

## Seminar

### Exploring Potential Applications and Mechanisms for Metal Complexes as Antiviral and Antibacterial Therapeutics

**D. Andrew Knight, Ph. D.**

**Chemistry Department, Florida Institute of Technology**

**March 15, 2013, 4:00 pm**

**Room 201A Parker Bldg., Nova Southeastern University**

**3301 College Ave., Fort Lauderdale, FL 33314**

Metals have been used in the treatment of diseases since ancient times. The Chinese were using gold for disease treatment, a practice known as chrysotherapy, as far back as 2,500 BC. In more recent times, metal coordination complexes such as Cisplatin and Auranofin have been used for the treatment of cancer and rheumatoid arthritis respectively. Radiopharmaceuticals based on metals such as technetium and rhenium are used in imaging and radiotherapy, and ruthenium complexes have had some success as anticancer drugs. We have been exploring the potential of the simple Werner complex, cobalt hexammine "Cohex" for use as a broad-spectrum antiviral and antibacterial therapeutic. Cohex is a coordinatively saturated complex of Co(III) surrounded by six ammonia ligands, is air and water stable and has low toxicity. We have reported on its antiviral activity against both Sindbis virus (SV) and adenovirus. Due to its kinetic inertness, Cohex interacts principally with its environment via outer-sphere coordination and through simple electrostatic interaction. One consequence is that, unlike previously studied Co(III) systems, Cohex does not hydrolyze nucleotides, but does show potent inhibition of protein synthesis and dose-dependent antiviral properties. Our recent studies on the activity of Cohex against Ebola and HIV will be discussed.

#### **About the Speaker**



Dr. Knight is a native of the United Kingdom and earned both his BSc and PhD degrees in chemistry from the University of St. Andrews, Scotland. After postdoctoral research at the University of Utah he held academic positions in Washington, DC and New Orleans and is currently Associate Professor of Chemistry at the Florida Institute of Technology. Dr. Knight has published over 50 papers in the field of inorganic coordination chemistry and his research group is interested in the broad applications of inorganic chemistry, including the use metals in medicine and catalysis using nanoparticle supports. He has been awarded Office of Naval Research-ASEE Distinguished Faculty fellowships, and a Centre National de la Recherche Scientifique Senior Fellowship.