

DRASTIC REDUCTION OF NDP'ASE POSITIVE MICROGLIAL CELLS IN MIXED ASTROGLIAL CELL CULTURES AFTER TREATMENT WITH cAMP

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Addition of cAMP to astroglial cell cultures changes the metabolism of astrocytes and induces a morphological differentiation with pronounced extension of cell processes. The effects of cAMP on microglial cells are, however, unknown.

The aim of the present study was to analyze the effects, if any, induced by cAMP on microglial cells in vitro. To accomplish this, primary, mixed cell cultures containing astroglia and microglia were prepared from newborn mice brains, using the standard method described to obtain pure astrocytic cultures. After 2 weeks in vitro, a number of cultures were treated with 0.25 mM cAMP for 10-12 days. Treated and untreated cultures were then fixed in 4% paraformaldehyde and double stained by combining GFAP immunocytochemistry with NDPase histochemistry as specific markers for astroglia and microglia, respectively.

Cultures not treated with cAMP contained a large population of NDPase positive microglial cells together with GFAP positive astrocytes. Amoeboid and ramified microglial cells were homogeneously distributed with a predominance of ramified forms. Pairs of round-amoeboid microglial cells were occasionally observed, suggesting cell division. In cAMP treated cultures, NDPase positive cells were few and mainly of the ramified type. They were distributed in patches, having wide areas devoid of microglial cells. Pairs of round amoeboid microglial cells were not observed.

The results demonstrate that NDPase positive microglial cells are sensitive to cAMP added to mixed astroglial and microglial cell cultures. Their presence in the mixed glial cell cultures is accordingly modifiable by the addition of this compound.