A VIP for normal brain development

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led by Pierre Gressens, at Inserm U676, Paris, France, and Vincent Lelièvre, at CNRS UPR-3212, Strasbourg, France -- has identified a signaling pathway key for normal brain development in the mouse. Of paramount importance, the data generated suggest that environmental factors, including maternal ones, can influence the final size of the brain.

Individuals with microcephaly primary hereditary (MCPH) are born with a very small head and a small brain. They suffer mild developmental delay, hyperkinesia (excessive restlessness), and mild to severe cognitive impairment. Although mutation of any one of seven genes is known to cause MCPH, a lack of good animal models has made it hard to understand the underlying mechanisms.

To gain insight into this, Gressens, Lelievre, and colleagues used a mouse model in which microcephaly is induced by blocking the peptide VIP during gestation using a VIP antagonist (VA). Initial analysis indicated that prenatal administration of VA gives rise to brain abnormalities that mimic those observed in patients with MCPH. Further analysis identified a cellular and molecular mechanism for the observed abnormalities. The authors therefore conclude that the identified molecular pathway (the VIP/Mcph1/Chk1 pathway) is key for normal brain development and suggest that environmental factors disturbing this pathway can modulate the development of the brain as well as its final size.

More information: www.jci.org/articles/view/4382 … 1236357151332f9ec680

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