Research interests

Combined, psychiatric disorders are the leading cause of disability worldwide. Perhaps because of their inherent social stigma, mental illnesses represent a particularly sensitive matter in modern societies. Our ongoing research aims to find the underlying molecular mechanisms involved in multiple human brain diseases. For example, all marketed drugs with proved antipsychotic activity are known to act at dopamine (DA) and/or serotonin (5-HT) receptors, all belonging to the G protein-coupled receptor (GPCR) family. Most of the current knowledge on GPCRs pharmacology assumes that these transmembrane proteins act as single molecules. We now know that GPCRs mainly work as heteromeric structures where two or more different GPCRs combine in the synaptic membrane to provide a physiological response. And yet the mechanisms underlying GPCR heteromerization and their impact on receptor pharmacology are poorly understood. Beyond receptors, the mechanisms ruling neurotransmitter release are also among our interests. Best known as SNARE complex, the neurosecretion machinery has an important role in psychiatric and neurological conditions. Misfolding and dysfunction of the proteins governing vesicle trafficking lead to cognitive and locomotor symptoms displayed by psychiatric patients. Our long-term goal is to find pharmacological tools that could ameliorate the suffering of people with severe mental illnesses.

Our current research lines are:
- Molecular mechanisms of GPCR heteromerization and their role in schizophrenia.
- Presynaptic deficits in severe mental illnesses: focus on the SNARE complex
- Molecular underpinnings of brain connectivity associated with age-related cognitive decline and dementia.
- In vivo and in silico models of neuropathologic propagation in Alzheimer's disease.

Funding received


Recent publications:


