

# Kavya Sree Maravajjala

Ph.D. Scholar

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## EDUCATION

### Doctor of Philosophy (Ph.D.)

2019-2023

BITS-Pilani, Rajasthan  
Pharmaceutical Sciences  
(Cancer nanomedicine, delivery, Chemo-immunotherapy)

### Master in Pharmacy (M.Pharm.)

2016-2018

St. Peters Institute of Pharmaceutical Sciences, Warangal, India  
Pharmaceutics | Marks: 87%

### Bachelor in Pharmacy (B.Pharm.)

2012-2016

Vaagdevi college of Pharmacy (Affl. Kakatiya University), Warangal, India  
Pharmacy | Marks: 80%

## RESEARCH INTEREST

- Multi-dimensional drug delivery system
- In-silico bioinformatics
- Nanotherapeutics
- Nano-evaluation
- Cancer immunotherapy
- Tumor microenvironment
- Cancer biology
- Breast cancer
- Glioblastoma

## ABOUT ME

- ✓ An enthusiastic pharmaceutical scientist driven by a relentless pursuit to discover better ways of healing and healthcare outcomes.
- ✓ My expertise in drug delivery science and technology empowers me to create new paradigms in pursuit of breakthrough treatments to enhance the lives of those affected by debilitating conditions.

## EXPERIENCE

### Senior Research Fellow (Ph.D.) | March, 2021 – Present

Birla Institute of Technology and Science, Pilani, India

- Ph.D. thesis work entitled "*Development of pH sensitive Nanoparticles for the treatment of combined chemoimmunotherapy of cancer*" funded by Shastri-Indo Canadian Institute.
- Allied work entitled "*Drug repurposing of the combinational therapy for the treatment of glioblastoma multiforme*"
- Allied work entitled "*Fabrication and Characterization of multicellular tumoroids using ECM mimetic scaffolds*"

### Junior Research Fellow (Ph.D.) | Feb, 2019 – March, 2021

Birla Institute of Technology and Science, Pilani, India

- Industrial collaborative work entitled "*Oral Bioavailability enhancement of BCS class III molecules*" sponsored by INTAS Pharmaceuticals Pvt Ltd., Ahmedabad, India
- Teaching assistance in various pharmaceutical subjects including Quality Assurance and Regulatory Affairs, Pharmaceutical formulations, Microbiology, Modern pharmaceutical analytical techniques, etc.

## LANGUAGES

- English
- Hindi
- Telugu

## SKILLS HIGHLIGHTS

- In-silico using bioinformatic tools
- Targeted polymer synthesis
- Stimuli-based Nanomedicine drug delivery system
- Analytical/Bioanalytical evaluation (HPLC-UV, LCMS)
- Industrial scale-up methods
- Nano-formulation evaluation
- Cell-culture techniques (2D, 3D, and complex using primary and secondary cell lines)
- Cellular biologics analysis
- Biochemical evaluation (DNA, gene, and protein expression)
- *In vivo* model development and evaluation (breast cancer, glioblastoma)

## HONOR AND AWARDS

- Selected for poster presentation at "8<sup>th</sup> Nano Today Conference, 2023" held at San Diego, CA, USA
- Oral presentation at international conference "PHARMACON-2022" held at NIPER, Mohali, India
- Selected for International travel grant from government funding agencies i.e. CSIR and ICMR
- Secured 1<sup>st</sup> Position in "COMPOUNDING" held at "PHARMASTHRA 2K18".
- Best Poster Award held at St. Peters Institute of Pharmaceutical Sciences, Warangal, in association with IPA.
- Student of the year (2014) at Vaagdevi College of Pharmacy, Warangal, India.
- Best Poster award in Pharmaceuticals, Warangal, in association with IPA, Hanamkonda, 2017.

## CORE COMPETENCIES

### In-silico Screening

- Good hands-on experience on bioinformatics tools such as STRING, KEGG, and drug path database for the better evaluation of pathways involved in the disease intervention.

### Dosage form Design

- Designing and fabrication of various biocompatible carrier system including polymeric, lipidic, micelles, bio-polymeric scaffolds, liposomes, niosomes, exosome, nanoemulsions, microneedles, micelles, polymeric drug conjugates, lipid polymeric drug conjugates, and their *in vitro* evaluation.
- Nanoparticle preparation using advanced techniques such as, microfluidics, high pressure homogenizer, probe sonication, etc.

### Analytical evaluation

- Characterisation of polymer using NMR, FTIR spectroscopy
- Development and validation of HPLC-UV and LCMS/MS based methods for small molecules, proteins and peptides.
- Nanoparticle characterisation using Dynamic light scattering (DLS), FE-SEM, TEM, DSC, Raman, and XRD.

### In-vitro studies

- Proficient in developing primary and secondary 2D and 3D multicellular complex models in human and mice cell lines, including stem cell model and resistance cell lines.
- Biological evaluation of various cells such as Immunological macrophage, dendritic cell, T-cells *viz.* cytotoxicity, apoptosis, cell cycle, cellular uptake assay using multicolor flow cytometry, apotome, confocal, and fluorescence microscopy.
- Gene analysis using Real-time PCR, and Primer Design, protein analysis using ELISA and western blot.

