AKASH PANDE RAJESHKUMAR

Master of Science (Biotechnology), University of Glasgow

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Professional Summary

Passionate MSc Biotechnology researcher at the University of Glasgow with specialization in nanomedicine, biomaterials engineering, and molecular cell biology. Experienced in designing and characterizing 2D/3D nanomaterials, including hydrogels, polymeric nanocomposites, and bio-nanoemulsions for therapeutic and antimicrobial applications. Skilled in AFM, SEM, TEM, FTIR, UV–Vis, DLS, zeta potential analysis, and quantitative image analysis (ImageJ/Fiji), with strong competency in RT-qPCR, cell culture, gene expression profiling, and biocompatibility assays. Founder & CEO of NovaHealZ, a funded biomedical startup developing hydrogel-based nanotech wound care solutions, supported by Glasgow Enterprise, EIBF Prize 2025, and Converge Microfinance Grant. Motivated student with multiple awards and a proven record in hypothesis-driven experimentation, scientific communication, and multidisciplinary collaboration. Driven to apply nanotechnology for targeted delivery, tissue regeneration, and bio–tissue modulation, aligning directly with the goals of this PhD program.

Education MSc Biotechnology 2024–2025 University of Glasgow (Recipient of the University of Glasgow Leadership Scholarship Award £10,000) (Synthetic Biology, Medical Communications, Molecular Research Skills – RT-PCR, Electrophoresis, SDS, Cloning, Recombinant Protein Expression, Industrial and Environmental Microbiology, Biotechnology Applications, Technology Transfer and Commercialisation of Bioscience Research) Expected: Merit

BTech Biotechnology Engineering 2020–2024

Anna University, Chennai, India

(PCR, Electrophoresis, Gel documentation, Animal Handling, Southern Blotting, Western Blotting, Microbiological assays, Purification techniques such as Chromatography, Filtration, Distillation, Molecular docking, Plant simulation, Biochemistry, Plant Tissue Culturing, Animal Biotechnology, Downstream Processing, Bioprocessing principles, Thermodynamics, Mass Transfer Operations)

CGPA: 9.14/10 (First Class with Distinction)

Top Rank Holder in the Department of Biotechnology

Projects

Phenotyping putative components of tissue development in blood flukes (Schistosoma mansoni) - Parasitology

May 2025 – August 2025 Berriman Lab (Parasitology), School of Infection & Immunity, University of Glasgow

Supervisor: Professor Matthew Berriman, Parasitology, University of Glasgow

Summary: Currently working on characterising a gene that is highly expressed and specific to a particular cell type in Schistosoma mansoni, a parasitic blood fluke that affects millions of people in low-resource settings. This project builds on recently published single-cell atlases that define 15–65 distinct cell types across various developmental stages of the parasite.

I am using RNA interference (RNAi) to knock down the expression of the target gene in developing worms cultured in vitro. Transcriptional knockdown is being assessed via RT-PCR, while microscopy is used to monitor developmental progression and identify any tissue-specific morphological defects. The goal is to uncover the gene’s role in tissue formation and explore its potential as a target for future therapeutic interventions.

Skills Acquired: Phenotyping, Seurat, Working in CL-2, RNAi, in-vitro transcription, Cloning, RT-PCR, Bioinformatics, Microscopy, R studio, ImageJ, Transformation & Parasite cultivation

Fabrication of Nanocomposite-Based Advanced Eco-Friendly Wound Dressing for Diabetic Foot Ulcers

Dec 2023 – May 2024

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Developed advanced eco-friendly wound dressings using nanocomposites. Targeted diabetic foot ulcers with biocompatible materials for enhanced wound healing properties.

Skills Acquired: Nanocomposite fabrication, Hydrogel, biomaterials, wound healing research, materials science, Biopolymer production, project management, AFM, Zeta potential, SEM, TEM, UV Spec, XRD, FTIR, ImageJ, Bioactive assays, Biochemistry.

Larvicidal Activity Using Bio Nano Emulsion Against Aedes aegypti Dengue Vector

May 2023 – Nov 2023

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Formulated bio nano emulsions to combat Aedes aegypti larvae, the dengue vector. Synthesized 2D nanoparticles to study the efficacy in larvicidal activity. Investigated biocompatibility and optimized the formulation for eco-friendly pest control.

Skills Acquired: Bio nanoemulsion formulation, larvicidal activity testing, vector control, pest control, experimental design, data analysis.

