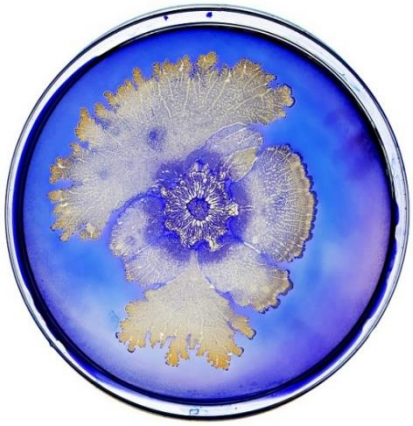
Bacterial World

19 October 2018 – 28 May 2019

As soon as we hear the word 'bacteria' most of us think of illness and disease, but a fascinating and enlightening new exhibition at Oxford University Museum of Natural History breaks this long-held myth.



This autumn, *Bacterial World* seeks to rehabilitate the reputation of bacteria and counter the popular misconception that they are all bad, or to be feared.

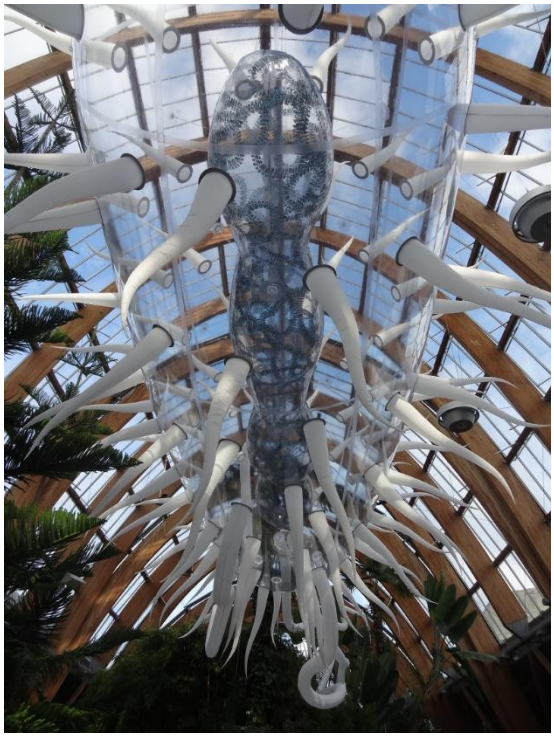
Incorporating more than 55 exhibits – spanning monumental art, geological and deep-sea specimens, film, and digital interactives – *Bacterial World* will demonstrate how these tiny organisms wield huge influence over us, shaping the past, present and future of life on our planet.

The exhibition will feature items generously loaned from institutions including the Wellcome Collection, Yale Peabody Museum of Natural History, the Pitt Rivers Museum, and the Natural History Museum, London.

Bacteria were the earliest form of life on Earth and exist practically everywhere today; from the deepest oceans to the driest deserts and even in the clouds. Bacteria survive, thrive, fight and die by the trillion every moment. These remarkable organisms can swim using nanoscopic motors, and battle with spears. They sense, communicate, and remember. What's more, there are as many bacterial as human cells within our bodies.

Bacterial World will demonstrate how science is lifting the lid on the secret lives and hidden stories of the smallest of organisms and their influence on us and our planet.

Making visible the microscopic world around us, one of the most striking elements of the exhibition – and at 28 metres long, by far the largest – is a giant inflatable *E. coli* sculpture created by renowned artist Luke Jerram. Suspended from the roof, in itself a dramatic feat of engineering, Jerram's *E. coli* is five million times bigger than the real thing (right, detail, of work installed in Sheffield).

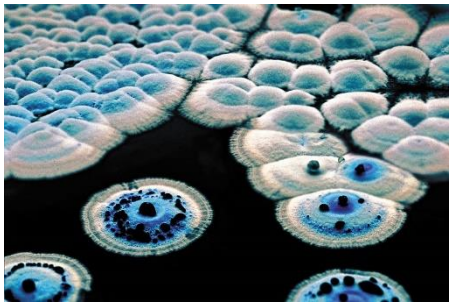


As bacteria were the earliest lifeforms, Jerram's artwork could be considered as a curious portrait of our distant ancestors. He asks: are

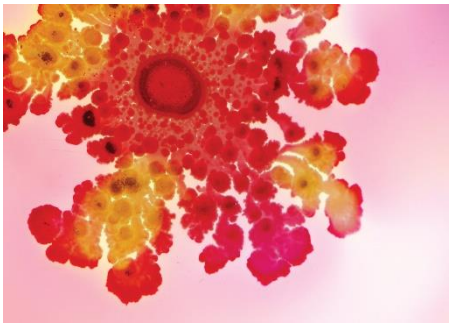
we attracted or repelled by it? And do we feel any different if we can put aside our preconceptions about food poisoning and discover that one of the first applications of DNA technology was the manipulation of *E. coli* to produce human insulin, improving innumerable lives?

Geological fossils will show evidence of how bacteria oxygenated the Earth 2.4 billion years ago. Deep sea specimens will demonstrate ecosystems where there is no sunlight; where, down in the darkness, bacteria use a cocktail of chemicals to generate energy in a possible echo of how life first began.

