

**ROLE OF IMMUNOSUPPRESSANTS IN ORGAN TRANSPLANTATION**

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**ABSTRACT**

Immunosuppressants are the class of drugs that suppress the immune response through various mechanisms according to their categories. In organ transplantation immunosuppressants are used to prevent the body from either recognition or attacking the foreign organ via various immune responses. Other immunosuppressants are calcineurin inhibitors, corticosteroids, sirolimus derivatives, used to prevent rejection of a transplanted organ and to treat autoimmune diseases.

**KEYWORDS:** Immunosuppressants, organ transplantation, auto immune diseases.

**INTRODUCTION**

Any agents that can suppress or prevent the immune response are called Immunosuppressant's.

They are used to prevent rejection of a transplanted organ and to treat auto immune diseases such as psoriasis, rheumatoid arthritis and chrons disease transplantation. The process of taking an organ or living tissue and implanting it in another part of the body or in another body.<sup>[1]</sup>

**Roles of Immunosuppressants**

The class of drugs that suppress the immune response through various mechanisms in organ transplantation.

Immunosuppressant are used to prevent the body either recognition or attacking the foreign organ via various immune responses.<sup>[2,3]</sup>

**Organs Used In the Transplantations**

- Cornea
- Kidney
- Skin
- Bone marrow
- Heart and heart valves
- Intestine
- Lungs
- Liver
- Pancreas.<sup>[4]</sup>

**Types of Transplantation**

- **Auto graft:** A tissue removed from one part of the body and transplanted to another site in the same individual.  
**Ex:** skin grafting, several types of tissue can be grafted including bone, nerves, tendons, blood vessels.
- **Allograft:** An allograft uses tissue transplanted from a donor in one species to another body in the same species, as in bone from one human to another human.  
**Ex:** skin, bone, blood vessel.
- **Isograft:** An isograft is a graft tissue between two individuals who are genetically identical (i.e., monozygotic twins).  
**Ex:** kidney transplant.
- **Xenograft:** Organ of the tissue from a individual of one species transplanted into or grafted onto an organism of another species, genus, or family.  
**Ex:** pig heart valves in humans.<sup>[5]</sup>

**EXPERIMENT****List of Immunosuppressants**

The drug or drugs will be prescribed depends on whether you have an organ transplant, an autoimmune disorder or another condition. Many people who receive immunosuppressant drugs are prescribed medications from more than one of these categories. immunosuppressants are drugs or medicines that lower the body ability to reject a transplanted organ.<sup>[6,7]</sup>

There are two types of Immunosuppressant's.

**Induction drugs:** Powerful anti-rejection medicine used at the time of transplant.

**Ex:** Mycophenolatemofetil and Azathioprine along with immunosuppressant drugs such as Basiliximab, Daclizumab, Muromonab.

**Maintenance drugs:** Anti rejection medications used for the long term.

- **Calcineurin inhibitors:** Tacrolimus & cyclosporine.
- **Ant proliferative agents:** Mycophenolatem of etil, mycophenolate sodium, azathioprine.
- **MTOR inhibitors:** E.g. sirolimus, everolimus.
- **Steroids:** E.g.: prednisolone.
- **Biologics:** E.g: adalimumab, etanercept, rituximab.
- **Monoclonal antibodies:** Eg: basiliximab, daclizumab.

### Drug Treatment

Transplant rejection involves the body producing T&B cell and immune responses that recognize markers on foreign tissue called antigens. Treatment regimens used to prevent rejection employ drugs from different classes taking advantage of their complementary actions & minimizing toxicity.<sup>[8,9]</sup>

**Double Drug Treatment:** Usually a calcineurin inhibitor such as tacrolimus or cyclosporine with azathioprine or mycophenolate.<sup>[10,11]</sup>

**Triple Drug Treatment:** Usually a calcineurin inhibitors such as tacrolimus or cyclosporine, a corticosteroid & either azathioprine or mycophenolate.<sup>[12,13]</sup>

**Quadruple Drug Treatment:** Triple drug treatment + immunosuppressant antibody  
Immunosuppression for organ transplants usually involves triple or quadruple drug treatment.<sup>[14]</sup>

### Immunosuppressants Uses

- Preventing organ rejection & reverse acute rejection in organ transplantation
- Prevent & treat graft - versus - host disease
- Minimize destruction of affected tissues in autoimmune & inflammatory diseases.<sup>[15,16]</sup>

### RESULTS

All immunosuppressant drugs carry the serious risk of infection. When an immunosuppressant drug weakens immune system, so body becomes less resistant to infection.<sup>[17,18,19]</sup>

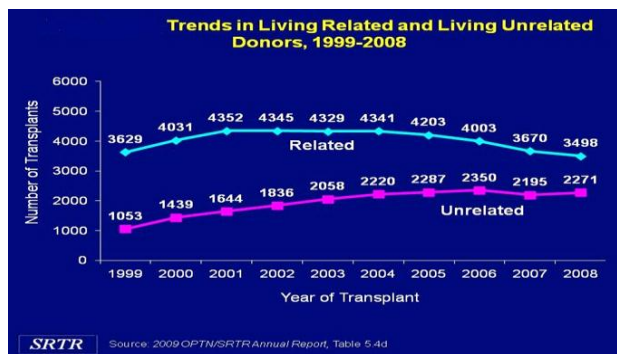
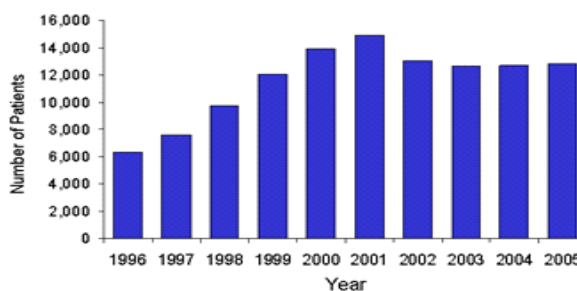
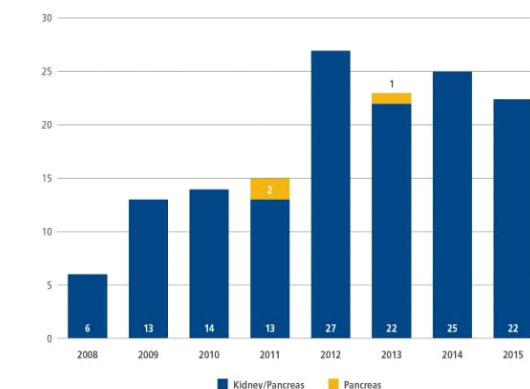


Figure V-1. Number of Patients on the Liver Waiting List, Active at Year-End, 1996-2005



COMBINED KIDNEY/PANCREAS & PANCREAS TRANSPLANTS 2008-2015  
OCHSNER MEDICAL CENTER



### Side Effects

Fever or chills, Alopecia, Pain in the side of lower back, frequent urination & pain while urinating, unusual tiredness or weakness, increased appetite, dyspepsia.

### Rare Serious Side Effects

- Muscle weakness, Amenorrhoea, Psychosis, Euphoria, Depression, Hirsutism, Gingival hyperplasia.

### CONCLUSION

More than 50,000 people waiting for compatible donor.

- Xenogeneic transplantation may be major issue of research xenograft technology including genetically modified animal may become a new source of organ supply.
- Immunosuppressants are used to prevent rejection of a transplanted organ and to treat autoimmune diseases.<sup>[20]</sup>

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