



THE UNIVERSITY of MISSISSIPPI

SCHOOL OF PHARMACY

RESEARCH INSTITUTE OF PHARMACEUTICAL SCIENCES

PII CENTER FOR PHARMACEUTICAL TECHNOLOGY

Introduction

The Pii Center for Pharmaceutical Technology (Pii Center) interfaces with the Department of Pharmaceutics and Drug Delivery at the University of Mississippi School of Pharmacy. The Pii Center is housed under the Research Institute of Pharmaceutical Sciences and provides a unique, multidisciplinary approach for enhancing the development, characterization and production of pharmaceutical dosage forms.

The Pii Center conducts interdisciplinary drug/polymer research that provides end-stage pharmaceutical products directed at therapeutic conditions, vaccines, antidotes, and wound care. Utilizing cutting-edge Hot-Melt Extrusion (HME) technology, the Pii Center collaborates with private industry, government, and academia to develop new, improved, and expanded drug delivery systems.

The Department of Pharmaceutics and Drug Delivery and the Pii Center are capable of performing a wide range of formulation development activities to facilitate commercialization of pre-approved active pharmaceutical ingredients, new molecular entities, drug products, and inactive ingredients. Specific capabilities include: preformulation characterization, solid-state characterization, dissolution testing, early assessment of commercialization potential, analytical methods development and validation, long term stability studies, solid, liquid and lipid based dosage form design, mucosal, transmucosal, transscleral and transdermal drug delivery, and pharmacokinetic studies and development of new technologies to commercialize drugs, including those from natural products.

Funding

Research is funded from a variety of sources including CDC, FDA, NIH/NIAID/NCI, NSF, USDA, and industry. The School of Pharmacy has been in the top ten nationally for U.S. schools of pharmacy in total federal funding over the last five years.

R&D Focus and Opportunity

- Development of cost-effective, patient friendly, and efficacious delivery systems for existing active pharmaceutical ingredients, as well as for new chemical entities/natural products.

- Assessing the pharmaceutical properties of complex lead compounds including multi-component botanical products and preformulation studies for all lead compounds
- Improving bioavailability via Hot-Melt Extrusion technology

Development Capabilities

- New formulation characterization
- Solid-state characterization
- Solubility testing
- Dissolution and CaCO₂ cell permeability
- Analytical methods development and validation
- Physical and chemical stability assessment
- Dosage form design
- Mucosal and transmucosal delivery
- Early assessment of commercialization potential

Facilities and Resources

The Pii Center and the Department of Pharmaceutics and Drug Delivery are housed in 6000 square feet of modern laboratory space. These entities are fully equipped to conduct pharmaceutical characterization studies. All pharmaceutics and drug delivery scientists have joint appointments in the Research Institute of Pharmaceutical Sciences and have access to equipment, scientific expertise, and facilities within the Thad Cochran Research Center, an advanced pharmaceutical research building with over 118,000 square feet of laboratories, classrooms, offices, and a science library.

Laboratory Personnel

All faculty within the Department of Pharmaceutics and Drug Delivery work together and have extensive experience, from preformulation to technology transfer.

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