BUTLER UNIVERSITY

College of Pharmacy and Health Sciences

Bachelor of Pharmaceutical Sciences

B S P S .AI

317-940-9322

butler.edu/pharmacy-health

4600 Sunset Ave, Indianapolis, IN 46208

Who are we?

We are a dynamic group committed to excellence in teaching and research, fostering a world class educational environment. By crafting cutting-edge student experiences, we equip our students with the skills and knowledge that make them highly marketable and ready to lead in their fields

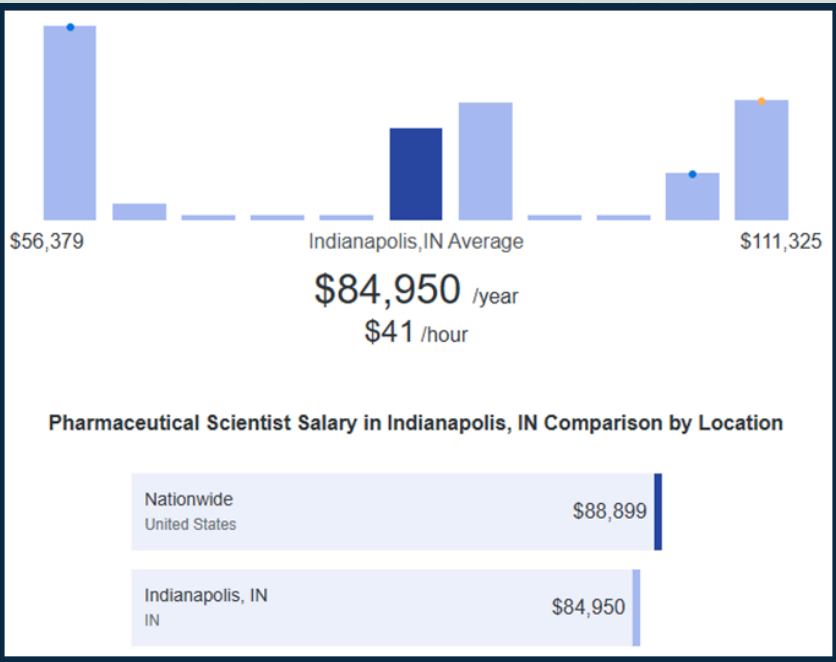
What to expect as a PharmSci Major

As a student in the PharmSci program, you'll be exposed to the latest advances in pharmaceutical sciences, A.I., cheminformatics, bioinformatics, pharmaceutics, and regulatory science through a curriculum that merges chemistry, biology, pharmacology, and informatics. You'll also participate in undergraduate research in areas such as precision medicine, gene therapy, genomics, and more. You'll be well-prepared for jobs in pharma, biotech, regulatory agencies, marketing, clinical trials, or pursing advance degrees such as PhD, MD, PharmD, or PA.

What careers can you get as a PharmSci major

- Associate Scientist
- Bioinformatics
- Cell Pharmacology
- Chemist
- Clinical Data Manager
- Clinical Scientist
- Digital Strategy
- Drug Production/Design
- Formulation Scientist
- Gene Therapy
- Global Regulatory Affairs
- Lab Automation
- Medicine Regulation
- Pharmacometrics
- Toxicology
- And dozens more

