

## ORGANOX LIVER TRANSPLANTS



Professor Coussios (right), Professor Friend (second from left) and team prepare a liver 'kept alive' for transplantation

*Transcription of an interview with Constantin Coussios, Professor of Biomedical Engineering and Peter Friend, Professor of Transplantation*

**CONSTANTIN COUSSIOS**

I will never forget the feeling of being about to place that first organ on the machine. It was a series of operations I had done a thousand times before, but there was something fundamentally different about this one. It was no longer an experiment that could be repeated next week; there was actually someone's life at the other end of that experiment.

**PETER FRIEND, PROFESSOR OF TRANSPLANTATION**

What we've done with OrganOx is to produce a clinically appropriate device from some research work we've been doing for many years in the University laboratories to enable us to maintain an organ – a liver in this case – 'alive', in a functioning state outside the body for a prolonged period.

**CONSTANTIN COUSSIOS**

At the moment transplantation is an emergency procedure. When an organ becomes available the race against the clock is felt every step of the way. Surgeons will try to implant an organ within six to eight hours of retrieval, with a maximum of about twelve hours. The liver is arguably the most complex organ in the human body, and the one that it is most difficult to replace artificially. The liver performs over a thousand chemical operations on the blood, and we are at least 20 years away from creating a completely artificial alternative.

What Peter and I have tried to do is create an environment whereby the organ essentially doesn't know it has left the human body. We have a substitute heart in the form of a centrifugal pump; we have substitute lungs in the form of this oxygenator; and this reservoir represents the blood volume typically within the patient.

We now have the capability of assessing the organ prior to even calling the patient in for the transplant, and actually having real, objective markers of how well the organ is working.

**PETER FRIEND**

What it means for patients is that we can start to use more organs for transplantation, and with more confidence. At the moment a patient is more likely to die waiting for a liver transplant than in the first 12 months after the operation, so it's a very, very risky period, the period of waiting, and the shorter that waiting period, the better.

**PETER FRIEND**

The clinicians looking after the patients have been enormously enthusiastic. It's been really great fun to be around, actually.

**CONSTANTIN COUSSIOS**

A trial at a European level is being initiated immediately upon completion of the current 20-patient trial in the UK, so we expect it to be up and running within 2014. Oxford is an absolutely unique place in which to translate research from lab to bedside. The building that we are currently in is located on the Churchill Hospital site, but is, essentially, an engineering building. So we have basic technologists such as myself in very close proximity to clinicians.

**PETER FRIEND**

I think that it's a fantastic privilege to work in an academic medical centre where you can really have one foot in the clinical camp and one foot in the research and development side. I think it makes for an extremely interesting and rewarding job.

**CONSTANTIN COUSSIOS**

The new procedure is robust, it is working every time, and that is really all the engineer can hope for.