The Red and Green of Drug Delivery

A Purdue University researcher has explained for the first time the details of how drugs are released within a cancer cell, improving the ability to deliver drugs to a specific target without affecting surrounding cells. "As a general strategy, the indiscriminate delivery of drugs into every cell of the body for the treatment of a few specific pathologic cells, such as cancer cells, is a thing of the past," says Philip Low, the Ralph C. Corley Distinguished Professor of Chemistry. "Most new drugs under development will be targeted directly to the pathologic, disease-causing cells, and we have shed light on the details of one mechanism by which this is achieved." Interest in how drugs are released after they enter their targeted cell led Low and his team to develop a color-coded method to visualize the cellular mechanisms. Jun Yang, a postdoctoral research associate in Low's research group, together with Ji-Xin Cheng, an assistant professor in the Department of Biomedical Engineering, and his graduate student Hongtao Cheng, developed this method using a technique called fluorescence resonance energy transfer imaging. "The drug turns from red to green when it is released inside the cell, clearly illuminating the process," Yang said. "This is the first optical method to be developed to monitor this release. The main promise of this method is that it does not damage the cells being studied. Therefore, we are able to observe the process under true physiological conditions and watch it right as it is happening."

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