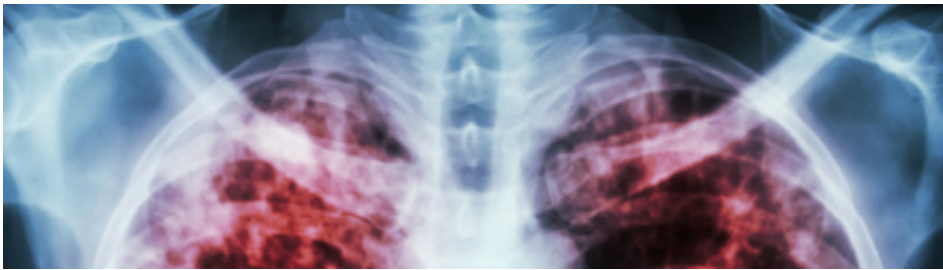


# Tuberculosis to be tackled using crowd-sourced computer power

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The University of Nottingham is launching a new study to address tuberculosis (TB), one of the world's most deadly diseases, supported by IBM's World Community Grid—one of the most powerful and fastest virtual supercomputers on the planet.

Hundreds of thousands of volunteers from around the world are expected to donate vast computing resources to aid the effort. Well-established in the US, this is the first time World Community Grid has supported a UK research project.

Launched today, the new "Help Stop TB" project on World Community Grid will model aspects of the behaviour of tuberculosis bacteria to better understand its potential vulnerabilities that new medicines may one day exploit.

Volunteers are needed to make the processing power on their devices available, when otherwise not being used, to perform the millions of calculations necessary for these simulations.

Crowd-sourcing a virtual supercomputer—facilitated for free by IBM to study the disease - in this manner will provide results significantly faster than relying on conventional computational resources typically available to researchers.

Tuberculosis has plagued humans for thousands of years. Approximately one third of the globe's human population harbours TB today and 1.5 million people died from it in 2014 alone, prompting the World Health Organization to rank TB alongside HIV as the world's deadliest infectious disease.

Dr Anna Croft, lead researcher of the Help Stop TB project and Associate Professor, Faculty of Engineering at the University of Nottingham in the UK, says: "My team will use World Community Grid to help science better understand the TB bacterium, so we can develop more effective treatments, and eventually eradicate this threat to human health."

Although several drugs and a partially effective vaccine have been developed to help combat TB, the TB bacterium can evolve to resist available medicines, particularly when patients interrupt or discontinue treatment, which often occurs when they do not have consistent access to medications and medical care.

Nearly half of European cases are now resistant to at least one drug, and four per cent of all cases worldwide are resistant to treatment regimens that combine drugs. HIV patients with weakened immune systems are especially vulnerable to TB.

Tuberculosis can be a slow killer, often dormant for long periods of time before exploiting poor nutrition, old age or a weakened immune system to become active. It is most often spread through the air when an infected person coughs, sneezes, laughs or even talks.

Symptoms can start with cough, weight loss, and fever, developing into breathing difficulties and violent coughs that bring up blood. Initially residing in the lungs, it can spread to, and cripple, other organs.

The tuberculosis bacterium has a coating which shields it from many drugs and the patient's immune system. Among the fats, sugars and proteins in this coat are fatty molecules called mycolic acids.

The Help Stop TB project will use the [computing power](#) donated by World Community Grid members to simulate the behaviour and chemical properties of mycolic acids to better understand how they protect the TB bacteria.

Scientists hope to use the results to eventually develop better treatments for this deadly disease, particularly those that evade TB cell wall defences.

World Community Grid was created as a philanthropic effort by IBM in 2004. Hosted on IBM's SoftLayer cloud technology, World Community Grid facilitates massive amounts of completely free computing power for scientists by harnessing the surplus cycle time from volunteers' computers and Android devices from all over the globe.

The combined power available on World Community Grid has created one of the most powerful and fastest virtual supercomputers on the planet.

"Thanks to World Community Grid's massive computational power, we

can study many different mycolic acid structures instead of just a few. This type of analysis at this scale would otherwise be impossible," Dr Croft adds.

More than three million computers and mobile devices used by nearly three quarters of a million people globally and 470 institutions from 80 countries have contributed virtual super-computing power that have fueled more than two-dozen vitally important projects on World Community Grid over the last 11 years.

Since the program's inception, World Community Grid has enabled important scientific advances in areas such as cancer research, AIDS treatments, genetic mapping, solar energy and ecosystem preservation. Many of these efforts might not have even been attempted without the free super-computing power provided by IBM's World Community Grid.

World Community Grid is enabled by Berkeley Open Infrastructure for Network Computing (BOINC), an open source platform developed at the University of California, Berkeley and with support from the National Science Foundation.

Volunteers can help stop TB by joining World Community Grid. IBM invites researchers to submit research project proposals to receive this free resource, and encourages members of the public to donate their unused computing power to these efforts at <http://www.worldcommunitygrid.org>.

Provided by University of Nottingham

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