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Gel implants on the horizon for targeting cancer drugs

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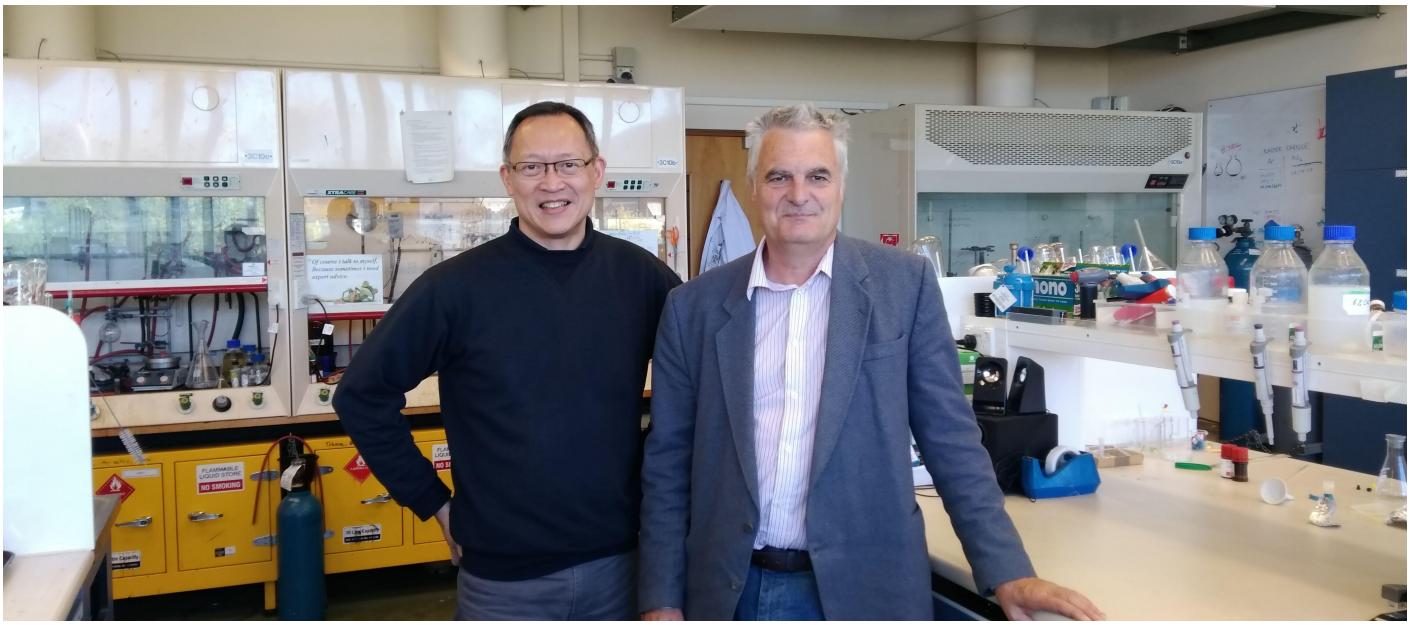

Otago University chemists Eng Wui Tan and Steve Moratti are working on unique gels that can deliver drugs at a controlled rate into the body

> Other conditions that may benefit from targeted doses of drugs include epilepsy, arrhythmia and pain

University of Otago researchers are using ultrasound to improve the release of anti-cancer drugs into the body.

Working in the field of polymer and supramolecular chemistry, the researchers are refining the action of drug-containing implants, already in use to treat brain cancer.

Their innovations are allowing them to use ultrasound to control when and how much of a drug is released from a new type of gel implant that was developed in-house.

Associate professor Steve Moratti can't be 100 per cent sure whether they have a world-first discovery on their hands, but believes it is a unique approach.

His team has developed stretchy gels which, though 90 per cent water, remain intact under pressure.

By chemically linking ultrasound-sensitive nanoparticles developed by chemistry senior lecturer Eng Wui Tan with the gels, the team produced drug reservoirs that can release some of their payload when ultrasound is applied.

Brain cancer is the initial target, but Dr Moratti says other applications may be possible. The researchers are keen to hear from doctors with suggestions.

Other conditions that may benefit from targeted doses of drugs include epilepsy, arrhythmia and pain.

Boosting the healing process

For brain cancer, having control over when an implant releases drugs could be beneficial in healing after tumour removal, Dr Moratti says.

A pulsating dose, rather than a constant one, might make it less likely the cancer becomes resistant to a drug.

Nanoparticles are normally injected into the bloodstream or swallowed in a capsule. In the Otago innovation, the gel would be implanted in the part of the body undergoing treatment.

The next steps are to refine dosages at different ultrasound intensities and to test the gel on tumours in animals, comparing it with conventional treatments.

The researchers are seeking $1 million from the Ministry of Business, Innovation and Employment. The initial research has been done part time over nine months for less than $100,000. The team had seed funding from the Science for Technological Innovation National Science Challenge.

Dr Moratti can be contacted at smoratti@chemistry.otago.ac.nz