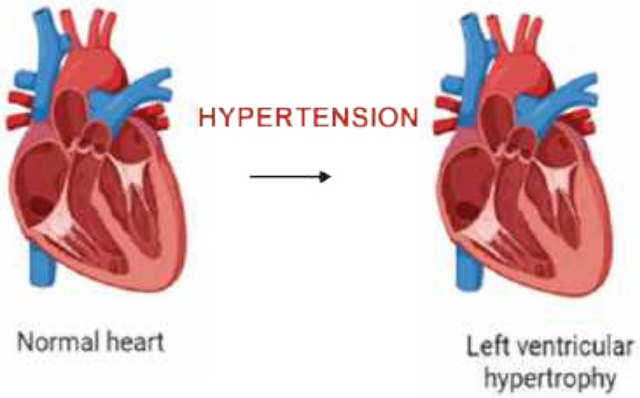
This project aims to combat antimicrobial resistance by targeting the virulence mechanisms of microbes using synthetic compounds and antimicrobial surfaces. Studies have shown that most of hospital-acquired infections are associated with implants. Our group aims at develop new polymer surface coatings that could prevent microbial adhesion and biofilm formation. It is envisaged that these antimicrobial surface coatings, when applied on implant materials, could reduce health care related infections significantly.

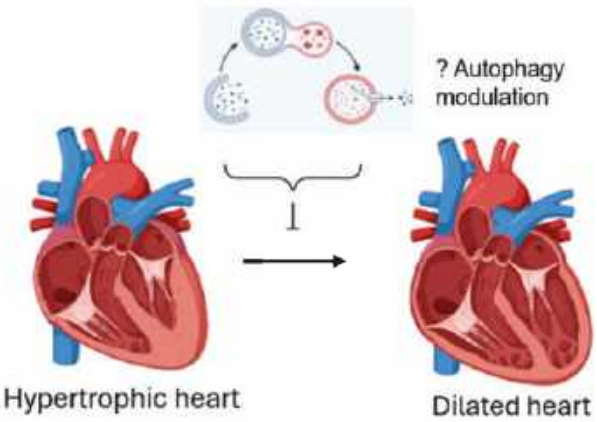
PI(s): **Dr. Sobha Vijayan Nair,** Co PI (s): **Dr. Jayalekshmi H.,** School of Biotechnology;
Collaborator(s): **Dr. R. Prakash Chandran,** MMNSS College, Kottiyam; **Dr. Sunil Kumar,** MG University, Kottayam; **Dr. Manojkumar T. K,** and **Dr. Anoop A,** Kerala University of Digital Sciences, Innovation, and Technology.

Association of Autophagy in Cardiac Hypertrophy

Cardiovascular Disease Biology

Cardiac hypertrophy is the first and foremost element in cardiac remodeling that occurs due to sustained hemodynamic load induced by hypertension. Although an initial adaptive response that sustains a normal cardiac output, hypertrophy can lead to heart failure in the long run. Current studies mainly focus on dissecting the autophagic paradox in angiotensin-II stimulated cardiac hypertrophy. Preliminary research were presented at the European Molecular Biology Organisation (EMBO) workshop, "Autophagy across scales" held in Italy in September 2024. There is an ongoing Government of India project (SERB POWER grant, 2022-25) which focuses on therapeutic targeting of autophagy in cardiac hypertrophy using phytochemicals derived from *Desmodium gangeticum.*





1. Normal heart 2. Hypertrophied heart

PI(s): **Dr. Vandana Sankar**, School of Biotechnology;
Collaborator(s): **Dr. Chinchu Bose**,
Dr. Bipin Nair, School of Biotechnology,
Dr. Dhandapany Perundurai, inStem, Bangalore,
Dr. Sapna Arjun, Queen Mary University of London.

Bioactive Molecule Producers in Extreme Environments

Novel Biomolecules from the Marine Environment

Marine organisms have adapted excellently to extreme environmental conditions with a range of physical parameters, such as pH, high salt concentration, low or high temperature, high-pressure, low nutrient availability, and low or high sun exposure. The wide diversity in the biochemical composition of marine organisms also provides an excellent reservoir to explore functional materials, many of which are rare or absent in other taxonomic groups.

Endophytes, microorganisms that live within plant tissues, are increasingly recognized as silent innovators of the microbial world. Among them, marine endophytes are especially captivating. Thriving in challenging environments of high salinity, pressure, and temperature, they have evolved unique metabolic pathways that enable the production of rare and powerful bioactive molecules. These adaptations make them a promising frontier for biotechnological research and innovation.

At our lab, we are actively exploring the potential of marine macroalgal endophytes across multiple fronts. Our studies focus on their ability to inhibit biofilms, offering natural strategies against persistent infections and industrial biofouling. These extremophiles use their plant growth-promoting traits, comprising nutrient solubilization, stress tolerance, and heavy metal bioremediation, to develop eco-friendly solutions for sustainable agriculture. Parallel efforts are directed toward their probiotic properties, which hold promise for improving host health in terrestrial as well as aquatic systems. Analysis of endophytic secretory biomolecules, which play a crucial role in all the above-said properties, is essential biotechnology research.

We are also advancing research on their role in green nanotechnology, particularly the biosynthesis of zerovalent iron nanoparticles (nZVI), which find applications in bioremediation, catalysis, and environmental cleanup. Another key focus is the exploration of their metabolites for cosmeceutical applications, particularly in natural skincare and wellness.

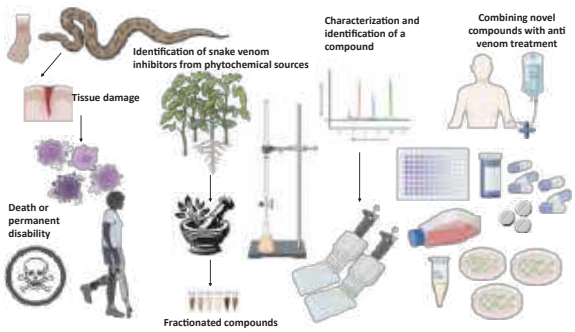
Through these efforts, our research positions marine organisms as nature's hidden biotechnologists, with the capacity to drive sustainable solutions across health, agriculture, environment, and industry.

PI(s): **Dr. Jayashree G.**, Assistant Professor, School of Biotechnology;
Co PI (s): **Dr. Sudarslal S.**, Professor, School of Biotechnology.

