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A microRNA-152 that targets the phosphatase and tensin homolog to inhibit low oxygen induced-apoptosis in human brain microvascular endothelial cells

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ABSTRACT. Brain damage caused by perinatal asphyxia is dangerous for neonatal infants, but the mechanism by which it occurs remains elusive. In this study, microRNA-152 (miR-152) expression was induced by low oxygen levels in rat models of hypoxia brain damage, as well as in human brain microvascular endothelial cells (HBMECs) cultured *in vitro*. Analysis of the sequence of miR-152 revealed that the phosphatase and tensin homolog gene (*PTEN*) is probably the target of miR-152 both in humans and rats. When HBMECs were transfected with miR-152 mimics, *PTEN* expression was inhibited at both the mRNA and protein levels. Moreover, transfection with the miR-152 mimic also inhibited apoptosis induced by hypoxia. Furthermore, expression of the pro-apoptotic gene *Bax* was downregulated while the anti-apoptotic

gene *Bcl2* was upregulated after miR-152 mimic transfection. Taken together, these results indicate that miR-152 induced by hypoxia suppresses cell apoptosis and acts as a protective factor during hypoxia by repressing *PTEN*.

Key words: miR-152; *PTEN*; Hypoxia; Apoptosis; Brain damage