Average Salary for PharmSci majors



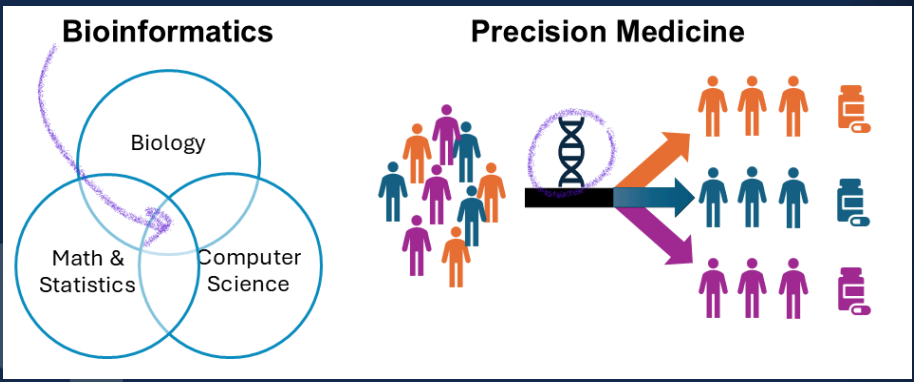
ZipRecruiter, August 2025

Let us introduce our faculty

Dr. Caleb Class

Title: Asst. Professor
Research: Bioinformatics

Their research involves bioinformatics which can help us solve some of the most complicated medical problems of our time. Ongoing projects include the analysis and integration of genomic and other “omics” data to help understand mechanisms of treatment-resistant depression and develop strategies for precision medicine in anti-depressant therapy, in addition to collaborative work identifying potential cancer vulnerabilities and treatment strategies. Research opportunities also include the development of accessible bioinformatics software that allows any researcher to more easily understand complicated biological data.



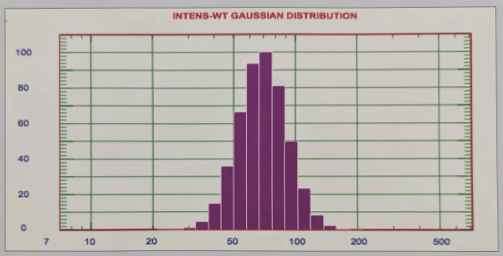
Dr. Nandita Das

Title: Professor
Research: Nanoparticles

Their work involves the targeted delivery of siRNA against neuro-degenerative diseases such as Alzheimer's and Huntington's disease, and modulation of multi-drug resistance (PGP & MRP) in cancer. Specifically projects involve fabrication and characterization of lipospheres and liposomes for nanomedicine applications.

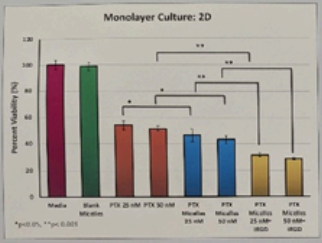
RESULTS

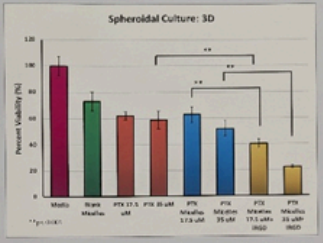
PARTICLE SIZE



- Particle size was quantified by dynamic light scattering (NICOMP 380ZLS).
- Minimal change in particle size was observed following paclitaxel loading in micelles.

EFFECT OF PACLITAXEL LOADED MICELLES ON CELL SURVIVAL





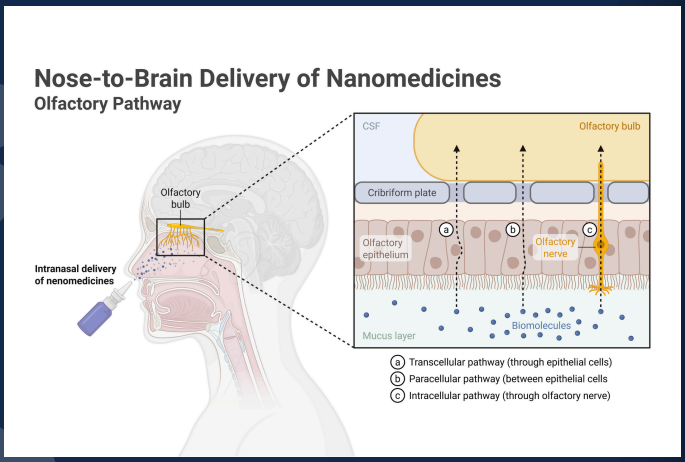
- Monolayer and spheroidal cultures of MDA-MB-231 were treated for 72 hours with paclitaxel concentrations at IC_{50} and $(1/2)IC_{50}$.
- Comparison was done with blank micelles and equivalent concentrations of drug loaded micelles, with or without iRGD.