Biosynthesis of Silver Nanoparticles Using Extracts of Ganoderma lucidum and Evaluation of Its Antibacterial Efficacy Against CAUTI-Causing E. coli

Feb 2023 – April 2023

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Synthesized silver nanoparticles using Ganoderma lucidum extracts and tested their antibacterial effects on E. coli strains causing CAUTI. Aimed to combat catheter-associated infections.

Skills Acquired: Silver nanoparticle synthesis, antibacterial assays, microbiology, CAUTI research, Bioactive assays, materials characterization.

Development of Wearable Coupled NIR/MIR Photoacoustic Spectroscopy Non-Invasive Device for Continuous Glucose Monitoring with Feedback Using Insulin Glargine

Sep 2022 – Jan 2023

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Designed a wearable device using NIR/MIR photoacoustic spectroscopy for non-invasive glucose monitoring. Integrated feedback control with Insulin Glargine for real-time diabetes management.

Skills Acquired: Wearable device design, non-invasive glucose monitoring, NIR/MIR spectroscopy, photoacoustic spectroscopy, insulin delivery systems, biomedical engineering.

Exoskeletal Prosthetic Leg Using Open Computer Vision

Jan 2022 – Aug 2022

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Engineered an exoskeletal prosthetic leg using OpenCV for motion tracking and gait analysis. Aimed to enhance user mobility through vision-based feedback.

Skills Acquired: Exoskeleton engineering, prosthetic design, computer vision (OpenCV), motion tracking, gait analysis, biomechanics, user interface, MATLAB, Python.

Comparative Expression Profile of Toll-Like Receptor (TLR-5) in Catfish and Zebrafish

July 2021 – Dec 2021

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Compared TLR-5 gene expression in Catfish and Zebrafish to understand immune responses. Contributed insights into fish immunology with potential vaccine applications.

Skills Acquired: Gene expression analysis, primer design, immunology, fish biology, TLR-5 research, molecular biology techniques, comparative genomics.

Investigation of Self-Assembly and Topological Changes in the Sessile Droplets of Klebsiella oxytoca by Chronological Study

Feb 2021 – May 2021

Department of Biotechnology, Prathyusha Engineering College, Chennai, India

Summary: Studied self-assembly and morphological changes in Klebsiella oxytoca droplets over time. Analyzed topological changes for potential applications in microbial studies.

Skills Acquired: Microbial self-assembly research, surface science, topological analysis, microscopy, bacterial handling, data analysis, microbiology.

Research Experience

Founder & Chief Executive Officer February 2025–Present

NovaHealZ – Hydrogel-based Wound Care Startup Glasgow, UK / India — Mar 2024 – Present

Leading product development of HydroShield, a wound patch for diabetic foot ulcers and post-surgical wounds.

Filed 5 provisional patents in the field of Nanomedicine.

Secured funding from FemTech Hackathon, EIBF Prize 2025, and Converge Microgrant.

Shortlisted in Converge Kickstart Challenge 2025

Selected as Top 6 finalist to pitch before the Scottish Minister for Enterprise.

Oversee R&D;, business strategy, IP planning, team coordination, and investor outreach.

Research Support Assistant & Coordinator August 2023–April 2024

Centre for Laboratory Animal Research (Animal House), Principal Investigator: Dr. H. Archana, PhD Prathyusha Engineering College, Anna University, Chennai

Conducted animal research experiments with a focus on maintaining strict compliance with ethical and laboratory standards.

Facilitated in vivo experimental setups, animal care, and documentation for study protocols on behavioral analysis, toxicity testing, and drug efficacy studies.

Assisted the principal investigator in report writing, literature reviews, and presentations for internal and external conferences.

Project Coordinator November 2023–April 2024

Institute’s Innovation Council, Faculty In-charge: Dr. A. Praveena PhD, Department of Biotechnology, PEC, Chennai

Oversaw project proposals, led brainstorming sessions, and coordinated innovative projects to solve real-world problems, fostering interdisciplinary collaboration.

Helped prepare reports, funding applications, and presentations for project showcase events and reviews.

Professional Scientific Writer February 2021–April 2024

Department of Biotechnology, Guide: Dr. R. Balachandar PhD, Ms. Joyce Hellen Sathya, Dr. S. Shobana PhD, PEC, Chennai

Written and edited research papers, review articles, and technical reports, contributing to publications for national and international journals.

Collaborated with faculty to translate complex scientific data into accessible content for academic papers, presentations, and grant applications.

Assisted with publication submissions, revising manuscripts based on reviewer feedback, and adapting writing style to meet publication standards.

