Faculty of Natural Sciences Research Image Competition 2025

Congratulations to our winners and all shortlisted entries, which are listed below with images and accompanying narratives.

Judges Awards

PhD Student Category

Liquid Gold

Anna Curran, Department of Mathematics

A lattice of bubbles inside a ring that has been dipped in soapy water. The bubbles hold their shape because of molecules in the dish soap called surfactants, which stabilise the interface. Surfactants are all around us - for example, they allow soap to break down dirt and bacteria, and they are given to premature babies to help them inflate their lungs. Conversely, they threaten the efficacy of various industrial applications such as self-cleaning surfaces and laptop cooling systems. My research focuses on mathematically modelling the effect of these molecules at a fluid interface, in order to gain a greater understanding of how to control their behaviour in these applications.

Research Staff Category

Purposeful Flames

Adriana Ford, Department of Life Sciences

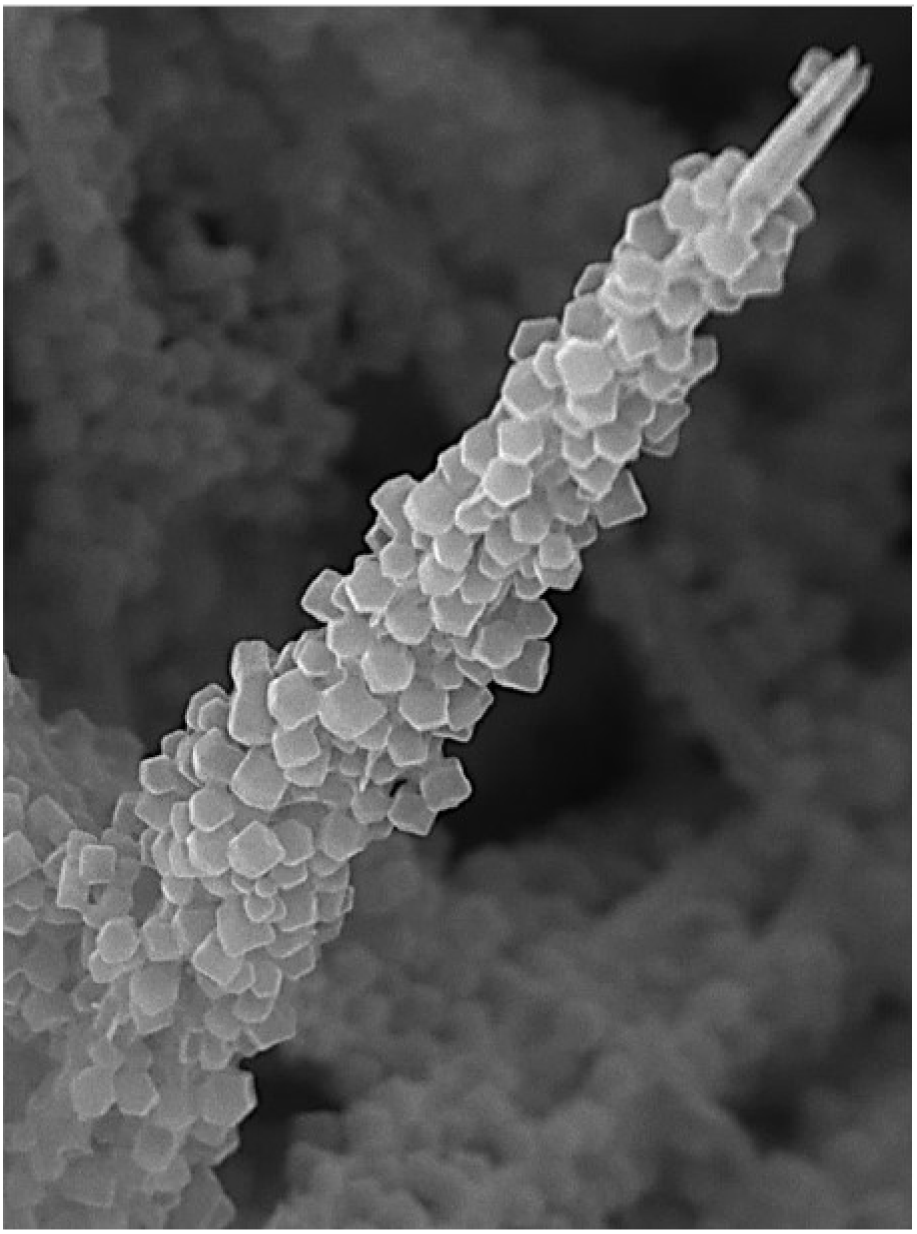
Witnessing a prescribed burn is an awakening of the senses - the constant crackling of burning vegetation, the thick smell of smoke, an unforgiving heat, and the captivating sight of purposeful flames. I could not help but imagine what it would be like in a wildfire, compared to this low-intensity, controlled burn, which was carried out in Brazil in the FIRE-ADAPT project. Prescribed burns can be an essential tool for fuel load management to reduce the risk of uncontrolled wildfires. Their slow speed and low intensity allow the majority of animals, such as this Brazilian stick mantis, to escape unscathed.

