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SCIENCE NEWS

RESEARCH PROMISES SAFER ORGAN TRANSPLANTS

Dramatic improvements in the methods used to prevent the rejection of foreign tissues in organ transplant patients could soon be possible as a result of research now being carried out at Cambridge in eastern England.

Currently, transplant patients' entire immune systems are suppressed with drugs which leaves them vulnerable to infections. Cambridge scientists have come up with what could be a less dangerous way, using monoclonal antibodies, to prevent this rejection.

"It has been possible to produce these antibodies which will identify all the different cell populations in the immune system", explained Dr Bruce Roser, researcher in the Immunology Department of the Institute of Animal Physiology and Genetics Research. "These antibodies bind to particular cells in the immune system, so that we can identify them and separate the immune system into its component parts to see what role the cells play in the rejection of organ grafts.

"Using this sort of technology with rats, we have been able to localize the cells that cause graft rejection to a particular sub-population in the T lymphocyte family. These cells are called CD 4 positive cells and we can use these antibodies to separate them and test their function".

Dr Roser's team has also injected these antibodies into animals as a drug and they have discovered that the antibodies bind to the particular cells they identify and work like normal antibodies in the immune system, causing the removal or destruction of these cells. "So it is possible to use these antibodies in a very precise way to eliminate one particular family of cells from the immune system. And what we have found is that if we remove the CD 4 positive family of T lymphocytes, we can completely prevent the rejection of organ grafts", Dr Roser continued. "What is more, after a course of treatment with these antibodies, we can allow the treatment to stop. This means that the immune system recovers and the family of CD 4 positive T lymphocytes regenerates and repopulates the animal. And the transplanted organ is still not rejected — in fact these organs go on to survive indefinitely".

Dr Roser believes that these techniques will be possible for human organ transplants. He continued: "What we have to do now is to find a particular antibody which not only identifies the cell population but also works very effectively when it is injected as a drug. There is a very active programme going on at the moment in this field".

This work has some other possible applications which are being investigated. Certain types of cancer of the immune system involve a particular family of lymphocytes, the CD 4 positive cells, and drugs that are very effective in removing these cells could prove to be an excellent treatment for this type of leukaemia.

Another interesting theoretical possibility, according to Dr Roser, concerns the AIDS problem. It is known that the AIDS virus itself lives in a particular family of lymphocytes, again the CD 4 positive T cells. So effective antibodies could possibly be used to treat AIDS patients — the idea being that they would destroy this family of lymphocytes, and the AIDS virus there would have no cells in which to grow and reproduce, so that eventually the virus would disappear. (Further details may be had from: Dr Bruce Roser, Immunology Department, Institute of Animal Physiology and Genetics Research, Babraham, Cambridge, England CB2 4AT.)