Patents

1. BIOCOMPATIBLE HYDROGEL MATRIX FOR SUSTAINED THERAPEUTIC RELEASE AND EXUDATE MANAGEMENT IN CHRONIC WOUNDS (Provisional filed: 2025) Status: Patent Pending • Development of a bio-nanocomposite hydrogel integrating crosslinked polysaccharide frameworks and nanoscale reinforcements for controlled drug release, exudate management, and improved granulation. • Exhibits enhanced angiogenic, antioxidative, and antimicrobial activity; supports cellular microenvironment modulation and tissue regeneration.

2. MULTIPHASE PHYTO-BIOPOLYMERIC THERMORESPONSIVE NANOCOMPOSITE HYDROGEL DERIVED FROM AN EMULSION-BASED POLYHERBAL MATRIX FOR CONTROLLED DERMATO-REGENERATIVE DELIVERY (Provisional filed: 2025) Status: Patent Pending • Engineering of a thermoresponsive nanocomposite hydrogel with emulsion-driven nanoscale morphology for controlled release of phyto-derived wound healing bioactives. • Tailored viscoelastic behavior enables on-demand release at wound temperature.

3. PLANT-DERIVED, METAL-FREE MULTIFUNCTIONAL HYDROGEL DRESSING WITH IMMOBILIZED ANTIMICROBIAL MOIETIES, OXYGEN-RELEASING MICROCAPSULES, AND ANTIOXIDANT PEPTIDES (Provisional filed: 2025) Status: Patent Pending • Metal-free biohydrogel system incorporating oxygen-releasing microcapsules for hypoxia mitigation, antimicrobial immobilization, and antioxidative support for chronic wound healing. • Designed for DFU (diabetic foot ulcer) therapy and infection control.

4. QUANTUM-CONFINED CATALYTIC BIOHYDROGEL PLATFORM WITH SPATIOCHEMICALLY ORCHESTRATED REDOX DOMAINS AND PHOTOTHERMAL NODES FOR ACCELERATED REGENERATIVE HEALING (Provisional filed: 2025) Status: Patent Pending • Integration of quantum-scale nanoparticles to enable catalytic redox modulation and localized photothermal activity for accelerated wound closure. • Enables spatiotemporal control of ROS scavenging and angiogenesis.

5. THERMORESPONSIVE BIOPOLYMERIC NANOCOMPOSITE HYDROGEL INCORPORATING POLYMERIC MICROPARTICULATE PHYTOBIOACTIVE SYSTEMS FOR CONTROLLED EPITHELIAL REGENERATION AND ANTIMICROBIAL MODULATION (Provisional filed: 2025) Status: Patent Pending • Hybrid nanocomposite hydrogel platform utilizing polymeric micro-/nanoparticulates for staged therapeutic payload release. • Designed for epithelial regeneration, infection reduction, and inflammation control.

Publications

Akash Pande R et al., 2022. Investigation of self-assembly and topological changes in the sessile droplets of Klebsiella oxytoca by Chronological study. International Journal of Engineering Technology and Management Sciences, 6(6), 278–285.

Akash Pande R et al 2024. Eco–friendly synthesis and optical characterization of silver nanoparticles using novel chitosan extracted from termite wings: Evaluation of antibacterial and antibiofilm activities against dental pathogens (Submitted and under review)

Akash Pande R et al., 2023. Larvicidal Activity using Bio Nanoemulsion formulated from the leaf extract of Calotropis gigantean against Aedes aegypti Dengue Vector (Submitted and under review)

Akash Pande R et al., 2024. Production of Biodiesel from Waste Cooking Oil Using biochar - based Heterogeneous Catalyst (Submitted and under review)

Akash Pande R et al., 2023. Exploring the potential of microbial secondary metabolites: From fundamental research to industrial applications and ecological significance (Submitted and under review)

Akash Pande R et al., 2024. Biochar And Its Derivatives for Bioremediation and Soil Health (Submitted and under review)

Akash Pande R et al., 2023. Comprehensive Phytochemical Profiling, Antioxidant Potential, and Anticancer Activity Evaluation of Syzygium cumini Seed Extracts (Submitted and under review)

Conference Presentations

Archana H., Akash Pande R. (2024). Cellulose Nanocomposite Wound Dressing for Diabetic Foot Ulcer. Poster, BIOTECH–2024, Gujarat Biotechnology University, Gandhinagar, India.

Joyce Hellen Sathya D., Akash Pande R., Karthikeyan P. (2023). In vitro Anti-diabetic Activity of Aloe vera Peel & Chrysanthemum indicum. Paper, Intl. Conf. on Translational Research, BIHER, Chennai, India.