People's Choice Award

The nano-micro Shard

Chandra Sekhar Sale, Department of Chemistry

This is an electron microscopy image (zoomed 100,000 times) of Zeolitic imidazolate framework-67–based nanoparticles directly deposited on copper hydroxide microrods. The entire architecture that looks like The Shard tower, power energy storage devices by converting the chemical energy into electrical energy and follow vice-versa process to store the energy. These unique architectures enhance surface area and capacity, making them ideal for next-generation electrodes. The direct growth of this architecture on electrode substrates enables the development of low-cost and high-performance energy storage devices. This image beautifully captures the intersection of nanotechnology and sustainable energy, highlighting the artistry hidden within cutting-edge nanotechnology and the push for efficient energy storage and production systems.



Shortlisted

Green bubbles

Arnab Majumdar, Department of Life Sciences

Most of the oxygen in the world comes not from plants but from microalgae and cyanobacteria. These tiny cells can form visible gas bubbles on the water's surface with a vibrant green color. These bubbles are fragile and sensitive to sheer forces. These green cellular hulks are superheroes of the microscopic world.

Weaving circularity

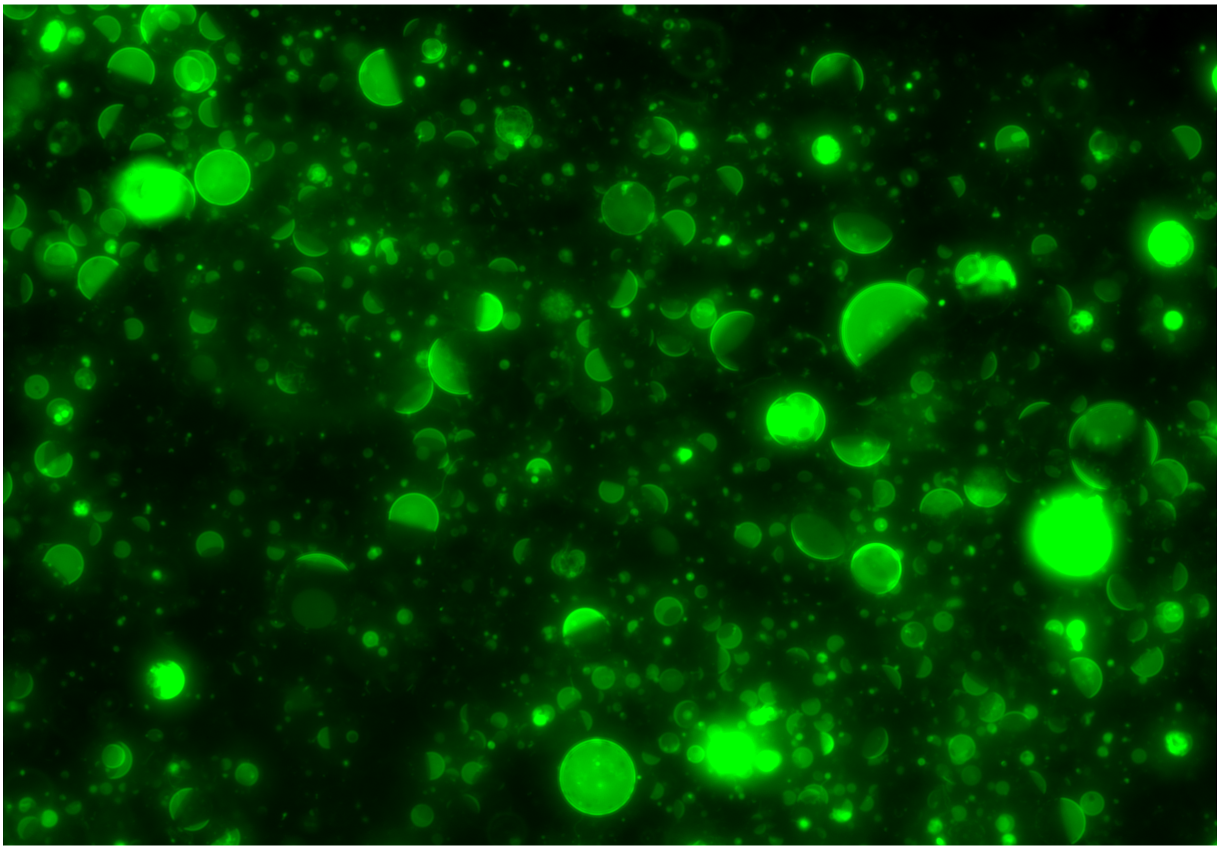
Abha Joglekar, Centre for Environmental Policy

In an age of AI and rapid mechanisation, this is one example of an entirely non-mechanised way of production. Gaddi pastoralists of the Indian Himalayas are migratory herders who traverse the Himalayas in seasonal patterns with their goats and sheep. The herders procure wool from their sheep, which is stitched into woolen clothing by the women, often using a non-motorised sewing machine.