Natural product-based therapeutics for snakebite envenomation: Mechanistic insights into venom toxin inhibition

Snake Venom Research

This project emphasizes screening bioactive compounds from plant sources to identify phytochemical inhibitors against the medically important “Big 4” snakes in India. It revolves around how such inhibitors can neutralize specific toxins, thereby preventing venom-induced effects such as necrosis, which contribute to venom spread and tissue damage. The study aims to understand molecular interactions where plant-derived compounds block toxin activity, reducing systemic venom distribution and limiting local injury in envenomated tissues. Additionally, it investigates how phytochemical inhibitors prevent impairment of wound healing, facilitating faster recovery following snakebite. By examining toxin-specific inhibition and tissue responses, this research seeks to uncover how natural compounds safeguard cellular integrity while minimizing inflammation. Another key aspect of the research is the isolation and characterization of novel phytochemicals as therapeutic alternatives that can act alongside conventional antivenom therapy. This is to reduce the toxic impact of envenomation while salvaging tissue, thereby preventing permanent disability. By screening and evaluating natural product-based bioactives, the aim is to mitigate venom-driven cytotoxicity, necrosis, and inflammation. Ultimately, this study offers critical insights into toxin-neutralization strategies and holds the potential to develop nature-derived adjunct interventions for managing snakebite pathology.



PI(s): **Dr. Aswathy Alangode,** Assistant Professor, **Dr. Bipin Nair,** Professor & Dean, School of Biotechnology
Co-PI: **Dr. Chinchu Bose,** Assistant Professor, School of Biotechnology

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Plant-Derived Protease Inhibitors for Pest Control

Sustainable Agricultural Pest Control

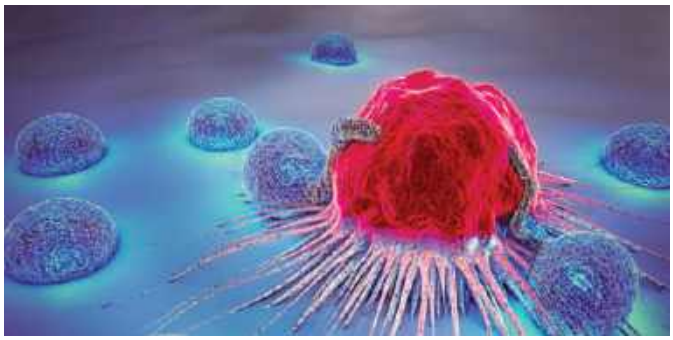
The project addresses the significant crop loss in India, where 30-35% of annual yield is wasted due to pests. Most commonly applied pesticides are losing effectiveness as insects develop resistance, necessitating new solutions. The focus of the project is to identify protease inhibitors (PIs), particularly trypsin inhibitors from plants, which hinder insect growth by forming enzyme-inhibitor complexes in their guts. To enhance their efficacy, the project proposes fusing PIs with cell-penetrating peptides (CPPs) to improve transmembrane permeability. Over the past few years, the lab has identified novel PIs from leguminous seeds and has been actively involved in constructing PI-CPP recombinant plasmids, expressing them in model systems, and testing their insecticidal properties.

PI(s): **Dr. Sudarslal S.**, School of Biotechnology;
Collaborator(s): **Dr. Rajaguru Aradhya**,
School of Biotechnology.

Regulation of ER-Phagy During Cancer Cell Death

Cancer Biology

Paraptosis is an alternate programmed cell death pathway to target apoptosis-resistant cancer cells. The main hallmark of paraptosis is the presence of large cytoplasmic vacuoles. Many natural products can induce ER stress in cancer cells, leading to cytoplasmic vacuolation and cell death. Recent studies indicate that ER stress, resulting from damage to the ER or the buildup of misfolded proteins, can activate autophagy and ER-phagy. These processes play a crucial role in maintaining ER homeostasis. We are investigating how ER-phagy is regulated during paraptosis in breast cancer cells. Uncovering the detailed mechanism of ER-phagy in cancer cell death and its key regulators will provide novel targets for cancer therapeutics.



PI(s): **Dr. Nandita Mishra**, School of Biotechnology;
Collaborator(s): **Dr. Bipin Nair**,
School of Biotechnology
Dr. Rekha Kar, The University of Texas Health Science Centre at San Antonio, USA.

Drug Repurposing and Natural Compounds for Alzheimers: Drosophila Insights

Drug Repurposing and Alzheimer's Disease

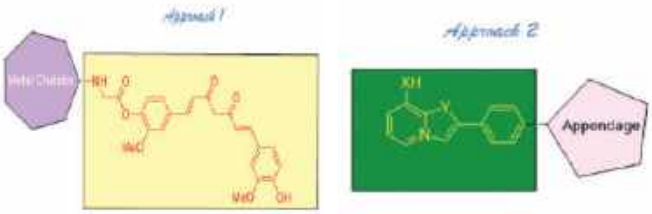
Drug repurposing and natural compounds targeting Alzheimer's disease (AD) pathways offer promising treatment options. Drosophila melanogaster, with its highly conserved biological pathways and ease of genetic manipulation, serves as a powerful model for studying Alzheimer's disease. Various Drosophila models expressing human Aβ42 and tau proteins have been successfully employed to simulate AD-like phenotypes, including memory loss, oxidative stress, and neurodegeneration. These models have been used to screen both repurposed drugs and novel synthetic compounds for their potential to mitigate AD-related pathology. These studies highlight the potential of Drosophila models for rapid drug screening and offer a foundation for the clinical development of AD therapies.

PI(s): **Dr. Rajaguru Aradhya**, **Dr. Parvathy Venugopal**, School of Biotechnology;
Collaborator(s): **Dr. Sobha V. Nair**, **Dr. Chinchu Bose**, **Dr. Bipin Nair**, School of Biotechnology.

Bifunctional Molecules to Probe Metal Amyloid - β Species in Alzheimer's Disease

Alzheimer's Disease Research

Metal ions associated with amyloid **β** have been implicated in AD neuropathogenesis. Therefore, to treat AD, small molecules that exihibit bifunctionality (metal chelation and amyloid **β** interaction) are being designed as potential therapeutic agents. The first approach links the structural components for metal chelation and amyloid **β** interaction. The second approach involves the incorporation of donor atoms for metal chelation into frameworks that interact with amyloid **β**. Comprehensive in vivo studies of these molecules need to be conducted. Common challenges in developing effective molecules include optimizing BBB permeability, stability, and toxicity. Efforts are being made to understand the role of metal-amyloid **β** species in AD neuropathogenesis.



PI(s): **Dr. Vipin A. Nair**, School of Biotechnology;
Collaborator(s): **Dr. Rajaguru Aradhya**, **Dr. Anu Melge**, Amrita School of Biotechnology.

NATURAL PRODUCTS FOR SOCIO-ENVIRONMENTAL SOLUTIONS

Green Process for Isolation of Phytochemicals

Sustainable Extraction and Green Chemistry

Conventional extraction and purification processes for natural compounds are laborious and time-consuming. We have developed a novel approach for the isolation of phytochemicals from plant extracts that is quick and involves a relatively small volume of solvents, making it eco-friendly. The applicability of the process has been established successfully by the isolation/separation of compounds from diverse structural backgrounds and in significant amounts.

