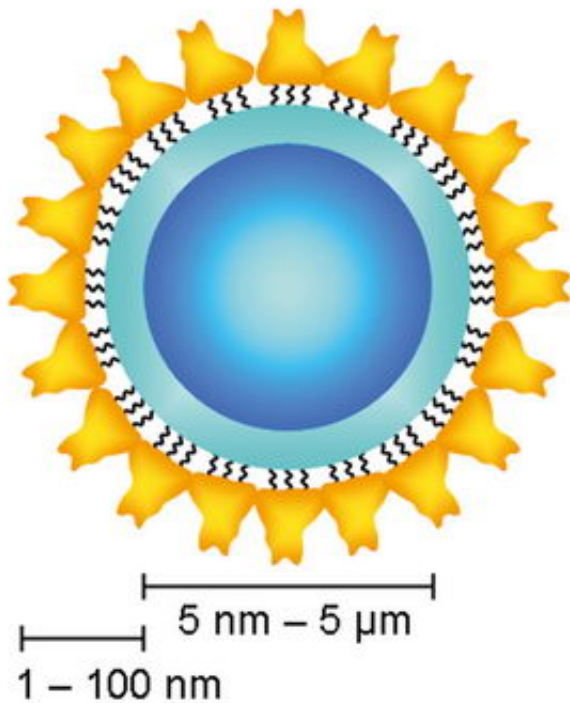


Nano fights cancer

February 17 2006



Nanocytosomes® consist of a silicate nucleus and an outer protein layer. ©
Fraunhofer IGB

They are only a few nanometers in size, but their impact is tremendous: The tiny particles drive cancer cells to their death in no time at all. At nano tech 2006 in Japan from February 21 to 23 Fraunhofer researchers will demonstrate the great efficiency of nanoscopic particles as a vehicle for drug delivery.

Medicines that will make their own way through the body and attack precisely the diseased cells on reaching their destination – such has been the dream of physicians and pharmacists since time immemorial. Fraunhofer researchers working in the Nanotechnology Alliance have now come a little closer to reaching this goal. They have developed bio-functional nanoparticles that cause necrosis in cancer cells. “These cell-like structures have a solid nucleus surrounded by proteins that detect and destroy cancer cells,” explains Dr. Günter Tovar of the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB.

So how does it work? “Communication in the human body is a biochemical process based on the exchange of molecules,” says Tovar. “We are trying to understand these communication processes and harness them for our own purposes.” The tumor necrosis factor TNF for instance, releases a molecule that attaches itself to the receptors of the cancer cell and passes on its deadly message. To introduce the biological messenger TNF into the body, Tovar and his colleagues at Stuttgart University have developed bio-functional nanoparticles. Known as nanocytes[®], these carry TNF proteins on their surface. “In producing these particles, we benefit from the self-organizing capability of the 'building blocks': Once a contact has been established between the particles and the proteins, the proteins grow and envelop the nuclei without any further effort on our part,” the researcher explains. Tovar tested the finished nanoparticles in a Petri dish. His findings were most encouraging: cancer cells that came into contact with the particles did indeed perish. The researchers documented this process on video, and will be showing the film at the Fraunhofer stand at nano tech 2006.

It will be a while before nanocytes[®] can be used in the battle against cancer. First of all, a great deal of time and effort must be invested in clinical studies. But meanwhile the bio-functional nanoparticles have already proved their mettle in practical applications – as a tool for cell

research or as a component in reagents for medical analysis.

Source: Fraunhofer-Gesellschaft

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