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Binding and membrane transport of anions and salts using synthetic receptors. Bradley D. Smith, Dept. of Chemistry and Biochemistry, Univ. of Notre Dame, Notre Dame, IN 46556-5670, USA

The principles of supramolecular chemistry are used to develop synthetic receptors for anions. If both of the counter-ions in a target salt have localized charges then the consequent ion-pairing of the salt can dramatically lower receptor/anion binding affinities and alter binding selectivities. One way to counter this problem is to develop ditopic receptors that can simultaneously bind both of the salt counter-ions. We are investigating the salt binding properties of various synthetic receptors using NMR and X-ray crystallography. We have synthesized a receptor that binds salts as a solvent separated and contact ion-pairs. An important feature with these synthetic receptors is their ability to promote phospholipid flip-flop and chloride transport through biological membranes. The biological and pharmaceutical activities induced by these processes will be discussed.