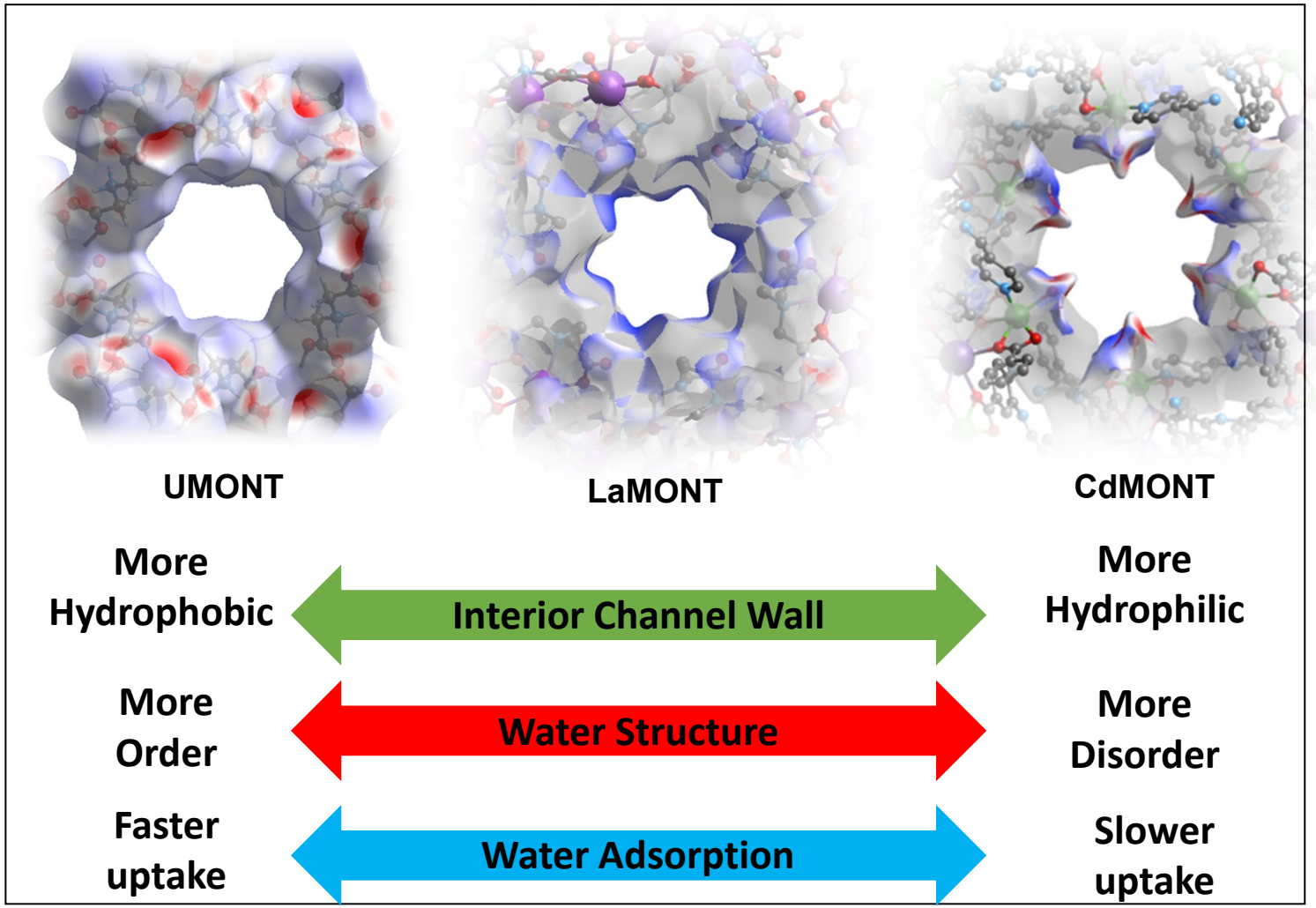
Confinement effects within metal organic nanotubes: Relationships between hydrophobicity and water structure, diffusion, and selectivity

Tori Forbes, University of Iowa

- When water molecules are placed under nanoconfinement, the physical and chemical properties deviate from the bulk solution, but the exact nature of the change is related to the structural features of the material itself, namely the interior wall of the channel.
- The overall hypothesize for this work is that increasing the hydrophobicity of the pore wall will lead to more structural ordering of the water and faster diffusion of water through the nanotube.
- A series of metal-organic nanotubes (UMONT, LaMONT, and CdMONT) that contain nanoconfined water were evaluated with a specific interest in structural ordering and uptake kinetics.
- Ordering of the water is dependent on hydrophobic repulsion of the channel walls and greater hydrogen bonding of the water network
- Faster uptake is dependent on capillary action and minimal hydrogen bonding with channel.



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- The focus of my broader impacts is on fostering resilience in science. As the general chair of the 2022 Midwest Regional Meeting, I was interested in the intersection of resilience with a sense of belonging.
- The organizing committee and I made concerted efforts to work with local DEI groups to brainstorm strategies to make our meeting more inclusive. We posted diversity statements, discussed importance of inclusion at opening session, created technical programming around DEI, offered funds to support students in need of financial assistance, and created social events.
- Currently developing content for the University of Iowa Chemistry DEI website (https://chem.uiowa.edu/diversity) to reflect on inclusive practices for scientific meetings in chemistry.

Creating an inclusive scientific meeting: Insights from the 2022 Midwest Regional American Chemical Society Meeting