

Small molecule to prevent transplant rejection

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Technology description

The purpose of our invention is to use a novel immunomodulatory drug to selectively attenuate the immune system in cases of human allo-transplantation. We believe that this could be used in cases of cell transplantation (such as the beta islets of the pancreas), tissue transplantation (such as skin), or solid organ transplantation (such as heart transplantation). In addition, we believe it could be used to limit the negative effects of graft versus host disease in cases of bone marrow transplant.

Disease indication- Transplant rejection, including cell transplants (such as beta islets of the pancreas), tissue transplants (such as skin) and solid organ transplants (such as heart). Also, potential for limiting negative effects of graft vs. host disease (GVHD) in bone marrow transplants.

Drug format- Small molecule
Drug class- Repurposing known immunomodulatory drug

Research stage and Preliminary data-

Drug has been used in humans as a nutraceutical, with an excellent safety profile. Inventors have tested the efficacy of the compound in mice with heart transplants. They demonstrated that the animals who were fed the drug for a month before their transplants had hearts that were preserved for 2-3 times longer than controls.

Target- An extracellular matrix component associated with inflamed tissue.

Background- Currently, patients undergoing transplants are treated with powerful

immunosuppressive drugs to prevent or reduce rejection of the transplanted cells/tissues/organs.

However, general immune suppression can result in toxicity or death from opportunistic infection. This

alternative approach utilizes an immunomodulatory compound that induces regulatory T-cells and

limits antigen presentation without compromising the rest of the immune system. Therefore, this drug

could be used as a safe maintenance drug for patients on long term immunosuppression.

Keywords- transplant rejection, regulatory T cells

Mode of action- This is an immunomodulatory drug that disrupts a specific component of the extracellular matrix in inflamed tissue. The compound limits the ability of

foreign proteins from the body to be recognized and presented to the effector immune cells of the

body. This activity suggests that the compound would inhibit an adverse immune response in a

transplant recipient.

Potential competitor- This compound has the potential to be used in conjunction with existing immunosuppressive therapy competitors (e.g., cyclosporine, prednisone, tacrolimus,

CellCept) to reduce the dosages of those drugs that possess extensive side effects.

Advantages

Less toxicity/side effects- expect that this drug would be less toxic than current immunosuppressive drugs because it acts at the stage of antigen presentation without affecting the rest of the immune

system Demonstrated safety- drug has already been used in humans as a nutraceutical, with an excellent safety profile and minimal, benign side effects

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