PI(s): **Dr. Chinchu Bose**, **Dr. Bipin Nair**, School of Biotechnology

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Natural Products as Therapeutic Agents

Bioactive Compound Research

A potential secondary metabolite compound library has been continuously developed and maintained in the lab. Promising bioactive lead compounds contribute to a novel understanding on various physiological conditions have been generated through collaborative and in-house studies. This includes studies on inflammatory conditions, cancer therapy, prebiotics, cardiac health, bone diseases,and radioprotection studies, among others.

PI(s): **Dr. Chinchu Bose,**
Dr. Bipin Nair, School of Biotechnology

Sustainable Biomass Management for Circular Economy

Waste Valorization Research

Underutilized plants have the potential for further promotion as they are locally available as byproducts or waste materials such as cashewnut shell liquid, T*agates erecta* flowers, jackfruit seeds, coconut shell, *Sesuvium portulacatrum*, and onion peels, peels, all of which offer commercial value. Studies include:

i. Screening bioactive compounds from Ayurveda waste, such as ecdysterone from *Coscinium fenestratum*, used for synchronized molting in sericulture.
ii. Investigating anacardic acid's antifungal activity against rice blast fungus (*Magnaporthe oryzae*).
iii. Developing a prebiotic fish feed from indigenous seaweeds and underutilized plant biomass, enhancing ornamental fish health and color.

PI(s): **Dr. Chinchu Bose**,
Dr. Bipin Nair, School of Biotechnology

ARTIFICIAL INTELLIGENCE FOR BIOSCIENCES (AIBS) LAB

Our laboratory is utilising Artificial Intelligence (AI), Natural Language Processing (NLP), genomics, and proteomics to transform drug development and biological research methodologies. Integrating AI into the analysis of intricate biological data accelerates innovation and reveals new possibilities for personalised medicine and precision therapies.

Artificial Intelligence in Drug Development

AI in Drug Discovery

Drug discovery is a complex and costly process. AI methods are essential in speeding it up by predicting drug-target interactions, safety, and efficacy profiles. The AIBS lab focuses on AI-driven drug discovery using deep learning models for Drug-Target binding Affinity (DTA) and ADMET property prediction to screen molecules and ensure drug safety. The lab also develops molecular generation and optimization models using advanced algorithms like GANs and GPT. These approaches aim to accelerate drug discovery in fields such as oncology, antimicrobial resistance, and neurological disorders, thereby reducing experimental costs and time.

Artificial Intelligence In Genomics and Proteomics

AI in Microbial Genomics

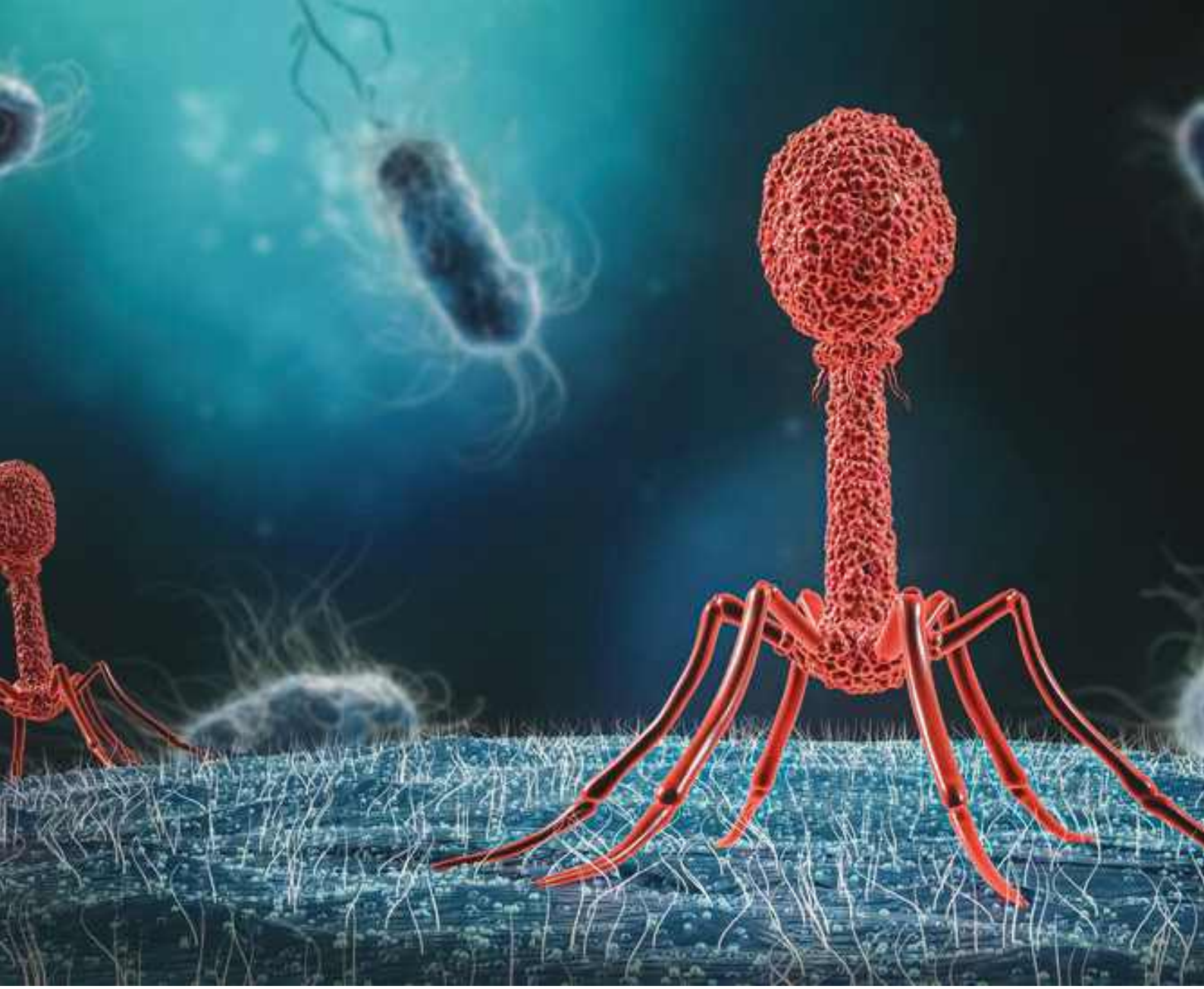
AI is revolutionizing proteomics and genomics by enabling the rapid analysis of biological data and biomarker identification. At AIBS, we use models like ESM-3 and DNA-BERT to predict antimicrobial resistance patterns in microorganisms and study phage-host protein interactions. By applying genomic models and neural networks, we predict antibiotic resistance patterns across species using whole genome data. Additionally, we focus on understanding the interactome profile of bacteriophages, aiming to engineer phage proteins to enhance their infectivity and specificity in host-pathogen interactions.

