

‘Let me explain....’

Explanation texts (can be printed for students, though this is not necessary):

Antibiotics was voted by YOU to be the challenge of Longitude Prize.

In order to tackle growing levels of antimicrobial resistance, the challenge set for the Longitude Prize is to create a cost-effective, accurate, rapid and easy-to-use test for bacterial infections that will allow health professionals worldwide to administer the right antibiotics at the right time.

The problem

The development of antibiotics has been vital to our survival, yet the rise of antimicrobial resistance is threatening to make them ineffective in the future.

The World Health Organization estimates that antibiotics treatments add an average of 20 years to all of our lives. But in the 80 years since the discovery of penicillin, our overuse of antibiotics has put pressure on bacteria to evolve resistance, leading to the emergence of untreatable superbugs that threaten the basis of modern medicine.

Clinicians often prescribe broad spectrum antibiotics to sick patients because doctors have to act quickly on imperfect information. These methods put selective pressure on microbes to evolve resistance to antibiotics.

Evolution

Radical change is needed to address the global problem of growing anti-microbial resistance, to ensure a health care system that can sustainably control and treat infections.

We cannot outpace microbial evolution. A new broad-spectrum antibiotic, if applied with current methods, would eventually meet new forms of resistance. The overall solution involves a long-term path towards a more intelligent use of antibiotics enabling a future of more effective prevention, targeted treatments and smart clinical decision support systems.

Challenge

The challenge for Longitude Prize will be set to create a cheap, accurate, rapid and easy-to-use point of care test kit for bacterial infections.

Impact

Point-of-care test kits will allow more targeted use of antibiotics, and an overall reduction in misdiagnosis and prescription. Effective and accurate point of care tests will form a vital part of the toolkit for stewardship of antibiotics in the future. This will ensure that the antibiotics we have now will be effective for longer and we can continue to control infections during routine and major procedures.

337 words

Longitude Prize and appeared originally on
<https://longitudeprize.org/challenge/antibiotics>

Vaccine cooling device wins UK's James Dyson Award :

The 2016 James Dyson Award national winner for the UK is ISOBAR, a portable vaccine cooling device, designed to maintain the correct temperature of a vaccination so it continues to be safe and effective.

The problem:

In 2015, an estimated 19.4 million children worldwide failed to receive routine immunisation services, with more than 60% of these living in developing countries. Figures suggest that an additional 1.5 million deaths could be avoided if global vaccination systems improve. And, current vaccine programmes in developing countries do not meet the international standards for temperature safe vaccine distribution which leads to vaccines losing potency.

The solution:

[ISOBAR](#) works by using a chemical process to provide a long term cooling effect for vaccine delivery.

A mix of Ammonia and Water is heated in a lower pressure vessel. The ammonia vaporises and separates from the water into the upper chamber where it is trapped by a valve. It remains trapped until the cooling effect is needed.

The design engineer behind [ISOBAR](#) is William Broadway, who just graduated from Loughborough University this year with a first class honours degree in Industrial Design and Technology. William will be given £2,000 to develop his idea, which he plans to put towards building more prototypes and applying for patents.

William Broadway said: "I am so pleased that the technology can get a bit of the limelight. Winning the UK James Dyson Award gives me the confidence to pursue my invention with my whole heart in the knowledge that yes, I can actually make this device and that it could have a great impact for the benefit of thousands of people".

Jack Lang, Fellow at the Judge Business School at Cambridge University, co-founder and chair of Raspberry Pi and UK James Dyson Award judge 2016 says: "Isobar is a brilliant invention. It solves a real problem and is a complete, well-thought-through system."

[ISOBAR](#) and the UK national runners up will now continue in the next round of the James Dyson Award as they go up against the best entries from across the globe, before they are rounded down to the final 20.

351 words
The James Dyson Foundation
<http://bit.ly/2hoS8cd>