Porcine xenografts for human organ transplantation

Technology #proxy73

Xenotransplantation, or transplantation of animal-derived organs or tissues, is a potential solution to the worldwide shortage of donor organs. In particular, the pig is regarded as a favorable species for clinical transplantation into humans because of greater availability, similarity in organ size, and reduced risk of infections. However, hyperacute rejection of xenografts, in which the foreign donor tissue is destroyed by the recipient's immune response, remains a critical barrier to xenotransplantation. This technology describes transgenic pigs that lack the expression of α(1-3)-galactosyltransferase (GalT), an enzyme that produces one of the primary antigens that trigger hyperacute rejection. By inhibiting the production of this epitope, this technology potentially enables the transplantation of porcine tissue into humans without the risk of hyperacute rejection.

Porcine tissue lacking GalT decrease immunologic response in xenotransplantation

It has been shown that the Galα1-3Galβ1-4GlcNAc (αGal) epitope is found on the cell surfaces of almost all mammals except for certain species of monkeys, apes, and humans. This sequence is a major target for xenoreactive antibodies that trigger rejection following pig-to-human xenotransplantation and is synthesized by GalT. This technology encompasses porcine cells and tissues that have been genetically modified to inhibit the expression of GalT, and, thereby of αGal. Protein analysis of cells derived from these transgenic animals has shown complete knockout of the GalT enzyme. This technology allows for xenotransplantation of porcine tissue into humans with decreased risk of immunologic response and hyperacute rejection, and creates a new viable source of donor tissue for patients.

Lead Inventor:

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**Applications:**

- Xenografts for patients needing organ and tissue transplants
- Cells and tissue for xenotransplantation research
- Transplant models for surgical training

**Advantages:**

- Decreased immunologic response and risk of rejection following xenotransplantation
- Decreased need for immunosuppressive therapy post-transplantation

**Patent Information:**

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