State-of-the-Art Mini-Symposium

From Bench to Bedside: Latest Advances in Inner Ear Regeneration and Otoprotection

Moderators:
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BOSTON RENAISSANCE WATERFRONT HOTEL

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Jonathan Kil
Sound Pharmaceuticals

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House Clinic

Manny Simons
Akouos

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Frequency Therapeutics
Minimally invasive, transcanal access to the inner ear for regeneration or otoprotection

Future in-office procedure?
The mammalian inner ear cannot spontaneously regenerate after damage.

New hair cells from supporting cells after damage.
The mammalian inner ear harbors dormant stem cells

Stem cells spontaneously renew indefinitely and differentiate into different cell types

Rapidly dividing:
- Hematopoietic system
- Intestinal epithelium
- Skin

Dormant:
- CNS and Inner ear

Adult stem cells

Stem cells need activation to proliferate and differentiate into different cell types
Single cells → Spheres → Differentiation → Hair cells, Neurons

- Myo7a
- Atoh1
- TuJ
Exogenous stem cell transplantation

- Harvest of stem cells
- Production of progenitors
- Cell transplantation

Transdifferentiation of endogenous cells

- Drug development
- Injection
- Proliferation/transdifferentiation of target cells

Gene therapy

- Neurotrophins
- Infection
Challenges of endogenous regeneration

Restoring the (tonotopic) infrastructure of the cochlea
Challenges of endogenous regeneration- surgical access

- Intratymppanic = indirect
- Intracoachlear = direct
Endoscopic Transcanal Retrocochlear Approach to the Internal Auditory Canal with Cochlear Preservation: Pilot Cadaveric Study.

Kempfle J#1,2, Kozin EB#1,2,3, Remenschneider AK#1,2,3, Eckhard A1,2, Edge A1,2, Lee DJ1,2,3.
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