

Lab results from pet dogs confirm promise of new immunotherapy gel for kids' cancer

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Three-year-old Bull Terrier, Maggie, being prepared for surgery to treat a sarcoma at Perth Veterinary Specialists. Maggie is one of the first dogs to take part in the clinical trial which is hoped to lead to better treatments for children with sarcoma. Credit: Telethon Kids Institute

Newly published research from Telethon Kids Institute and The University of Western Australia has found a gel applied during surgery to treat sarcoma tumors is both safe and highly effective at preventing

the cancer from growing back.

The findings, published in the journal *Cell Reports Medicine*, have formed the scientific backbone of a trial underway in Perth to test the feasibility and safety of the gel on pet dogs.

The polymer-filled gel is packed with a type of [immunotherapy](#) and is applied inside the wound when the tumor is removed, drawing [immune cells](#) to the wound/resection site to "mop up" any remaining cancer cells.

The research team, led by Telethon Kids Cancer Center head Associate Professor Joost Lesterhuis, discovered a significant reduction in cancer recurrence in laboratory mouse models treated with the immunotherapy gel.

The study's lead author, Dr. Francois Rwandamuriye said the early lab work paved the way for the canine trial.

"The main work we did in the early stages was about optimization of the gel so that it can be feasible for use in surgery, so making sure it was the right consistency to be applied easily inside the wound," he said.

"We were able to show in mice that the gel is effective in delivering the immunotherapy at the correct dose and that it was effective in stopping the cancer from recurring.

"The early lab work also satisfied us that the gel is safe to use."

The research, which was conducted over several years in the labs at Telethon Kids Institute in Perth, initially involved determining what type of materials the gel should be made from and which immunotherapy drugs would be most effective.

The clinical trial in dogs is well underway at Perth Veterinary Specialists and showing promising results, demonstrating that the gel was safe, easy to use by the veterinary surgeons, and resulted in strong immune cell activation.

Sarcoma presents similarly in humans as it does in dogs, with solid tumors forming in [soft tissues](#) such as muscle, fat or connective tissues, or on bones and joints, and the first treatment in both is always surgery.

Telethon Kids Institute Cancer Center head, Associate Professor Joost Lesterhuis, said this research laid the foundation for the exciting work that's underway to develop the gel for use in humans.

"There are a lot of aspects to translating this work, which is why the early work that took place in our labs was very detailed and wide-ranging," he said.

"It also helped us to identify some new biomarkers to determine what types of cancers can be effectively treated by this immunotherapy gel."

Immunotherapy works by activating the patient's own immune system to fight the [cancer](#), but it is typically administered through the bloodstream, which can result in [severe side effects](#) and making it ineffective for localized treatment of solid tumors.

The gel was developed in collaboration with molecular scientists at The University of Western Australia, led by Associate Professor Killugudi Swaminatha Iyer.

Associate Professor Swaminatha-Iyer, from UWA's School of Molecular Sciences said the gel is made from natural materials.

"The gel is made of long polymers which are natural and that are broken

down by the body itself," he said.

"For this treatment, the team has tagged on some immunotherapy to those long polymers which are then slowly these are released in the body and the polymers themselves are broken down."

It is hoped the immunotherapy gel will be proven safe and effective for trial in humans within the next five years.

More information: Francois Xavier Rwandamuriye et al, A surgically optimized intraoperative poly(I:C)-releasing hydrogel prevents cancer recurrence, *Cell Reports Medicine* (2023). [DOI: 10.1016/j.xcrm.2023.101113](https://doi.org/10.1016/j.xcrm.2023.101113)

Provided by Telethon Kids Institute

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