### In-vivo studies

- Preclinical development of breast and brain cancer model.
- Delivering small molecule and its evaluation *viz.* efficacy, pharmacokinetics, tissue bio-distribution, biochemical, and histological analysis.
- Animal dosing techniques (such as oral, intraperitoneal, intravenous) and blood collection from retroorbital plexus and tail vein.
- Ex-vivo evaluation using splenocytes for antigen presentation analysis using PCR, western and flow cytometry.

### Software

Data handling and interpretation interface such as

- Mestre nova, chem draw for structural analysis,
- Design expert (QbD) for scale-up
- Gel-Doc for molecular biology assay
- ImageJ and Zen for subcellular assay
- Phoenix WinNolin for PK/PD data analysis
- Graph pad Prism & Origin for data analysis & statistics

## REFEREES

### 1. Dr. Aniruddha Roy

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of Pharmacy BITS-Pilani,  
Rajasthan, India

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### 3. Dr. Gaikwad Anil Bhanudas

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of Pharmacy, BITS-Pilani,  
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## PUBLICATIONS

- Sumit; **Kavya M**; Khanna, S; Kachwal V; Karnam S; Santosh M; Chowdhury R; Roy A and Laskar I. Rational molecular designing of aggregation enhanced emission (AEE) active red-emitting Iridium(III) complexes: effect of lipophilicity and nanoparticle encapsulation on photodynamic therapy efficacy. **ACS Applied Bio Materials**; 2023; March
- K Laxmi Swetha, Milan Paul, **Kavya Sree Maravajjala**, Soniya Kumbham, Swati Biswas, Aniruddha Roy. Overcoming drug resistance with a docetaxel and disulfiram-loaded pH-sensitive nanoparticle. **Journal of Controlled Release**. 2023;356: 93-114
- **Maravajjala, K.S.**, Swetha, K.L. and Roy, A., 2022. pH-responsive nanoparticles for multidimensional combined chemo-immunotherapy of cancer. **Journal of Pharmaceutical Sciences**.
- **Maravajjala, K.S.**, Swetha, K.L., Sharma, S., Padhye, T. and Roy, A., 2020. Development of a size-tunable paclitaxel micelle using a microfluidic-based system and evaluation of its in-vitro efficacy and intracellular delivery. **Journal of Drug Delivery Science and Technology**, 60, p.102041.
- Swetha, K.L., **Maravajjala, K.S.**, Sharma, S., Chowdhury, R. and Roy, A., 2021. Development of a tumor extracellular pH-responsive nanocarrier by terminal histidine conjugation in a star shaped poly (lactic-co-glycolic acid). **European Polymer Journal**, 147, p.110337.
- Swetha KL, **Maravajjala KS**, Li SD, Singh MS, Roy A. Breaking the niche: multidimensional nanotherapeutics for tumor microenvironment modulation. **Drug Deliv Transl Res**. 2022 Jun 13. doi: 10.1007/s13346-022-01194-7. PMID: 35697894.
- Sharma, S., Madhyastha, H., Swetha, K.L., **Maravajjala, K.S.**, Singh, A., Madhyastha, R., Nakajima, Y. and Roy, A., 2021. Development of an in-situ forming, self-healing scaffold for dermal wound healing: in-vitro and in-vivo studies. **Materials Science and Engineering: C**, 128, p.112263.
- Padhye, T., **Maravajjala, K.S.**, Swetha, K.L., Sharma, S. and Roy, A., 2021. A comprehensive review of the strategies to improve oral drug absorption with special emphasis on the cellular and molecular mechanisms. **Journal of Drug Delivery Science and Technology**, 61, p.102178.

## PRESENTATIONS, SEMINARS AND WORKSHOPS

- **M. Kavya Sree**, K.L.Swetha, Aniruddha Roy, Oral presentation on "Development of a tumor responsive nanoparticle-based multi-dimensional therapeutics against cancer" at NIPER- PHARMACON2022, organized by NIPER, Mohali.
- Attended training course on "Exploring Chromatography and Mass Spectroscopy", 2019, held at Birla Institute of Technology and Science, Pilani, Hyderabad, Organized by Shimadzu Analytical (India) Pvt. Ltd.
- WAICEE 2019, 4 th Workshop on Analytical Instruments for Chemical and Environmental Engineers, 2019, Organized by IlchE Pilani Regional Centre & Department of Chemical Engineering, at BITS Pilani-Pilani Campus.
- **Kavya Sree**, Rajeshri Dhurke, poster presentation "Microemulsion based gel for Topical delivery of Mupirocin" for 70<sup>th</sup> IPC, 2018, held at Amity University, Noida

- **Kavya Sree**, Rajeshri Dhurke, Presented Poster on Topic: “Zinc Finger Proteins- A Novel Tool in Huntington’s Disease” Zinc Finger Proteins-A Novel tool in Huntington Disease at *NEUROGEN2018*.
- **Kavya Sree**, Rajeshri Dhurke, Presented Poster on Topic: “Human Genome Project – A New Phase of Pharmaceutical Science” at St. Peters Institute of Pharmaceutical Sciences in association with IPA.
- **Kavya Sree**, Sandeep, Presented Poster on Topic: “Nanorobots-Future of the Medicine” at 14<sup>th</sup> Indo- African Conference on “Global Trends & Innovations in Translational Research and Herbal Technology” at Vaagdevi Group of Pharmacy Colleges, Warangal, Telangana, India.

#### WEBSITE/PROFILE

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2. <https://www.researchgate.net/profile/Kavya-Maravajjala>