



How nasal stem cells might prevent childhood deafness

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Australian scientists have shown for the first time in mice that nasal stem cells injected into the inner ear have the potential to reverse or restore hearing during early onset sensorineural hearing loss.

Sensorineural hearing loss occurs when hearing cells in the cochlea lose their function. Frequently inherited, and usually starting during infancy and early childhood, the condition can slow a child's development and lead to speech and language problems.

Drs Jeremy Sullivan, Sonali Pandit and Sharon Oleskevich from Sydney's Garvan Institute of Medical Research, found that stem cells appear to release 'factors', or chemical substances, that help preserve the function of cochlear hearing cells, without the stem cells becoming part of the tissue of the inner ear. Their findings are published in [STEM CELLS](#), now online.

"We are exploring the potential of stem cells to prevent or restore hearing loss in people," said project leader Dr Sharon Oleskevich.

"The mice we are using have a very similar form of childhood deafness to their human counterparts – except, of course, that mouse years are shorter. So a mouse will tend to lose their hearing within 3 months, where a person might take 8 years."

"We are encouraged by our initial findings, because all the mice injected with stem cells showed improved hearing in comparison with those given a sham injection. Roughly half of the mice did very well indeed, although it is important to note that hearing was not completely restored to normal hearing levels."

Adult human nasal stem cells were used in the procedure, because they are plentiful, easy to obtain and unspecialised (so have the ability to self-renew for long periods, as well as differentiate into cells with a variety of functions).

The same group of scientists has shown in previous publications that stem cells can also be used to improve hearing in noise-induced hearing loss – a condition that affects both young and older people.

It has taken 5 years to reach the current stage of research, and scientists anticipate that it will take a further decade at least for the findings to benefit people.

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ABOUT GARVAN

The Garvan Institute of Medical Research was founded in 1963. Initially a research department of St Vincent's Hospital in Sydney, it is now one of Australia's largest medical research institutions with over 500 scientists, students and support staff. Garvan's main research programs are: Cancer, Diabetes & Obesity, Immunology and Inflammation and Neuroscience. Garvan's mission is to make significant contributions to medical science that will change the directions of science and medicine and have major impacts on human health. The outcome of Garvan's discoveries is the development of better methods of diagnosis, treatment, and ultimately, prevention of disease.

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