Lipid assemblies resemble microscopic moons

Aileen Cooney, Department of Chemistry

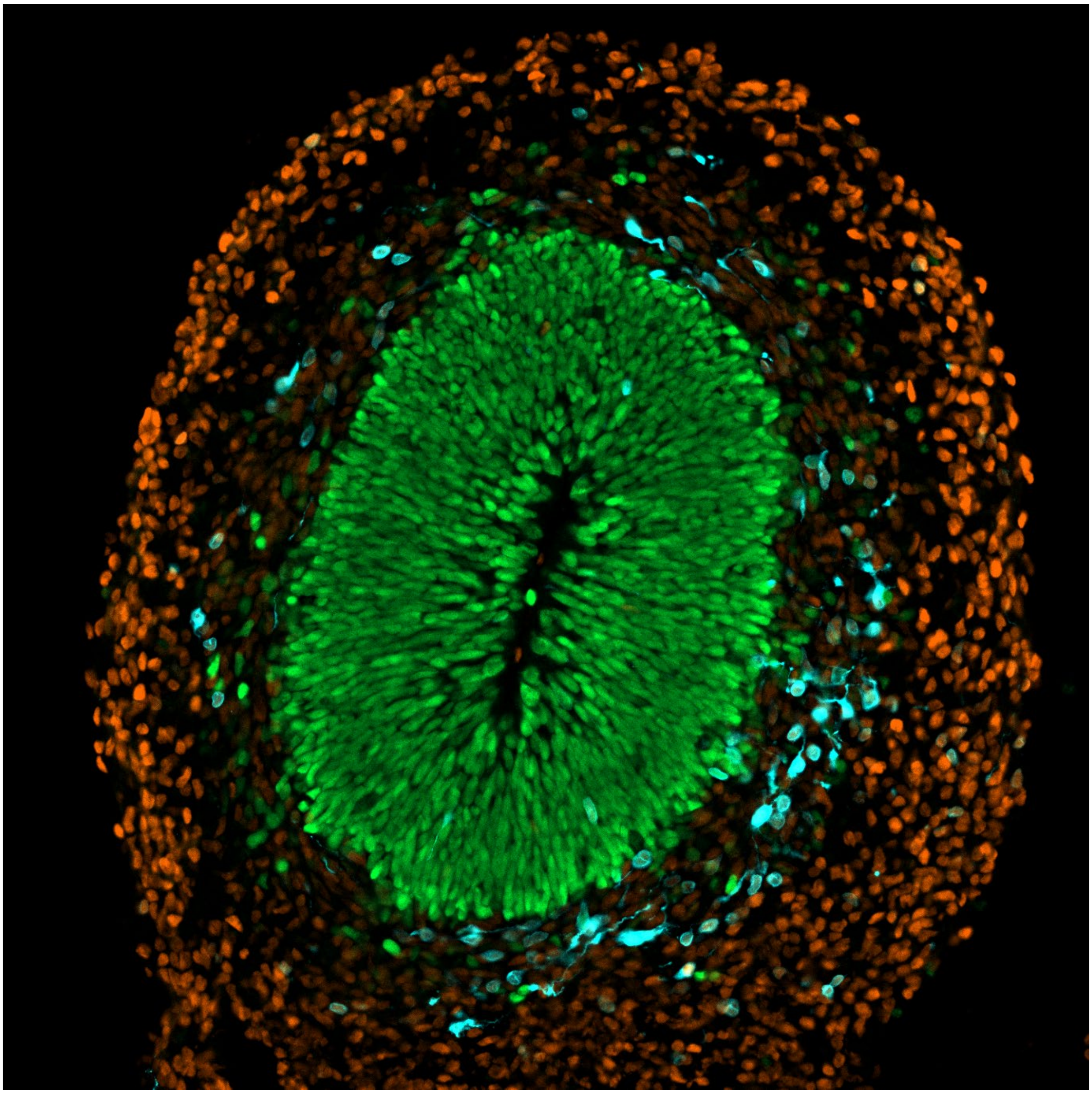
Here is a collection of cell-sized microbots that contain a fluorescent probe inserted in their membranes. We call these microbots "synthetic cells" as they are made of lipid (oil) molecules assembled into a membrane, similar to a biological cell. Depending on the type and shape of the lipids, the synthetic cells show a variety of membrane patterns, resembling different phases of the moon. The fluorescent lipid (green colour) acts as an indicator of how well-mixed the membrane is, with some membranes being fully mixed and others separated into two or more regions. This is useful for engineering different functions at specific locations across the membrane.



