

Glycine receptor

Glycine receptors (GlyRs) are involved in the development of spinal pain **sensitization**. The **GlyR α 3** subunit has recently emerged as a key factor in inflammatory pain pathways in the spinal cord dorsal horn (DH). Our study is to identify the extent of location and cell types expressing different GlyR subunits in spinal cord and dorsal root ganglion (DRGs). To tease out the possible actions of GlyRs on pain transmission, we investigate the effects produced by GlyRs on acute inflammatory pain by behavioral testing using prostaglandin E2 (PGE2) intrathecal injection models. Furthermore, we investigate the changes of GlyR expression in DRGs and spinal cord in rats after the induction of acute inflammatory pain.

Compared to the vehicle administration, the PGE2 intrathecal injection model produced significantly higher hyperalgesia, which started 3 h after PGE2 injection and lasted more than 5 h. PGE2 intrathecal injection significantly decreased GlyR α 1 and GlyR α 3 protein expressions in the L5 DH at 1 h and lasted to 5 h, and similar results were observed in the L5 DRG at 5 h. Confocal microscopic images showed the co-existence of punctate gephyrin and GlyR α 3 immunoreactivity (IR) throughout the gray matter of the spinal cord, mainly in DH laminae I-III neurons and in ventral horn neurons. It also showed the co-existence of punctate gephyrin and GlyR α 3 IR in DRG neurons.

In this study, PGE2 intrathecal injection significantly decreased protein expression of gephyrin, GlyR α 1 and GlyR α 3 in spinal cord DH and DRG. The gephyrin and GlyR α 3 were localized on neuron cells both in the DH and DRG ¹⁾.

¹⁾

Wang HC, Cheng KI, Chen PR, Tseng KY, Kwan AL, Chang LL. Glycine receptors expression in rat spinal cord and dorsal root ganglion in prostaglandin E2 intrathecal injection models. BMC Neurosci. 2018 Nov 9;19(1):72. doi: 10.1186/s12868-018-0470-8. PubMed PMID: 30413143; PubMed Central PMCID: PMC6230273.

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