UNIVERSITY of MARYLAND
SCHOOL OF PHARMACY

RESEARCH FACTS

EXPERTISE. INFLUENCE. IMPACT.

As a top research school, the University of Maryland School of Pharmacy applies an integrative approach to drug discovery and development, innovative patient care, and drug outcomes and their economic impact. Researchers in the **Department of Pharmaceutical Sciences (PSC)** are identifying new drugs to treat drug abuse, cancer, neurodegenerative diseases, and infection. The **Department of Pharmaceutical Health Services Research (PHSR)** provides valuable information on the economic costs and public policy issues that arise once drugs and therapies have been made available to the public. The **Department of Pharmacy Practice and Science** is dedicated to advancing pharmacy practice through education, research, leadership and advocacy, and shapes the future of pharmacy by offering innovative teaching methods, and translating research discoveries and pharmacy practice innovations into exemplary patient care.

The School of Pharmacy has more than $27.1 million in grants and contracts, with more than $3.1 million of that funding from the National Institutes of Health.

PHARMACEUTICAL HEALTH SERVICES RESEARCH

Centers

- Peter Lamy Center on Drug Therapy and Aging
- Pharmaceutical Research Computing
- Center on Drugs and Public Policy
- Center for Drug Safety

Graduate Program

- The PHSR PhD program provides graduates with the theory, practical experience, and problem-solving skills needed to address a wide range of pharmacy and health services issues
- Adapted from the top-tier PhD in PHSR program, the MS in PHSR is geared towards experienced professionals who will gain the experience and decision-making skills needed to improve prescription drug use and health among diverse populations.
- Graduates secure jobs in academia, industry, and government agencies, including the Food and Drug Administration, the Agency for Healthcare Research and Quality, and the Centers for Medicare and Medicaid Services

Research Initiatives

- **Comparative Effectiveness Research:** Compares different health care and treatment approaches to help patient and providers make more informed decisions on care and coverage.

- **Pharmacoeconomics:** Examines the true value of pharmaceuticals by researching, among other variables, costs, expenditures, patient outcomes, quality of life, and budget impact of new technologies.

- **Pharmacoepidemiology:** Examines the use and the effect of drugs at the population level, and includes evaluation of appropriateness of drug use in vulnerable populations such as children and the elderly.

- **Pharmaceutical Policy:** Involves the development, provision and use of medications within a health care system, including regulatory issues, pricing, coverage and payment, and other similar topics.

Funding

- PHSR has more than $4.4 million in grants and contracts from sources such as:
  - Agency for Healthcare Research and Quality
  - Academy of Managed Care Pharmacy
  - Maryland Citizens' Health Initiative Education Fund, Inc.
  - Maryland Department of Health and Mental Hygiene
  - National Association of Chain Drug Stores
  - National Institute on Aging
  - National Pharmaceutical Council
  - Novartis Pharmaceuticals Corporation
  - Patient-Centered Outcomes Research Institute
  - Pharmaceutical Research and Manufacturers of America (PhRMA) and the PhRMA Foundation
  - Takeda Global Research & Development Center, Inc.

PHARMACEUTICAL SCIENCES

Centers

- Computer-Aided Drug Design Center
- Center for Bio- and Nano-technology
- Center of Excellence in Regulatory Science and Innovation
- Mass Spectrometry Center

Graduate Program

- The PSC PhD program provides students with the knowledge and skills to direct the discovery of novel biological pathways in human disease and the development and delivery of medications for safe and effective therapy
- The Master of Science (MS) in Regulatory Science provides graduates with the knowledge and skills necessary to contribute to drug and biologics regulation and pharmaceutical product lifecycles.
- Graduates excel as leaders in the pharmaceutical and regulatory sciences, and have opportunities to gain excellent positions in academia and the pharmaceutical industry, or in government agencies such as the Food and Drug Administration and the National Institutes of Health

Core Capabilities and Facilities

- Nuclear Magnetic Resonance
- Pharmacokinetics and Biopharmaceutics Laboratory
- Confocal Microscopy
- Good Manufacturing Practice Labs