Brain in a Dish: Cerebral Organoid Rosette

Alex Kingston, Department of Life Sciences

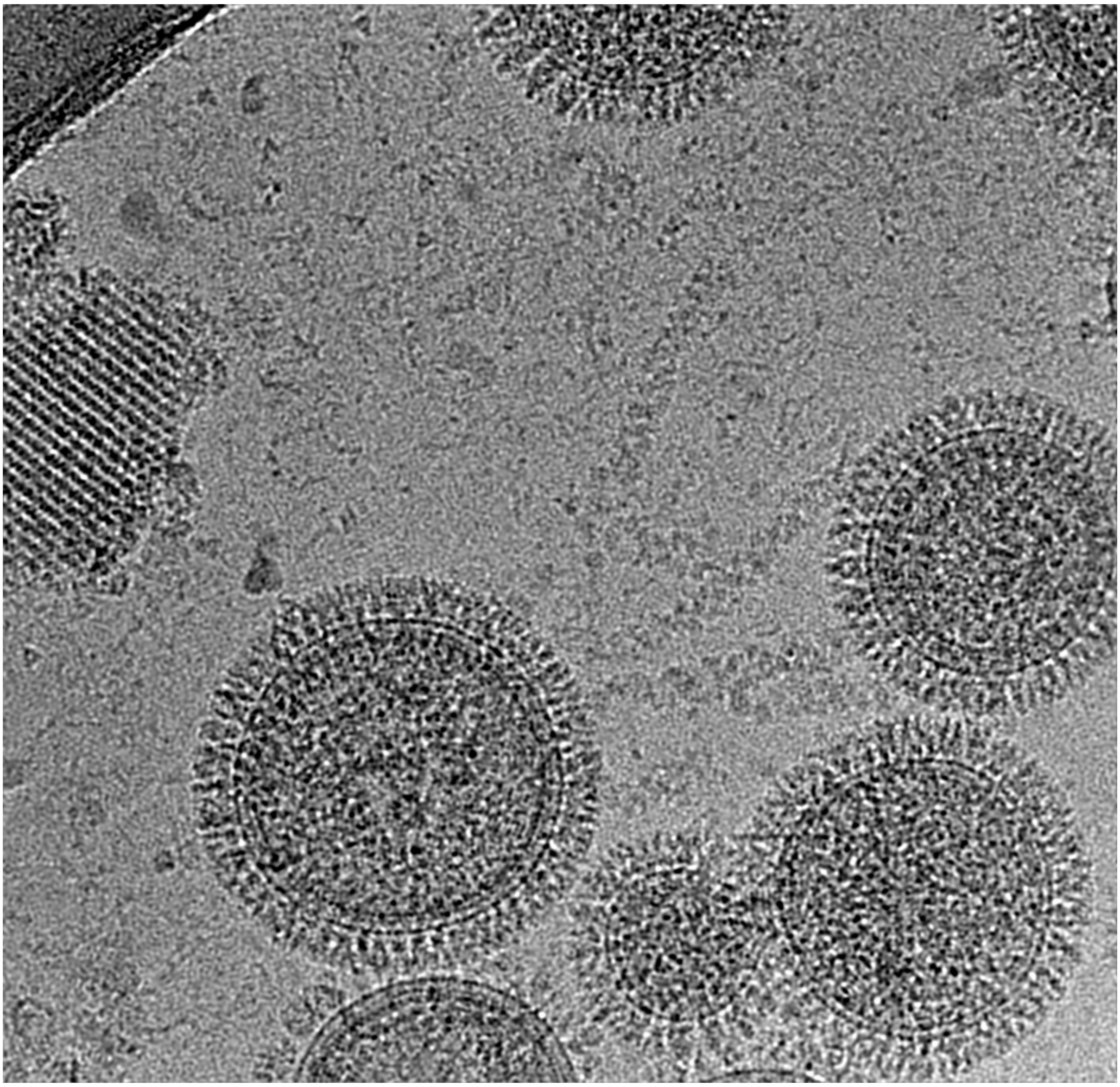
This image depicts a single rosette within a cerebral organoid. Cerebral organoids are 'mini-brains' which can be grown in a dish. Each organoid develops dozens of these rosettes, each a tiny microcosm of the very earliest stages of human brain development. This organoid has been stained using antibodies specific for markers of progenitor (green) and neuronal (orange) identity. The cells coloured in blue have been genetically engineered to disrupt how they sense their physical environment. My project is investigating how these cells behave in complex tissues, to better understand the role of physical forces in development.



Decoding Influenza C Virus: Geometry and Mechanics of Infection

Barry Liu, Department of Life Sciences

This cryo-EM image captures the structural complexity of the Influenza C virus, elucidating its important structures for infection. The viral envelope is stabilised by an outer hexagonal surface protein lattice and an inner matrix layer as scaffold, which is also accidently detected in isolated linear arrays. Helical RNA genomes, are released and primed to hijack host machinery. Fused particles highlight membrane fusion—a pivotal mechanism for cell entry. As Influenza C causes respiratory infections in children, dissecting these structural components advances our understanding of its infection mechanisms and therefore aids antiviral and vaccine developments.



