



CBS RESEARCH SEMINAR



Friday, 15 Nov, 2024

2:00 PM – 3:00 PM (HKT)

Venue: AG710

Zoom ID: 925 2441 8249

Passcode: 557055



Title: Brain plasticity for multisensory integration and speech processing in cochlear implanted deaf patients

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Abstract: Since Molyneux's question was first posed in the 17th century, there has been a long debate regarding the capacity of the animal or human brain to process sensory information after a long period of sensory privation. Only limited insights into Molyneux's problem have been obtained following curable congenital cataracts. However, because profound deafness can now be routinely corrected through a cochlear implant, implanted deaf patients constitute a unique model to study how sensory modalities compete and interact during recovery from a prolonged period of hearing deprivation.

Though cochlear implant (CI) can efficiently restore auditory functions, there is a large range of recuperation levels, and in extreme cases some CI recipients never develop useable speech and oral language skills. Our hypothesis is that the level of auditory recovery is highly dependent on brain plasticity mechanisms and the capacity of the brain to adapt to a long period of deafness and to the impoverished electrical signal delivered by the implant. We will provide evidences of multisensory synergetic neural facilitation mechanisms so that a better functional level of one modality leads to the better performance of the other. Such cooperation may be a reflection of the multisensory nature of speech communication and reinforces the crucial role of the audiovisual integration strategies that are strongly enhanced in CI users to compensate for the poor information delivered by the implant

BIO: P. Barone is Research Director (Exceptional Class) at the Centre National de la Recherche Scientifique (CNRS) in Toulouse France. He is currently the Director of the Toulouse Mind & Brain Institute that regroup 9 departments devoted to integrative neuroscience in healthy humans, patients and animals, combining basic and applied research to elucidate the mechanisms of cognitive functions and their dysfunction during nervous system diseases.

During the last decades, P. Barone has led several projects focusing on hearing deficits and their functional recovery in deaf and hearing loss patients. Transdisciplinary approaches, combining psychophysics and brain imaging in patients, aim to delimit the sensory and cognitive deficits associated with hearing loss. More specially, P. Barone is conducting a multidisciplinary approach (behavioral and brain imaging PET studies) to better understand the neuronal mechanisms of multisensory integration and crossmodal compensation which are associated to speech comprehension in CI patients. Because speech is by nature a multisensory mechanism, P. Barone showed how visuo-auditory interactions participate to the functional recovery of auditory functions in deaf patients and how such compensatory mechanisms can guide individual rehabilitation programs