Research Initiatives

PSC has significant strength in the areas of microbiology and antibiotics, drugs of abuse, and novel treatments for cancer through the use of:

Proteomics

- Determination of the underlying mechanism of disease through the function and dysfunction of proteins using mass spectrometry and cellular and structural biology

Drug Design and Discovery

- Translation of the findings from proteomics to the computer-aided rational design to target identification, chemical synthesis, and lead optimization

Drug Development and Translational Research

- Preclinical development, formulation, and delivery of new experimental therapeutics; drug metabolism and pharmacogenomics, with an emphasis on drug safety, toxicity, and efficacy

Funding

PSC has more than $7.7 million in grants and contracts from a variety of agencies and organizations, such as:

- National Institutes of Health
- Food and Drug Administration
- National Science Foundation
- Samuel Waxman Cancer Research Foundation
- American Foundation for Pharmaceutical Education
- Epilepsy Foundation of America
- Wyle Integrated Science & Engineering Group
- Philips Home Healthcare Solutions
- Various other public and private sources

PHARMACY PRACTICE AND SCIENCE

Centers

- Center for Innovative Pharmacy Solutions
- Center for Translational Medicine
- Maryland Poison Center
- Mental Health Program

Programs

- The Applied Therapeutics, Research, and Instruction at the University of Maryland (ATRIUM) Cardiology Collaborative
- Patients, Pharmacists, Partnerships (P^3) Program

Practice-Based Research Highlights

- **Cardiology**
  - The ATRIUM Cardiology Collaborative is focused on research and the pharmaceutical care of patients with cardiovascular diseases.
- **Palliative Care/Geriatrics**
  - Faculty are leading a group of international experts to develop guidelines for methadone use in hospice and palliative care patients, have been integral in creating a controlled substance emergency preparedness plan, are evaluating Part D MTM Technical Implementation, and developing safeguards in ambulatory care for veterans with chronic kidney disease.
- **Infectious Disease**
  - Research focuses on HIV and multidrug resistant pathogen prevention and patient outcomes.
- **Mental Health**
  - Faculty developed a buprenorphine/naloxone-maintenance program within local health departments and have conducted research on patient outcomes. The center also manages psychiatric pharmacy services in state facilities throughout Maryland.
- **Ambulatory Care**
  - Faculty research barriers and facilitating factors in transitions of care, improving care for children with chronic gastrointestinal illnesses, and management of heart failure in the elderly.
- **Toxicology**
  - Faculty are nationally renowned experts in clinical toxicology and clinical pharmacokinetics providing real world solutions as new agents continue to be introduced to the market.

Translational Research

The Center for Translational Medicine (CTM) uses its unique ability to employ advanced and innovative analyses to create intelligence from information. The center analyzes and summarizes data from experiments and clinical trials using quantitative disease, drug, and trial models. These quantitative models, along with cutting-edge development techniques such as adaptive and enrichment trials, are integrated into tools that drug developers, regulatory agencies, and other research organizations can use to guide decisions pertaining to "go/no-go," dosage, patient population, design, endpoint, analyses, and therapeutics choices.

Educational Research

- The **Walgreens Objective Structured Clinical Examination (OSCE)** Suite helps student pharmacists practice their clinical skills in simulated real world situations. Research on the effectiveness of OSCEs to assess soft skills and preparedness of pharmacy students for advanced rotations has shown that OSCEs are an effective teaching instrument.

- **Innovations in Teaching**
  - Faculty have developed innovative teaching methods based on research that measures and analyzes the effectiveness of unconventional teaching methodologies and contemporary adult learning.

Funding

PPS has more than $14.9 million in grants and contracts from a variety of agencies and organizations, including:

- National Institutes of Health
- Maryland Department of Health and Mental Hygiene
- Agency for Healthcare Research and Quality
- Food and Drug Administration
- National Cancer Institute
- MedStar Research Institute
- Econometrica/Centers for Medicare and Medicaid Services
- Centers for Disease Control and Prevention
- American Society of Health-System Pharmacists Foundation