BBC NEWS

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Synthetic blood from embryos bid

UK scientists plan a major research project to see if synthetic human blood can be made from embryonic stem cells.

Led by the Scottish National Blood Transfusion Service, the three year trial could provide an unlimited supply of blood for emergency transfusions.

The blood should be free of infections like the human form of mad cow disease.

Teams will test human embryos left over from IVF treatment to find those destined to develop into the universal "O-negative" blood donor group.

“We could provide an unlimited supply of blood in this way”, said Project lead Professor Marc Turner.

O-negative blood can be transfused into anyone without fear of tissue rejection and is the only safe option when a patient's blood group is unknown or not immediately available.

This precious blood is in limited supply because only 7% of the population belongs to this blood group.

The Wellcome Trust is understood to have promised £3m towards the cost of the multimillion-pound project, with further funding coming from the blood transfusion services of Scotland, and England and Wales.

The Irish government is also believed to be involved.

The project will be led by Professor Marc Turner of Edinburgh University who is the director of the Scottish National Blood Transfusion Service.

He said the work would begin in the next few weeks after final approval had been gained from the relevant research bodies.

Making blood from embryos

1. Embryo created from IVF is tested for O-negative blood group, then allowed to develop for several days until stem cells can be extracted
2. Stem cells are cultured in laboratory with nutrients to stimulate red blood cell creation
3. Nuclei are removed in final stage to produce oxygen-carrying mature blood cells. Trillions of these will be needed to build up a blood bank

Stem cells are the body's master cells, with the ability to transform into any type of tissue.

Scientists have already shown it is possible to take a single stem cell from an early human embryo and encourage it to develop into mature blood cells in the laboratory.

And a US firm called Advanced Cell Technology has managed to produce billions of red blood cells from embryonic blood cells in this way.

The challenge now is to scale up the production and move the science from the lab to the bedside, which will take years.

Professor Turner said: "We should have proof of principle in the next few years, but a realistic treatment is probably five to 10 years away.

"In principle, we could provide an unlimited supply of blood in this way."

However, many groups object to the use of embryonic stem cells on the grounds that it is unethical to destroy embryos in the name of science.

Josephine Quintavalle of the public interest group Comment on Reproductive Ethics said: "Like so many of the claims associated with embryonic stem cells, this is first steps research rather than a cure around the corner, and just as hypothetical as the rest of the claims which try to justify destroying the human embryo for the benefit of mankind.

"Associating this controversial research with a National Blood Transfusion service may even end up contaminating the feel-good image of blood banks.

"Those who donate blood but who defend the right to life of the human embryo may be reluctant to continue giving their blood."