S61-3 Neural and vascular protective effects of vanadyl compound in brain ischemia

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Vanadate and vanadyl strongly inhibit protein tyrosine phosphatase 1B, thereby eliciting insulin-like actions through enhancement of tyrosine phosphorylation of insulin receptor substrate that in turn activates Akt and ERK pathways. We synthesized vanadyl compound [VO(OPT)], and defined its neuroprotective effects on brain ischemia-induced injury. VO(OPT) administration restored Akt and ERK activities reduced following brain ischemia, thereby inhibiting FOXO transcriptional activity and Fas-ligand expression. Furthermore, the intraperitoneal administration of VO(OPT) markedly enhances brain ischemia-induced neurogenesis in the SGZ of mouse hippocampus. The VO(OPT)-induced neurogenesis was associated with an amelioration of cognitive dysfunction following brain ischemia. Taken together, VO(OPT) is potential therapeutics that promote ischemia-induced neurogenesis through Akt and ERK activation, thereby improving not only memory but also neurological deficits following brain ischemia. Thus neurogenesis therapeutics encourages the development of new strategies to restore the brain functions in brain ischemia. The strategy is also attractive to ameliorate neurological deficits following brain ischemia. In this symposium, we discuss the vascular protective effect of VO(OPT) in brain ischemia