

Graeme Clark – Scientific Achievements

Graeme Clark led the research that resulted in the first clinically approved multi-channel cochlear implant, providing speech understanding in profoundly deaf people. His basic research has shown temporal coding is essential for the perception of low pitches and voicing, and temporo-spatial patterns for high fidelity sound. His research has shown the importance of place coding for the perception of timbre and vowel recognition. He has helped establish place coding requires early exposure to sound, and that separate neural channels are used for temporal and place coding. The research he led was also crucial in establishing a multi-channel implant could be achieved safely, including with minimal risk of meningitis. He and team have shown that formant speech codes are important for understanding running speech, and that speech recognition is retained in memory after exposure to sound. It thus became the first sensory-neural prosthesis to effectively bring electronic technology into functional relationship with the central nervous system and human consciousness. His research also established that the multi-channel implant provided effective speech perception and language in profoundly deaf children through early development of place coding. It is the first major advance in helping deaf children communicate in the last 200 years.