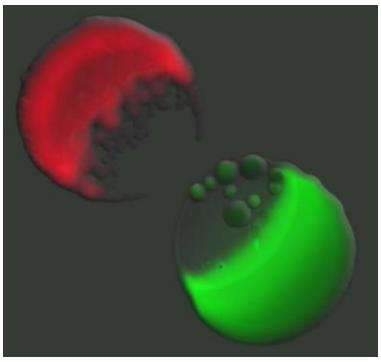
There will also be a display of animals and plants which live symbiotically with bacteria, for all manner of reasons – to create bioluminescence that lures prey or creates camouflage (such as bobtail squid, lanternfish and ponyfish); to support diet (rabbits, koalas, leafcutter ants, leeches, vampire vats); and in order to create a toxin for hunting or defence (arrow worms, blue-ringed octopuses, pufferfish, armadillos and horseshoe crabs, to name but a few).



A display of 'Top 10 Bacteria that Changed the World' will show the positive impact bacteria have had, and continue to have, on the planet. Bacteria feed the world by driving the nutrient cycles on which all life depends. A display of pea plants shows how bacteria break things down in decay and then 'fix' vital nitrogen to the roots to ensure growth. They also help to fight disease: the exhibition reveals how the *Wolbachia* bacterium is being used to combat malaria.



Bacterial World shows how bacteria might help us to tackle some of our biggest environmental problems. Bacteria in the oceans have evolved to consume some human-caused pollution, including oil-spills, as in the case of the Deepwater Horizon disaster. Recently-discovered bacterium *Ideonella sakaiensis* can eat some plastic, thanks to an evolved ability to produce an enzyme called PETase, which breaks down Polyethylene terephthalate (PET) – an amazing evolution story and perhaps a small ray of light in the fight against global pollution.



Visitors will enjoy the chance to play *Gut Wars*, a specially developed game in which they set bacteria armed with different weapons and abilities up against one another in a simulated gut environment. Another interactive, *Bacteria Explorer,* will allow users to descend into the microscopic world of bacteria and learn more about their shapes and abilities by exploring virtual 3D models.

Professor Paul Smith, director of the Museum of Natural History says: *"Bacteria are essential for almost every aspect of life on Earth, from the very origins of life itself to the deeply intricate relationships that underpin all ecosystems. Drawing on research from across the University of Oxford, the Bacterial World exhibition explores our very intimate relationships with bacteria and reveals the vital roles they play in enabling our planet's huge variety of life."*

Professor Judith Armitage FRS, lead scientist for the exhibition, Professor of Biochemistry at University of Oxford and President-elect of the UK Microbiology Society, adds *"I hope this exhibition goes some way to revealing the generally unknown and unseen vast, diverse world of bacteria. Bacteria have been evolving since the beginning of life on Earth and helped form the planet on which we live, providing the oxygen and much of the nitrogen needed for current life. Their complex communities, where they live and die, compete, communicate, cooperate, fight and have sex have evolved for specific environments and, we are coming to realise, are essential for healthy soils, oceans and even ourselves. While some, in the wrong place, can cause diseases, we need to understand microbial communities to be able to continue to control those diseases and to maintain both a healthy body and a healthy planet."*

For more information visit www.oum.ox.ac.uk/bacterialworld and **follow @morethanadodo on Twitter**

NOTES FOR EDITORS

About Oxford University Museum of Natural History
Founded in 1860 as the centre for scientific study at the University of Oxford, the Museum of Natural History now holds the University's internationally significant collections of entomological, geological and zoological specimens. Housed in a stunning Pre-Raphaelite-inspired example of neo-Gothic architecture, the Museum's growing collections underpin a broad programme of natural environment research, teaching and public engagement. In 2015, the Museum was a Finalist in the Art Fund Prize for 'Museum of the Year'. In 2016, it won the top accolade, 'Best of the Best', in the Museums + Heritage Awards.

IMAGES

- Bacteria found in probiotics. Image: Soonhee Moon / Tal Danino
- *E. coli*, Luke Jerram, installed in Sheffield (c) Courtesy of Luke Jerram
- The Common Grass Yellow butterfly hosts *Wolbachia* bacteria which skew the population in favour of female butterflies. Image: Oxford University Museum of Natural History
- Colonies of *Streptomyces coelicolor* making the blue antibiotic actinorhodin. *Streptomyces* bacteria generate antibiotics to kill rival bacteria, and they are the source of many of our antibiotic medicines. Image: Tobias Kieser, John Innes Centre
- Bacterial colonies grow in a multitude of forms depending on the species and environment. This dyed *Paenibacillus* colony shows one such pattern of growth. Image: Soonhee Moon / Tal Danino
- Two strains of *E. coli* fight using colicin toxins. The chemical warfare escalates leading to a large no-man's land in the middle where all cells are killed. Image: Despoina Mavridou, Foster Lab

High resolution images can be **downloaded here.**

FOR MORE INFORMATION, INTERVIEWS AND IMAGES
Tracy Jones, Brera PR– tracy@brera-london.com / 01702 216658 / 07887 514984 / www.brera-london.com