Key to tuberculosis cure lies in the starving of the enemy

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Scientists at the University of Surrey have undertaken research into tuberculosis which could result in quicker treatment for sufferers and potentially reduce the problem of drug-resistance. The study was recently published in the journal *Cell Chemistry and Biology*

As a disease that kills 2 million people per year, tuberculosis is second only to HIV among infectious agents, according to the World Health Organization. The disease is becoming a bigger problem as strains of the TB bacillus become more resistant to existing drugs. The bacterium is very difficult to treat, often due to the long periods of time required to sustain long-term drug and treatment programmes.

Johnjoe McFadden, Professor of Molecular Genetics at the University of Surrey, and his colleague Dr Dany Beste, are lead investigators on this new Wellcome Trust-funded project, which examines what the bacterium 'eats' when it enters the human body in the hope of 'starving' the pathogen.

The tuberculosis bacterium grows in human blood cells. The bacillus must obtain sufficient nutrients to survive and grow either by adapting its own metabolic pathways or manipulating the metabolism of the host. Professor McFadden and his team have been dissecting the metabolism of infection and the mystery of what the pathogen eats. In feeding red cells infected with the pathogen, the team discovered that the bacterium attacks the host cells and eats fatty acids, amino acids and some other unknown compounds. It also captured dissolved carbon dioxide and

turns it into its own biomass. The team can now use this greater understanding of what the pathogen eats to find vulnerabilities that could be targeted with new drugs.

Professor McFadden is focusing on more effective ways to kill the bacterium and kill it faster. He comments: "Tuberculosis kills millions every year. By discovering what the pathogen eats we can hopefully starve it and make it more vulnerable to antibiotic treatment.

"This is the first time we have been able to directly measure the metabolism of the bug and identify what it eats. This is crucial to our understanding of the disease and is a significant step forward in our quest for a successful treatment. The next step in the project is to identify ways of starving the bacterium in host cells, so it can be killed quicker."

More information: www.cell.com/chemistry-biology … 1074-5521(13)00245-7

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