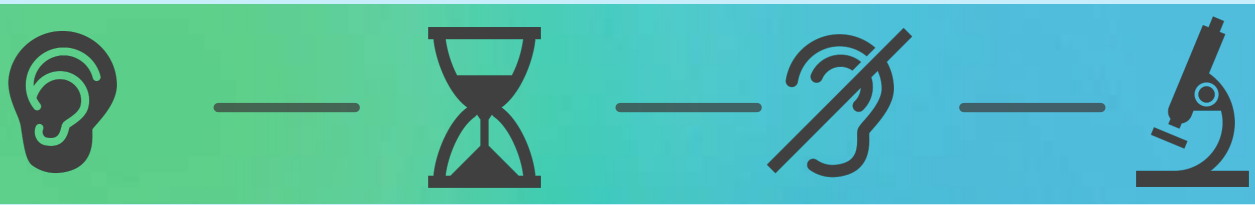
The University Of Sheffield. Neuroscience Institute.

Hearing Research Group

AGE-RELATED HEARING LOSS

Facts about Age-Related Hearing Loss and how research is helping tackling this common sensory disorder



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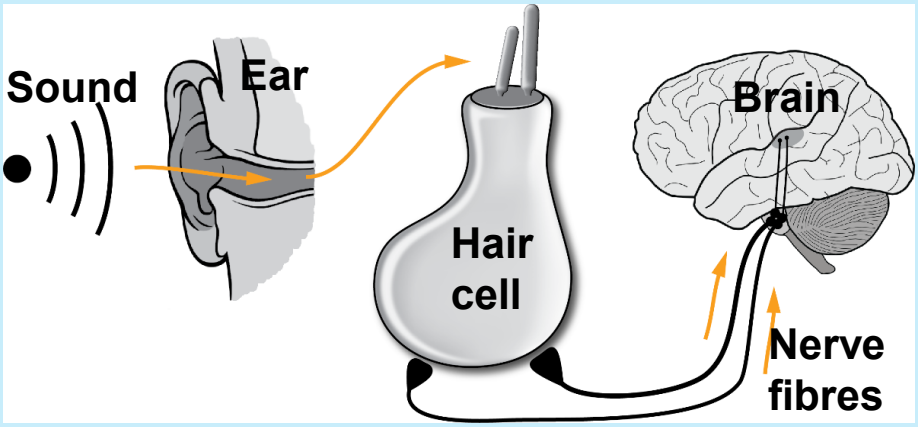
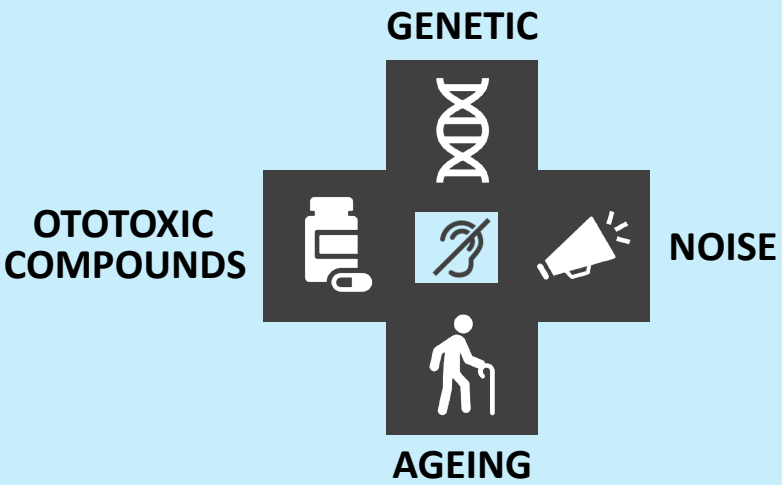
How do we hear?

Inside the ear are specialised cells called **hair cells**. Hair cells detect the information carried by sound waves (such as pitch and intensity) and transmit it in the form of electrical impulses to the brain via **nerve fibres**. This allows us to perceive sound as speech and music.



What is hearing loss?

Hearing loss means being unable to hear (partially or completely) from one or both ears. There are different types and causes of hearing loss, including:



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What is Age-Related Hearing Loss?

Age-Related Hearing Loss (ARHL), also known as presbycusis, is one of the most common health conditions in the elderly, leading to the progressive loss of hearing sensitivity.

Approximately 12 million people in the UK (and 500 million people worldwide) are affected by hearing loss, with ARHL being the single biggest cause.

ARHL is a progressive disorder that decreases our ability to:

- Enjoy music
- Understand speech in noisy environments

<u>When left untreated, ARHL is associated with:</u>

- Social isolation, depression, increased risk for neurodegenerative diseases.

What causes ARHL?

ARHL is a very complex disorder, caused by the cumulative effects of several factors, including genetic mutations, damaging levels of noise exposure and chemicals that damage the cells in the ear (for example, anticancer drugs and some types of antibiotics).

Can we cure hearing loss?

The available therapeutic options to ameliorate hearing loss, hearing aids and cochlear implants, are extremely beneficial for many patients; yet they are unable to restore important features of hearing, such as the ability to understand speech in a noisy environment.

Hearing aids use microphones to pick up sound and adjust it digitally.

Cochlear implants use electrical devices to directly stimulate the nerve fibres that carry sound information from the ear to the brain.

Additionally, hearing aids and cochlear implants cannot restore hearing if the cells and nerve fibres in the ear are missing or do not function, which are both characteristic features in ARHL.

What we can do to tackle hearing loss?

The major obstacle preventing the development of treatments is a lack of understanding about why the cells and the nerve fibres in the ear die or stop functioning correctly.

We, and other research groups in the world, are working to identify the mechanisms leading to the loss or malfunction of the cells and nerve fibres in the ear. This involves, for example, the identification of the key genes and molecules that are affected during ARHL.

By identifying the genes responsible for ARHL, we can develop therapeutic interventions aiming at correcting these malfunctioning genes (see Gene Therapy Brochure).

Protect your ears!

- Avoid exposure to loud sound
- Keep music level low or wear earplugs
- Limit the time you listen to music through headphones

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