The Client

In the Reading School of Pharmacy at the University, research in the Connon laboratory is primarily in the area of corneal tissue engineering. Within the research program, the team is seeking to engineer functional replacement and temporary 'bridge' tissues while also developing model systems to study physiological and pathophysiological corneal tissue formation.

All projects in the lab are linked by the hypothesis that combinatorial approaches to tissue formation are superior to individual stimulation. More specifically, successful tissue engineering approaches will be realized upon the proper spatial and temporal presentation of cells, signalling molecules, biomaterials, and mechanical stimulation.

The biotechnology industry is rapidly expanding and the emerging field of tissue engineering and cell based therapy are projected to have a high impact in regenerative medicine. In particular the team are investigating the application of hydrogels in this field. However, they also predict that the future of tissue engineering will not be limited to regenerative medicine. They are now starting to conceive of functional cell-based biological constructs engineered not for transplantation but for a specific biotechnological need. We have termed this 'super tissue engineering' i.e. the design of cell based constructs that have a limited but exceptional biotechnological function.

Presently the group consists of 3 PDRA’s, 3 PhD students and an ophthalmic clinical fellow funded mainly by Research Council grants. Currently the team have MRC funding to develop a hydrogel based corneal stem cell transplant procedure that doesn’t require ex vivo expansion or GMP facilities. They also have BBSRC grants to develop smart/intelligent hydrogels for wound healing and templates that control the spatiotemporal positioning of stem cells to create a bioprosthetic cornea.

“Diseases affecting the cornea are a major cause of blindness worldwide. Current treatments are limited by availability of donor tissue. Over the next 5 years we aim to apply both basic and applied research to improve corneal stem cell isolation and characterisation as well as providing novel therapeutic stem cell delivery systems using natural and synthetic hydrogels. The equipment supplied by Triple Red will be core to this research including centrifuges, CO2 incubators and a safety cabinet with fitted dissection microscope as well as the centralised water system.”

Dr Che Connon
Reader in Tissue Engineering,
University of Reading
The Client’s Needs
The research team will develop a prosthetic cornea comprised solely from human cells and proteins, their growth and development having been directed by a synthetic polymer template which mimics the corneas natural architecture.

In order to conduct this research, the team needed a high quality tissue culture lab and that’s when talks started with Triple Red who already supplied products and services to other parts of the organisation.

The Solution
Triple Red was able to supply, maintain and service a range of equipment for the group including a safety cabinet, CO2 incubators a centrifuge and an ultrapure water system. The equipment was supplied and installed by our team of local engineers who are now on hand should they be needed for maintenance and service visits. With this kind of breakthrough research, it is essential that Dr Connors’s team was up and running smoothly.

The NuAire ranges of Class 2 cabinets are completely manufactured from stainless steel and are known for their ergonomic and safety features. The HEPX bag patented system of air flow means the air flow across the cabinet is completely uniform protecting the operator and giving longer filter life. The DC-ECM also means they have low energy consumption which is important for Dr Connons’s group to operate economically. Ergonomic features include diffused lighting, very low noise level and arm rests to support the scientists for long periods of working at a cabinet.

New research could restore sight to patients whose cornea has been damaged without the need of a donor.

More than 48,000 cornea transplants have been recorded on the UK Transplant Registry since the Corneal Transplant Service began in 1983, and this is set to rise a with an ageing population.

For further information, get in contact:
Tel: 01844 201142
Email: UK.Info@avidityscience.com
Web: www.avidityscience.com/en_gb/

Unit D4 Drakes Park,
Long Crendon Industrial Estate,
Bucks. HP18 9BA