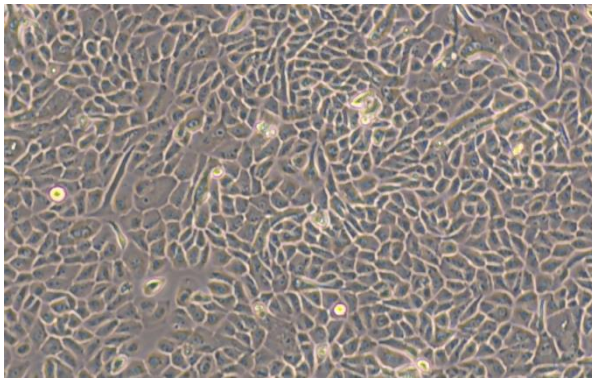


Urinary incontinence is a socially-disabling condition affecting all ages. It can occur in children born with neurological problems or with developmental defects of the urinary tract. In adults, the likelihood of bladder problems increases with age and in any single year in the UK, around one third of all persons aged over 40 years will have a healthcare need related to urinary storage symptoms. There are limited treatment options available, with most therapies targeting the symptoms and major surgery used as a final resort.

The inner surface of the urinary bladder is lined by a specialised epithelial tissue called urothelium. As a self-repairing tight barrier, urothelium is important in enabling the bladder to store urine and preventing urinary toxins crossing back into the body. Previous observations by a research team at the University of York led by Professor Jenny Southgate have found that urothelial cells from children undergoing surgery for advanced bladder problems had lost the ability to form a tight barrier - irrespective of the underlying cause. This indicates a common mechanism for benign bladder diseases and opens up new opportunities for therapy.

Through funding from IMPRESSplus Professor Southgate and her team have been growing normal human urothelial cells in their laboratory (Fig. 1) and using them to investigate a theory for the cause of the damage to the urothelium found in the diseased bladder. They are now building on some initial observations that a research drug is able to repair this damage thereby reinstating the barrier function of the urothelium, and have begun to explore the underlying molecular mechanisms involved. Although these studies are not yet complete, the current findings have begun to reveal a better understanding of how the drug is working in the urothelium.



**Figure 1.** Normal human urothelial cells in culture.

A collaboration with Consultant Urologist, Mr Ased Ali at Pinderfields Hospital has been established to try and identify the most suitable patient population for future therapy. Bladder biopsies from men undergoing surgery for bladder outflow obstruction were collected and the urological symptoms of these patients will be followed up at 6 months to see if there is any evidence of a relationship between urothelial damage and persistence of urinary symptoms.

IMPRESSplus funding has helped this research team take a step along the way to what they hope will lead to a new therapy for patients with urinary bladder symptoms. Prof. Southgate and her team have recently been granted funding from the Medical Research Council. Their Confidence-in-Concept award entitled *A Regenerative Therapy for Benign Dysfunctional Conditions of the Urinary Bladder* will allow their research to continue towards validation of this novel therapy for urinary incontinence arising as a consequence of benign bladder conditions.