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KIDS' SUPERBUG BREAKTHROUGH

World-first bacteria research

SARAH BOOTH

MELBOURNE scientists have grown – and then deliberately infected – human immune cells in world-first research that could one day help countless children overcome dangerous infections.

The Murdoch Children's Research Institute used cutting-edge stem cell technology to engineer immune cells called macrophages in a laboratory, and then infected them with bacteria to test different treatments.

The institute hopes its breakthrough, published in Stem Cell Reports, will lead to an effective treatment for infections caused by mycobacteria, which are common in immunocompromised children, especially those with cystic fibrosis.

Murdoch Children's researcher Sohinee Sarkar said mycobacteria could "hide" inside macrophages, giving vulnerable patients nasty infections that were often treatment-resistant.

"Macrophages are like little vacuums in the human body, they go and gobble up anything," she said.

"Then their job is to get rid of bacteria, kill it."

However, in the presence

of the mycobacteria its function was compromised.

Dr Sarkar said it took some patients with infections more than a year to recover and current treatments had high failure rates.

Repeated infections accelerated lung failure in people with cystic fibrosis.

"It's very difficult for the antibiotics to go in and kill the bacteria within the immune cells," she said.

"Current treatments ... involve giving cocktails of different antibiotics with wide-ranging toxicities.

"In some healthcare settings, you cannot be included in a lifesaving transplant list if you have this infection.

"There's a very urgent need to find good antibiotics."

Dr Sarkar said the next step was to secure funding to scale up research and test more treatments.

"I'm hoping within the year at least to have completed an initial screen of a few thousand compounds and have a short list of things that I can take forward," she said.

Dr Sarkar said given the lengthy testing new drugs required, the team planned to trial combinations of

already approved drugs in addition to testing new ones.

The model could also be adapted to test treatments against other so-called "superbugs" – bacteria that develop resistance against antibiotics and are becoming increasingly common.

Melbourne mum Rachel Regan knows how life-changing improved treatments could be for her 11-year-old son Wade Smith, who has cystic fibrosis.

She said he had been trying various antibiotics for more than a year to clear a mycobacteria-linked infection and wore a bag around his waist to help infuse medication into his body.

"His lung function has dropped to 63 per cent and that will continue to worsen if we can't get on top of it," she said.

"It's hard when you are doing everything you can and nothing seems to work.

"Any sort of advancement in treatment is pretty exciting for us.

"We have to try and keep his lungs as healthy as they can possibly be until treatments are available."

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DR SOHINEE SARKAR

Wade, 11, who has cystic fibrosis, struggles with a mycobacteria infection. Picture: Tim Carrafa