2-Y-F2-1 YIA

Intrathecal injection of sulfatides induced mechanical allodynia via glial cells activation and nitric oxide production

Motoki Morita^{1,2}, Shun Watanabe^{1,2}, Misa Oyama^{1,2}, Takashi Iwai^{1,2}, Mitsuo Tanabe^{1,2}

¹Lab. Pharm., Sch. Pharm., Kitasato Univ., ²Medical Research Lab., Sch. Pharm., Kitasato Univ.

Sulfatides, 3-O-sulfogalactosylceramide, are the major lipid component of the myelin sheath and are synthesized by myelin-producing cells. Abnormal metabolism of sulfatides causes dysfunction of the nervous system. Our previous study revealed that the gene expression of *Gal3st1* (a sulfatide synthase) was increased in the spinal cord one day after inflammation caused by intraplantar injection of complete Freund's adjuvant (CFA). Furthermore, intrathecal injection of sulfatides into naïve mice induced the spinal glial cells activation and mechanical allodynia. Nitric oxide (NO) is an important mediator released by glial cells in the spinal cord during inflammatory pain. We examined the effects of several NO synthase (NOS) inhibitors on sulfatides-induced allodynia. Intrathecal injection of the inducible NOS inhibitor or the neuronal NOS inhibitor attenuated sulfatides-induced allodynia. In addition, the fluorometric measurement assay of nitrite/nitrate suggested that intrathecal injection of sulfatides increased NO contents in the spinal cord. Our research leads to the hypothesis that up-regulation of sulfatides synthesis exacerbates pain via glial cells activation and the NO pathway during inflammatory pain. Future studies are needed to reveal the molecular mechanisms that sulfatides increase NOS activity during inflammatory pain.