

Growth factors and environment combine to increase brain maturation

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A new study showing that growth factors and the environment combine to increase brain maturation appears in the May 30th issue of the online, open-access journal PLoS ONE. The study was conducted by Francesca Ciucci, Elena Putignano, Laura Baroncelli, Silvia Landi, Nicoletta Berardi and Lamberto Maffei, based at the Neurobiology Laboratory of Scuola Normale Superiore in Pisa.

Professor Maffei's research group is known for studies on the development and plasticity of the brain. Recent studies by this group have demonstrated that rodents' brains are sensitive to the influences of the environment and in particular that maturation of the visual system is accelerated in an enriched environment, where animals can explore new objects, engage in physical exercise and play. The aim of this research was to clarify the molecular mechanisms that control this phenomenon.

Specifically, in this study a molecular factor, called Insulin-like growth factor I (IGF-I), has been found to be capable of mediating the accelerated maturation of cortical development produced by enriched environment. The present work suggests that IGF-1 action in mediating the effects produced by environmental enrichment on visual system could be exerted through an accelerated maturation of inhibitory circuitry, the modulation of which has already been involved in cortical plasticity. IGF-I could influence the expression of other neurotrophins like NGF and BDNF, important for visual system plasticity. New studies could lead to a better understanding of the relationship between these molecules in the modulation of brain plasticity.

Source: Public Library of Science

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