Title: Role of interhemispheric connections in health and disease

Abstract: The corpus callosum is the major white matter structure in the brain and it is involved in information processing between the two hemispheres. In particular, visual callosal connections interconnect homologous areas of visual cortices, binding together the two halves of the visual field. This interhemispheric communication plays a significant role in cortical output and are involved in development of cortical function, such as visual function as we demonstrated years ago. Thus, it is not surprising that callosal projections dysfunction could contribute to pathologies such as neglect and occipital epilepsy (e.g. photosensitive epilepsy). We have developed a mouse model of focal neocortical epilepsy, that is ideal to functional evaluate how transcallosal communication changes with the establishment of hyper-excitability, and its contribution to originate the mirror epileptic focus, a phenomenon of clinical relevance. The analysis of the transcallosal pathway is also dictated by evidence that suggests that the imbalance between the two cerebral hemispheres may on the one hand contribute to other disease, such as autism. The project is aimed to shed light on the physiological and pathological role of interhemispheric connections, looking for similarities and differences in human and animal brain physiology.

References:


Keywords: corpus callosum, neuronal plasticity, epilepsy
Contacts: LAURA RESTANI, IN-Pisa; laura.restani@in.cnr.it
Website(s): http://www.in.cnr.it/index.php/it/people-it/139-laura-restani
Collaborations: Prof. Matteo Caleo (University of Padua, Pisa, Italy); Dr. Eleonora Vannini (CNR Neuroscience Institute- Pisa, Italy); Prof. Ferdinando Sartucci (University of Pisa, Italy); Dr. Giovanni Bortolan (CNR Neuroscience Institute-Padua, Italy); Dr. Alberto Mazzoni (Scuola di Studi Superiori Sant’Anna, Pisa, Italy); Dr. Alessandro Panarese (Scuola di Studi Superiori Sant’Anna, Pisa, Italy)