L-glutamate is a major excitatory neurotransmitter in vertebrate central nervous system. L-glutamate enables synaptic transmission through ionotropic and metabotropic glutamate receptors. These receptors are indispensable in the brain.

The main role of metabotropic glutamate receptors is to mediate slow excitatory and inhibitory responses by activation of intracellular messengers and to regulate cationic channels.

Metabotropic glutamate receptors are involved in synaptic plasticity, different types of memory, learning, motoric coordination and neural development. On the other hand excitotoxicity of glutamate is often associated with neurodegenerative processes such as Alzheimer, Huntington and Parkinson disease.

Metabotropic glutamate receptors are promising therapeutic targets for a treatment of psychiatric and neurological diseases.

Targeted trafficking of metabotropic glutamate receptors to distinct parts of neurons is influenced by neuronal polarity and thus regulates sensing and transmission of extracellular signals. Newly detected heterodimeric receptors might be trafficked in a different way than homodimers and therefore our knowledge of molecular pathways of these complexes could help us with subsequent drug targeting.

This work confirms heterodimerization of metabotropic glutamate receptor 1 into functional complexes (mGluR1a+mGluR1b). Furthermore it sheds more light on how both heterodimeric and homodimeric receptors (mGluR1a+mGluR1a) are trafficked to synapses.