Synthesis and Drug Development of the Anti-Cancer and Anti-Viral Compound OSW-1.

**Project Description:** The complex natural product compound OSW-1 was first identified in the early 1990s based on its potent activity in inhibiting the growth of human cancer cell lines. Recently, the OSW-1 compound was identified as also having anti-viral activity against a broad spectrum of human viral pathogens. OSW-1 induces its biological activity through binding a family of proteins called the oxysterol-binding proteins (OSBPs), which is a class of proteins not previously identified as being involved in cell proliferation or viral reproduction. Therefore, the OSW-1 compound is an exciting potential target for drug development since it exhibits anti-cancer and anti-viral activity through a novel mechanism of action. Our research group has an interdisciplinary biology and chemistry research program to understand the biology of the OSBPs and to develop small molecules for potential therapeutic development that target the OSBPs. We are especially interested in using organic chemistry to produce new versions of the OSW-1 compound that have superior anti-cancer or anti-viral activity with enhanced properties typically found in drug molecules.

**Description of the HRAP Position:** The selected student will assist in using organic chemistry methods to accomplish the synthesis, purification and analysis of new OSW-1 derivative compounds. The students will be trained and work alongside professional organic chemists in performing chemical reactions to engineer and build the new OSW-1-related compounds. The experimental techniques performed will include running organic reactions, chromatography, extractions, NMR, mass spectrometry and other analytical methods.