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international news

PAN-EUROPEAN TEAM REVOLUTIONISE TRANSPLANTATION

The world's first tissue engineered whole organ transplant was carried out by surgeons in Barcelona, using stem cells cultured in a laboratory at Bristol University, and a technique developed at Padua University, Italy.



PROFESSOR Pablo Macchiarini and his team transplanted a trachea into 30 year old Claudia Castillo who, five months on, is reported to be in perfect health according to a report in the *Lancet*.

The procedure, which had only previously been performed on pigs, was a great success, and 4 days after the operation, the hybrid windpipe was identical to the adjacent airways. A biopsy 1 month after transplant confirmed the organ had developed its own blood supply.

Using a technique developed at Padua University, Italy, scientists obtained a donor trachea and, using chemicals and

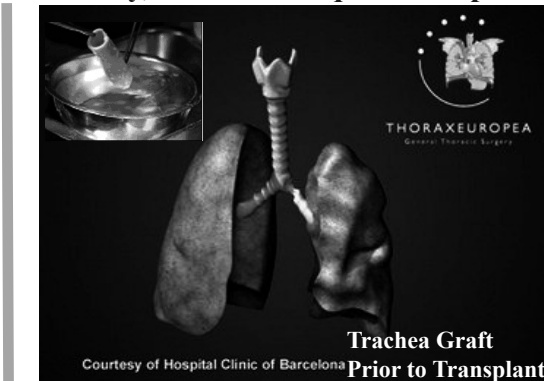
enzymes, stripped away all the donor cells. This left a framework of collagen, which was then coated in immature cells from Ms Castillo's bone marrow and cells from the lining of her trachea.

The obvious benefit of using organs specifically created using patient's stem cells is the removal of the necessity for immunosuppressive medication, thereby removing

"VIRTUALLY ANY ORGAN COULD BE ENGINEERED THIS WAY"

the risk of complications caused by immunosuppression such as infection and cancer.

Tracheal transplant has previously been attempted using a donor



trachea, but these have proven unsuccessful due to the severity of the rejection, and therefore the large amount of immunosuppression required to counteract that – complications included infection, haemorrhage and tissue necrosis.

Ms Castillo was admitted to hospital in March, with shortness of breath, resulting in the inability to carry out daily tasks and climb stairs – she was diagnosed with a TB in-

fection.

The only alternative therapy would have been a pneumonectomy, which would have reduced her life expectancy.

As a consequence of the surgery, she has resumed daily activities. The Columbian mother of two hails the operation as a success – although she admits she was initially quite scared, she says "I was a sick woman, now I will be able to live a normal life".

Professor Martin Birchall, professor of surgery at Bristol University, helped to culture the cells for transplant.

He said "surgeons can now start to see and understand the potential for adult stem cells and tissue engineering to radically improve their ability to treat patients with serious disease" and believes in 20 years time, virtually any organ could be engineered this way.

The impact of this revolutionary technique is momentous – over a thousand people die on the waiting list for a transplant every year in the UK, and thousands more worldwide.

The ability to engineer individual organs will essentially remove the need for donor organs, and the emotional turmoil associated with the transplant waiting list.



Ms. Castillo - five months post-op

294 KILLED AS CHOLERA STRIKES TROUBLED NATION



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THE World Health Organisation (WHO) reports that Zimbabwe should prepare itself for the current health crisis to worsen, with the death count is at 294 and is rising daily.

Several aid agencies have acted in an effort to stop the spread of Cholera and provide shelter, sanitation and effective treatment for the thousand fold that come to their centres.

"WORST OUT-BREAK SINCE 2000"

Medicins Sans Frontieres (MSF) have issued a statement that with each passing day the infection rates are rising rapidly placing over 1.5 million people at risk.

Although endemic to the region the BBC printed MSF reports that the current epidemic is predicted to be the "worst outbreak since 2000".

Many will point the finger of blame to seemingly ex-president Mugabe and his years of political turmoil, power struggle and neglect towards Zimbabwe.

The complete loss of infrastructure, sewage control and health system deterioration has to be managed promptly to bring this acute situation under control.



BONE MARROW TO CURE HIV?



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DOCTORS in Germany claim to have cured a HIV positive man with a bone marrow transplant. Dr Huetter at the Charite Clinic in Berlin is said to have cured a 42 year-old man suffering with advanced leukaemia of his decade long HIV infection.

Could this spell the end for a virus so complex that many within the medical profession believe it incurable? Or was it just a lucky shot in the dark?

Two years ago the patient had a bone marrow transplant to treat his leukaemia. The bone marrow transplant came, not from a normal donor, but from one with genetic resistance to HIV.

Twenty months post transplant the patient, without any HAART, has no bone marrow, blood tests or tissue samples showing HIV infection.

The genetic mutation

inferring resistance to HIV infection has long been known to be present in roughly 1% of Europeans. The mutation, Delta 32, prevents HIV from attaching to CD4 T-cells by blocking the CCR5 receptor.

The CCR5 receptor is effectively the gate way through which HIV enters the cell, if blocked the cell is HIV-resistant. By applying the science to clinical treatment Dr Huetter believes that he has found the 'Achilles heel' of the virus, the CCR5 receptor.

David Baltimore, Nobel Prize winner for his research on cancer viruses, called the finding 'a proof of principle' and a very good sign that future gene therapy blocking the expression of the CCR5 receptor may be beneficial to patients with HIV.

Many experts, however, have erred on the side of caution. Andrew McMichael, Oxford Professor of Immunology, warned that the HIV

virus is notoriously adept at hiding and could remain in the body at an undetectable level for years. Therefore, it will only be testing and long-



term follow up that the success of the treatment can be proven and its possible success in other patients determined.

Even if the long term studies prove that Dr Huetter has been successful there is still much debate about whether the treatment is ethical.

Bone marrow transplants carry a mortality rate of up to 30% and so are reserved for advanced cases of leukaemia as a last resort therapy. In many patients with HIV HAART can offer up to

twenty years of life, so it will be difficult to justify such risks.

Bone marrow transplant is very expensive, up to £165,000, so it could never be a viable option in developing countries where the HIV rates are the highest.

This case is valuable as it provides a new avenue for exploration into a possible gene therapy cure. Whether or not a breakthrough in the fight against HIV has been made remains to be seen, not over the coming months or years, but decades.

Spokesman for the Charite Clinic admitted that 'to promise to millions of people infected with HIV that there is hope of a cure would not be right' but, if Dr Huetter has found the Achilles heel of the virus that has ravaged the world for 30 years and infected 33 million people worldwide, it would surely be the breakthrough of the century.