

Research Award: Research Equipment Application for MP Biomedicals™ FastPrep-24™ 5G Bead Beating Grinder and Lysis System

Awarded to: Liku Bekele Tezera

Amount: £4,868.335

Lay summary:

First, I am very grateful to the AAIR Charity for making my research and wider collaboration possible. With support from the AAIR Charity, the researchers at the School of Clinical and Experimental Sciences in the University of Southampton now have reliable equipment for extracting RNA from complex biological samples. RNA helps scientists understand which genes are active and how cells or bacteria respond to their surroundings, which has implications for disease progression.

During the first year of the purchase, the equipment was used to extract RNA from the bug that causes tuberculosis (TB), one of the world's most serious infectious diseases, in different tissue environments. TB mainly affects the lungs, where infection can cause tissue damage and changes in stiffness. However, we do not yet fully understand whether these physical changes influence how TB bacteria grow, survive, or respond to treatment.

To investigate this, TB bacteria were grown in laboratory environments designed to represent different levels of lung-tissue stiffness. The AAIR-funded equipment was then used to break open the bacteria and extract high-quality RNA. These samples have been sent for sequencing. The next step is to compare gene activity under the different conditions and identify biological changes that may be important in TB. These findings will support future publications and funding applications and may provide early evidence for larger studies. In the longer term, this research could improve our understanding of TB and support research into asthma, infection, inflammation, and other respiratory diseases, all of which are interrelated.

The equipment is also a valuable shared resource. Dr. Mirella Cosma Spalluto and colleagues have used it in research involving human-relevant lung models, while Dr. Andrés Vallejo Pulido has tried it in work on molecular biology and immune responses. The researcher in charge is always keen to help other investigators and advertises this to the whole faculty community so they can use it.

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