Human neuroglobin interacts with flotillin-1, a crucial structural component of lipid raft microdomain

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Neuroglobin (Ngb) is a newly discovered vertebrate globin that is expressed in the brain and that can reversibly bind oxygen. It has been reported that Ngb levels increase in neurons in response to oxygen deprivation, and that it protects neurons from hypoxia. However, the mechanism of this neuroprotection remains unclear. Recently, we found that oxidized human Ngb bound to the α-subunits of heterotrimeric G proteins (Gα) and acted as a guanine nucleotide dissociation inhibitor for Gα. To identify other Ngb-binding proteins, we herein screened a human brain cDNA library by using a yeast two-hybrid system. Among the plasmids isolated from positive clones, one contained an insert with 100% sequence identity to human flotillin-1. The interaction of Ngb with flotillin-1 was confirmed by glutathione S-transferase pull-down experiments. Since Gα exists within lipid rafts critical for signal transduction and flotillin-1 recruits signaling proteins to lipid rafts, flotillin-1 might recruit Ngb to lipid rafts as a means of preventing neuronal death.