MEDIA RELEASE

15 March 2019

Antioxidants help contain killer bug

Research led by the Centenary Institute in Sydney has identified a powerful tool to fight tuberculosis. In collaboration with scientists at the University of Sydney, our team has shown antioxidant drugs both kill mycobacteria, the cause of infection, and keep the immune system from causing too much damage through out-of-control inflammation.

Tuberculosis is the single leading cause of death from infectious disease around the world and infects someone every three seconds, causing life-long damage to the lungs. Tuberculosis is one of the most common inflammatory diseases, and it is the immune systems that do most of the damage to the body during infection. Says senior author and head of Centenary's Immune-Vascular Interactions Laboratory, Dr Stefan Oehlers "the more we study inflammatory diseases, the more we find shared drug targets that can prevent or undo the damage they cause to our bodies".

Using the zebrafish model of tuberculosis, the researchers used fluorescent microscopy to observe a dramatic reduction in bacterial burden after antioxidant treatment. They then worked out that antioxidants increase the lifespan of macrophages (sometimes known as white blood cells) fighting the infection while having the extra effect of killing the stressed bacteria. Dr Oehlers says "this double dipping effect of antioxidants was quite unexpected and would have been hard to catch if we weren't using the zebrafish model".

This study combined the work of two University of Sydney Fellows, Drs Stefan Oehlers and Amandeep Kaur who crossed the fields of chemistry and biology to image the effects of antioxidant therapies. The lead authors on the study are a former University of Sydney Honours student, Mr Harrison Black, and RMIT Masters student Mr Wenbo Xu, on secondment to the Centenary Institute.

The study shows an impact of understanding the mechanisms of inflammation to create new cures for our most important global diseases. This work has been published in the journal *Free Radical Biology & Medicine*.

One quarter of the world's population (approximately two billion people) are infected with tuberculosis. As the world comes together on March 24, World TB Day, to highlight the impact of TB globally, this research contributes to advancing knowledge of the disease and, ultimately will save lives.

View the full paper at https://doi.org/10.1016/j.freeradbiomed.2019.03.010 and https://authors.elsevier.com/a/1YkGm3AkHAM02J

To arrange an interview with Dr Oehlers, please contact
Karen McBrien, Marketing Manager, Centenary Institute on 0408 601 836.

For more information about Centenary Institute and the Immune-Vascular Interactions Laboratory, visit www.centenary.org.au

About the Centenary Institute

The Centenary Institute is a world-leading independent medical research institute, closely affiliated to the University of Sydney and the Royal Prince Alfred Hospital. Our research focuses on three key areas: cancer, inflammation and cardiovascular disease. Our strength lays in uncovering disease mechanisms and applying this knowledge to improve diagnostics and treatments for patients.

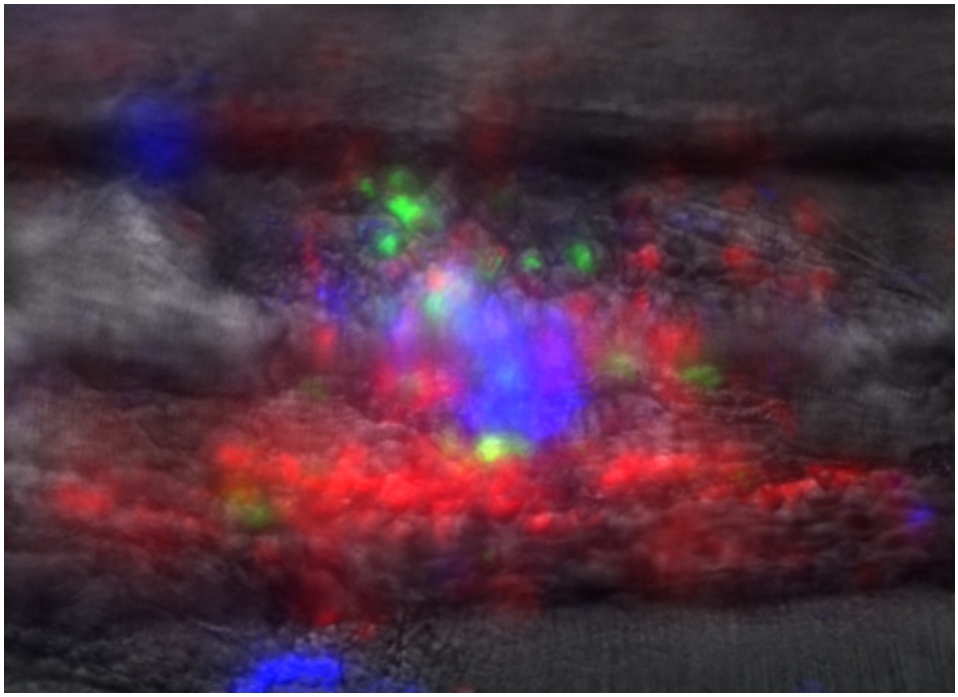
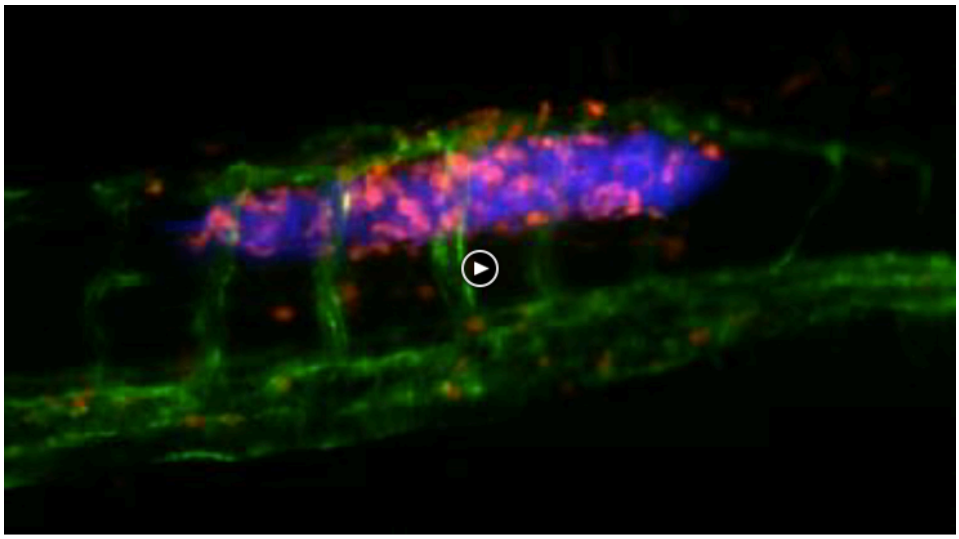


Image - Green oxidants being produced around a granuloma formed by blue bacteria and red inflammatory immune cells. Too much oxidant production by inflammatory cells creates collateral damage and is bad for containing the infection.



Follow this link https://youtu.be/Xz7OjfGo8hc to view and download the video.

Video - Red inflammatory immune cells attacking blue bacteria in a zebrafish outlined by green blood vessels. Too much of this inflammation is harmful, antioxidant treatment helps restore the protective balance of immunity against chronic infection.