Archana H., Akash Pande R., Narmadha M. (2023). Silver Nanoparticles from Ganoderma lucidum: Antibacterial Efficacy against CAUTI E. coli. Poster, Intl. Conf. on Sustainable Biotechnology, REC, Chennai, India.

Joyce Hellen Sathya D., Akash Pande R., Karthikeyan P. (2022). Larvicidal Activity of Bio-Nanoemulsion on Aedes aegypti. Paper, ICANNOCB–22, Crescent Institute & Purdue University.

Balachandar R., Akash Pande R., Tharun R. (2022). Bioplastic Production from Renewable Sources. Poster, ICANNOCB–22, Crescent Institute & Purdue University.

Dhasarathan P., Akash Pande R., et al. (2022). TLR–5 Expression in Catfish vs. Zebrafish. Poster, Bangalore Tech Summit (BTS–2022), Bangalore Palace, India.

Joyce Hellen Sathya D., Akash Pande R., Abhinav J. (2022). NON-Spray & Casticin Aerosols for COVID-19 Therapy. Poster, AICTE National Conference on COVID-19 Therapeutics, Jeppiaar Engg. College, Chennai, India.

Awards and Achievements

Graduate Skills Award – MVLS, University of Glasgow, Scotland – Sep 2025

University of Glasgow Leadership Scholarship (£10,000), MSc Biotechnology – Sep 2024

Best Final Year Project Award, Dept. of Biotechnology, PEC – Apr 2024

Editor-in-Chief, Biovivus Magazine, PEC – Mar 2024

Best Poster Award, EMBIOS Int'l Conf. – Mar 2023

Techgium Finalist, L&T; Technology Services – Jan 2023

Poster Delegate, Bangalore Tech Summit (BTS–2022) – Nov 2022

Certificate of Appreciation, ICANNOCB–22, Crescent Inst. & Purdue Univ. – Oct 2022

Smart India Hackathon Grand Finalist, Govt. of India – Aug 2022

Best Poster Award, AICTE National Conf. on COVID-19 – Mar 2022

Winner, Flipkart Grid 3.0 Robotics Challenge (■1.5 Lakh) – Feb 2022

Teaching and Leadership Experience

Class Representative, MSc Biotechnology, University of Glasgow – Oct 2024 – Sep 2025

Technical Event Coordinator, Mass Symposium, PEC – Jan 2024 – Feb 2024

Editor-in-Chief, Biovivus Magazine (DBT), PEC – Apr 2023 – Apr 2024

Team Leader, Smart India Hackathon (Govt. of India) – Mar 2022 – Aug 2022

Team Leader, Techgium 2022, L&T; Technology Services – Nov 2022 – Jan 2023

Additional Training & Workshops

Internship – Lab Animal Care & Management, Mass Biotech, Chennai – Jan 2024

USDA–APHIS – Animal Welfare Act Compliance Training – Jan 2024

NPTEL–IIT Certifications:

Scientific Communication – Apr 2024

Municipal Solid Waste Management – Nov 2023

Biomass Conversion & Biorefinery – May 2023

Dairy & Food Technology – Oct 2022

Nanotechnology in Agriculture – Apr 2022

Soft Skills & Personality Development – Oct 2021

MIC Alumni (SIH) – Ministry of Education's Innovation Cell, Govt. of India – 2022–2024

Converge Microfinance Grant , Scottish Government (Converge) – Jan 2025

Industrial Biotechnology – University of Manchester (Coursera) – July 2025

Introduction to Business Management – London School of Business Administration – July 2025

Introduction to the Pharmaceutical Industry – University of Glasgow – July 2025

Patenting in Biotechnology - Technical University of Denmark (DTU) & Copenhagen Business School (Coursera) – November 2025

Memberships:

Associate Member (AMRSB) – Royal Society of Biology – Issued Jan 2024 Student membership - International Association of Engineers (IAEM) – Issued Feb 2023

Reference

Dr. Matt Berriman Professor, Parasitology Berriman Lab, School of Infection & Immunity University of Glasgow Email: Relationship: Academic Referee / MSc Faculty Contact (Project Supervisor)

Dr. Yael Dagan Research Associate Berriman Lab, School of Infection & Immunity University of Glasgow Email: Yael.Dagan@glasgow.ac.uk Relationship: Academic Referee / MSc Faculty Contact

Ms. Joyce Hellen Sathya D Assistant Professor, Department of Biotechnology Prathyusha Engineering College (Affiliated to Anna University) Email: joycehellensathyad@prathyusha.edu.in Relationship: Academic Referee / UG Faculty Contact