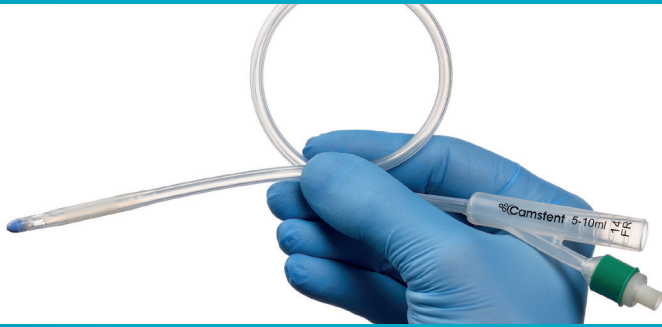




# Bacteria resistant coatings to reduce infection



**The University of Nottingham's Faculty of Engineering worked closely with the School of Life Sciences and School of Pharmacy to develop a new 'non-stick' catheter coating that prevents bacteria forming biofilm and so reducing potentially life-threatening hospital acquired infections (HAI).**

The Chemical/Materials Engineering research, led by Professor Derek Irvine, was critical to overcoming key barriers to commercialisation of this new catheter coating. His expertise in polymers and their industrial applications includes 16 years in research posts in Imperial Chemical Industries (ICI). His work focused on four areas: flexibility, ease of use, shelf life and supporting manufacturing scale up.

Initially Professor Irvine came into the team to identify and optimise a suitable copolymer structure that would give the level of flexibility needed to match that of the catheter without actually damaging the coating. This had to be achieved whilst maintaining its bacterial resistant properties. The co-polymerisation strategy he used to achieve this, building on his previous industrial developments, also delivered the added benefit of making the catheter easier to insert than the current industry benchmark catheters. Professor Irvine's team then further developed the coating such that it exhibited an appropriate shelf-life to match the needs of the customer. The problem of the coating becoming brittle with time was overcome through more research into restricting the level of cross-linking within polymers. Addressing these key challenges made the product commercially viable and the bacteriophobic urinary catheter achieved CE mark approval in 2017.

Professor Irvine then closely worked with Camstent Ltd, a platform medical materials and coating process company based in Cambridge, to bring the new catheter to market. Camstent worked closely with the University of Nottingham to manufacture the coated catheters for hospital trials.

This new catheter coating has the potential to reduce the burden of HAIs which are recognised as one of the biggest problems facing global healthcare, costing the NHS more than £1 billion a year. Millions of urinary catheters are used every week around the world and anyone who uses a catheter for more than a week is likely to get HAI. Having an HAI prolongs the time patients spend in hospital and is sadly a significant cause of death. Trials of the new catheter are being held in six hospitals across the UK and these will help determine whether the promising lab results translate into a significant reduction in infection rates.