

Listening to classical music modulates genes that are responsible for brain functions

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Although listening to music is common in all societies, the biological determinants of listening to music are largely unknown. According to a latest study, listening to classical music enhanced the activity of genes involved in dopamine secretion and transport, synaptic

neurotransmission, learning and memory, and down-regulated the genes mediating neurodegeneration. Several of the up-regulated genes were known to be responsible for song learning and singing in songbirds, suggesting a common evolutionary background of sound perception across species.

Listening to music represents a complex cognitive function of the human brain, which is known to induce several neuronal and physiological changes. However, the molecular background underlying the effects of listening to music is largely unknown. A Finnish study group has investigated how listening to [classical music](#) affected the [gene expression profiles](#) of both musically experienced and inexperienced participants. All the participants listened to W.A. Mozart's violin concert Nr 3, G-major, K.216 that lasts 20 minutes.

Listening to music enhanced the activity of [genes](#) involved in dopamine secretion and transport, synaptic function, learning and memory. One of the most up-regulated genes, synuclein-alpha (SNCA) is a known risk gene for Parkinson's disease that is located in the strongest linkage region of musical aptitude. SNCA is also known to contribute to song learning in songbirds.

"The up-regulation of several genes that are known to be responsible for [song learning](#) and singing in songbirds suggest a shared evolutionary background of sound perception between vocalizing birds and humans", says Dr. Irma Järvelä, the leader of the study.

In contrast, listening to music down-regulated genes that are associated with neurodegeneration, referring to a neuroprotective role of music.

"The effect was only detectable in musically experienced participants, suggesting the importance of familiarity and experience in mediating music-induced effects", researchers remark.

The findings give new information about the molecular genetic background of music perception and evolution, and may give further insights about the molecular mechanisms underlying [music](#) therapy.

More information: "The effect of listening to music on human transcriptome." *PeerJ* 12 March, 2015. peerj.com/articles/830/

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