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Action of various peptide fragments of MBP on a viability and production of nitric oxide in glial cells

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Several peptide fragments of myelin basic protein (MBP) are formed in a brain during demyelinating diseases, which together with proinflammatory cytokines can influence proliferation and damage of glial cells. We studied the action of C8-isoform of MBP and its tryptic peptide fragments on viability (MTT-test) and on production of nitric oxide in rat primary glial cells. Two preparations of MBP hydrolizate were used: with-(Preparation 1) and without of encephalitogenic peptide 45–89 (Preparation 2), which was added in culture medium in a final concetration of 20 μg/ml. It was found that C8 isoform and Preparation 2 reduce viability of primary astrocytes and mixed oligodendrocyte/microglia cells, whereas Preparation 1 induces proliferation of astrocytes. After the treatment of primary culture with C8 isoform of MBP and Preparation 2 the production of nitric oxide was markedly increased in rat primary astrocytes, but decreased in oligodendrocyte/microglia cells. Addition of Preparation 1 into tissue culture medium had no effect on production of nitric oxide in both type of cells. It is supposed, that encephalitogenic fragment of MBP-C8 (45–89) has different effect on a glial cells viability and proliferation, compared with MBP-C8 and another MBP-fragments. As Preparation 1 does not change production of nitric oxide against the background of a stimulated proliferation, reduced viability of primary astrocytes under the action of C8 isoform and MBP-fragments (without 45–89) is caused by induction of nitric oxide synthase followed by increased level of nitric oxide. It is suggested that different intracellular mechanisms are responsible for actions of MBP fragments.