

Energy to burn – how immune cells respond to infection during TB disease

Tuberculosis (TB) is the most deadly infectious disease globally. About one-third of the world's population is infected with the causative agent, the bacterium *M. tuberculosis* (Mtb). Although TB is treatable and curable, it has devastating effects and the emergence of drug-resistant strains is challenging. Normal treatment includes taking several drugs for up to six months, extending to two years for multi-drug-resistant TB. By understanding how the patient (the host) and the Mtb interact, we can improve therapies which boost a patient's immune system to overcome infection. Research led by Professor Joseph Keane, Head of Clinical Medicine, Trinity and Director of the TB Service at St James's Hospital, focuses on the immune cells in the lung and how they respond when infected with Mtb.

Professor Keane's research team is based at the Trinity Translational Medicine Institute (TTMI) and works with St James's Hospital. In the lab, we infect certain lung cells (alveolar

macrophages) with Mtb and study their immune responses. One area of focus is the metabolism of immune cells. We have

“There has never been a better time to be engaged in the research of respiratory infection.”

Professor Joseph Keane

Head of Clinical Medicine

Trinity College Dublin

Director of the Tuberculosis Service

St James's Hospital

discovered how certain drugs improve the metabolism and hence the immune response of lung cells, and we are working on better ways to tackle multiple-drug-resistant TB. Such host-directed therapies can shorten treatment time, improve patient outcome and reduce costs.

Our research supports programmes in the TB service such as smoking cessation, and forms a basis for writing treatment guidelines. Professor Keane has co-authored the international CDC/ATS TB Treatment Guidelines, a globally recognised standard for TB care. Our research has been funded by many bodies, including the Health Research Board, Royal City of Dublin Hospital Trust, Medical Research Charities Group and the Irish Thoracic Society, and philanthropy.

