Bubble Engineering
Changing the way we deliver medicine

The challenge
Medicines for treating serious diseases such as cancer and strokes are becoming more powerful. But the challenge is delivering these medicines to specific places in the body and minimising side effects.

Microbubbles
We can use tiny gas bubbles, 100 times smaller than a human hair, as vehicles to deliver drugs. The bubbles are injected into the bloodstream and the drug is only released when the bubbles are "popped" using ultrasound.

Case study: Eleanor Stride
Professor at the Institute of Biomedical Engineering in Oxford.

Eleanor studied Mechanical Engineering at university and became fascinated with the physics of ultrasound. This led to her undertaking a PhD on the use of microbubbles in medical ultrasound imaging. Since her PhD, she's focused on how microbubbles can be used to treat disease.

Real time feedback
Because bubbles are full of gas, when they are exposed to ultrasound, they produce really strong echoes. These allow us to track the bubbles' progress through the body in real time.

Making bubbles
It is important that we control the size of the bubbles and the amount of drug inside them. We use techniques such as microfluidic processing to manufacture bubbles with the right properties.

Targeting in the body
We still need to make sure that the bubbles get to the right place. We can coat the bubbles with molecules that make them "sticky" to particular types of cell. We can also make them magnetic and use a strong magnet outside the body to collect them at a target.