G-protein-coupled receptors (GPCRs) are seven transmembrane receptors that transduce information provided by the extracellular stimuli into intracellular second messenger pathways via their coupling with G-proteins. Activation of a GPCR also initiates a variety of cellular and molecular mechanisms, viz., receptor desensitization and internalization. Internalization of the receptor, in turn leads to the resensitization or down regulation of the receptor. In the central nervous system, glutamate acts as a major excitatory neurotransmitter. Glutamate activates three types of receptors in the post-synaptic membrane, viz., NMDARs, AMPARs and metabotropic glutamate receptors (mGluRs). mGluRs belong to the GPCR family. They have been subdivided into three groups depending on their sequence similarity, the signal transduction pathways and pharmacology. Among the eight subtypes, mGluR1 and mGluR5 belong to the group I mGluR family. These receptors are believed to be involved in multiple forms of experience dependent synaptic plasticity including learning and memory. In addition, group I mGluRs also have been implicated in various neuropsychiatric disorders like Fragile X syndrome, autism etc. Similar to many other GPCRs, mGluR5 also gets desensitized subsequent to the ligand-mediated activation and undergo rapid internalization. However, very little is known about the protein machineries that control these trafficking events, and the functional consequences of these trafficking events. The objective of this study is to investigate the cellular and molecular mechanisms that govern the ligand-mediated trafficking of mGluR5 and its physiological significance in the central nervous system.