Natural Language Processing in Biological Sciences

AI-Driven Biomedical Data Analysis

NLP is transforming scientific literature and database analysis. At AIBS, we use advanced named entity recognition models and Large Language Models with Retrieval Augmented Generation (RAG) to create knowledge graphs from vast information sources. We are developing BioNERD, an AIbased NLP analytics platform with a user-friendly interface for data exploration. Our goal is to integrate natural language data with genomics, proteomics, and transcriptomics, enabling comprehensive analysis of complex biological systems. By combining AI, genomics, proteomics, and NLP, we aim to accelerate biological research and pharmaceutical development, offering innovative solutions for health challenges.

PI(s): **Dr. Nidheesh M**, Amrita School of Biotechnology;
Collaborator(s): **Dr. Pradeesh Babu**, **Mr. Joshy Alphonse**, **Dr. Geetha Kumar,** Amrita School of Biotechnology



Centre of Excellence in Antimicrobial Resistance Research

(Collaboration with Indian Institute of Technology, Kanpur)

Department of Science and Technology, Government of India

Antimicrobial resistance (AMR) represents an escalating global crisis that demands urgent attention. Given its burgeoning threat, prioritizing research initiatives geared towards devising innovative strategies to combat the menace of AMR is paramount. The research focus at the Centre of Excellence in AMR includes diverse strategies such as the isolation and characterization of novel lytic bacteriophages targeting the WHO priority pathogens, followed by the formulation of phage cocktails for the treatment of multidrugresistant infections non-responsive to conventional antibiotic therapy. Research at the centre is also focused on the identification of novel natural products or synthetic leads with promising antimicrobial properties, understanding host-pathogen interactions, identifying host-derived targets, and developing Point-of-Care (PoC) devices for the rapid detection and diagnosis of drug-resistant pathogens. Additionally, surveillance strategies integrating meta-omics and AI are being employed to better predict emerging patterns of resistance in a geospatial manner. These endeavours hold the potential to revolutionize treatment paradigms and expand our arsenal against AMR.

www.amrita.edu/www.amrita.edu/center/antimicrobial

Phage Therapy: A Solution for Multidrug Resistant Infections

Phage Therapy as a Powerful Solution to combat Multidrug Resistant Infections

With the growing global challenge of antibiotic resistance, phage therapy offers a natural and targeted approach to eliminate bacterial pathogens while preserving healthy microbiota. We explore and develop novel phage formulations specifically designed to target and effectively neutralize multidrug-resistant pathogens. This therapy harnesses the power of bacteriophages—viruses that specifically infect and destroy bacteria—offering a promising alternative in treating drug-resistant infections that are non-responsive to conventional treatment modalities. Our research also focuses on the development of ex vivo testing models, that allow us to assess the efficacy of these phage formulations under conditions that replicate the complexities of human infections, ensuring more accurate and relevant outcomes that can be effectively implemented in clinical settings. To further optimize our study's effectiveness, we will also also apply AIdriven models that enable us to garner a better understanding of the intricacies of the phage-host interactions, predict phage efficacy, tailor treatments, and accelerate the discovery of new phage formulations.

PI(s): **Dr. Geetha Kumar**, **Dr. Bipin Nair**, **Dr. Pradeesh Babu**, School of Biotechnology

Anti-Virulence Strategies to Combat AMR

Infectious Disease Therapeutics and Biofilm Disruption

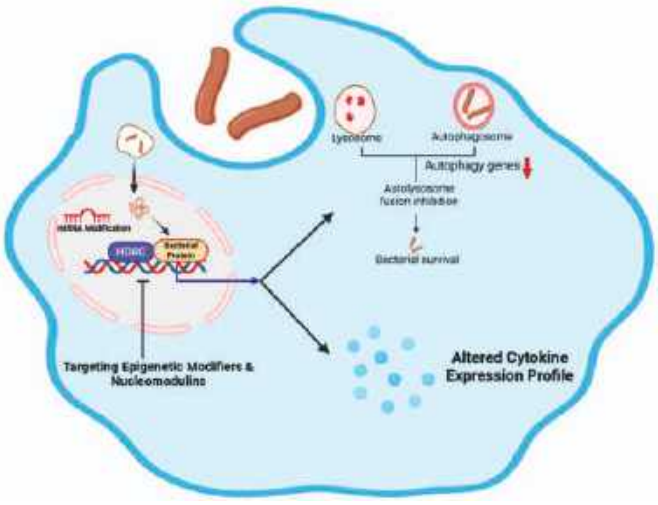
Antimicrobial resistance and tolerance play a significant role towards contributing to the therapeutic failure of infectious diseases. The propensity of pathogens to form intractable biofilms add an further burden and challenge in healthcare settings. Therefore, there is an urgent need for alternative strategies to counter the escalating global AMR crisis. Compounds that target virulence can attenuate pathogenicity and represent a promising alternative for the antimicrobials currently in use. Anti-virulent compounds have distinct properties, which including reduced selection pressure for the development of drug resistance and have the added advantage of not causing dysbiosis of the normal microbiome, unlike conventional antibiotics. Natural products have a rich repository of bioactive compounds and have been traditionally used in effectively to treat infectious diseases. Our research focuses on combating antimicrobial resistance, tolerance and biofilm in ESKAPE pathogens and Candida species by targeting virulence factors using natural compounds. These studies will also delve into the impact of anti-virulence strategies in host immunomodulation employing in vitro, ex vivo and in vivo methods, which will enhance our understanding of hostpathogen interactions.

PI(s): **Dr. Jayalekshmi H**, **Dr. Geetha Kumar**, **Dr. Bipin Nair**, School of Biotechnology

Development of Host-Directed Therapies to Combat AMR

Host-Pathogen Interaction and Epigenetic Modulation

Epigenetic regulators play a central role in the intracellular survival of pathogens like Klebsiella pneumoniae and Mycobacterium by modulating host immune responses and varying the expression of crucial host genes. In Klebsiella pneumoniae, these factors aid the bacterium in evading host defences by altering chromatin structure and gene expression patterns in host cells, thereby reducing the efficacy of the immune response. This permits the bacterium to survive within the intracellular environment, avoiding detection and destruction. Likewise, Mycobacterium species, such as Mycobacterium tuberculosis, exploit epigenetic mechanisms to survive within macrophages. By altering histones (HDACs) and DNA methylation patterns, these bacteria can hinder the gene expression responsible for the activation of autophagy. This allows them to reside in a dormant state within granulomas, evading immune surveillance and antibiotic treatment. Identifying antigens that enable these pathogens to survive intracellularly by interacting with host epigenetic modifiers is critical and understanding their mechanisms could significantly advance drug discovery. Thus, epigenetic regulators are key players in the intracellular survival strategies of both Klebsiella pneumoniae and Mycobacterium, influencing hostpathogen interactions and contributing to chronic infections and antibiotic resistance. Our research focuses on the identification of bacterial and host factors involved in epigenetic modifications to develop novel targets for host-directed therapies



PI(s): **Dr. Aravind Madhavan, Dr. Geetha Kumar, Dr. Bipin Nair,** School of Biotechnology.

