Random Samples

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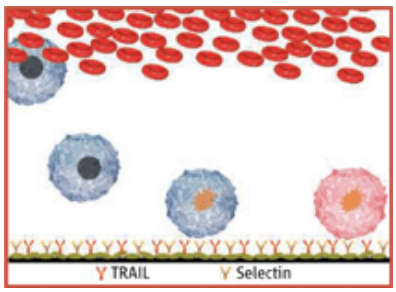
TO CATCH A CELL



CREDIT: KULDEEP RANA/CORNELL UNIVERSITY

Circulating tumor cells--the cause of cancer metastases--are the bane of oncologists. Cells can evade surgery, drugs, and radiation, moving through the bloodstream to set up shop elsewhere in the body. But Cornell University biomedical engineer Michael King and his colleagues have an idea to stop these cells in their tracks.

As the team will report in an upcoming issue of *Biotechnology and Bioengineering*, they have coated a small, coiled tube with two human proteins. One, called a selectin, attracts cancer cells, causing them to stick temporarily to the tube wall. The second, called TRAIL, then activates cell death, or apoptosis.

In the laboratory, a single pass through the tube killed nearly one-third of the cancer cells in a solution. The ultimate goal is to implant a protein-lined shunt into a cancer patient's arm that will reduce the number of malignant cells enough to allow the immune system to get rid of the rest.

"This approach is extremely novel," says Bryan Greene, chief scientific officer of BioCytics Inc., a biotechnology company in Huntersville, North Carolina. It's all very preliminary--the researchers have yet to show it will work in living animals. But, he says, "if these are indeed the cells that ultimately form distant tumors, then targeting [them] should lead to a dramatic patient response."

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NO FREE RIDE FOR BLUBBER

Looking for another good reason to keep that New Year's resolution to lose weight? How about saving the planet?

Operations researchers Sheldon Jacobson and Douglas King at the University of Illinois, Urbana-Champaign, calculate that trimmer U.S. drivers would burn about 3.8 billion liters less fuel per year. The estimate comes from combining driving data from the Department of Transportation, fuel-efficiency figures from the Environmental Protection Agency (EPA), and obesity numbers from the National Center for Health Statistics.

Cars and light trucks currently burn around 0.0045 liters per kilogram of cargo every 100 km, EPA says. With Americans traveling 7.2 trillion km per year, each extra half-kilo of flab requires using an additional 150 million liters of gas. The average adult is nearly 14 kg overweight, teens around 3.6 kg, and children 1.4 kg.

All this excess adds up to anywhere from 2.8 billion to 4.2 billion liters, the authors report online in *Transportation Research Part D: Transport and the Environment*. "We are essentially transporting a load of blubber around," says the journal's editor, Kenneth Button, an economist at George Mason University in Fairfax, Virginia. "We're damaging the environment by being fat."

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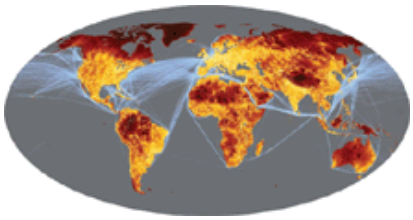
GETTING THERE

The first Global Accessibility Map has been assembled by the European Commission and the World Bank. It depicts the time needed to travel by land or water--from less than an hour (pale yellow) to 10 days (dark brown)--from any location in the world to the nearest city of 50,000 people or more. It also indicates the density of shipping lanes. Only 10% of the world's land area is now "remote"--defined as more than 48 hours from a large city--according to the World Bank. The map was made for *World Development Report 2009* (see gem.jrc.ec.europa.eu/gam/index.htm).



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