

## Role of Selective serotonin reuptake inhibitors (SSRIS) as immune-modulator and immune-suppressant

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### Abstract

Interactions between the immune system and the CNS play a critical role in the maintenance of bodily homeostasis and the development of diseases, including psychiatric disease. Alterations in CNS function brought about by a variety of stressors have been shown to influence both the immune system and diseases that involve the immune system. Numerous chemical messengers derived from or regulated by the nervous system are capable of altering immune cell function and distribution. SSRIs act through various neurotransmitters; not only serotonin reuptake inhibition but also lesser degree of actions at other neurotransmitters and enzymes. SSRIs are amongst the most prescribed antidepressants worldwide. SSRIs such as Fluoxetine, have recently been shown to exert anti-inflammatory and immune-suppressive effects such as suppression of T cell activation, cytokine secretion and proliferation and induction of apoptosis in vitro and in vivo. Two Different possibilities have already described: First, SSRIs suppress unwanted immune response in autoimmune diseases & Second, SSRIs as immunosuppressant to inhibit allogeneic T cell responses after transplantation.

Their potential mechanism of actions may be as described below:

- Involvement of 5HT and its transporter
- Effects on signal transduction pathways
- Induction of apoptotic cascade
- Unexplained mechanisms like influence on mitochondrial pathways, affecting cell dynamics, enhancing activity of second messenger system, etc.

This particular group of drugs have been tested in animal models of autoimmune diseases such as multiple sclerosis, rheumatoid arthritis, contact hypersensitivity reaction, inflammatory bowel disease, septic shock and allergic asthma. SSRIs definitely show some immunological effects and that potentially could be used to alter immune responses in autoimmune pathologies and graft-versus-host disease. Although data are limited and more researches are needed to evaluate that whether this is direct effect of the antidepressants on immune parameters, or an indirect effect through resolving psychiatric symptomatology which is known to exacerbate the symptoms of autoimmune diseases.

### Biography



Ankita Patel (MD Psychiatry), I have done my observer ship in child and adolescent psychiatry from NIMHANS. My special interests are in neurobiological bases for psychiatric illnesses especially in OCD, Autism spectrum disorders and ADHD. I have been working on few researches in past years and two among them published in international journals and one in national journal.

### Publications

- V. Gobin et al. Selective serotonin reuptake inhibitors as a novel class of immunosuppressants. *Int. Immunopharmacol.* 2014; 20:148-156
- D.G.Janssen et al. A psychoneuroimmunological review on cytokines involved in antidepressant treatment response. *Hum. Psychopharmacol.* 2010;25(3): 201-215.
- V. Gobin et al. Fluoxetine reduces murine graft-versus-host disease by induction of T cell immunosuppression. *J Neuroimmune Pharmacol* 2013;8: 934-943.
- ME Di Rosso et al. Immunomodulatory effects of fluoxetine: A new potential pharmacological action for a classic antidepressant drug? *Pharmacol Res.* 2016; 109: 101-107.
- SA Abdelrahman et al. Fluoxetine pretreatment enhances neurogenic, angiogenic and immunomodulatory effects of MSCs on experimentally induced diabetic neuropathy. *Cell Tissue Res.* 2018; 374 (1): 83-97

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