

Re: PHYSICAL REVIEW FOCUS 4 October 2007 <http://focus.aps.org/>

Source: <http://sci.tech-archive.net/Archive/sci.physics/2007-10/msg00325.html>

- *From:* Andy Resnick <andy.resnick@xxxxxxxxxxxx>
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Sam Wormley wrote:

PHYSICAL REVIEW FOCUS 4 October 2007 <http://focus.aps.org/>
David Ehrenstein, American Physical Society

Introductions to the Focus stories of the past week;
visit <http://focus.aps.org> for the complete stories.

OIL HOLDS WATER TRANSFIXED

Many of life's essential biological processes depend on water and specifically on the repulsion that the oily parts of biomolecules have toward water. But some aspects of the oil-water interaction haven't been clear. Researchers reporting in the 5 October Physical Review Letters studied water mixed with oily compounds using precisely-timed pulses of infrared light. They showed that part of the shell of water surrounding oily molecules is frozen in place, confirming a controversial model from 60 years ago. The findings could help scientists better understand how water repulsion molds the molecules of life.

(Y. L. A. Rezus and H. J. Bakker, Phys. Rev. Lett. 99, 148301)

Link to the paper: <http://link.aps.org/abstract/PRL/v99/e148301>

COMPLETE Focus story at <http://focus.aps.org/story/v20/st11>

This is interesting work- it is important to realize that there is an electric field gradient of 60 mV/10nm (6×10^7 V/m) across every single cell membrane in our body. More across the mitochondria: 220 mV/10nm. This is a real electric field, and the cell extracts work from this to create ATP from ADP and move ions in and out of the cell.

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