Mechanism for tolerance induction in lung allograft transplantation

**Background:** Lung transplantation is an accepted therapeutic option for individuals with end-stage lung disease; however, formidable immunologic barriers limit long-term allograft survival. There are approximately 2,500 lung transplants worldwide each year with a far greater number of patients, 176,100 patients in the U.S. alone, waiting to receive a transplant. Successful immunosuppressive strategies have been developed for several models of organ transplantation. This achievement, however, has yet to translate into long-term success for clinical lung allografts. The five-year 50% survival rate of allograft recipients has remained unchanged for 15 years warranting a new approach.

**Technology Description:** Scientists from Washington University in St. Louis recognized that increasing nitric oxide levels in the lung enhances local immunoregulation for improved and possible long-term acceptance of lung allografts. The technology utilizes a local increase in nitric oxide concentration or CD8+ T cell supplementation to promote the release of cytokines and nitric oxide production in order to attenuate inflammation. Studies utilizing a murine model revealed that CD8+ T cells were essential for production of pro-inflammatory cytokines leading to synthesis of nitric oxide and downregulation of the immune response. This method resulted in the long-term survival of lung allografts and provides an alternative to current immunosuppressive strategies.

**Key Advantages:**
- Increased lung allograft acceptance
- Decreased lung rejection
- Improve organ survival
- Extends survival rate of lung-allograft recipients
- Line-extensions for other organ transplantations

**Patents:** US patent application: US20150023919


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<td>Lung Transplant, Organ Transplant, Tissue Transplant, Surgery</td>
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