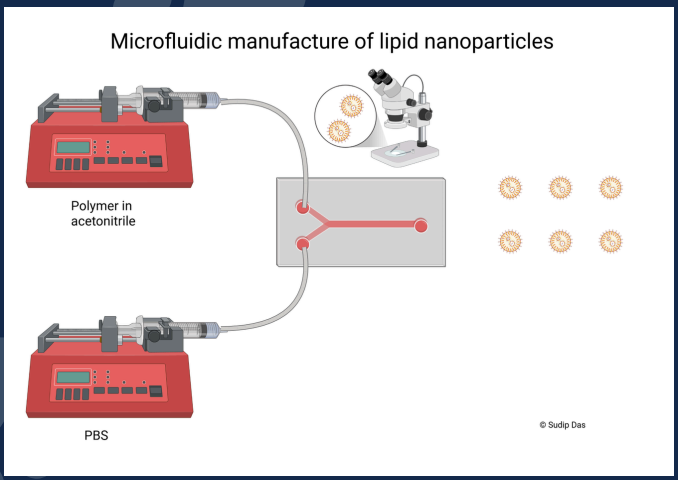
- Luminescence assay was used to determine the effect of nanomicelles on cell viability.
- The luminescence produced by untreated media was considered 100% cell viability and all results were normalized against it. DMSO is used as the negative control and represents 0% cell viability.
- Paclitaxel loaded micelles showed significantly higher cell death when compared to equivalent concentrations of free drug in 2D models. The degree of response was not replicated in the 3D models.
- Significant inhibition of cell growth was observed on coadministration of iRGD in both 2D and 3D models.

Dr. Sudip Das

Title: Professor
Research: Nanoparticles

Their research involves using nanotechnology for approaches in targeted delivery of siRNA and small molecule drugs for the treatment of cancer. Specifically projects involving the fabrication and characterization of polymer nanoparticles for nanomedicine applications.

