Is Pleased to Present a Seminar
Presented By

Anthony W.G. Burgett
University of Oklahoma

Friday, September 20, 2019
At 4:00 pm
NWC 1313

Novel Bioactive Small Molecules As Starting Points for New Molecular Targeted Therapies:
Discoveries in Chemistry, Biology, and Bioanalysis

Our research program seeks to discover the cellular mechanisms of action through which novel bioactive compounds affect biological systems, and then to apply these research discoveries to unlock new understandings in cellular biology and to launch new approaches in the therapeutic intervention of human disease. Our interdisciplinary research combines cellular biology, protein biochemistry, and bioanalysis built on the foundational capability to make and modify complex structures through organic synthesis. The oxysterol-binding protein (OSBP/ORP) family of human proteins are important mediators of lipid biology, and specific OSBP/ORP family members execute essential functions in cancer proliferation and pathogenic viral infection. The OSBP/ORPs are the cellular targets of a class of structurally-complex natural product compounds. Our current research program uses these natural product compounds as chemical probes to define the OSBP/ORP cellular functions and as starting points for the synthesis of potential lead therapeutic compounds targeting OSBP/ORP family members. We have discovered novel OSBP/ORP cellular function and regulation. Through biochemical studies on the OSBP/ORP proteins, we have developed an extensive structure-activity relationships (SAR) model for small molecule ligand interaction with the OSBP/ORPs. Based on this SAR model, we have undertaken the synthesis of novel OSBP/ORP targeting compounds, using novel synthesis routes, for the development of new potential antiviral and anticancer lead compounds. Additionally, through a collaboration with the mass spectrometry technology research group of Dr. Zhibo Yang, we have developed and begun to deploy a novel single cells mass spectrometry technology capable of quantifying drug molecules, lipids, and metabolites present in individual single cells. This new single cell mass spectrometry capability has been an important tool in our OSBP/ORP projects. Additionally, using this single cell mass spectrometry technology, we successfully developed, for the first time, the ability to quantify the intracellular drug concentrations in individual cancer cells isolated from patients undergoing chemotherapy. This advancement in small molecule drug bioanalysis could allow for a new level of precision and effective drug administration in patients. (Bio on back)

Refreshments will be served at 3:45 pm
REMINDER – WEAR YOUR ID
Bio:
Anthony Burgett graduated from Jenks High School, located outside of Tulsa Oklahoma. He earned separate B.S. degrees in Microbiology and Biochemistry at the University of Oklahoma. As an ACS Medicinal Chemistry Pre-doctoral Fellow at UT-Southwestern, he completed the total synthesis of the complex anti-cancer natural product diazonamide A under the direction of Prof. Patrick Harran. Concurrently, he studied the biological activity and molecular pharmacology of diazonamide A and derived compounds supervised by Prof. Michael Roth. He then was a Susan G. Komen Postdoctoral Fellow at Harvard University in the laboratory of Prof. Matthew Shair. His interdisciplinary postdoctoral project focused on a successful target identification program for a class of anti-cancer natural product compounds.