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Nano props to get molecule-sized blades

Jul 16 03:34 PM US/Eastern



CHICAGO, July 16 (UPI) -- U.S. scientists have created a theoretical blueprint for assembling a nanoscale propeller that has molecule-sized blades.

University of Illinois-Chicago researchers, led by Assistant Professor Petr Kral, used classical molecular dynamics simulations to learn how such tiny propellers pump liquids.

The researchers found that at the molecular level the chemistry of the propeller's blades and their sensitivity to water play a big role in determining the propeller's efficiency. If the blades have a hydrophobic nature, they pump a lot of water. But if they are hydrophilic, they become clogged with water molecules and pump poorly.

"In principle, we could even attach some biological molecules to the blades and form a propeller that would work only if other molecules bio-compatible with the blades are in the pumped solution," he said.

Kral said such technology probably won't become reality for several years, but he said he believes the 21st century will be about hybrid biological and artificial nanoscale systems and their mutual co-evolution.

The work is featured in the July 12 issue of Nature and was described in the June 28 cover story of the journal Physical Review Letters.

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