



2002 IOTA SIGMA PI AWARD IN PROFESSIONAL EXCELLENCE

Professor Kristin Bowman-James, University of Kansas

Professor Kristin Bowman-James is the **2002 recipient of the Iota Sigma Pi Award for Professional Excellence**. This award is given for outstanding contribution to chemistry and allied fields by a woman.

Dr. Bowman-James is currently a professor of chemistry at the University of Kansas. She was also the chair of the chemistry department from 1995-2001. Early in her career, Dr. Bowman-James worked on macrocyclic chemistry, by exploring their derivatives with heavier transition metals. Her significant findings include (1) formation of novel intermediate condensation products in some cases, shedding light on mechanistic pathways involved in a template-facilitated macrocycle formation. (2) Second and third row transition metal complexes display a propensity toward formation of higher order polyiodide chains as

counterions. (3) Photosensitive lability of coordinated aldehydes was discovered and explored.

Dr. Bowman-James designed a novel and promising new family of ligands, the *accordion porphyrins*. She recognized that two key types of metal complexes successfully manipulate molecular oxygen for respiring organisms. She produced a unique tetrapyrrolic ligand that combines central features of both natural phenotypes, a hybrid porphyrin/binucleating macrocycle capable of binding two metal ions simultaneously.

Subsequent work using macrocycles for selective recognition of anions led to the discoveries that (1) simple polyammonium macrocycles not only form very stable complexes, they also catalyze the hydrolysis of nucleotides; (2) metal ions regulate the catalysis performed by these macrocycles; and (3) a simple polyammonium macrocycle could essentially control a complex multi-step catalytic process. Her studies in coordination chemistry led to the crystallographical characterization of (1) the first binuclear complex of a ditopic azacryptand which contains two encapsulated and eclipsed nitrates; (2) the first cascade complex in which two fluorides occupy two "metal-ion-like" sites in a ditopic azacryptand, and are linked by a bridging water molecule; and (3) a "sandwich complex" in which a sulfate is sandwiched between neutral tetraamido macrocycles.

Dr. Bowman-James was asked by the National Science Foundation to co-organize a workshop on the future of inorganic chemistry; she has served on the editorial boards of *Inorganic Chemistry* and *Supramolecular Chemistry*. Dr. Bowman-James has published 70 papers and give 17 invited lectures at national and international meetings. She has written chapters in 4 books and co-authored a book.