

Abstract

Glutamate is the main excitatory neurotransmitter in the mammalian brain and its transmission is responsible for higher brain functions, such as learning, memory and cognition. Glutamate action is mediated by a variety of glutamate receptors, though their properties were until now studied predominantly in neurons. Glutamate receptors are expressed also in NG2-glia, however their role under physiological conditions as well as in pathological states of the central nervous system is not fully understood. The aim of this work is to elucidate the presence, composition and function of these receptors in NG2-glia under physiological conditions and following focal cerebral ischemia. For this purpose we used transgenic mice, in which NG2-glia are labeled by a fluorescent protein for their precise identification. To analyze the expression pattern of glutamate receptors in NG2-glia we employed single-cell RT-qPCR. Furthermore, we used calcium imaging to characterize their functional properties.