



# CHARACTERIZATION AND RESCUE OF NEURONAL DYSFUNCTION

April 25<sup>th</sup> - 26<sup>th</sup>, 2023

Session 4

**Neurorehabilitation and rescue of nervous system dysfunction**

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### **Functional plasticity and reorganization in the language network**

Efficient cognition requires flexible interactions between distributed neural networks in the human brain. These networks adapt to changing cognitive demands by flexibly recruiting different regions and connections. In this talk, I will discuss how we can study functional network plasticity and reorganization with combined neurostimulation and neuroimaging. I will argue that short-term plasticity enables flexible adaptation to challenging conditions in human cognition, via functional reorganization. My key hypothesis is that disruption of higher-level cognitive functions such as language can be compensated for by the recruitment of domain-general networks in our brain. Examples from healthy young brains illustrate how neurostimulation can be used to temporarily interfere with normal processing, probing short-term network plasticity at the systems level. I will also discuss examples from aging brains where plasticity helps to compensate for loss of function. Finally, examples from lesioned brains after stroke provide insight into the brain's potential for long-term reorganization and recovery of function. Collectively, these results challenge the view of a modular organization of the human brain and argue for a flexible redistribution of function via systems plasticity.

