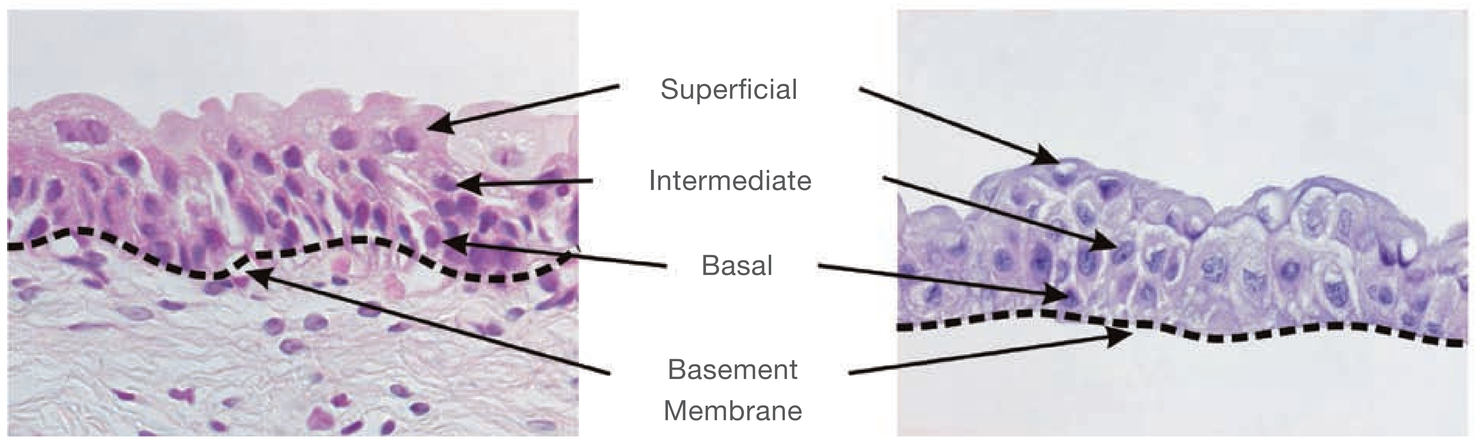
Novel Drug Screening Assay Using Human Bladder Tissue

Lead Academic: Professor Jennifer Southgate, University of York

The Challenge

Existing animal models for testing pharmaceuticals are expensive and failures in these mandatory tests mean single compound development costs have reached £250-400million. Failures in animal trials are largely due to unanticipated effects from drugs selected following simple in vitro test assays, often based on cancer cell lines. The inadequacies of existing in vitro and in vivo models may lead to unnecessary delays and even discontinuation of drug development. Even results from animal models do not necessarily reflect the effect that would be seen in human cells and tissues, leading to adverse reactions in clinical trials and to drugs being launched to market with unexpected side-effects.



Micrographs of the urothelium in human bladder tissue (above left) and the “biomimetic” human urothelium (above right) created in the laboratory show their structural similarities including distinct basal, intermediate and superficial cells.

The Innovation

Relevant human tissue models are required to bridge the gap between animals and humans. The lining of the bladder (urothelium) is a direct target tissue for drug interventions in bladder disease; but crucially, it is also an important secondary target and toxicity site for all drugs, since most are urinary-excreted either unmodified or as metabolites. We have developed a robust and patented “biomimetic” human urothelial cell culture system as a research tool that is phenotypically and functionally equivalent to the native human tissue.

The Opportunity

The biomimetic urothelium has opened two distinct opportunities, the exploitation of which requires the development of specific assays. The first is the development of the biomimetic urothelium as a pre-clinical tool for evaluating drug toxicity and the second is to examine more specific drug interactions (e.g. mode-of-action) in human bladder tissue. These assays have potential to be delivered to market through two different routes. Although development will proceed in parallel, early focus will be on the development of toxicity assays that will be licensed to contract research organisations through a spin-out company for use as part of their portfolio. This early income stream will then be used to develop more specific drug assays, for direct sale, where our technical expertise in the field will be of crucial value.

How has the Yorkshire Concept Fund Contributed?

This funding has secured dedicated research and business staff to focus on the development of the biomimetic urothelium into a commercially saleable system with a portfolio of assays. The fund has provided much needed critical evaluation and development of the business plan.

Proposition Position Today

This project is in a product development phase and as such assay benchmarking for the two markets is ongoing. During this process we continue to liaise with business in order to tailor the system directly to market need. This project is supported by Dr Simon Baker who is a Yorkshire Enterprise Fellow.

Fact Box

Lead Academic:
Professor Jennifer Southgate

Department Of Biology, University of York,
York, YO10 5YW

01904 328705

js35@york.ac.uk

Business Development Manager:
Dr Joe Ross

Enterprise & Innovation Office,
The Innovation Centre, York Science Park,
York, YO10 5DG

01904 435286

jr23@york.ac.uk

THE UNIVERSITY of York

For further information on the Yorkshire Concept PCCF
Contact us on 0114 225 2129
Email: D.L.Snellgrove@yorkshireconcept.com
www.yorkshireconcept.com

Yorkshire Universities
The regional voice for higher education

Supported by
YORKSHIRE FORWARD
The Region's Development Agency

Yorkshire Concept: helping create the right conditions for successful commercialisation

PCCF
Yorkshire Concept
Proof of Commercial Concept Fund