One angry bird

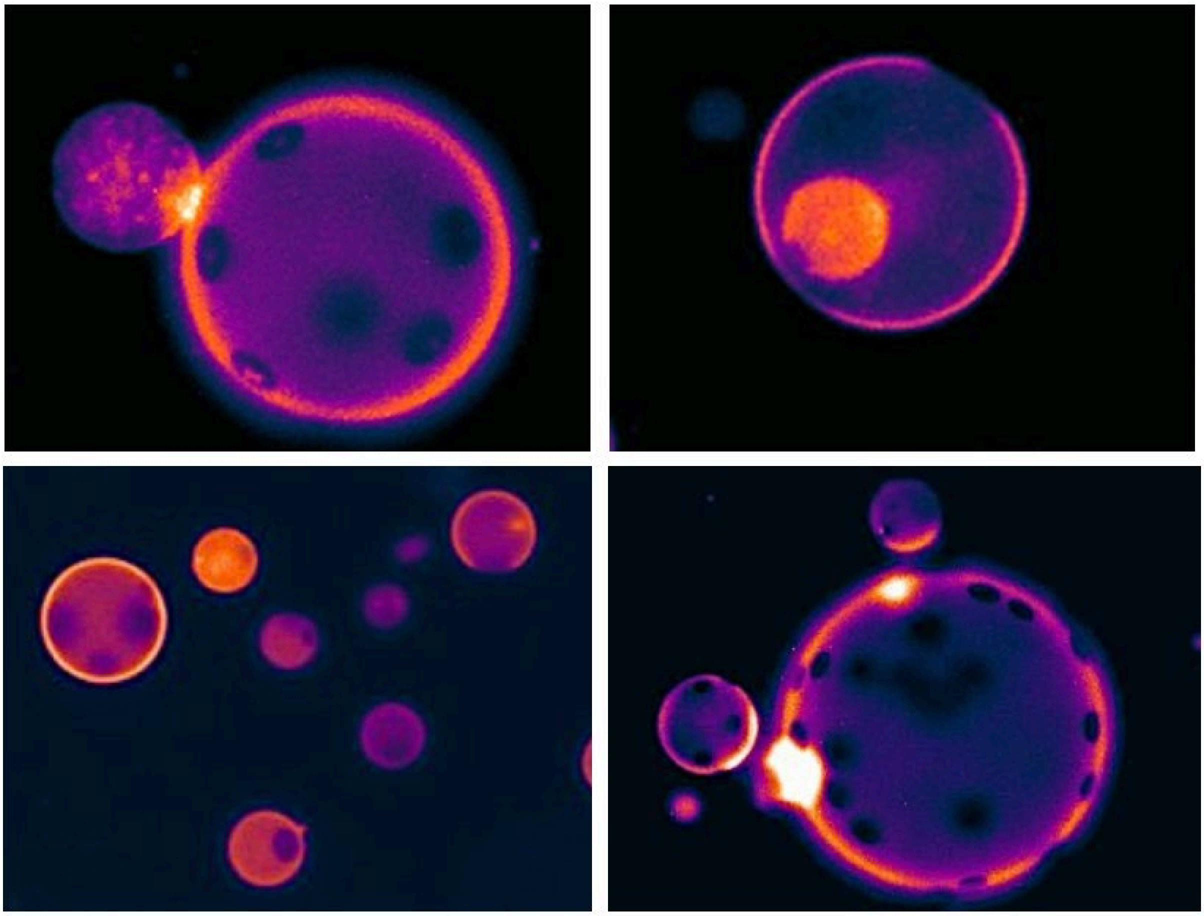
Catalina Estrada Montes, Department of Life Sciences

Every spring I lead a Blue Tit nest box monitoring program in the college campus. Our team visit hundreds of nests to record when birds make their nests, lay their eggs, and feed their chicks. The hour of walking always pays off when we can measure and mark the cute fluffy chicks from successful nest. The picture shows this moment for us sitting on the ground with a not very happy bird that has just been briefly disturbed for a short time from its eating and sleeping routine.

Synthetic Cell Pop Art

Claudia Contini, Department of Life Sciences

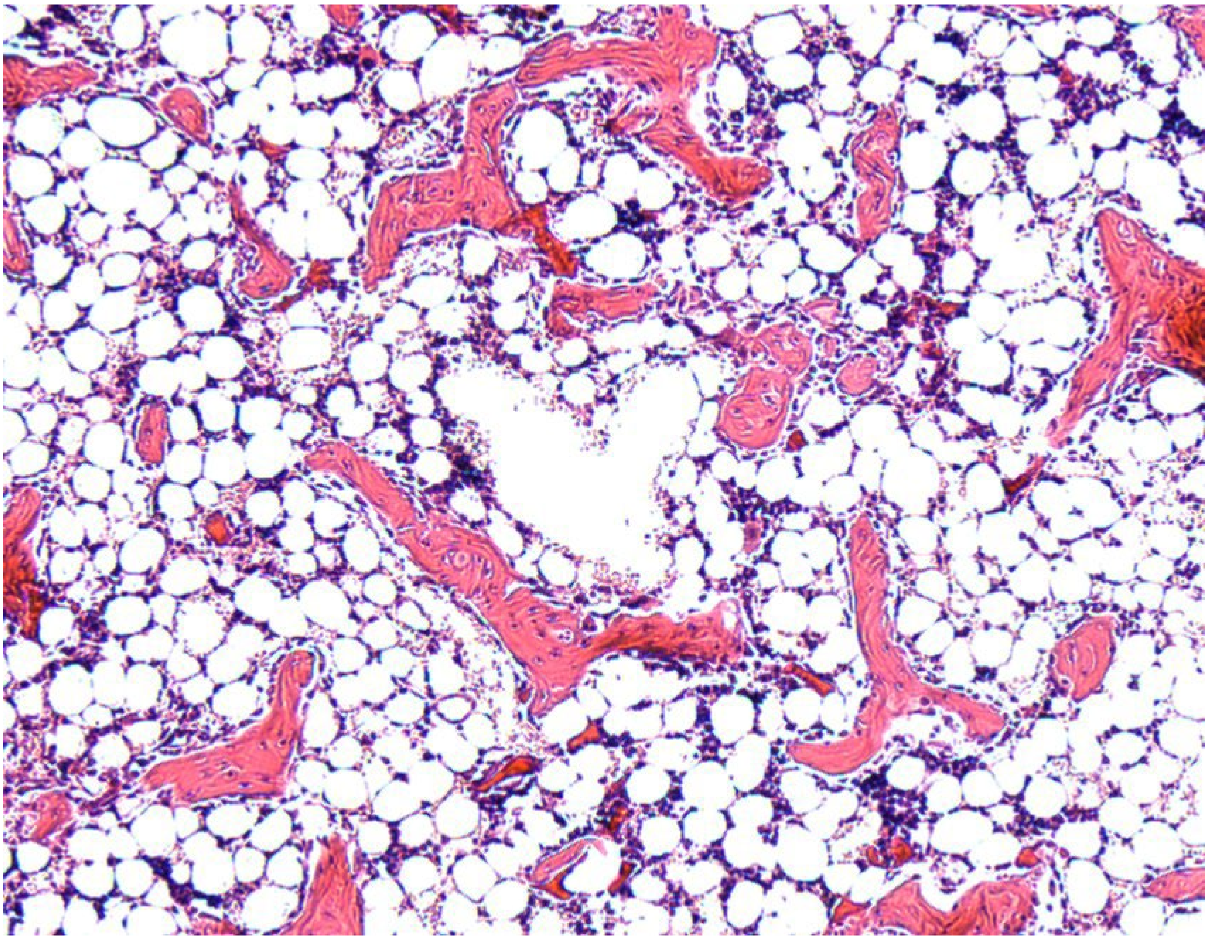
The image captures polymeric vesicles, the foundational structures for our synthetic cell engineering. These vesicles exhibit distinct surface domains, which we can precisely control in terms of size and distribution. By leveraging a domain-selective functionalization strategy, we introduce spatially confined chemical modifications which is functional for the sophistication from soft matter to life-like cellular behaviours.



