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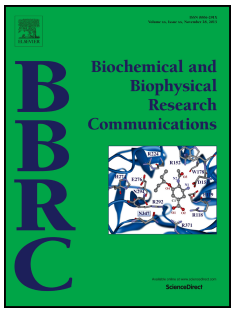

AntagomiR-613 protects neuronal cells from oxygen glucose deprivation/re-oxygenation via increasing SphK2 expression

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PII: S0006-291X(17)31809-0

DOI: 10.1016/j.bbrc.2017.09.049

Reference: YBBRC 38494

To appear in: *Biochemical and Biophysical Research Communications*

Received Date: 4 September 2017

Accepted Date: 10 September 2017

Please cite this article as: G. Di, Z. Wang, W. Wang, F. Cheng, H. Liu, AntagomiR-613 protects neuronal cells from oxygen glucose deprivation/re-oxygenation via increasing SphK2 expression, *Biochemical and Biophysical Research Communications* (2017), doi: 10.1016/j.bbrc.2017.09.049.

AntagomiR-613 protects neuronal cells from oxygen glucose deprivation/re-oxygenation via increasing SphK2 expression

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Abstract. Oxygen glucose deprivation (OGD)/re-oxygenation (OGDR) causes damages to neuronal cells. Sphingosine kinase 2 (SphK2) expression could exert neuroprotective functions. Here, we aim to induce SphK2 expression via inhibiting the anti-SphK2 microRNA: microRNA-613 ("miR-613"). In both SH-SY5Y neuronal cells and primary murine hippocampal neurons, transfection of the miR-613's specific inhibitor, antagomiR-613 ("antamiR-613"), induced miR-613 depletion and SphK2 expression. Reversely, forced over-expression of miR-613 caused SphK2 downregulation in SH-SY5Y cells. OGDR-induced cytotoxicity in neuronal cells was largely attenuated by antamiR-613. SphK2 is required for antamiR-613-induced actions in neuronal cells. SphK2 knockdown (by targeted-shRNAs) or inhibition (by its inhibitor ABC294640) almost completely abolished antamiR-613-mediated neuroprotection against OGDR. Further studies showed that OGDR-induced reactive oxygen species (ROS) production, lipid peroxidation, and DNA damages in SH-SY5Y cells were largely attenuated by antamiR-613, but were intensified by miR-613 expression. Taken together, we conclude that antamiR-613 protects neuronal cells from OGDR probably via inducing SphK2 expression.