Dr. Filosa's major research interest is to gain understanding of the signaling mechanisms governing bi-directional communication among the various cell types within the brain. In particular, I am interested in the communication between neurons and their surrounding glial and vascular cells. Recent findings have demonstrated an important role for astrocytes as intercellular bridges between the state of neuronal activity and vascular dynamics (or neurovascular coupling). These findings have led to a number of different hypotheses addressing the potential role astrocytes have in neurovascular coupling. However, major gaps in our knowledge are still present in regards to: the nature of the signals released (both by neurons and astrocytes during the hyperemic response), the mechanisms by which astrocytes decode various degrees of neuronal activities, and the targets (ion channels and receptors) involved. Until recently, the small size and location of parenchymal arterioles precluded us from studying the intrinsic mechanisms governing the dynamics of these micro vessels. Today's technology allows us to explore the cellular signals controlling parenchymal micro vessels in the brain. I believe this is an important area of research that merges our basic understanding of neuroscience with that of cardiovascular physiology. Furthermore, I believe understanding the communication between these two major systems will increase awareness on pathologies known to show vascular and neuronal deteriorations, including hypertension, diabetes, Alzheimer's disease and stroke.