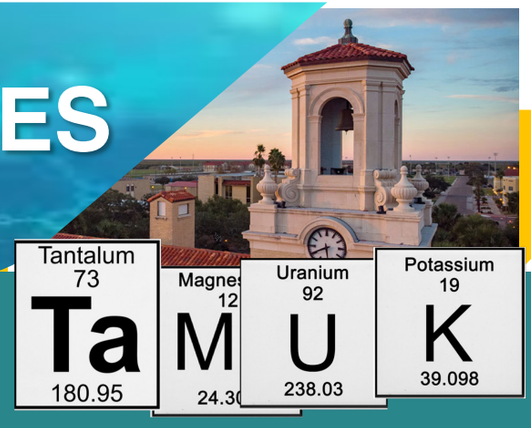
CHEMISTRY SEMINAR SERIES

Department of Chemistry | College of Arts and Sciences



ZOOM LINK:
https://tamuk-edu.zoom.us/j/6769157893?pwd=Y29YSTBxeEJVOU1JVkh2MHlXZG5yUT09
Meeting ID: 676 915 7893 **Passcode:** 552210

February 27 | 3:00 – 4:00 pm | Nier 251

Design & Development of Nanoparticles Based Delivery Systems for Inflammatory Diseases

Formulation Scientist
ARx Pharmaceuticals

Sushesh Srivatsa Palakurthi, PhD

Two distinct nanoparticle-based delivery systems for treating inflammatory diseases were developed. The first, an oral delivery system for tofacitinib, utilized Eudragit-coated zein nanoparticles for Inflammatory Bowel Disease (IBD). These nanoparticles demonstrated pH-dependent controlled release and successful colonic targeting in a colitis model, confirmed by physiologically based pharmacokinetic (PBPK) modeling, leading to enhanced local efficacy and potentially reduced systemic exposure. The second part focuses on a generic ophthalmic nano-emulsion of difluprednate. A novel, bio-relevant in vitro release testing (IVRT) method using microdialysis was developed and validated. This method successfully demonstrated bioequivalence between the in-house formulation and the reference product, providing a crucial tool for the development of complex generic ophthalmic drugs. Collectively, this work highlights the application of advanced formulation strategies to improve targeted drug delivery and facilitate the development of generic alternatives for inflammatory conditions.

Keywords: Nanoparticle Drug Delivery, Biorelevant In vitro methods, PBPK Modeling

Biography:

Sushesh earned his Bachelor's in Pharmacy from India and a Master's in Chemistry from Texas A&M University-Kingsville. He completed his Ph.D. in Pharmaceutical Sciences at Texas A&M University College of Pharmacy in December 2025, focusing on innovative nanoparticle delivery systems for inflammatory diseases. His research included developing an oral delivery system for tofacitinib for Inflammatory Bowel Disease (IBD) and an in vitro release testing method for a generic ophthalmic nano-emulsion of difluprednate. With over six years of experience in oral formulation design and drug delivery, he has interned at Takeda Pharmaceuticals and GSK, gaining expertise in advanced characterization techniques and PBPK modeling. Sushesh will start as a Formulation Scientist at ARx Pharmaceuticals in Pennsylvania in March 2026.