Cortical Plasticity and Connectivity - Chronic Recordings
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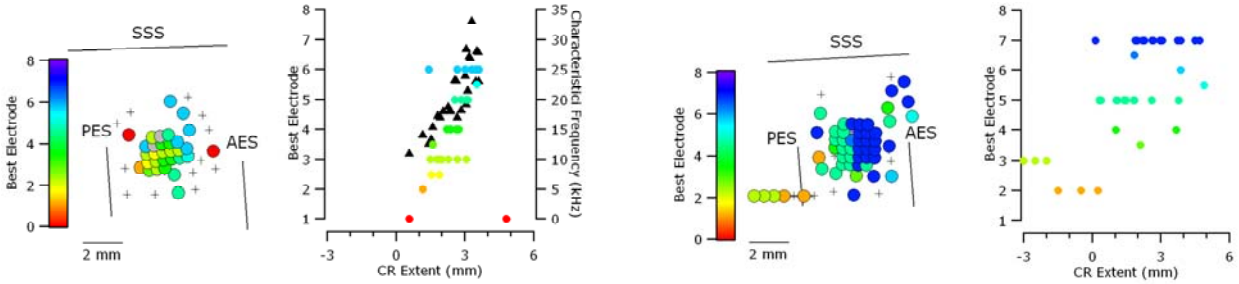
All modern cochlear implants rely on the organisational structure of the auditory pathway to provide cues for speech perception. The structure of the auditory pathway is controlled by both genetic cues and auditory experience, and in deaf individuals the lack of acoustic input results in a more rudimentary pathway. We have previously shown that chronic cochlear implant use, from a very young age, can ameliorate many of the deafness-induced changes in the auditory pathway (Fallon et al., 2009). It is this ability of the auditory pathway to undergo plastic reorganization that is a major factor underlying the clinical success of cochlear implants. However, there are critical periods before which the auditory system must be activated to achieve the best clinical outcomes. This project therefore aims to examine how the auditory pathway changes and reorganises over time with long-term deafness and chronic cochlear implant use. Our previous method of taking a single 'snap shot' of the auditory brain is not suitable to address these issues; we are therefore developing the ability to perform repeated chronic recordings from the auditory brain. Data from these experiments will assist the clinical decision-making processes concerned with the optimum time for cochlear implantation, and the best forms of rehabilitation and training given to cochlear implant patients. Ultimately, the results of this project should lead to improvements in the quality of auditory perception for cochlear implant patients.

Normal Hearing **Chronically Stimulated**



Techniques that you will learn:

- General surgical skills including sterile techniques
- Electrophysiological recordings
- Light microscopy
- Imaging and analysis
- Statistical analysis of results