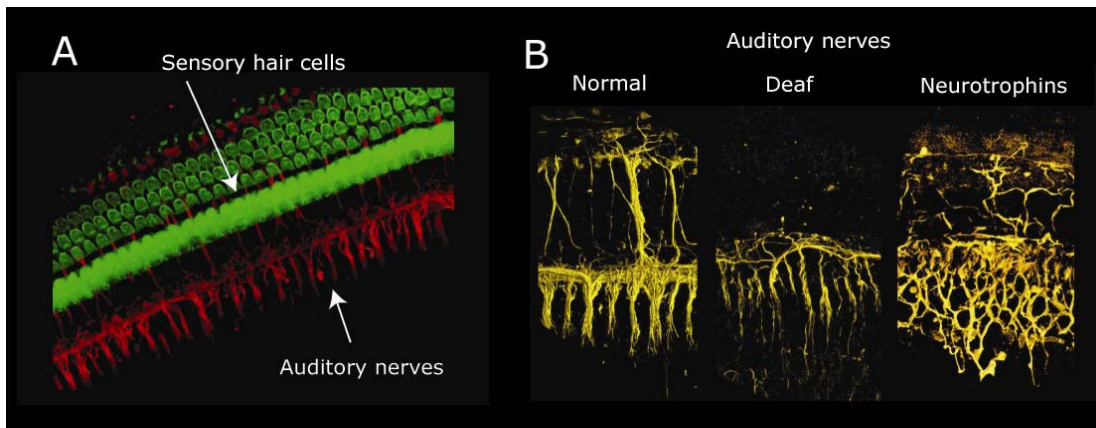


## Repairing the auditory system with cochlear implantation and drug delivery

Supervisor: Dr Andrew Wise

Email: [awise@bionicear.org](mailto:awise@bionicear.org)

A common cause of deafness is the loss of sensory hair cells (**green** cells shown in the normal cochlea, figure 1A) in the cochlea that normally convert sound into nerve impulses. The cochlear implant works by electrically exciting auditory nerves (**red** figure 1A) directly to bypass the sensory hair cells that are either damaged or absent. However, auditory nerves degenerate after deafness (figure 1B) leading to a significant reduction in their population and changes in their responses to electrical stimulation. The administration of growth factors can prevent nerve degeneration and even promote resprouting of the nerve endings (figure 1B). The aim of this research project is to prevent this degenerative process and restore function to the deaf cochlea using a cochlear implant and/or with the delivery of neuroprotective drugs.



### Techniques that you will learn:

- Animal handling skills
- Micro-surgery and cochlear implantation
- Electrophysiological recordings from the auditory pathway
- Immunohistochemical staining
- Confocal and light microscopy
- Data and image analysis
- Statistical analysis

**This project area is suitable for:** AMS, Honours and PhD Students