

GM pigs best bet for organ transplant

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A new generation of genetically modified pigs has been bred to provide organs for humans. Scientists believe the pigs provide the best chance yet for the thousands of patients with heart, kidney and liver failure who are dying for want of a transplant.

Transplant pioneers who are carrying out experiments this autumn have told *The Independent on Sunday* that they now have 'realistic hope' in the search for a new source of organs.

After years in which progress in xenotransplantation - using animal organs to replace human ones - was stalled, researchers are optimistic that they have overcome the major barriers and can make the technique work.

If the pioneers succeed in establishing a human trial of the technique, a new medical frontier - cross-species transplantation of whole organs - will have been breached and the ground laid for a network of organ farms spanning the globe. Instead of relying on human donors, we could farm pigs for their hearts, kidneys and livers.

The need is immense. Throughout the Western world thousands of patients die each year on transplant waiting lists. In the UK 2,777 transplants were carried out last year - the highest for six years - but there are twice that number on the waiting list. The demand is fuelling a black market in organs sold by donors in poor countries.

However, if the experimental transplants being carried out in Massachusetts and Pittsburgh fail, it could bring down the curtain on a dream that has been nurtured for decades, cost hundreds of millions of pounds and raised hopes around the world.

John Dark, a transplant surgeon at the Freeman Hospital, Newcastle, and a member of the UK Xenotransplantation Interim Regulatory Authority, said the new strain of 'GAL-knockout' genetically modified pigs - modified to remove a galactose sugar that triggers an immunological reaction in humans - held out real promise that the problem of rejection could be solved.

Rejection of organs happens in at least two stages. First-stage 'hyperacute' rejection was conquered almost a decade ago, but second-stage 'vascular' rejection has proved much more difficult. Organs from the new pigs have already been shown to survive in baboons for 76 days, much longer than in previous experiments, suggesting that second-stage vascular rejection has been overcome.

'The GAL-knockout pigs are very exciting indeed,' Mr Dark said. 'Several groups are furiously doing transplants with them into baboons.'

'We should have pre- liminary results soon - they could be presented to the International Conference on Xenotransplantation in Glasgow next month.

'But there is a feeling in the field that we are in the last-chance saloon. The [pharmaceutical] industry has ploughed millions into this. If these experiments don't work it will be very depressing.'

If the rejection problem can be solved, there remains the infection threat - potentially the biggest hurdle facing animal-to-human transplants. But new research suggests the threat of pig viruses being transmitted with the organ and escaping into the human population, potentially triggering an epidemic, is receding.

Robin Weiss, professor of virology at University College London, who first warned of the risk of transmission of pig viruses in the late 1990s, said the experience of recent years had been reassuring. At least 200 patients had had live pig tissue transplanted into them in the past two years with no sign of viral transmission.

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