

Patent approved for cancer-fighting process

February 13 2014, by Patty Pitts

A new process developed at the University of Victoria that will help oncologists better identify and target cancerous tumours has been granted a US patent. The patented technology involves synthesizing lanthanide (rare earth metal) for use with MRIs to increase the image contrast between a malignant tumour and surrounding tissue for more accurate and effective diagnosis and surgery.

"The patent gets companies interested in supporting further research," says UVic chemistry professor Dr. Frank van Veggel. "You want to cover the US because the potential market is so big and there's a greater potential to access venture capital."

A Canadian patent application is currently being reviewed by the Canadian Intellectual Property Office and a patent is expected to be issued in the near future.

van Veggel and his team work with [nanoparticles](#), very tiny matter more than 10 times smaller than a speck of dust. Using their patented process they synthesize nanoparticles made of the lanthanides sodium and fluoride, and then transfer those nanoparticles to water. Lanthanides, which are available in small amounts throughout the world, are a family of 14 elements with unique optical and magnetic properties.

"Following injection prior to an MRI, the nanoparticles will not only inform a surgeon as to the location of a tumour but also provide a better image of its shape, which helps surgeons determine how much surrounding tissue needs to be removed," says van Veggel. "We hope to make the material so potent that we will be able to find very small

tumours."

van Veggel thinks the new process might even eliminate the need for biopsies in some cases. "With a lot of work we can produce antibodies or biomarkers particular to specific forms of cancer and connect them to our nanoparticles. When they localize on a [malignant tumour](#), they both confirm a malignancy and provide additional information about the cancer in question to the oncologist."

Using one of UVic's advanced electron microscopes, van Veggel and his team need about a week to synthesize a vial of lanthanide nanoparticles, which is then sent to a collaborator at the University of Calgary for further tests involving MRI technology. van Veggel thinks it will be about 10 years before human applications are possible but he is optimistic about the potential for the new process.

"In diseases such as prostate cancer there are a lot of unnecessary interventions," he says. "Once this process is ready for human use we'll be able to differentiate between smaller, less aggressive tumours but also find small metastasized ones."

Provided by University of Victoria

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