Cambridge Festival showcases pioneering health research and innovations in medicine

The Cambridge Festival is returning from March 19 to April 4 with a series of events that bring together cutting-edge health research and the latest innovations in medical science.

This year's health theme comes at a pivotal moment, as global health challenges such as ageing populations, chronic disease and cancer diagnosis continue to drive scientific inquiry and public debate. Against this backdrop, the Festival provides a platform to engage the public with pioneering research from some of the brightest minds in health and medicine.

The Festival offers almost 400 mostly free events across multiple themes, including environment, society, and discovery, with health research at the forefront. Visitors can attend more than 130 events focussed on this theme, many designed to demystify the science of healthcare and highlight innovations that have the potential to transform lives.

Among the major highlights:

How AI Could Help Us Treat Insomnia (March 22)
How does relaxation music affect our brains, and can it be tailored to our unique brain waves for personalised therapy? New research from the **BrainTwin** project, part of the Accelerate Science programme, shows how AI and neurofeedback can create custom sleep and relaxation treatments. This could revolutionise the treatment of sleep disorders like insomnia, with digital therapies that adapt to a patient's brain function. The project also holds promise for tackling other challenging brain conditions, such as neurodegeneration and brain tumours. Collaborators include University of Cambridge, Royal Papworth Hospital, the Alan Turing Institute, and Haleon. At this event, Dr Sam Nallaperuma-Herzberg and her team will showcase a simple demo of early versions of the music therapy and brain signal analysis modules.

How Polymers Can Keep Your Heart Ticking (March 22)
By 2050, over 1 million patients will need heart valve replacements, but current prosthetic options face major limitations. Mechanical valves require lifelong anticoagulation, and bioprosthetic valves degrade over time. A new polymeric heart valve (PHV) developed by the University of Cambridge, University of Bristol, and CamBris Cardiac Ltd. could change this. This material mimics natural heart valve tissue, offering exceptional durability and performance in bench tests. The prototypes exceed ISO durability standards, showing the equivalent of 30 years of functionality.

With clinical testing underway, the team plans to launch an Early Feasibility Study by the end of the decade to assess safety and performance. PHVs could revolutionise heart valve therapy and improve access to life-saving treatments worldwide. This session with Dr Joanna Stasiak and a team of researchers in Cambridge provides an inside look at the revolutionary technology that could one day save lives.

Tomorrow's Cures: Game-Changing Molecules and Innovations (March 22)
This discussion highlights recent breakthroughs in gene editing, nanotechnology, and regenerative medicine. Professor Ljiljana Fruk will explore how these innovations address chronic diseases and health disparities, focusing on treatments that can prevent and reverse

age-related conditions. She will present cutting-edge research on cell therapies, engineered bacteria, gene editing, and nanomedicine, along with new developments in diagnostics. Professor Fruk will also showcase exciting new projects from her department, such as protein capsules for drug delivery and immune system modulation using bacteria, offering a glimpse into the future of healthcare.

The Odyssey of the Lungs (March 25)
Professor Emma Rawlins and her team are pioneering a new scientific approach to understanding lung development with the creation of mini lung organoids grown from human stem cells. This innovative model is providing crucial insights into how human lungs form, with a direct impact on lung disease research, including the study of chronic diseases like COPD—currently responsible for one-third of global deaths, according to the WHO.

In this session, one researcher will reveal how this advanced organoid system is accelerating genetic research into COPD, while another will explore the potential of lung stem cell analysis, aiming to unlock new treatments for lung regeneration. This research represents a powerful fusion of fundamental and applied science, driving forward new possibilities for both disease prevention and therapeutic breakthroughs.

Hidden Little Brain (April 2)
Repairing the adult mammalian brain is one of the biggest challenges in medicine. While some regions of the brain have a strong ability to regenerate during development, this capacity decreases significantly with age. The developing cerebellum (little brain), a key brain region important for how we move as well as our social behaviours, has proven to be a powerful model to understand how we can regenerate the brain. Dr Sumru Bayin and a team of researchers at the Gurdon Institute are studying how the brain develops, the factors that facilitate regeneration, and why the regenerative potential is lost in the adult brain using the cerebellum as model system. Understanding this is the crucial first step to designing regenerative therapies. This talk explores brand new research into how the cerebellum develops and regenerates, why the regenerative potential declines with age, and elaborates on potential strategies to overcome this decline.