Advantage **AMRITA**

A premier institution for higher education and research in Life Sciences in India under the aegis of Amrita Vishwa Vidyapeetham

- ✓ Faculty members with extensive industry and research experience from India and abroad.
- ✓ Curriculum in alignment with the latest NEP guidelines.
- ✓ The syllabus with choice-based credit system, also places a significant emphasis on research with societal impact, geared towards academia and industry.
- ✓ Unique opportunity to obtain dual degrees from Amrita and University of Arizona, USA simultaneously
- ✓ Excellent placement record - Our students have secured positions in premier pharmaceutical and biotechnology companies as well as leading national and international research institutions such as Merck Lifescience, Sun Pharma, Thermofisher Scientific, LabCorp India, Icon PLC, Saint Gobain, Hindustan Unilever.
- ✓ Well-equipped laboratories for the different labs are Genetic engineering, Biochemistry and Enzymology, Cell and Molecular biology, Immunology, Industrial Biotechnology, Food Microbiology, and Medical Bacteriology with advanced instrumentation.
- ✓ Spacious smart classrooms, auditorium, seminar and conference halls.
- ✓ AUMS, an integrated system that enables easy access to data, reports and statistical analysis of student progress along with a parent portal.
- ✓ State-of-the-art IT infrastructure with over 5000 computers connected with High-speed 150 Mbps internet, using Wi-Fi mesh network in the campus, along with dedicated email and file server facility for both students and faculty members.
- ✓ Library and reading room with access to contemporary online digital libraries, international editions of books and journals.
- ✓ Excellent sports facilities including gymnasium, swimming pool, volleyball, basketball and badminton courts.
- ✓ Disciplined and serene campus environment set in the midst of famous Kerala backwaters, providing an excellent ambience for learning and overall growth.
- ✓ Potential for active collaboration with faculty of top USA universities.
- ✓ Excellent collaboration with various top Indian Research Institutes facilitates students in carrying out their research projects at internationally reputed organizations / establishments including Biocon Limited, National Centre for Biological Sciences (NCBS), Indian Institutes of Technology (IIT), Institute of Genomics & Integrative Biology (IGIB), Institute of Bioinformatics (IOB), Regional Cancer Centre (RCC), Tata Institute of Fundamental Research (TIFR), Indian Institute of Science (IISc), Agilent Technologies etc.

ALUMNI SPEAKS

Dr. A. ACHUTHAN

B.Sc. Microbiology (2014-2017)
M.Sc. Microbiology (2017-2019)

Post Doctoral Research Associate,
Oklahoma State University, USA

Amrita School of Biotechnology has always been a second home for me. The care and attention given by the faculty and staff to individual students was much unexpected before coming here. Amrita is the place one could find an amalgamation of learning, fun, culture, lore, literature and many such life preaching activities. The school culminates in all of its curricular activities and that might be the reason why the passed-outs being recognized and endorsed when compared to other institution students. The school not only helped me in becoming a good scientist but was also successful in inculcating some good values in me. There are no words to express my gratitude to be a part of this wonderful Institution.

VINAYAK A. K.

B.Sc. Microbiology (2007-2010)
M.Sc. Biotechnology (2011-2012)

Application Scientist,
Agilent Technologies, India

Amrita School of Biotechnology is like a second home to me and the faculty members and staff are like family members. One of the most important and valuable lessons that I have learned at Amrita is “How to live in a competitive and stressful corporate world with a smile on your face”. Besides providing valuable advice and motivating the students, the teachers at Amrita are well experienced, friendly and approachable. I am extremely lucky to have spent 5 years in such a vibrant learning environment. I would like to express my sincere love and respect to all the faculty members - especially to our Chancellor Amritanandamayi Devi.

Dr. HRIDYA

B.Sc. Biotechnology (2009-2012)
M.Sc. Biotechnology (2012-2014)

Postdoctoral researcher, Kennedy Institute of Rheumatology, University of Oxford, UK

It was one of the best decisions of my life to become a part of the Amrita School of Biotechnology. Amrita provided an environment where my passion for research was carefully nurtured by inspiring mentors and hands-on learning experiences. Alongside academics, the humanitarian programs conducted by Amrita instilled in me the values of compassion, responsibility, and service to society, which I consider truly invaluable as an Amritian. Moreover, Amrita gifted me lifelong friendships that I continue to cherish to this day. In a nutshell, the time I spent at Amrita was a balanced blend of education and joy, making each experience memorable and transformative.

DR. JYOTSNA NAMBIAR

[M.Sc. Biotechnology (2007-2009); Ph.D. Biotechnology (2010-2016)]

(Post Doc, University of Southern Denmark, Denmark)

At the Amrita School of Biotechnology, I discovered an ideal equilibrium between acquiring knowledge and fostering a sense of purpose and service in life. The school’s warm, welcoming atmosphere and a strong sense of community were unparalleled experiences for me. Engaging, thought-stimulating lectures and scientific discussions sparked my passion for pursuing a research career. Amrita served as the roots of my personal and academic growth, providing a solid foundation and stability. The value-based education and various service initiatives offered by Amrita directly contributed to my holistic development. These experiences allowed me to balance my career aspirations with a positive perspective on life and its challenges. In essence, the transformative environment at Amrita has been instrumental in shaping who I am today, instilling in me the importance of giving back to the community through a unique blend of academic excellence and service-oriented experiences.

ANANTHU A I

B.Sc. Biotechnology (2013-2016)
M.Sc. Biotechnology (2016-2018)

Scientist, Evotec, London, UK

Life at Amrita School of Biotechnology is always going to be one of the most cherished memories of my life. The concept of 'Education for Living' and 'Education for Life' followed here is unique and exclusive. There are very few Institutions across the country which can deliver you a real purpose of knowledge along with Quality education. The care & attention provided by the staff and the well-experienced faculty members have facilitated me to grow as a better being both professionally and personally. The peaceful atmosphere and the wonderful infrastructure facility catered here is the best a student can ask for. I always feel the decision I took to join Amrita for studies is providential and I am glad that it turned out to be a right one. I feel proud to say that I belong to this amazing Amrita family

Dr. DILIP MENON

B.Sc Biotechnology (2009-2012)
M.Sc Biotechnology (2012-2014)

Postdoctoral researcher, Institute of Metabolic Sciences (IMS), University of Cambridge, UK

Like any other profession, scientific careers in academics and research are built on strong foundations. Amrita School of Biotechnology provided me with the best possible foundation on which my current scientific career has been established. Amrita instilled in me the true necessity of being humble and modest to colleagues while building qualities of confidence, aptitude and competitiveness. This is a unique feature which very few institutions could claim off in the current educational arena. Along with academics, a truly vibrant campus life intertwined with an emphasis on extra-curricular and humanitarian activities nurtures an individual's personality and prepares him/her to lead a balanced and successful life. Above all, my time spent at Amrita, is memorable due to the enduring connection I still share with the faculty and friends whom I met here. It gives me a great sense of pride to be called an Amritian.