Bone Marrow's Beating Heart

Esme Fan, Department of Life Sciences

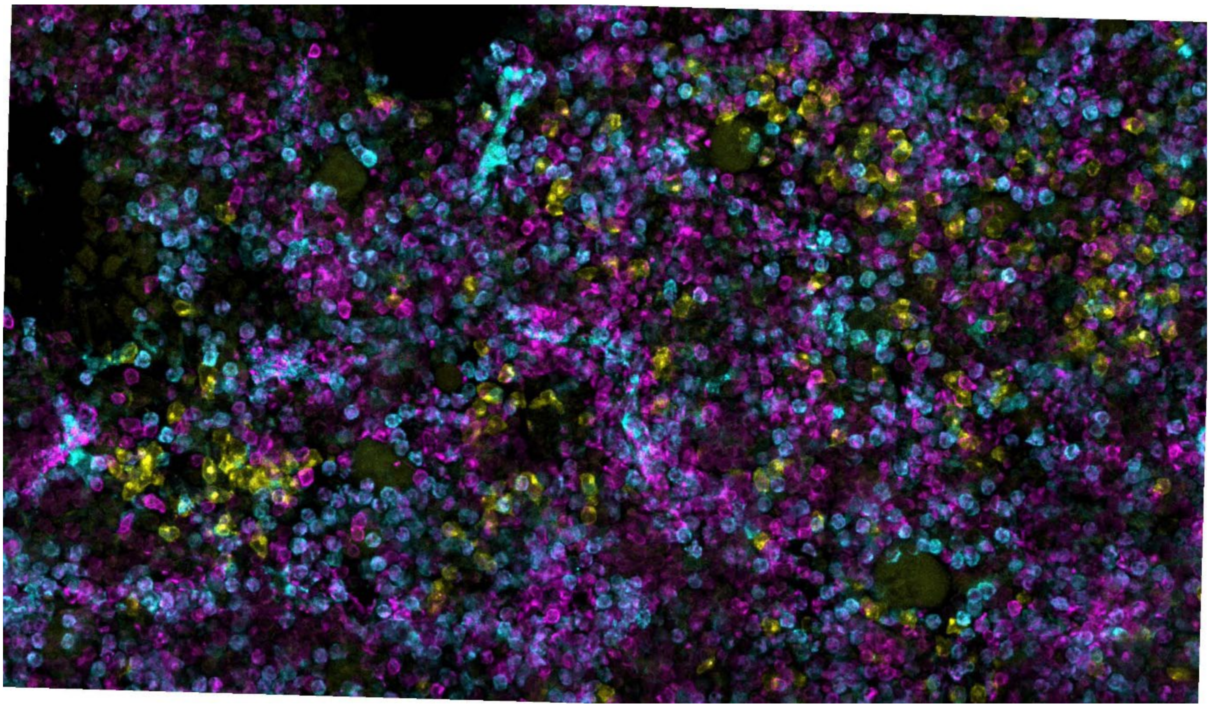
At the centre of this intricate bone marrow tissue lies a hidden message - one shaped like a heart itself. This histology image captures a microscopic cross-section of an engineered artificial bone tissue. Fat cells appear as white circular pockets, bone marrow cells as rich purple regions, and bone as a web of pink filaments. Shaped like a heart, the blood vessel embodies the lifeblood of this engineered environment, a poignant reminder of its crucial role. In our lab, we use this artificial bone model to understand how cancer cells spread and how stem cells enter dormancy.



