

Playing music by professional musicians activates genes for learning and memory

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Credit: Wikipedia.

Although music perception and practice are well preserved in human evolution, the biological determinants of music practice are largely unknown. According to a latest study, music performance by professional musicians enhanced the activity of genes involved in dopaminergic neurotransmission, motor behavior, learning and memory. Interestingly, several of those up-regulated genes were also known to be responsible for song production in songbirds, which suggests a potential evolutionary conservation in sound perception and production across species.

Music performance is known to induce structural and functional changes to the human brain and enhance cognition. However, the molecular

mechanisms underlying [music performance](#) have been so far unexplored. A Finnish research group has now investigated the effect of music performance (in a 2 hr concert) on the [gene expression profiles](#) of professional musicians from Tapiola Sinfonietta (a professional orchestra) and Sibelius-Academy (a music university).

Playing music enhanced the activity of genes involved in dopaminergic neurotransmission, motor function, learning and memory. Some of the up-regulated genes like SNCA, FOS and DUSP1 are known to contribute to song perception and production in songbirds suggesting a potential evolutionary conservation in [molecular mechanisms](#) related to sound production across species.

In addition, several of the up-regulated genes are known to be involved in biological pathways like calcium ion homeostasis and iron ion homeostasis that are essential for neuronal function, survival and neuroprotection.

"The findings provide a valuable background for molecular studies of [music perception](#) and evolution, and music therapy", says the leader of the study, Dr. Irma Järvelä from the University of Helsinki.

More information: "The effect of music performance on the transcriptome of professional musicians" *Scientific Reports*, 2015.

Provided by University of Helsinki

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