

# A new, breathable treatment to halt drug-resistant TB

**An engineered molecule delivered straight into the lungs might offer new hope for patients suffering from antibiotic-resistant tuberculosis (TB) infection, an Australian-Indian collaboration reveals.**

About 10 million people fall ill with TB every year, and a growing number of these infections can't be cured using current methods. New approaches for treatment are urgently needed.

Funded by a grant from the Global Connections Fund, Associate Professor Charlotte Conn, Professor Leslie Yeo, Dr Sarvesh Soni and Dr Sampa Sarkar from RMIT University are working with collaborators in India to develop a new targeted TB therapy. Their aim is to formulate and trial a drug that can be breathed in by patients in a similar way to using an asthma puffer.

"The grant was critical in helping us meet with our international colleagues, and for setting up a specialised TB laboratory at the RMIT Bundoora campus in Melbourne," explained Professor Conn.

TB is caused by a bacterium, *Mycobacterium tuberculosis*, that typically infects the lungs and causes serious illness and death if not treated effectively.

This project aims to bypass drug resistance issues seen with current antibiotics by delivering a new type of treatment directly to the lungs.

The new drug molecule, called an aptamer, was developed by Conn's collaborators at the Apta Bharat company in India. Using RMIT technology, it has been packaged inside liquid crystal nano-structures known as cubosomes.

"With our new lab now up and running, we're able to do experiments to see how the drug-loaded cubosomes interact with TB-infected cells," said Conn.

Once laboratory testing is completed, work on a clinical treatment protocol will commence. This will involve creating a breathable form of the drug using a specialised version of a machine called a nebuliser, developed by Professor Yeo.

"We are excited about translating this technology to treat drug-resistant TB, which is a huge problem in India and around the world," said Conn.

As an expansion of this project, Conn and her colleagues in India are also exploring the potential for this approach to be adapted for treatment of COVID-19 infections, using antiviral drugs loaded into cubosomes that patients can breathe in. They have applied for funding from the Australia-India Strategic Research Fund to progress this opportunity.



## Associate Professor Charlotte Conn

Research & Innovation Portfolio, RMIT

An engineered molecule offers new hope for patients suffering from antibiotic-resistant #tuberculosis infection, thanks to research led by @RMIT's @conncharlotte1 & India's @AptaBharat, assisted by a grant from the @IndustryGovAu Global Connections Fund. @ATSE\_au @ausgov

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