

# How music prevents heart transplant rejection

March 22 2012

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Music has a fundamental affect on humans. It can reduce stress, enhance relaxation, provide a distraction from pain, and improve the results of clinical therapy. New research published in BioMed Central's open access journal *Journal of Cardiothoracic Surgery* demonstrates that music can reduce rejection of heart transplants in mice by influencing the immune system.

The link between the immune system and [brain function](#) is not clearly understood, nevertheless music is used clinically to reduce anxiety after heart attack, or to reduce pain and nausea during [bone marrow transplantation](#). There is some evidence that music may act via the parasympathetic nervous system, which regulates the bodily functions that we have no conscious control over, including digestion.

Researchers from Japan investigated if music could influence the survival of [heart transplants](#) in mice. They found that opera and classical music both increased the time before the transplanted organs failed, but single frequency monotonous and new age music did not.

The team led by Dr Masanori Niimi pinpointed the source of this protection to the spleen. Dr Uchiyama and Jin revealed, "Opera exposed mice had lower levels of interleukin-2 (IL-2) and [interferon gamma](#) (IFN- $\gamma$ ). They also had increased levels of anti-inflammatory IL-4 and IL-10. Significantly these mice had increased numbers of CD4+CD25+ cells, which regulate the peripheral immune response."

It seems that music really does influence the immune system – although the mechanism behind this still is not clear. Additionally, this study only looked at a limited selection of composers, so the effect of music on reducing organ rejection may not be limited to opera.

**More information:** Auditory stimulation of opera music induced prolongation of murine cardiac allograft survival and maintained generation of regulatory CD4+CD25+ cells, Masateru Uchiyama, Xiangyuan Jin, Qi Zhang, Toshihito Hirai, Atsushi Amano, Hisashi Bashuda and Masanori Niimi, *Journal of Cardiothoracic Surgery* (in press)

Provided by BioMed Central

Citation: How music prevents heart transplant rejection (2012, March 22) retrieved 10 May 2024 from <https://medicalxpress.com/news/2012-03-music-heart-transplant.html>

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