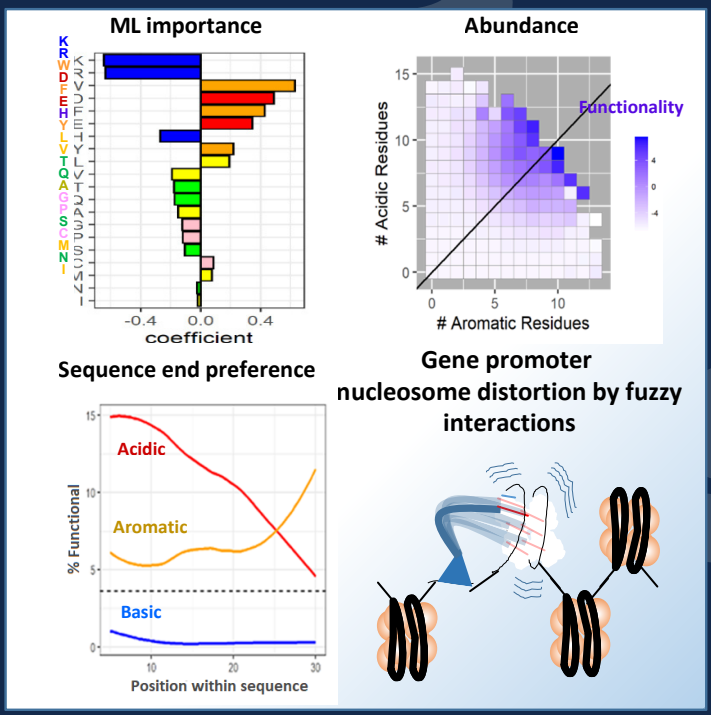




Dr. Alexandre Erkine

Title: Professor
Research: Gene Activation

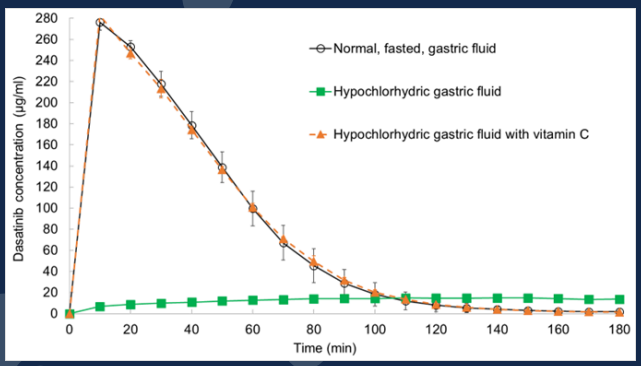
Their work involves the activation and proper tuning of eukaryotic gene expression depend on the function of gene activators and are related to numerous diseases and medical conditions. The key parts of gene activators – Activation Domains (ADs) - are astronomically variable sequences. We use a combination of in vivo high-throughput experimentation and bioinformatics to study ADs and gene regulation mechanisms. ML-based predictive algorithms, developed by us, apply to disease-related gene editing using CRISPR-Cas9 gene therapy. Students learn wet lab techniques and bioinformatics while being an integral part of research projects and publications.

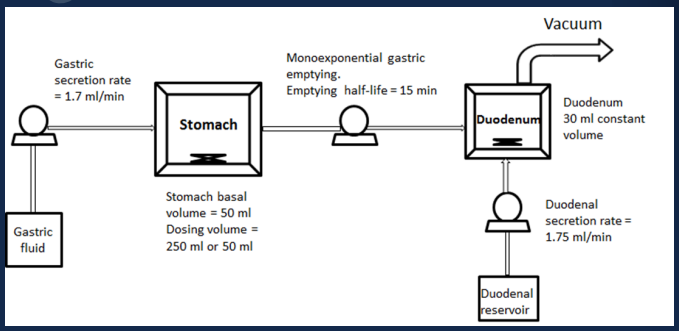


Dr. Hala Fadda

Title: Professor
Research: Oral Drug Delivery

Their research is about the development of pharmaceutical methodologies that optimize drug product development by identifying predicting and mitigating variability in drug exposure. To address the challenges of variability, her focus is on drug product design and developing models to exploit in vitro in vivo correlations for formulation development. This integrated approach enables the acceleration of the availability of new, generic and biosimilar medicines that are more efficacious and predictable. Current collaborative projects in Dr Fadda's lab include advancing platforms that address formulation challenges for pediatrics





Dr. Alican Gulsevin

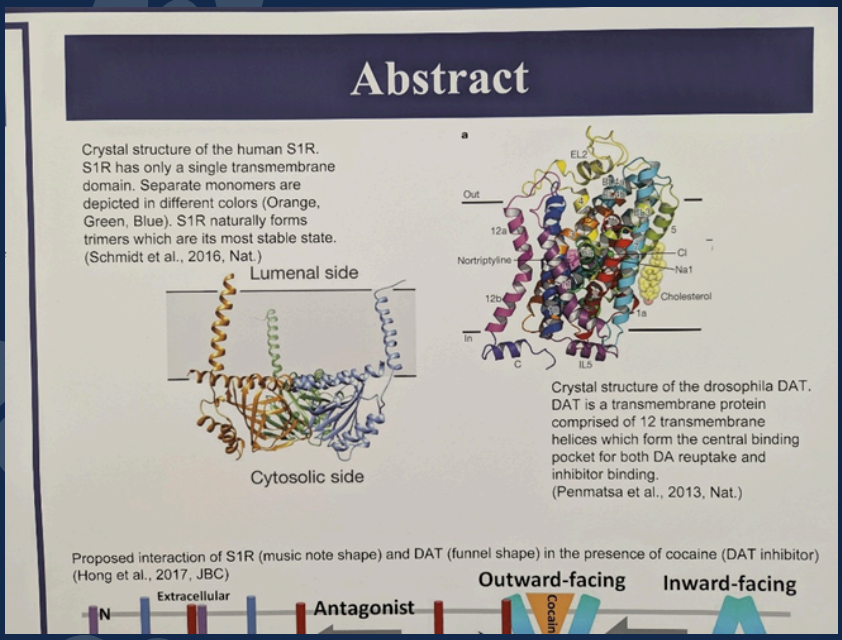
Title: Asst. Professor
Research: Computer Drug Discovery

