Does Urine Inhibit the Genitourinary Reconstructive Capacity of Xenogenic Extracellular Matrices?
Niall.Davis@ul.ie
Davis NF\textsuperscript{1,2}, Callanan A\textsuperscript{2}, McGuire BB\textsuperscript{1}, Flood HD\textsuperscript{1}, McGloughlin TM\textsuperscript{2}
1. Dept. of Urology, Mid-Western Regional Hospital, Limerick, Ireland.
2. Centre for Applied Biomedical Engineering Research, Department of Mechanical and Aeronautical Engineering and Materials and Surface Science Institute, University of Limerick, Ireland.

Introduction
Reconfigured autogenous bowel is a treatment option for functional reconstruction of the lower genitourinary tracts. Concerns persist as the intestine is lined with absorptive mucus-secreting epithelium that is not ideal in a urinary reservoir. Functional reconstruction with a biocompatible acellular xenogenic material may be an alternative option. This study investigates the effects of urine on the regenerative and remodelling capabilities of xenogenic extracellular matrices (ECMs) seeded with human urothelial cells.

Materials and Methods
Human urothelial cells were cultured onto porcine small intestinal submucosa (SIS) and porcine urinary bladder matrix (UBM) at seeding densities of 20,000 cells/cm\textsuperscript{2} under different growth conditions (Fig 1). The control group consisted of urothelial cells seeded on to sterile SIS and UBM samples. The treatment group consisted of urothelial cells that were seeded onto SIS and UBM samples that were pre-soaked in urine for 24 hours (Fig 2). Both luminal and abluminal surfaces of the SIS and UBM bioscaffolds were tested for proliferation and cellular viability using fluorescent markers for cytoplasm and nuclei. Differentiation and growth rate was assessed by Alamar blue and MTT assays.

Results
Cellular proliferation and growth rate varied on luminal and abluminal surfaces of UBM and SIS bioscaffolds. Greater proliferation rates indicated preferred substrate architecture and improved growth performance of the urothelial cells. The urine had a repressive effect on the growth and proliferation of urothelial cells on the SIS and UBM materials.

Discussion and Conclusions
In a sterile environment xenogenic ECMs possess characteristics that favour genitourinary tract reconstruction. However, the repressive effects of urine may limit their \textit{in vivo} performance.

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