

# A NOVEL MALE PORCINE URETHRAL EX VIVO MODEL: CHARACTERISATION OF STRUCTURAL AND METABOLIC VIABILITY

## TAKE HOME MESSAGE:

The male porcine urethra, with its preserved structure and metabolic activity, represents a valuable model for advancing research on the human male urethra.

### STUDY AIMS

- Male pig urethras share similar physical characteristics with those of adult human males.
- Therefore, they're useful experimental models: such as assessing injuries from urethral trauma, or modelling the mechanics of catheterisation.
- Data regarding the degradation of pig urethral tissue over time, which could affect experimental results, is limited.
- This study assesses the structural integrity and metabolic activity of the male pig urethra over time.

### METHODOLOGY



Pig Urethras:

- From four-to six-month old male pigs.

Placed in:

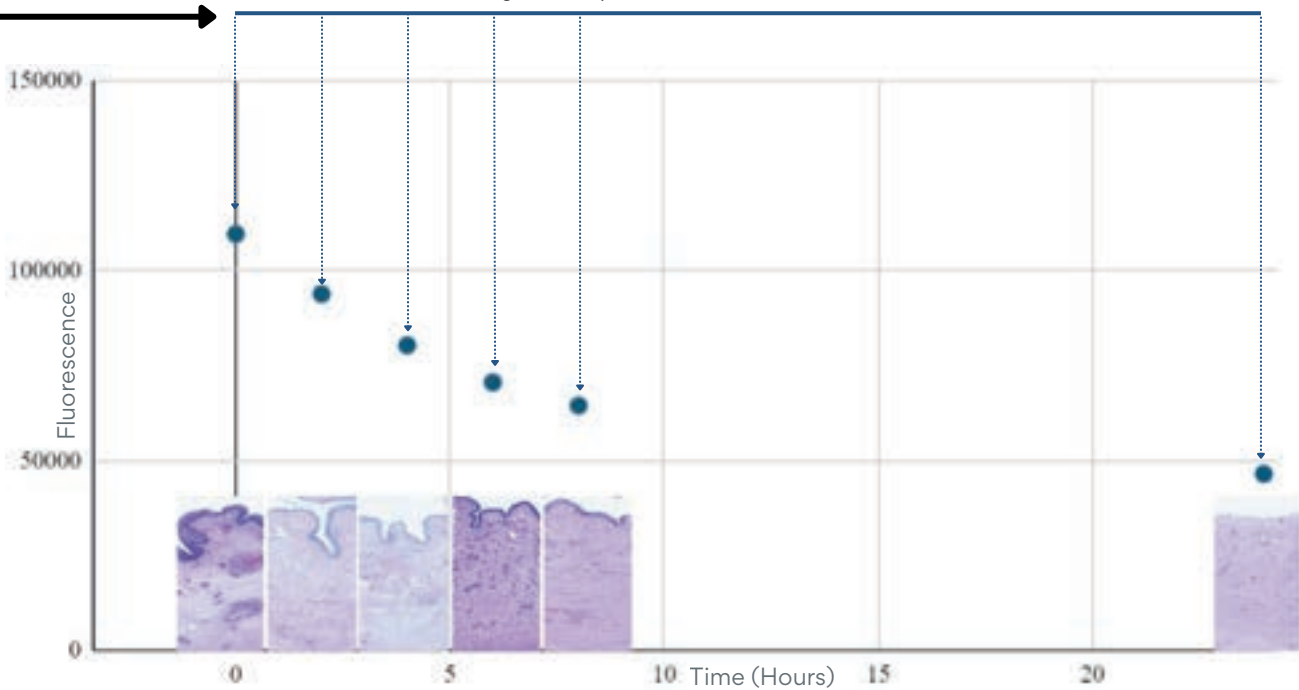


Cell Culture Media Mixture (CCMM):

- 94% **cell culture** media (Dulbecco's Modified Eagle Medium)
- 5% Foetal **Bovine Serum**
- 1% **Penicillin/Streptomycin** (10,000 µg/mL)

### ASSESSMENT OF METABOLIC ACTIVITY

- PrestoBlue 10% added to a section of urethra and blank control in CCMM.
- Samples placed in a BINDER incubator set at 37°C, 90% humidity, and 5% CO<sub>2</sub> for 60 minutes.
- 100µL supernatant from each sample taken and placed into a plate-well for fluorescence measurement.
- Fluorescence measured using a microplate reader, with excitation set at 520nm and emission at 590nm



### ASSESSMENT OF STRUCTURAL INTEGRITY

- Tissues preparation: formalin fixation > embedding in paraffin wax > sectioning into 4µm slices > deparaffinising > rehydrating with alcohol.
- Stained with Haematoxylin and Eosin (H&E)
- Visual inspection under a high-powered light microscope



### RESULTS

Gradual but diminishing loss of metabolic activity over 24 hours:

- At 7 hrs: 50% metabolic activity.
- At 24 hrs: 42% metabolic activity.

H&E analysis:

- Loss of urothelium overtime (explaining drop in metabolic activity).
- Preserved overall structure of urethra (including the crucial inner & outer muscularis layers).

Even with reduced metabolic function, the tissue remains viable ex vivo and suitable for longer experiments.