

## HISTOCHEMICAL DEMONSTRATION OF IDPase ACTIVITY IN OLIGODENDROCYTES AND MYELIN SHEATHS IN THE HUMAN WHITE MATTER

L. ACARIN<sup>1</sup>, B. CASTELLANO<sup>1</sup>, B. GONZALEZ<sup>1</sup>, I. DALMAU<sup>1</sup>, J.M. VELA<sup>1</sup>  
and C. NAVARRO<sup>2</sup>

(1) Dept. Cell Biol. and Physiol. Autonomous Univ. of Barcelona, and (2) Dept. Neuropathol. Inf. Hosp., C.S. Valle de Hebrón. Barcelona, Spain.

During the last decades, biochemical studies have shown that a significant number of enzymatic activities are related to the myelin fraction. Histochemical studies reporting specific localization of these myelin-related-enzymes are, however, few. In the present study we investigate the presence and ultrastructural localization of the enzyme inosine diphosphatase (IDPase) in the human white matter. Pieces of corpus callosum from post-mortem normal brains were dissected out and fixed in cacodylate buffered 4% paraformaldehyde. Vibratome sections were incubated for IDPase histoenzymatic demonstration, using 5'-inosine diphosphate as substrate. For light microscopy visualization of the histochemical reaction product was achieved by treating the sections with ammonium sulfide and silver nitrate. For electron microscopic studies, sections were postfixated in 1% osmium tetroxide and embedded in epoxy resin. Micrographs were obtained from unstained ultrathin sections. Our observations showed that, in addition to an intense activity in the plasma membrane of microglial cells and in the wall of blood vessels, a discrete IDPase activity was also present in the myelin sheaths. This myelin-associated IDPase activity was principally found in the major dense line and in cytoplasmic clefts. In samples with a longer post-mortem time, IDPase activity was also apparent in oligodendrocytes, mainly inside the nuclear envelope and in cytoplasmic dense bodies. These findings suggest that, besides other specific functions in the nervous tissue, nucleoside phosphates and the enzymes related to their metabolism could be involved in the structural maintenance of myelin sheaths or in the biosynthesis of their components.