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正常、退行性病变、脱髓鞘小鼠的脊髓内Mts1/S100A4表达及作用比较

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摘要：

目的：研究正常、退行性病变以及脱髓鞘小鼠脊髓内Mts1/S100A4蛋白的表达模式,及其对胶质细胞反应的影响。方法：以野生型和Mts1/S100A4基因敲除型小鼠为试验动物，采用背根损伤、坐骨神经损伤、溴乙啶局部微量注射的方法复制退行性病变及脱髓鞘脊髓动物模型，应用免疫荧光技术，检测S100A4 、GFAP、NG2 、Mac1的表达情况。结果：野生型小鼠脊髓内，仅白质星型胶质细胞表达S100A4蛋白，且主要分布于Lissauer束；背根或坐骨神经损伤后，白质星形胶质细胞内的S100A4及GFAP表达上调，野生型与S100A4基因敲除小鼠GFAP表达量无显著差异；溴乙啶注射7d后，野生型小鼠脊髓脱髓鞘区域内见S100A4呈云雾状分布，胶质细胞反应局限于注射侧，并且形成清晰的胶质瘢痕，而S100A4基因敲除小鼠则未见上述病理变化。结论：S100A4蛋白在小鼠脊髓内的表达模式与大鼠相似；退行性变的脊髓内，细胞内上调的S100A4蛋白并不影响胶质细胞的反应；脱髓鞘脊髓内，细胞外的S100A4蛋白明显影响胶质细胞反应，包括胶质瘢痕的形成。

关键词：钙结合蛋白 退行性变 脱髓鞘 Mts1/S100A4

The calcium-binding protein Mts1/S100A4 in normal, degenerating and demyelinated spinal cord of the adult mouse

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Abstract:

Objective: To investigate the expression pattern of Mts1/S100A4 in mouse spinal cord; to investigate the effects of Mts1/S100A4 on glial cell responses. Method: The study was carried out on Mts1/S100A4 wild type and knock-out mice. The degenerative spinal cord model was established by dorsal root or sciatic nerve injury. The demyelinated spinal cord model was established by ethidium bromide injections. Then the expressions of S100A4,GFAP,NG2 and Mac1 were measured. Result: The expressions of Mts1/S100A4 in mice spinal cord were similar to that in rats. In WT mice this protein expressed in a thin layer of fiber bundles in the tract of Lissauer, and in white matter astrocytes. There was intracellular up-regulation of Mts1/S100A4 in white matter astrocytes of WT mice after dorsal root or sciatic nerve injury, with no difference in glial cell response between WT and KO mice. However, 7 days after ethidium bromide injection, in WT mice, the astroglial reaction was restricted on operated side, where a distinct glial scar had formed. While in KO mice, no distinct glial scar formed in demyelinated area. Conclusion: Mts1/S100A4 expression in mouse spinal cord is similar to the pattern as in rats; intracellular Mts1/S100A4 up-regulation does not affect glial responses in degenerative spinal cord; the presence of extracellular Mts1/S100A4, which entered the spinal cord after ethidium bromide induced demyelination, markedly affects the glial cell responses in demyelinative spinal cord, including glial scar formation.

Keywords:calcium-binding protein degeneration demyelination Mts1/S100A4

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