UF College of Pharmacy UNIVERSITY of FLORIDA

CENTER FOR NATURAL PRODUCTS, DRUG DISCOVERY & DEVELOPMENT



The Center for Natural Products, Drug Discovery and Development, or CNPD3, was established in 2013 in recognition of the urgent need for concerted drug discovery and development at the University of Florida. The center features members from 10 departments across five UF colleges, and its headquarters is in the College of Pharmacy.

Mission

The mission of the CNPD3 is to foster early-stage drug discovery by providing the infrastructure, chemical libraries and expertise to screen for disease-relevant targets and drug-like, disease-modifying molecules that modulate target activity. The CNPD3 provides an academic home for the identification of drug leads and subsequent development campaigns carried out in concert with other biomedical centers at UF to drive forward preclinical and clinical drug development.

Focus

The chemical focus of the CNPD3 is unique natural products, and the goal is to fully exploit the biosynthetic and therapeutic potential of untapped biodiversity for drug discovery. Candidate compounds are investigated for further development through interactive chemistry and pharmacology efforts. The center embraces all aspects of natural products research from discovery, biosynthesis and chemical synthesis, assay development, screening and target identification to drug development.

Education and Training

The educational and training objectives are to integrate all Ph.D. students and postdoctoral fellows whose interdisciplinary interests are focused on drug discovery. The CNPD3 hosts a seminar series, which runs through the academic year, featuring outstanding speakers in the area of drug discovery and development. Through the biennial UF Drug Discovery Symposium, the center has created a forum to bring together UF researchers with common interests in drug discovery and development and leading experts in the field across the U.S.



Hendrik Luesch, Ph.D. Debbie and Sylvia DeSantis Chair in Natural Products Drug Discovery and Development

Professor and Chair, Department of Medicinal Chemistry

Director, Center for Natural Products, Drug Discovery and Development

> 410 square-foot screening laboratory

graduate students and postdoctoral fellows

faculty and co-faculty

\$7.5 million in annual research awards

Hendrik Luesch, Ph.D. Director P.O. Box 100485 • Gainesville, FL 32610 • 352.273.7738 C N P D 3 . P H A R M A C Y . U F L . E D U

CENTER FOR NATURAL PRODUCTS, DRUG DISCOVERY & DEVELOPMENT

D3 Platform

Our drug discovery and development, or D3, platform is natural products centric. CNPD3 members generate and annotate diverse natural and synthetic chemical libraries, including peptides, for phenotypic and target-based screening and subsequent medicinal chemistry efforts and use synthetic biology approaches to manipulate microbial natural products chemistry. Additionally, we are also evaluating the scientific basis for pharmacological effects of selected dietary components and ethnobotanicals to characterize the active ingredients.

Research programs include characterization and the mechanisms of action of drug candidates at the cellular and molecular level and use structure-based drug design to improve on candidate compounds with identified targets. Towards translation of the most promising discoveries, we are using state-of-the-art in vivo models that are most predictive for activity in a clinical setting. Our disease focus is on cancer as well as drug abuse, addiction and pain as the major indications, and we collaborate with other centers on our leads in infectious diseases and other areas.



The entire spectrum of multidisciplinary research from genomes to drugs, including genome mining, biosynthetic engineering, chemical synthesis and biological profiling of natural products and natural product-like compounds, leading to the corresponding in vitro and in vivo pharmacology, mechanistic studies and preclinical evaluation of drug candidates is depicted above. We have several collaborative cores and emerging cores in the main areas of the D3 process. Candidate compounds with promising activity can also be evaluated in UF's Translational Drug Development, or TDD, Core at the Clinical and Translational Science Institute, or CTSI, for bioanalytical testing, including pharmacokinetic studies.

Ranjala Ratnayake, Ph.D. Assistant Director P.O. Box 100485 • Gainesville, FL 32610 • 352.627.9220 C N P D 3 . P H A R M A C Y . U F L . E D U