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The bioenergetic role for Myelin suggest new approach to therapeutic of Multiple Sclerosis

The Myelin is very abundant in brain and recent research highlights its role as an energetic support for the axon, quite different from the traditional one. Myelin incorporates many molecular devices typical of mitochondria and aerobically produces ATP better than mitochondria. It has been shown that axonal firing determines a transient drop in Myelin ATP and suggestive hypotheses can be formulated about an important role of myelin in memory and in general in support of cognitive abilities. The alteration of mitochondria as a triggering cause of Multiple Sclerosis (MS) is confirmed because myelin appears to derive from mitochondria, probably due to membrane fusion processes. As far as MS is concerned, promising nutritional and/or pharmacological approaches that support myelin growth and turnover appear promising: i) integration with high doses of vitamin D, a known trophic agent for mitochondria and therefore also for myelin; ii) food supplementation with galactose, a sugar that appears functional to myelin growth; iii) integration with Biotin and fumarate esters, which support the anaplerotic processes of the myelin, feeding Krebs cycle. In the brain myelin is enriched in the enzyme Carbonic Anhydrase (containing the essential metal Zinc), demonstrative of the active combustion operating inside it. Myelin has also an active synthesis of the heme group, which ensures a good functioning of the respiratory complexes. A link between heavy metal pollution (lead in particular) and neurodegenerative diseases is evident: Lead can replace Zn in the pathway of heme synthesis (inhibiting delta-Aminolevulinic acid dehydratase). The increased incidence of multiple sclerosis in the Sardinia region (Italy), which could derive from the millenary mining activity of lead mining, is interesting.

Speaker Biography

Alessandro Morelli is working as a professor on Biological Chemistry University of Genova, School of Medical and Pharmaceutical Sciences,DIFAR-Dept of Pharmacy - Biochemistry Lab.He worked as an associate professor at the Faculty of Medicine (before) and full professor (1986) to the Faculty of Science, has been owner of many of Biological Chemistry courses. He coordinated the Interdisciplinary Laboratory for Experimental Biology II, expressing particular passion and competence for teaching application.He was the President of the Paritectic Commission (Professors-Students) for Education and the Right to Study (2005-2008) for University of Genoa and held the office of President of the Degree Course in Biological Sciences (2009-2012).

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