

New discovery could impact how the body receives medicine

October 7 2010

Researchers at Queen's University have discovered how molecules in glass or plastic are able to move when exposed to light from a laser. The findings could one day be used to facilitate medicinal drug distribution by allowing doctors to control the time and rate at which drugs are delivered into the body. The drugs, in a solid plastic carrier, could be released through the body when exposed to light.

Lead researcher Jean-Michel Nunzi, a professor in the departments of Chemistry and Physics, has determined that "molecular cooperation" is what allows the molecules to move and shift.

"Glasses and plastics are mysterious materials. We knew how the molecules moved in a liquid, but we didn't know how they moved in a glass or plastic – no one did," said Dr. Nunzi. "We discovered the way motion takes place at the molecular scale in a glass or plastic."

Dr. Nunzi compares the findings to cars in a crowded parking garage. If the garage is full of cars, without any space between them, then a car cannot move unless another one moves with it. The same can be said for molecules – the light causes them to move slightly, but it is the cooperation with other molecules that enables them to move significantly.

When plastic is exposed to light from a [laser](#), the molecules under the light move together, changing the shape of the solid material. The [molecules](#) that are not exposed to the light remain stable. The result is a

dramatic change in the shape of the solid material that is visible to the naked eye.

The findings, published in the *Journal of Chemical Physics*, build on a study done at Queen's in 1995 that showed it was possible to make solid materials fluid, or movable, using light.

Provided by Queen's University

Citation: New discovery could impact how the body receives medicine (2010, October 7)
retrieved 25 April 2024 from

<https://phys.org/news/2010-10-discovery-impact-body-medicine.html>

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