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WNT3A Promotes Neuronal Regeneration upon Traumatic Brain Injury

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Abstract

The treatment of traumatic brain injury (TBI) remains a challenge due to limited knowledge about the mechanisms underlying neuronal regeneration. This current study compared the expression of WNT genes during regeneration of injured cortical neurons. Recombinant WNT3A showed positive effect in promoting neuronal regeneration via in vitro, ex vivo, and in vivo TBI models. Intranasal administration of WNT3A protein to TBI mice increased the number of NeuN+ neurons without affecting GFAP+ glial cells, compared to control mice, as well as retained motor function based on functional behavior analysis. Our findings demonstrated that WNT3A, 8A, 9B, and 10A promote regeneration of injured cortical neurons. Among these WNTs, WNT3A showed the most promising regenerative potential in vivo, ex vivo, and in vitro.

Keywords: neuronal regeneration; traumatic brain injury; WNT3A; cortical neurons

Biography:

I am a recent Ph.D. graduate in Molecular Medicine, working on the Project of Neuronal Regeneration upon Traumatic Brain Injury (TBI). Research interest has been mainly in the identification of regeneration-associated genes in brain neurons that as well as the investigation of molecular mechanism underlying injury-induced transcriptomic/epigenomic regrograming. For future perspectives, we aim to expedite bench-to-bedside translation via providing new insight onto therapeutic targets for TBI.

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