KALYANI K.

M.Sc. Biotechnology (2023-25)

(Nutrition Officer Trainee, Nestle, India)

As an institution Amrita has been a life changer helping me placed in a reputed multinational company like Nestle. The institution will always be cherished for its role it played to sail through all the personal and academic obstacles rather confusions i faced. Always proud to be an alumnus of Amrita

Dr. DAMU SUNIL KUMAR

B.Sc. Biotechnology (2006-2009)
M.Sc. Biotechnology (2009-2011)

Ph.D. in Life Science
Researcher Specialist, Comprehensive Cancer Centre,The Ohio State University, USA

My academic journey at Amrita has been truly eventful and very close to my heart. What began as a simple interest in biotechnology and research gradually evolved into a lifelong pursuit, leading to the completion of my Bachelor's, Master's, and Ph.D degrees at the institute.

Amrita was far more than an academic institution—it was a second home, a true Amrita family. The inspiring and very friendly faculty, strong research culture, and highly supportive environment shaped my scientific thinking, confidence, and values, laying a foundation that continues to guide my professional journey.

Life at Amrita was especially memorable because of the many opportunities beyond academics. The vibrant mix of cultural, social, and extracurricular activities brought energy to campus life and created memories I continue to cherish—and deeply miss today. Above all, Amrita offered something rare: a genuine sense of belonging. Even now, I remain closely connected with my mentors, colleagues, and friends from the institute, relationships that reflect the warmth and community that define Amrita.

I am immensely proud to be an Amrita alumnus and deeply grateful for the institute's enduring role in shaping not only my career, but also my life—and the lives of countless others who continue to graduate from Amrita.

PLACEMENTS

FROM CLASSROOM TO CAREER

The future belongs to those who learn more skills and combine them in creative ways."— *Robert Greene*

At our institution, students don't just earn a degree—they prepare for the future.

Our graduates have gone on to work with leading organizations such as **Nestlé, Hindustan Unilever, MedGenome, and Syngene**, along with many other well-known across the biotechnology, pharmaceutical, and life sciences sectors.

MODERN SKILL-SET

Alongside strong subject knowledge, students are trained using modern digital tools and AI-enabled technologies that are now widely used in research and industry. This helps them understand how data, automation, and intelligent systems support today's scientific work.

GLOBAL OPPORTUNITIES

Many of our students also choose to pursue higher studies and have secured admissions into premier institutes in India and abroad, such as IISc, IITs, NCBS, CCMB, Oxford University, University of California, and Ohio State University—reflecting the quality of education and mentorship they receive.

ONE LEARNING ECOSYSTEM. MULTIPLE CAREER PATHWAYS.

Placements. Research. Higher Studies.

Final Semester Research Project

HANDS-ON EXPERIENCE

From Learning in Class to Working in Real Laboratories

In the final semester, all M.Sc. students complete a full-time research project in reputed academic institutions and industry laboratories.

During this period, students:

- Work on real research and industry-relevant problems
- Learn to use advanced laboratory instruments and AI-supported analysis tools
- Gain exposure to professional research and corporate work environments

REAL-WORLD APPLICATION

This hands-on experience helps students apply what they learn in class to real situations, making them confident and career-ready.

In simple words, we ensure that students graduate with practical skills, industry exposure, and clarity about their future—whether it is a job, research, or a PhD.

CAMPUS INFRASTRUCTURE & AMENITIES

Hostel Facilities:

Our hostels, separate for boys and girls, are located within walking distance, a few hundred meters from the School. Students are provided with adequate facilities to make them feel at home. A modern central kitchen operates in the campus, providing pure vegetarian food prepared under hygienic conditions. Hostel life enables them to imbibe a healthy life-style and participate in activities including yoga, meditation, sports, music, etc., which are conducive for leading a balanced life of work and play. Intake of tobacco in any form and any other intoxicants is strictly prohibited. Students learn to take care of their personal needs and grow in a nurturing environment. All students are required to live on campus; however, students staying with their parents within a 30 km radius of the College may commute to the School.

Laboratories:

Well-equipped Microbiology, Biochemistry and Biotechnology laboratories along with Tissue culture facilities, Microscopy room and a state-of-the-art instrumentation room.

Medical Facility:

Qualified medical and paramedical personnel including doctors, nurses, pharmacists and an ambulance are available in the campus medical clinic. An Ayurveda hospital also functions in the campus.

Transport:

College buses pick-up and drop day-scholars from specified locations within 30 kms from the campus.

Canteen:

Day scholars, staff members and guests can avail themselves of this facility. Students living in the hostels may also make use of this canteen for additional refreshments.

Library:

A large collection of over 8,000 international books and journals is available for reference in the library which is open to staff and students. Students and staff can access the online archives while on campus.

Store:

The General Store caters to requirements for stationery, toiletries, provisions, etc. The store also stocks publications, audio/video cassettes, herbal/ayurvedic products, etc. produced by the Mata Amritanandamayi Math.

Gymnasium:

An International standard gymnasium equipped with multi-purpose machines for cardio workouts and strength training, coaching for power-lifting, weight lifting and body building. Counselling offered in fitness, weight loss and nutrition.

Sports Facilities:

Playgrounds with volleyball, basketball and badminton courts, facilities for indoor games like table tennis and chess are available.

Banking:

An extension counter of the Dhanalakshmi bank is conveniently located in the campus and functions on all working days. Services include personal banking facilities and a 24-hour ATM facility.

ICTS:

Information and Communication Technology Services (ICTS) provides computing and all related facilities including 2000 computers and nearly 20 high-end servers, Network implementations and Wi-Fi networks, E-Learning amenities, campus PABX functions and administrative supervision over UPS.

Yoga:

Yoga and meditation classes are conducted under expert guidance. In addition, the students have the option of attending evening prayers at the Mata Amritanandamayi Math, which is a means for mental relaxation and rejuvenation.

Photocopying Facility:

Photocopying facility is available at a nominal rate.

CO-CURRICULAR / EXTRA CURRICULAR ACTIVITIES -

CREATOME

Most life science students are sure to come across a genome, proteome or metabolome at some point or the other over the course of their studies. But now we at Amrita School of Biotechnology have a new word to add to that list. “CREATOME”, a cornucopia of creativity and ideas. A student driven club that acts as a platform to showcase the fabulous array of talents that the students of our department possess. We have 7 wings – Performing Arts, Non-Performing Arts, Literature, Sports, Multimedia, Science, Values for Life that broadly represent most of the activities that take place at Amrita School of Biotechnology. CREATOME hopes to inspire creativity, ingenuity, team spirit, confidence and individuality in our students and help them prepare to take on the big bad world

Visit
creatome.in
to know more

Extension Activities

Cultural

Amritakalotsavam, our annual arts festival gives tremendous opportunities for students to be creative and exhibit their artistic talent. Cultural festivals like Onam, Vishu, Christmas and Gokulashtami are also celebrated with great élan on the campus.

