Deafness Fact Sheet

CIRM funds many projects seeking to better understand deafness and to translate those discoveries into new therapies.

Description

According to the National Institute on Deafness and Other Communication Disorders (NIDCD) approximately 36 million American adults have some form of hearing loss.

One of the most common causes of deafness occurs when the cells that detect sound in the inner ear, or cochlea, lose their function. These cells contain highly sensitive hair-like structures that turn sound into electrical signals. The signals are then transmitted to the brain where they are interpreted as sound. If the hairs are damaged by injury, exposure to loud noises, toxins or genetic conditions they are no longer able to transmit sounds to the brain.

Researchers in California and elsewhere have developed ways of coaxing stem cells to form these hair-like structures in the lab. Their discovery raises the hope that hair cells derived from stem cells could ultimately replace the damaged cells and restore hearing.

Other researchers are investigating whether stem cells can protect remaining hair cells or be used to replace the nerve that transmits sound signals from the ear to the brain.

CIRM Grants Targeting Deafness

<table>
<thead>
<tr>
<th>Researcher name</th>
<th>Institution</th>
<th>Grant Title</th>
<th>Grant Type</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alan Cheng</td>
<td>Stanford University</td>
<td>Modulation of the Wnt pathway to restore inner ear function</td>
<td>Quest - Discovery Stage Research Projects</td>
<td>$1,394,870</td>
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<tr>
<td>Ebenezer Yamoah</td>
<td>University of California, Davis</td>
<td>Hair Cells and Spiral Ganglion Neuron Differentiation from Human Embryonic Stem Cells</td>
<td>SEED Grant</td>
<td>$458,071</td>
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<tr>
<td>Stefan Heller</td>
<td>Stanford University</td>
<td>Generation of inner ear sensory cells from human ES cells toward a cure for deafness</td>
<td>Comprehensive Grant</td>
<td>$2,330,371</td>
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<tr>
<td>Alan Cheng</td>
<td>Stanford University</td>
<td>Enhancing hair cell regeneration in mouse and human inner ear</td>
<td>New Faculty Physician Scientist</td>
<td>$3,088,525</td>
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<tr>
<td>Neil Segil</td>
<td>University of Southern California</td>
<td>A screen for drugs to protect against chemotherapy-induced hearing loss, using sensory hair cells derived by direct lineage reprogramming from hiPSCs</td>
<td>Quest - Discovery Stage Research Projects</td>
<td>$741,574</td>
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</tbody>
</table>

Total: $8,013,411.00

CIRM Deafness Videos
News and Information

- CIRMResearch Blog entries on deafness research
- Stem Cells Explored As Hearing Loss Treatment (Stanford University)
- UC Davis researchers coax brain cells to mimic inner ear sensory cells (UC Davis)

Resources

- NIH Hearing Loss Information
- Find a clinical trial near you: NIH Clinical Trials database
- Deafness Research Foundation
- National Association of the Deaf
- Hearing Loss Association of America

Find Out More:
Stem Cell FAQ | Stem Cell Videos | What We Fund

Source URL: https://www.cirm.ca.gov/our-progress/disease-information/deafness-fact-sheet