Their work is about the development and application of state of the art computational methodology for the modeling of proteins and their interactions with drug molecules, including peptides and small molecules. We use a variety of computational tools to help guide structure determination and drug discovery efforts in collaboration with experimental biophysicists, medicinal chemists, and structural biologists. Our work with ligand and voltage-gated ion channels so far has led to the discovery of small molecules and peptides of potential therapeutics significance and improved our understanding of the allosteric mechanisms governing the activity of these molecules. Although our particular focus has been on membrane proteins, the versatility of the computational methods we use enables us to work with different types of systems and deploy computational methods to enhance collaborative drug discovery projects relevant to human health.

Dr. W. Conrad Hong

Title: Associate Professor
Research: Neuropharmacology

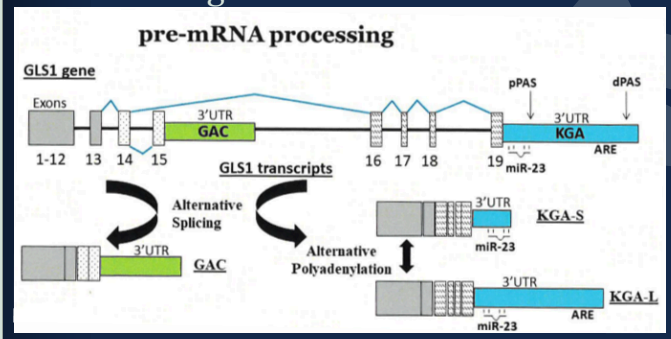
Their research focuses on the investigation of signaling mechanisms of dopamine in the brain, particularly the dopamine transporter (DAT), a membrane carrier uniquely expressed on dopamine neurons. DAT and its close homologs (the serotonin transporter and norepinephrine transporter) are important targets of therapeutic agents such as antidepressants and ADHD medications, and abused psychostimulants cocaine and methamphetamine

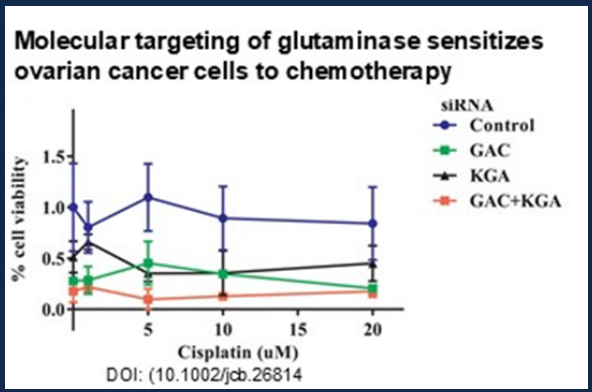


Dr. C. Patience Masamha

Title: Associate Professor
Research: Cancer Biology

Their work involves understanding the molecular mechanisms that are involved in the development of cancer. This is critical in identifying biomarkers for early disease detection and in the development of targeted anti-cancer therapeutics in precision medicine. Projects use techniques of next generation sequencing technologies, bioinformatics, and a wide array of molecular biology techniques to study cancer. In addition, we develop and test our own anti-cancer therapeutics as well as different combinations of novel and currently used cancer drugs to determine their effectiveness in eliminating cancer cells.