Science wing

We are committed to bringing out the best in each student. The science club kick-started with the notion of developing young scientists who will be a promise to the future generation. Paper presentations, working models, hypothesis building are a part of the club's activities. In addition to this, the students are also encouraged to come up with innovative ideas to bring scientific and effective solutions to the major problems plaguing the globe.

Catalyst

Research is an integral part of scientific learning. Creatome aims to expand the research capabilities of our students through the "Catalyst" initiative. As the tagline suggests, we strive to "Hasten Progress". Launched under the Science WIng of Creatome and inaugurated by our beloved Dean, Dr. Bipin Nair, Catalyst is both a platform and a guide to help the students to expand their wings in the field of research. We provide timely notification of prestigious fellowships and internships across the country and provide first-hand aid to students to successfully apply for the scholarships.

Arts

To instil a deep appreciation for various art forms, to build the cognitive skills and enhance ones emotional quotient, arts have always played a significant role. The club aims to bring up the creative skills of students, to hone their talents and to rediscover their skills. A plethora of activities from doodling, painting, and other varied forms of dance and music will surely be a visual treat.

Sports

The sports clubs aim to bring supple physical development and a deep sense of involvement and team spirit among the participants. In addition to this, the students are taught to remain in a sense of equanimity during success and failures thereby helping them to accept the challenges of life in a calm and composed manner. A wide variety of sports ranging from cricket, football, basketball and athletics are focused on the major run.

Literature

To build the language and communicative skills among students teachers and society, the club aims to bring up and transform one's skills in literature. It also provides an opportunity to decipher the various forms of culture that a particular country is affiliated with, thereby bringing a deep understanding of various cultures that exist around the world.

Green Initiatives

In Amrita, we are committed to Mother Nature for sustaining our lives. On that note, various innovative ideas, clean-up drives, awareness campaigns are regularly conducted as part of the green initiative campaign to instil the necessity of sustaining Mother Nature, which is not just inevitable for our lives but also for the upcoming generation.

Amrita Yuva Dharma Dhara (AYUDH)

AYUDH, the International youth movement of Mata Amritanandamayi Math, is active in Europe, North America, Asia, Australia and Africa. AYUDH seeks to empower young people to integrate universal values into their daily lives. Starting with themselves, AYUDH wants to help establish a future of hope, peace and social engagement while maintaining an awareness of spiritual principles.

AYUDH stands for Amrita Yuva Dharma Dhara, a Sanskrit term which means "the youth which perpetuates the wheel of dharma (righteousness)". In Sanskrit AYUDH also means Peace, which is symbolized by the dove in the logo. AYUDH was founded in 1985. AYUDH is currently active in four domains:

Social Service
Personal Development
Intercultural Exchange
Green Initiatives

How to reach **AMRITAPURI**

Amrita School of Biotechnology is situated in the beautiful Amritapuri campus, which is nestled in the picturesque village of Vallikavu beside the scenic backwaters of peninsular India.

TRAIN AND BUS

Kayamkulam (12 km north of Amritapuri) and Karunagapally (10 km south) are the closest towns to reach. Auto-rickshaws can bring you to Amritapuri premises.

There are regular buses from Kayamkulam Railway Station (KYJ) to the foot of the Amrita Setu bridge. From the Trivandrum Transport Bus-Stand, one may board a bus going towards Ernakulam via Kollam and alight at Karunagappally. From Karunagappally, a bus going to Vallickavu Junction can be taken, which is about a five-minute walk from the campus. From the Ernakulam Transport Bus-Stand, one may board a

bus going towards Trivandrum via Alappuzha, and alight at Ochira. From Ochira, an autorickshaw can be taken to bring one directly to Amritapuri, which is 6 km away from Ochira. Or one may board a bus going to Vallickavu Junction, which is about a five-minute walk from the campus.

AIR AND TAXI

The two closest airports are in Trivandrum (110 km south of Amritapuri) and in Cochin (140 km north). At the airport you may go to the “Airport Taxi Service” counter and ask for a prepaid taxi to “Mata Amritanandamayi Ashram” at Amritapuri.

The journey from Trivandrum takes about three hours and the journey from Cochin takes about four hours. You can ask to come by the “Beach Road” from Karunagappally. This road crosses the backwaters by a road bridge and brings you directly into the ashram premises. Otherwise you will be dropped off in Vallickavu, from where you can cross the backwaters over Amrita Setu, the ashram’s pedestrian bridge. If you find yourself on the other side of the backwaters with heavy luggage you may also take a hand-poled boat across the backwaters.

EMBRACING THE WORLD

Embracing the world (ETW) is a global network of regional humanitarian organizations inspired by the India-based humanitarian initiatives of Math Amritanandamayi Math (MAM)

(an NGO with Special Consultative Status to the United Nations)

Empowering Women

Embracing the World has provided more than 100,000 economically vulnerable women throughout India with vocational training, start-up capital, and marketing assistance, as well as access to microcredit loans from government-regulated banks and affordable insurance plans. The women use these assets to form self-help groups, share microsavings accounts, and start their own home-based businesses. For many of the women, it is the first job they have ever had. Empowering women in this way has proven to be one of the most effective strategies for reducing poverty throughout entire communities.

Education for Everyone

Embracing the World places a high priority on guaranteeing the opportunity of education for all ages. From its literacy and vocational training for India's indigenous tribal population to its scholarship programme supporting 100,000 of India's poorest children – girls and boys – all the way toward obtaining a university degree, Embracing the World is working to ensure that knowledge remains the birthright of all humankind.

Disaster Relief

Since 2001, Embracing the World has been quick to respond to natural disasters. Most well-known for its $46 million Tsunami-Relief Project, our volunteers have been at ground zero in several of the decade's most devastating natural disasters, from the 2001 Gujarat Earthquake to Hurricane Katrina in the United States to the 2011 Japan Earthquake and Tsunami, where thousands of lives were lost. With a dual focus on rapid response and extensive long-term rehabilitation, Embracing the World has developed a reputation for being first on the scene and the last to leave – long after the spotlight has faded away.

Homes & Slum Renovations

Embracing the World believes that everyone in the world deserves to sleep without fear. It is this belief that has propelled ETW's massive homes for the homeless programme. To date ETW has relocated over 1600 families from wretched slums into newly constructed apartment blocks and built more than 45,000 homes for the homeless in over 75 locations across India. ETW has helped more than a quarter of a million people move from the streets or inadequate shelters into the safety and comfort of their very own home.

