

The effect of lead on matrix metalloproteinase-9 expression in rat primary glial cells

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Lead has long been considered as a toxic environmental pollutant, which severely damages central nervous system. Lead can cause hypo- and de-myelination, and glial cells are closely related with myelination or demyelination. Matrix metalloproteinases (MMPs) are proteolytic enzymes that are involved in the remodelling of the extracellular matrix in a variety of physiological and pathological processes. MMPs also seem to be important in the pathogenesis of inflammatory demyelinating diseases of the central and peripheral nervous system. In this study, we investigated whether lead affects MMP-9 expression in rat primary glial cells. Treatment of 0.1-5 μ M lead dose- and time-dependently increased MMP-9 expression in rat primary glial cells. The activity of MMPs was determined using zymography. Lead activated Erk(1/2) but neither of the other endogenous MAP kinases, p38 or JNK. Inhibition of Erk(1/2) activation by PD98059, a MEK inhibitor, prevented lead-induced expression of MMP-9. The results of the present study suggest that lead intoxication may adversely affect brain function at least in part by inducing MMP-9 expression through Erk(1/2) activation in primary glial cells.