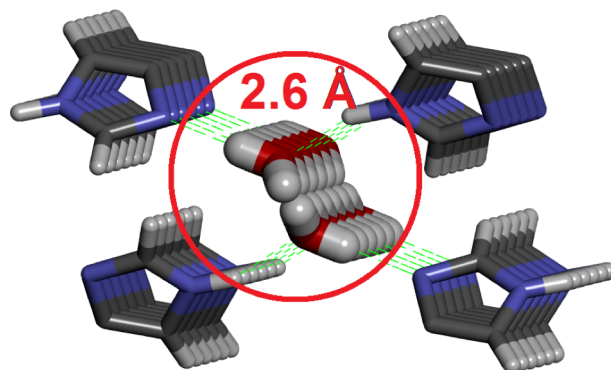


Artificial Water Channels



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This lecture discusses the incipient development of the artificial water channels systems. We include only systems that integrate synthetic elements in their water selective translocation unit. We review many of the natural systems involved in water and related proton transport processes. We describe how these systems can fit within our primary goal of maintaining natural function within bio-assisted artificial systems. In the last part, we present several inspiring breakthroughs from the last decade in the field of biomimetic artificial water channels. All these examples demonstrate how the novel interactive water-channels can parallel biomolecular systems. At the same time these simpler artificial water channels offer a means of understanding the molecular-scale hydrodynamics of water for many biological scenarios.



- [1] M. Barboiu and A. Gilles, From natural to bio-assisted and biomimetic artificial water channel systems. *Acc. Chem. Res.* 2013, **46**, 2814–2823.
- [2] M. Barboiu, Artificial water channels, *Angew. Chem. Int. Ed.* 2012, **51**, 11674-11676.
- [3] Y. Le Duc, M. Michau, A. Gilles, V. Gence, Y.-M. Legrand, A. van der Lee, S. Tingry, M. Barboiu, Imidazole I-quartet water and proton dipolar channels, *Angew. Chem. Int. Ed.* 2011, **50(48)**, 11366-11372.
- [4] E. Licsandru, I. Kocsis, Y.-x. Shen, S. Murail, Y.-M. Legrand, A. van der Lee, D. Tsai, M. Baaden, M. Kumar, M. Barboiu, Salt-excluding artificial water channels exhibiting enhanced dipolar water and proton translocation, *J. Am. Chem. Soc.*, 2016, **138**, 5403-5409.
- [5] M. Barboiu, Artificial Water Channels –incipient innovative developments. *Chem. Commun.*, 2016, **52**, 5657- 5665.