Whispers of the Bone Marrow: Illuminating the Unseen

Floriane Tissot, Department of Life Sciences

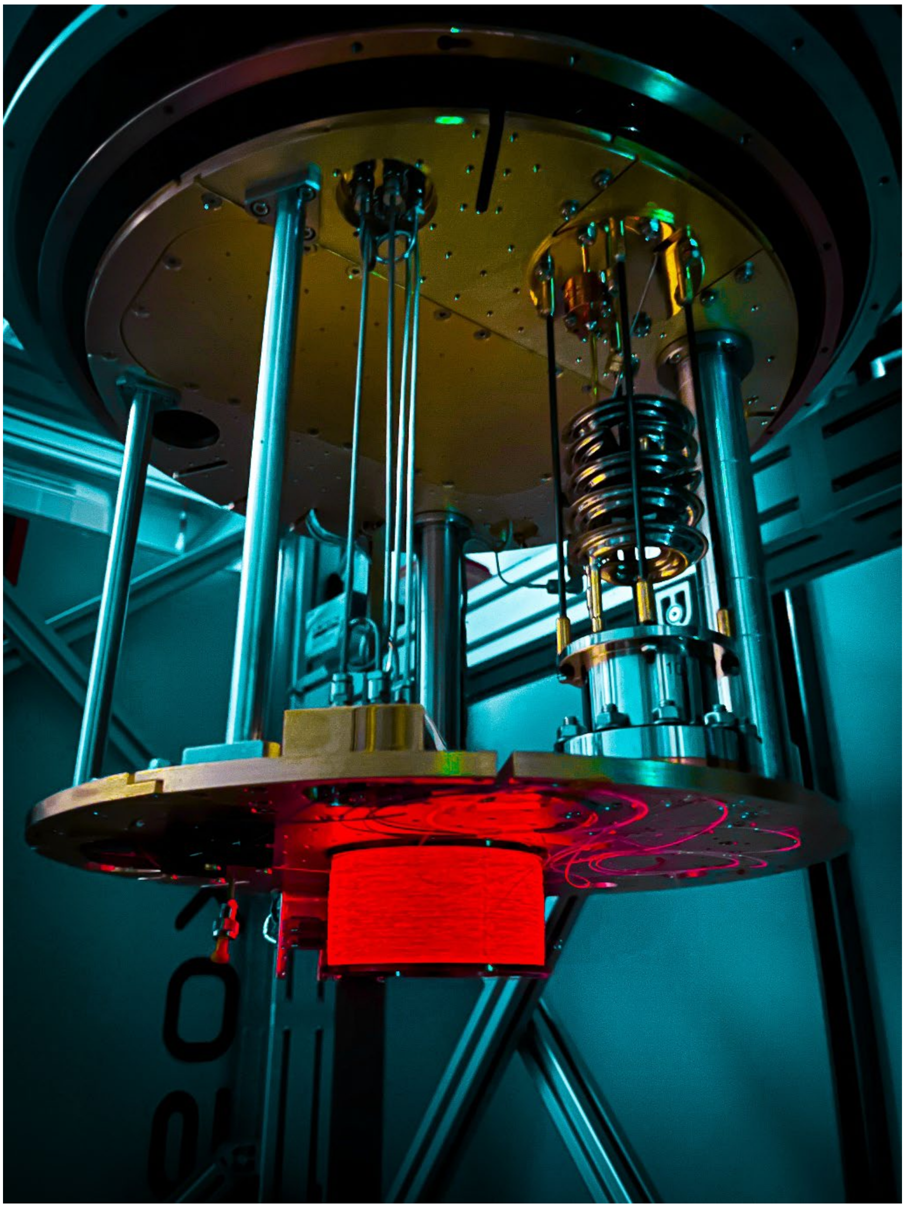
"Whispers of the Bone Marrow: Illuminating the Unseen" unveils the hidden world within bones, where life and disease intertwine at a microscopic scale. Through the lens of advanced imaging, this image captures the interplay of leukaemia cells (yellow), fibroblasts (cyan), and haematopoietic cells (magenta), how disease reshapes the cellular architecture of the bone marrow. Each image tells a silent story - of resilience, transformation, and discovery - shedding light on the beauty and complexity of cellular landscapes that shape health and disease.



Quantum Coolness

Harsh Rathee, Department of Physics

This image shows an optical fiber connected to a dilution refrigerator, a device that cools to an incredible 8 milliKelvin—1,000 times colder than space! Scientists use these refrigerators to study how materials behave at extremely cold temperatures, uncovering phenomena like superconductivity and quantum effects. By observing how light interacts with sound waves in special waveguides (like the optical fiber), they can explore the unique properties of matter at the quantum level. Real experiments use infrared light, which is invisible to the human eye. A red probe laser is used in the image to illustrate this light in the optical fiber.