Program Timeline

Year 1

Year 2

Foundational Studies

- Chemistry
- Biology
- Anatomy
- Physiology

Year 2 Summer

Start of Experiential Learning

- Research
- Professional Development
- Real world experiences
  - Internships in PharmSci/BioTech industries

Year 3

Foundational PharmSci

- Biochemistry
- Pathophysiology
- Principles of Drug Action

Year 4

Informatics, Business, & Electives

- Informatics Focus
  - Chemistry, Genes, Proteins
- Regulatory
- Business Supply Chain

Butler University

Butler University is a private university in Indianapolis, Indiana, United States. Founded in 1855 and named after founder Ovid Butler, the university has over 60 major academic fields of study within six colleges in the arts, business, communication, education, liberal arts and the sciences, and health sciences. It enrolls approximately 5,700 undergraduate and graduate students.

On January 15, 1850, the Indiana General Assembly adopted Ovid Butler's proposed charter for a new Christian university in Indianapolis. After five years in development, the school opened on November 1, 1855, as North-Western Christian University at 13th Street and College Avenue on Indianapolis's near northside at the eastern edge of the present-day Old Northside Historic District.

Attorney and university founder Ovid Butler provided the property. The university was founded by members of the Christian Church (Disciples of Christ), although it was never controlled by that church. The university's charter called for "a non-sectarian institution free from the taint of slavery, offering instruction in every branch of liberal and professional education". The university was the second in Indiana and the third in the United States to admit both men and women.

Pharmaceutical Sciences

The Pharmaceutical Sciences department offers undergraduate students the opportunity to be at the forefront of groundbreaking research that drives advancements in medicine and healthcare. Our faculty are leaders in scientific innovation, conducting research in bioinformatics, neurobiology, cancer research, gene activation, oral drug delivery, nanotechnology, and computational drug discovery.

In bioinformatics, our faculty are developing cutting-edge algorithms and computational tools to analyze biological data, enhancing our understanding of complex biological systems. Neurobiology research uncovers the intricacies of the neuronal receptors linked to neurological disorders. Our cancer research focuses on understanding the mechanisms of RNA in gene activation.

Our faculty's work in gene activation explores innovative methods that help us understand how gene expression is regulated. These methods have the potential to significantly impact the treatment of genetic disorders. Our research aims to create more effective and patient-friendly medication administration methods in oral drug delivery. Our nanotechnology projects are also revolutionizing drug delivery systems, making treatments more precise and effective.

Furthermore, our emphasis on computational drug discovery combines the expertise of biologists, chemists, and computer scientists to accelerate the identification and design of new drug candidates. Join us in this interdisciplinary approach to shaping the future of medicine and healthcare.

FAQ's

What is Pharmaceutical Science?

Pharmaceutical Science is a four-year program for students seeking experience in the drug development and research aspects of medicine. Pharmaceutical Science gives students a robust background in AI, cheminformatics, bioinformatics, pharmaceutics, and regulatory science through a curriculum that merges chemistry, biology, pharmacology, and informatics. The program also serves as an excellent foundation for undergraduate students aspiring to pursue advanced degrees such as PhD, MD, PharmD, or PA.

Are Pharmaceutical Scientists in demand?

Yes, current trends show pharmaceutical scientists are in high demand, and the field is projected to see continued growth.

Is med school required for Pharmaceutical Science?

Going to medical school is not required if you want to work in the pharmaceutical sciences, as there are many careers in the field that only require a bachelor's degree.

What other degrees can students obtain with Pharmaceutical Sciences degree?

Doctor of Pharmacy (PharmD)
PhD in Pharmaceutical Sciences
Masters of Business Administration
Masters in Business Analytics

College of Health Sciences

Bachelor of Pharmaceutical Sciences

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butler.edu/apply