

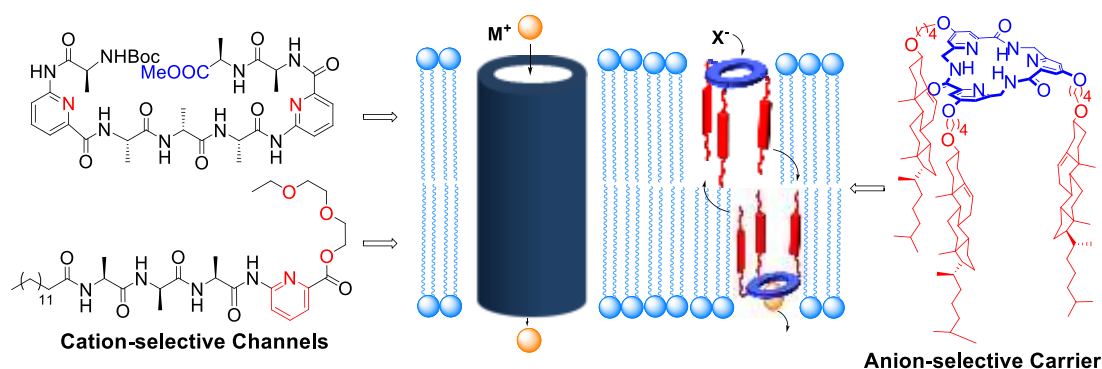
Invited Lecture
57th Annual Convention of Chemists (ACC) - Indian Chemical Society (ICS)
Recent Trends in Chemical Sciences (RTCS 2020)

Engineering Peptides to Mimic Proteins

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Abstract:

Transmembrane ion-transport is crucial for the smooth functioning of living organisms.¹ Molecules that mimic the ion-selectivity of these transporters are attractive for the development of drugs.² Similarly, compounds that mimic the gating behavior i.e. regulated opening and closing of ion channels can be potentially used as molecular switches.³ Our group develops minimalistic scaffolds that mimic the function of natural ion channels. Our acyclic octapeptide⁴ and macrocyclic⁵ scaffolds are cation and anion selective, respectively. Smaller tetrapeptide scaffolds appended with hydrophobic tails are also able to transport ions.⁶ Further, the ion-selectivity of these peptides can be modulated using “selectivity inducers” at the C-terminus of the peptides.⁷ The talk will discuss the design principles involved in development of our minimalistic peptidic scaffolds



References and Notes:

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Bio-Sketch of Speaker

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Nandita Madhavan got her bachelor's degree in Chemistry from S.I.E.S. College (Mumbai University) and her master's degree from IIT Bombay. She joined the University of Illinois at Urbana-Champaign for her Ph.D., where her research under the guidance of Dr. Mary Gin focused on the development of cyclodextrin derivatives for light activated transmembrane ion transport. Her post-doctoral research in Dr. Marcus Weck's research group at Georgia Institute of Technology involved the development of polymer supported catalysts for asymmetric organic synthesis.

She started her independent research career in 2009 at IIT Madras and subsequently moved to IIT Bombay in 2016. Her research group mimics the activity of natural ion channel proteins using small peptides. The ion selectivity and the reversible opening-closing or “gating” of these peptides can be potentially used for the development of therapeutics and molecular switches. Another research focus area of her group is the development of cost-effective methods for peptide synthesis. Nandita is also associated with the Centre of Teaching and Learning at IIT Bombay and is interested in understanding and exploring novel methods of teaching & learning.