Mixed chimerism as a method to induce tolerance for transplantations

Technology #proxy82

Organ and tissue transplantations save lives and restore vital tissue functions to patients with otherwise untreatable conditions. However, there are multiple problems associated with transplants, including recipient immune response, which can potentially lead to transplant rejection. One such method for reducing the risk of rejection is to induce a state of “mixed chimerism,” in which donor stem cells are used to help prime the recipient’s body to recognize donor cells prior to transplantation. In order to achieve this, the body needs to be largely cleared of its own stem cells through a process called whole body irradiation, to create space for the donor’s stem cells. However, this process can put patients at risk for infectious diseases and other medical conditions. This technology describes a means of utilizing mixed chimerism to promote transplant tolerance without the use of whole body irradiation. This allows for an increased chance of transplant success, while minimizing the risk of infection and other negative side effects.

Mixed chimerism without the use of whole body irradiation improves the chances of transplant tolerance with decreased side effects

Mixed chimerism is a state in which the transplant recipient’s blood system is comprised of both the recipient and the donor’s stem cells. Once achieved, mixed chimerism has been shown to result in transplant tolerance for other tissue or organ transplants from the same donor in the future. For this reason, this method can be used in preparation for organ or tissue transplantation, in order to minimize the immune reaction following transplantation. However, in order to achieve this, the recipient must typically undergo whole body irradiation, a process that destroys or suppresses the immune system in order to prevent stem cell rejection during transplantation. This technology avoids the use of whole body irradiation and instead achieves mixed chimerism through a number of potential other methods, including thymic irradiation or T-cell depletion. These combined methods allow for induced tolerance in transplant recipients without the risks associated with whole body immune suppression.

This technology has been tested in vivo in animal models including swine and primate.
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Applications:

- Mixed chimerism without the use of whole body irradiation
- Hematopoietic stem cell/bone marrow transplantation
- Induced tolerance of allograft transplantations
- Induced tolerance of xenograft transplantations

Advantages:

- Does not require the use of whole body irradiation to achieve mixed chimerism
- Increased allograft tolerance
- Increased immunity post-transplantation
- Increased transplantation opportunities due to potential xenograft tolerance

Patent Information:

- Patent Issued (US 6,006,752)
- Patent Issued (US 6,412,492)
- Patent Issued (US 6,718,986)
- Patent Issued (US 6,877,514)

Tech Ventures Reference: IR Proxy82

Related Publications:


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