Foster Homes for Orphans and Disadvantaged Children

Embracing the World has run a care home for 500 orphans and disadvantaged children in Kerala for the last 20 years. The children study at one of the most competitive secondary schools in the state (run by MAM) and win awards in Sanskrit, music, sports and dance. In 2009, Amma inaugurated a second care home in Kenya – this one for more than 100 children from the slums of Nairobi.

Amrita Self-Reliant Villages

This is a "village adoption" programme through which the Math (MAM) has selected 101 villages throughout India with the goal that the villages of India should become role models for sustainable development.

With the goal of holistic development, the Amrita SeRVe project will provide assistance to each of the 101 villages in the following focus areas: health, education, water and sanitation, agriculture, eco-friendly infrastructure, income generation and self-empowerment.

AMRITA SeRVe
SELF RELIANT VILLAGE

Fighting Hunger

Embracing the World feeds more than 10 million people annually throughout India, and distributes uncooked rice, milk and other staples to deeply impoverished communities. Along with food distribution, our centres often provide free, specialized medical services. In 50 cities throughout North America, our volunteers prepare and serve 150,000 meals each year for the homeless and hungry. Some groups also collect and distribute clothing, household items or food staples for communities in need.

Healthcare & Nutrition

Embracing the World's 1,300-bed AIMS Hospital (Kochi, Kerala) is renowned as one of the premier health-care facilities in South Asia. Since its establishment in 1998, AIMS together with its smaller satellite hospitals and medical outreach teams have provided more than $70 million worth of charitable medical care; over three million patients have been treated free of charge. Our telemedicine-enabled medical outreach teams also conduct primary health care training and intervention programmes for treatable illness, bringing the best of modern medicine into the most remote areas of rural India.

Community Outreach

Embracing the World wants to see a world where no one slips through the cracks into invisible poverty and despair, and where everyone has a chance to see their dreams come true. With that in mind, ETW runs multiple care homes for the elderly, provides monthly financial aid for 100,000 widows and victims of poverty and disability for throughout India, offers free meditation courses for soldiers, prisoners, and the general public, sponsors weddings for the poor, and has established service oriented youth groups throughout the world.

Research

Through Amma's Amrita Vishwa Vidyapeetham, Embracing the World volunteer researchers are breaking new ground in a broad range of highly specialized fields including nanotechnology, biotechnology, robotics, and e-learning software. Projects include tissue engineering, stem cell research, water-purification systems, and low-cost biomedical devices. On the cutting edge of emerging technologies, Embracing the World is developing haptic, biofeedback and virtual reality systems to bring vocational training capabilities into remote areas.

Green Initiatives

The environmental initiatives are aimed at innovating solutions in sustainability defined by simple, practical steps that can be adopted on a large scale. Several of our projects and events have been formally recognized by UNESCO as part of the UN Decade on Education for Sustainable Development. A member of the United Nations Billion Tree Campaign, Embracing the World has planted over a million trees worldwide since 2001, including 30,000 trees along India's shoreline to prevent erosion. Green Friends, our grassroots environmental organization, promotes local participation in conservation efforts around the world.

Amala Bharatam Campaign

The Amala Bharatam Campaign (ABC) is a programme aimed at improving public health and at restoring India's physical beauty. The project was launched on Amma's 57th birthday celebrations in 2010. Through this campaign, volunteers undertake regular and periodical cleaning of roads, markets, temples, government offices and hospitals along with the sorting of garbage, recycling, proper disposal of waste and constructing public toilets. The campaign is also working to make people more aware of the need to avoid littering, spitting and urinating in public, and to maintain environmental cleanliness. This awareness campaign is ongoing in every language and every state in India, and has already reached millions of people nationwide.

Amma in **GLOBAL FORUM**

Amma teaches that everyone rich or poor has the power to make a difference in the life of another, and that no selfless gesture is insignificant. Rather, it is the selfless actions we perform for one another that hold the keys to true peace in the individual, peace in the community and peace among diverse cultures, nations and faiths

1993:
Amma receives the Hindu Renaissance Award from Hinduism Today. **(USA)**

Amma addresses the Parliament of the World's Religions'100th Anniversary, where she is named President of the Hindu Faith. **(CHICAGO)**

1995:
Amma addresses the Interfaith Celebrations at the 50th anniversary of the UN. **(NEW YORK)**

2000:
Amma is a keynote speaker at the Millennium World Peace Summit, UN General Assembly. **(NEW YORK)**

2002:
Amma is the keynote speaker at the Global Peace Initiative of Women Religious & Spiritual Leaders at the UN. **(GENEVA)**

The World Movement for Nonviolence confers upon Amma the Gandhi-King Award for Non- violence at the UN. **(GENEVA)**

2004:
Amma delivers a keynote address at the 2004 Parliament of the World's Religions. **(BARCELONA)**

2005:
Amma receives Centenary Legendary Award of the Rotary Club International. **(KOCHI)**

Amma receives the Mahavir Mahatma Award. **(LONDON)**

2006:
Amma receives the James Parks Morton Interfaith Award in New York. **(NEW YORK)**

Amma receives the Philosopher
Saint Sri Jnaneswara World Peace Prize. **(PUNE)**

2007:
Amma is awarded the Prix CinémaVérité for her humanitarian activities and work for peace at the Cinema Verite Film Festival. **(PARIS)**

2008:
Amma is a keynote speaker at the Summit of the Global Peace Initiative of Women. **(JAIPUR)**

2009:
Amma inaugurates the Vivekananda International Foundation. **(NEW DELHI)**

2010:
Amma receives an honorary Doctorate in Humane Letters from the State University of New York at Buffalo. **(New York)**

2012:
Amma addresses United Nations Alliance of Civilizations' (UNAOC) Regional Consultations for Asia-South Pacific. **(SHANGHAI)**

2014:
Amma joins Pope Francis and 10 other world religious leaders in signing of a declaration against human trafficking and slavery. **(VATICAN)**

2015:
Amma addresses United Nations Academic Impact Conference on Technology for Sustainable Development. **(NEW YORK)**

Amma addresses the Summit of Conscience for the Climate. **(PARIS)**

2019 :
Amma receives Honorary Doctorate of Letters from University of Mysore. **(MYSORE)**

2021:
Amma conferred with a doctorate by Kalinga Institute. **(ODISHA)**

2023:
Amma has been appointed the Chair of the country's Civil 20 (C20), an official engagement group of the Group of 20 (G20), by the union government. **(C20)**

Education for Life.
Education for Living.

AMRITA VISHWA VIDYAPEETHAM
SCHOOL OF BIOTECHNOLOGY

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nirf
NAAC
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No.1 IN INDIA
Times Higher Education Impact Rankings 2025
THE WORLD UNIVERSITY RANKINGS 2020