

A Resource for Guiding your Prostate Cancer Patients on Their Journey to Wellness



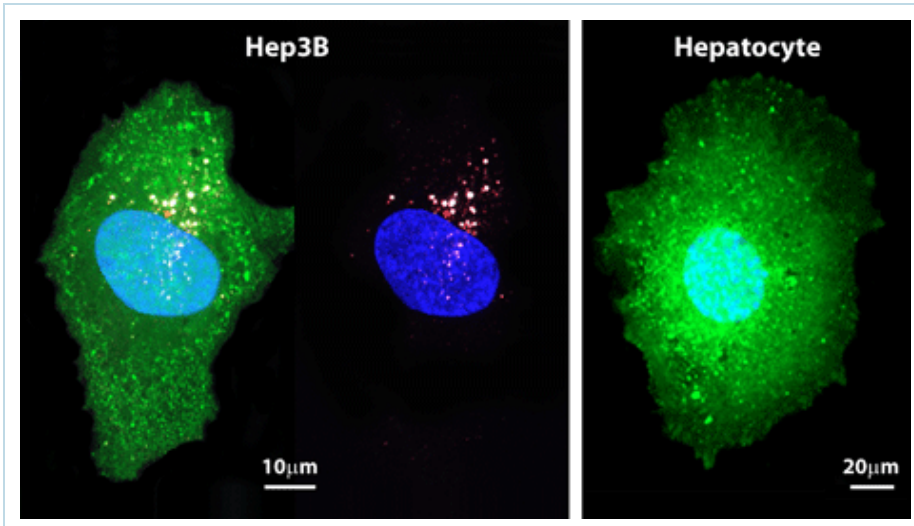
# medGadget

internet journal of emerging medical technologies

Wednesday, April 20, 2011

## [Drug Carrying Protocells Overcome Some Liposome Downsides for Cancer Battle](#)

Filed under: [Nanomedicine](#)



Researchers from Sandia National Laboratories and University of New Mexico developed new silica nanoparticles capable of transporting large amounts of cancer medications. Some of the advantages of these "protocells" over traditional liposome encapsulation is that the silica particles are able to easily absorb drugs when soaked in their solution and the package is delivered in a more targeted and concentrated way.

The nanoparticles and the surrounding cell-like membranes formed from liposomes together become the combination referred to as a protocell: the membrane seals in the deadly cargo and is modified with molecules (peptides) that bind specifically to receptors overexpressed on the cancer cell's surface. (Too many receptors is one signal the cell is cancerous.) The nanoparticles provide stability to the supported membrane and contain and release the therapeutic cargo within the cell.

A current Food and Drug Administration-approved nanoparticle delivery strategy is to use liposomes themselves to contain and deliver the cargo. In a head-to-head comparison of targeted liposomes and protocells with identical membrane and peptide compositions, Brinker [Jeff Brinker, Sandia researcher and UNM professor] and colleagues report that the greater cargo capacity,

Part of the  
**HCP**live  
Healthcare Professionals Network

ARCHIVES

By specialty...

By date...

Ads by Google



[Prostate Cancer Treatment](#)

Noninvasive  
Alternative to Surgery  
or Radiation. See If  
You Qualify!

[HIFU.ca/Prostate-Cancer-Tre](http://HIFU.ca/Prostate-Cancer-Tre)

[Liposome Formulation Lab](#)

Formulate Various  
Compounds, Improve  
PK/PD, Solubility, Stabili  
[www.Liposomes.com](http://www.Liposomes.com)

[Electric Wheelchair](#)

9/10 People Had  
Medicare Pay for an  
Electric Scooter! Free  
Info Kit

[www.Hoveround.com/Wheelc](http://www.Hoveround.com/Wheelc)

[Liposomes](#)

stability and targeting efficacy of protocells leads to many times greater cytotoxicity [destruction] directed specifically toward human liver cancer cells.

Another advantage to protocells over liposomes alone, says lead author Carlee Ashley, a Harry S. Truman post-doctoral fellow at Sandia's California site in Livermore, is that liposomes used as carriers need specialized loading strategies that make the process more difficult. "We've demonstrated we can just soak nanoparticles to load them with unique drug combinations needed for personalized medicine. They effectively encapsulate toxins as well as siRNA [ribonucleic acid] that silence expressions of proteins."

RNA, the biological messenger that tells cells which proteins to manufacture, in this case is used to silence the cellular factory, a way of causing apoptosis or cell death.

The lipids also serve as a shield that restricts toxic chemotherapy drugs from leaking from the nanoparticle until the protocell binds to and takes hold within the cancer cell. This means that few poisons leak into the system of the human host, if the protocells find no cancer cells. This cloaking mitigates toxic side effects expected from conventional chemotherapy.

Instead, the particles – crafted small enough to float under the radar of the liver and other cleansing organs – can circulate harmlessly for days or weeks, depending on their engineered size, seeking their prey.

A library of phages – viruses that attack bacteria – was created at UNM's nationally accredited cancer center by collaborator David Peabody. This permitted researchers to expose the phages to a group of cancerous cells and normal cells, allowing identification of peptides that bind specifically to cancer cells but not normal cells.

Press release: [Sandia and UNM lead effort to destroy cancers](#)

Abstract in *Nature Materials*: [The targeted delivery of multicomponent cargos to cancer cells by nanoporous particle-supported lipid bilayers](#)

Medgadget posts you might like:



Many Pigs Exploded to Protect British Soldiers



Around 70,000 Children a Year Injured by Medical Devices



Photoacoustic Imaging of Melanoma Using Gold Nanocages



Axis Three Launches XS-400 Scanner for Simulation of ...

LinkWithin

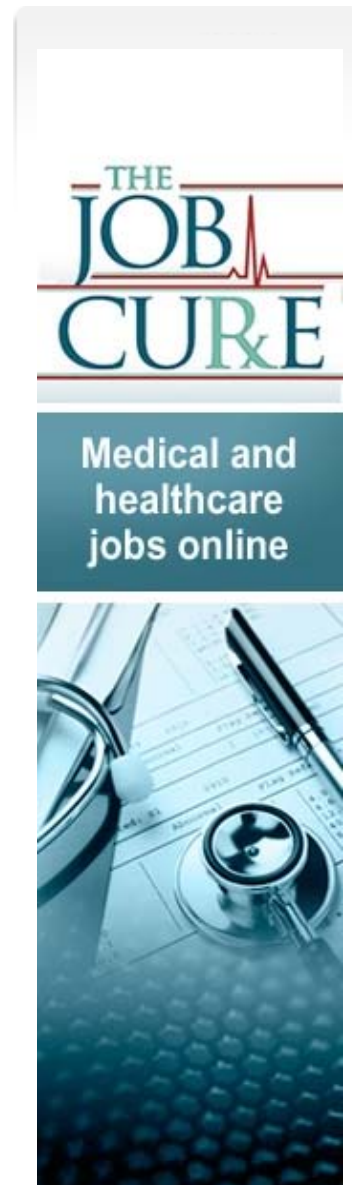
📄 | ➕ | 💬 (0) | 👍 Like Confirm

### Technology

Lipex  
Extruder, Formulation, A  
cGMP Manufacturing  
for Injectables  
[www.northernlipids.com](http://www.northernlipids.com)

### Unparalleled Liposomes

Tight distribution  
<100 nanometers  
using a Microfluidizer  
processor  
[www.microfluidicscorp.com](http://www.microfluidicscorp.com)



### Metastatic tumors

New Mexico's Gamma Knife Center for treatment of metastatic tumors.  
[www.lovelace.com](http://www.lovelace.com)