Tomorrow's Health Today: AI and Data Science Explained (April 2)
AI and data science are transforming healthcare by improving diagnoses, disease prevention, and patient care. With healthcare systems facing mounting pressures, this event will explore how innovations in AI and big data are enhancing outbreak monitoring, illness screening, and public health strategies. Experts from the UK Health Security Agency and the University of Cambridge, including Professor Steven Riley (UKHSA), Professor Daniela De Angelis (Cambridge), Professor Raj Jena (Cambridge NHS Trust), Dr Paul Kirk (MRC Biostatistics Unit), and Professor Angela Wood (Cambridge), will share their insights on AI's crucial role in the future of healthcare.

Investigating Cancer: Evolution and Ageing (March 25)
Cancer is a leading cause of death worldwide, and as our understanding of cancer biology improves, so too does our ability to detect and treat it early. This event will delve into how cancer develops over time, especially in ageing populations. With early detection and prevention being critical in the fight against cancer, two talks will explore how the biological link between ageing and cancer could lead to new diagnostic tools and therapies. Professor Jamie Blundell will explore how evolution, genomics, and maths can predict and prevent cancer long before it's diagnosed. He will discuss new technologies for early detection and prevention. Dr

Daniel Muñoz Espín will address the connection between ageing and cancer, highlighting potential interventions for rejuvenation and disease prevention.

Do we know too much about cancer? (April 3)
In the age of big data and AI, vast medical information presents both opportunities and challenges. This panel will explore the ethical and practical implications of using AI and machine learning to shape future cancer treatment and prevention. How can we ensure responsible use of this growing data? Experts from the Cancer Research UK Cambridge Institute, including Professor Florian Markowetz, Professor James Brenton, Dr Ania Piskorz, and Dr Claire Mulvey, will reveal how cutting-edge advancements are transforming oncology and paving the way for the next era in cancer care.

From Sponges to AI: New Technologies for Finding Cancer Early (3 April)
The University of Cambridge's Early Cancer Institute will host a talk showcasing innovative technologies for early cancer detection. The Institute, the only UK centre dedicated to understanding cancer development, risk factors, and early diagnosis, will feature two leading experts: Professor Rebecca Fitzgerald, who pioneered a non-invasive capsule sponge test for oesophageal cancer now rolling out in the NHS, and Dr Mireia Crispin, who leads the Ovarian Cancer Programme at the Cancer Research UK Cambridge Centre and works on developing affordable at-home cancer tests through her biotech start-up, 52 North Health.

The Impossibility of Whales: Unlocking the Secrets of Healthy Ageing (April 3)
With the global population living longer than ever before, understanding the biology of ageing is critical. This talk with Dr Alex Cagan dives into how certain species have evolved superior DNA protection and repair mechanisms. By studying the genomes of animals with exceptional lifespans, from giant tortoises to short-lived fish, groundbreaking research is unlocking secrets to healthy aging. New DNA sequencing technologies are now allowing scientists to explore age-related changes across various species, offering fresh insights into why some animals age slower—and what that might mean for humans. Early results are already challenging our understanding of ageing, and this event will reveal brand new data with exciting potential for the future of longevity research.

With such a wide array of topics, the Cambridge Festival offers an unparalleled opportunity to engage with some of the world's leading experts in health and medicine, fostering public understanding of the cutting-edge research that could shape the future of healthcare.

For further details visit www.cam.ac.uk

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About the Cambridge Festival
The Cambridge Festival is an annual multidisciplinary event that brings together the University of Cambridge's cutting-edge research and creative thinking. Offering a diverse array of events across science, technology, health, arts, humanities, and social sciences, the festival invites all to explore new ideas, engage with experts, and engage in conversations that shape our understanding of the world.

About the University of Cambridge

The University of Cambridge, founded in 1209, is one of the world's oldest and most prestigious academic institutions. With a commitment to research excellence and global impact, the university continues to lead in education and innovation across a wide range of disciplines. It remains at the forefront of scientific discovery, social progress, and cultural understanding.