

CD44 IS EXPRESSED IN NON-MYELINATING SCHWANN CELLS OF THE ADULT RAT, AND MAY PLAY A ROLE IN NEURODEGENERATION-INDUCED GLIAL PLASTICITY AT THE NEUROMUSCULAR JUNCTION

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CD44 is a ubiquitous cell adhesion molecule that plays important roles in the cell- and matrix-biology of a variety of tissues. In particular, the protein was found to be expressed in glial cells of developing, but not adult, peripheral nerves, where it takes part in signaling mediated by ErbB class of receptors for neuregulins. Here, we demonstrate, using high resolution morphological methods, including Stimulated Emission Depletion (STED) microscopy, tissue fractionation and RT-PCR, that CD44 is strongly expressed in terminal Schwann cell (TSC) at the neuromuscular junction (NMJ) of the adult rat skeletal muscle. As CD44 is also expressed by Schwann cells of the non-myelinated Remak bundles of the proximal peripheral nerves, it appears to be a marker of non-myelinating Schwann cell subpopulation. The analysis of transgenic rats bearing a mutated superoxide-dismutase gene (SOD1^{G93A}) causing familial amyotrophic lateral sclerosis (ALS) revealed that TSC activation and morphological plasticity at the NMJ, caused by ongoing denervation-reinnervation is associated with a strong increase in CD44 expression therein. Notably, CD44 immunoreactivity is present in fine axon-escaping processes of the glial cells that guide reinnervation. In addition, we found that both in normal and SOD1^{G93A} muscle, CD44 expressed in TSC partially colocalizes with immunoreactivities of neuregulin receptors ErbB2 and ErbB3. Importantly, TSC activation upon ALS-like neurodegeneration results in significant increase in colocalization degree of CD44 and ErbB3, which may have impact on glial plasticity at the NMJ.