

# Researchers discover potential treatment for tuberculosis

October 29 2015, by Rebecca Tucker

---



This photomicrograph reveals *Mycobacterium tuberculosis* bacteria using acid-fast Ziehl-Neelsen stain; Magnified 1000 X. The acid-fast stains depend on the ability of mycobacteria to retain dye when treated with mineral acid or an acid-alcohol solution such as the Ziehl-Neelsen, or the Kinyoun stains that are carbolfuchsin methods specific for *M. tuberculosis*. Credit: public domain

Deakin University scientists have discovered a potential new treatment for tuberculosis, a disease rapidly gaining resistance against current medical therapies.

The discovery, a group of molecules which appear to block the growth of the bacteria which leads to the disease, was made by a researcher while investigating a new treatment for a completely different condition – [prostate cancer](#).

The finding has generated excitement among the medical world, frustrated by a rise in tuberculosis, which the World Health Organisation estimates has now infected 30 per cent of the globe's population and is becoming increasingly resistant to current treatments.

Dr Luke Henderson, a Senior Research Fellow within Deakin University's Institute for Frontier Materials said his discovery came about while his team was researching the value of the same group of molecules for [prostate cancer treatment](#).

"While we were working on a group of 25 to 30 compounds, six of the most active components proved to be able to inhibit the growth of TB," Dr Henderson said.

"The good thing about these molecules is that we can easily generate and modify a lot more. We can synthesise them in one day, which means that we can speed up the research process.

"While there is still a long road ahead before a drug would be ready for commercialisation, we are very excited about its potential as current treatments are just not getting on top of the global pandemic.

Dr Henderson said that while annual TB fatalities were declining, resistance to the disease was increasing, which could soon prove disastrous.

"The disease is evolving resistance to the two frontline drugs that have been used to treat TB for almost 30 years, Isoniazid and Rifampicin," he

said.

"Now, around half a million of all TB cases are multi-drug resistant and around 10 per cent of these are extremely drug resistant.

"The first new drug in 30 years, Bedaquiline, was made available in 2012, but unfortunately it has a 'black box' warning, which is the most serious warning in relations to side-effects able to be given by the FDA."

In 2013, TB killed 1.5 million people, with more than half of these deaths occurring in the South East Asia and Western Pacific regions.

But while TB was once kept out of rich first-world nations by modern vaccinations, the disease is no longer isolated to poorer countries. The London Assembly recently reported that parts of London had higher rates of the disease than countries such as Rwanda, Eritrea and Iraq, recording more than 2,500 new cases of TB in England's capital last year – or about 40 per cent of the UK's total.

Dr Henderson said TB currently affected less than one per cent of Australia's population, due to our quality health care system and geographical isolation, but human movement across the globe and increasing drug resistance meant that TB also posed a potential risk to the country.

Dr Henderson's team's next step will be to focus on understanding how the molecules select and kill TB bacteria and whether they may cause side effects.

The team has also received support from the US National Institute of Allergy and Infectious Diseases, which tested the effect of the molecules on TB bacteria.

The researchers have used the pioneering approach to chemistry called "click chemistry", introduced to the world by Nobel Laureate Professor KB Sharpless in 2001.

Click chemistry enables substances to be generated quickly by joining small modular units together, like Lego, and is proving to have outstanding applications in areas ranging from materials sciences and polymer chemistry, to pharmaceuticals.

The research was published in a recent edition of prestigious international journal *ChemMedChem*.

**More information:** Jarrad M. Altimari et al. Novel 1,4-Substituted-1,2,3-Triazoles as Antitubercular Agents, *ChemMedChem* (2015). [DOI: 10.1002/cmdc.201500051](https://doi.org/10.1002/cmdc.201500051)

Provided by Deakin University

Citation: Researchers discover potential treatment for tuberculosis (2015, October 29) retrieved 25 April 2024 from

<https://medicalxpress.com/news/2015-10-potential-treatment-tuberculosis.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------