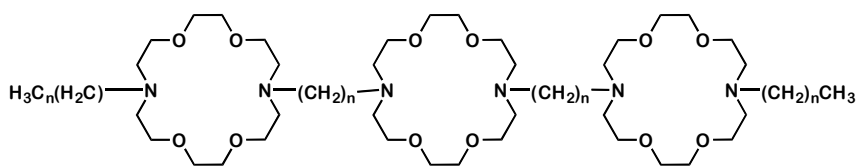


# Synthetic Channels that Selectively Transport Cations or Anion Through Phospholipid Bilayer Membranes

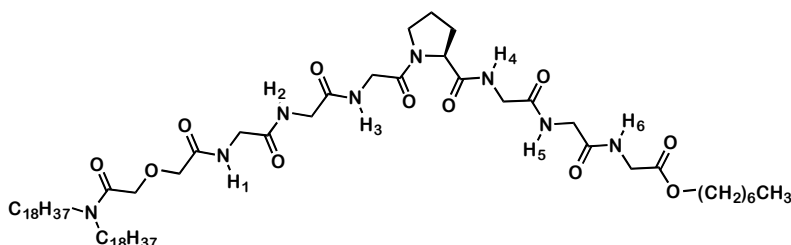
George W. Gokel

*Departments of Chemistry & Biochemistry and Biology, Center for Nanoscience,  
University of Missouri — St. Louis, St. Louis, MO 63121*

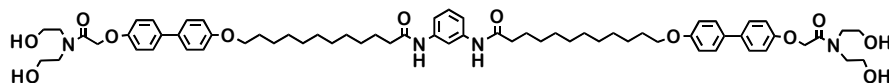
We have developed and characterized several families of compounds that can function as ion channels in planar lipid bilayers. The family of compounds that we call “hydraphiles” transport  $\text{Na}^+$  in planar lipid bilayers and in synthetic liposomes. Several of these compounds were applied to cultured cells at concentrations up to  $8 \mu\text{M}$  and showed increased membrane currents (HEK 293 cells) or selective toxicity to various bacteria. A second family of synthetic anion transporters (SATs) are alkane-anchored heptapeptides also show classic channel behavior while transporting  $\text{Cl}^-$ . A third family of compounds that we have called “aplosspans” were designed to be extremely simple amphiphiles. These compounds show modest ion transport and selectivity. Our most recent studies of synthetic channel activity relate to pyrogallol[4]arenes, which insert in bilayer membranes and form remarkably stable, switchable pores.



Hydraphiles



Synthetic Anion Transporters: SATs



Aplosspans

