

## Student sheet for Hearing is believing

### *Understanding the role of cells in our ability to hear*

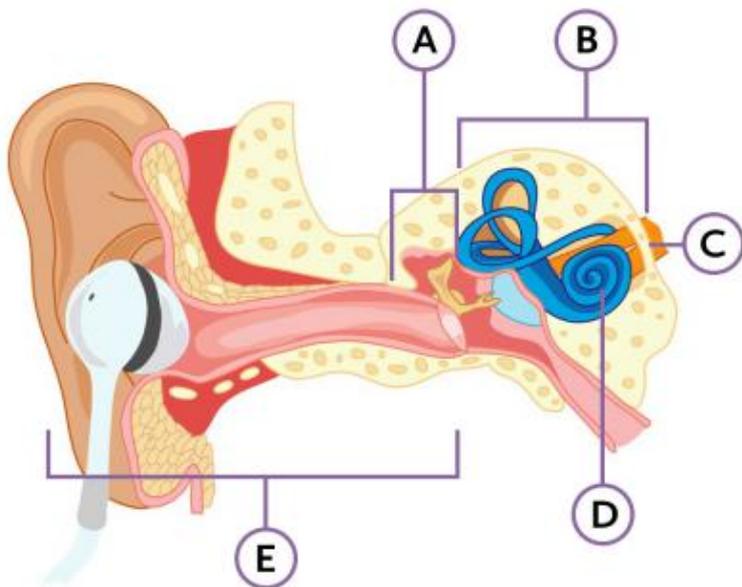
#### Learning objectives

#### You will:

- understand how the ear translates sound waves so the brain can process sound
- consider the potential advantages and ethical implications of stem cell therapy
- discuss how science is reported in the media.

#### Activity 1

Watch [this animation](#) and then answer the following questions.



#### ABOUT THIS RESOURCE

This resource first appeared in 'The Cell' in January 2011, reviewed in September 2015. Published by the Wellcome Trust, a charity registered in England and Wales, no. 210183. [bigpictureeducation.com](http://bigpictureeducation.com)

**1a.** Label the following parts of the ear.

- middle ear
- inner ear
- cochlear nerve
- cochlea
- outer ear

**1b.** What is the name of the structure inside the cochlea that contains hair cells involved in translating sounds into nerve impulses?

**2a.** Particular ions entering the hair cells trigger the release of neurotransmitters and the generation of action potentials in the auditory nerve leading to the brain. What ions are involved in this process?

**2b.** Name two neurotransmitters.

**3.** At the end of the animation, it's mentioned that researchers are investigating the possibility of recreating hair cells as a way of treating people with hearing loss. [Read an article](#) about this on the NHS website. How did the researchers recreate mouse hair cells?

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## Activity 2

Do you agree or disagree with the following statements? Give your reasons.

**Statement 1:** The potential of stem cells outweighs the ethical risks.

**Statement 2:** If I developed hearing loss I would be happy to be treated using stem cell therapy.

**Statement 3:** It is irresponsible for newspapers to sensationalise science stories.

What might the opinions of these other groups be?

- the Deaf community
- religious groups
- researchers
- funders of the research.

## Additional resources

- [More about the central nervous system, action potentials and neurotransmitters](#)
- [BBC Q&A about stem cells](#)
- [Free debate kit on stem cells from 'I'm a Scientist, Get Me Out of Here'](#)
- [New Scientist article about science reporting](#)
- [Tips and resources for debating and discussing controversial issues](#)

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