Curiosity Unites Us

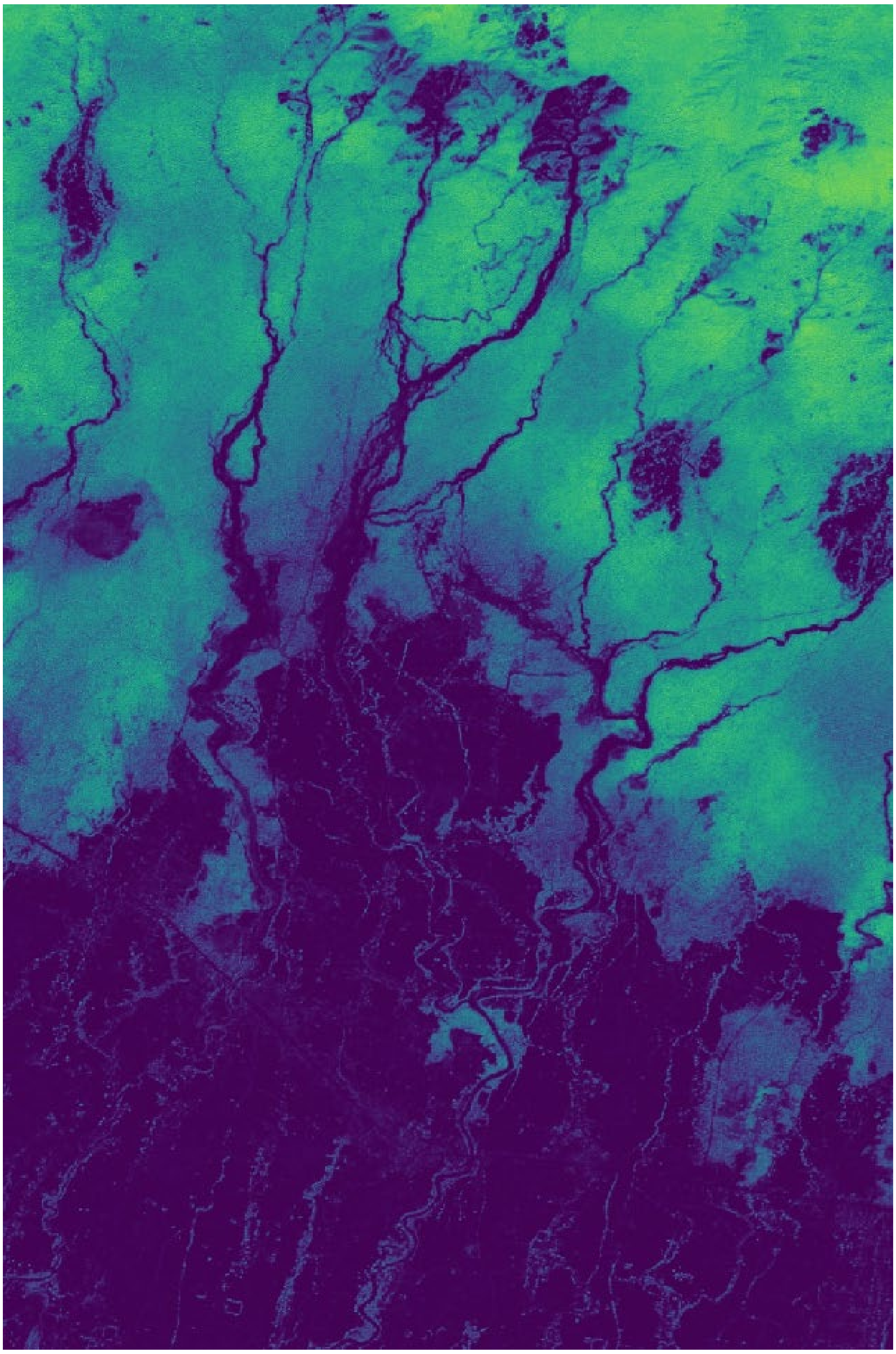
Katarina Piponi, Department of Life Sciences

In the dense greenery of Puerto Rico, where I spend seven hours a day observing rhesus macaques to uncover the inherited nature of same-sex socio-sexual behaviour, I captured this moment of shared curiosity. As I study their intricate social dynamics, this young monkey mirrors my own work—intently examining a simple stick, trying to make sense of its world. In this quiet moment, our roles blur: the observer and the observed, both engaged in the same pursuit of understanding. Science often reminds us of our connection to the natural world, but sometimes, the simplest interactions illustrate just how alike we really are.

Tracing Trees

Matthew Clark, Centre for Environmental Policy

This image shows tree-detection in Nepal at the highest resolution ever mapped at the country-scale. The bright green/yellow areas represent high tree density, while dark purple areas indicate an absence of trees. Each pixel is just three meters across, revealing patterns of change in individual trees and branches. By pairing these observations with information on droughts and floods, we can measure how communities use forests in response to shocks. These insights allow us to better understand the cumulative effects of climate change on both people and nature to better implement environmental conservation in a changing world.



Chamber of Secrets: Mosquito Eggs in Development

Pei-Shi Yen, Department of Life Sciences

This is an image of a female malaria mosquito's eggs. Each chamber-like structure contains not only an egg, but also a number of other cells which help its development. But these eggs do not belong to a regular mosquito - they belong to a genetically modified gene drive mosquito. This mosquito is able to pass on a specific traits to her offspring at a near complete rate, as opposed to the natural 50% chance. It is here in these eggs where this gene drive technology is taking place, and may hold the key to malaria eradication in the future.