



Nerve Regeneration Small Molecules

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HIGHLIGHTS

- Small molecules that bind to Rb1 and stimulate growth of non-replicating neurons.
- Potential applications in treatment of neurological disease and neurotrauma.

OPPORTUNITY

Researchers at University of Alberta have identified modulators of the Retinoblastoma 1 (Rb1) and their ability to block Rb1 binding to E2F1. A computational screen of several million commercially-available compounds discovered several hits that are capable of interrupting Rb1- E2F1 binding. Disruption of Rb1 binding stimulates E2F1 transcriptional activity and promotes cell growth. Three compounds demonstrated evidence of significant binding and differentiation of PC12 cells and five compounds were identified with evidence of enhanced outgrowth in sensory neurons.

Currently, there are no therapeutic options to facilitate regrowth and reconnection of severed axons in the peripheral or central nervous system. Typically, neurons have very limited ability to regenerate and form new axons. Rb1 protein is a tumor suppressor robustly expressed in adult dorsal root ganglia and axons. Tumor suppressor pathways such as Rb1 may offer novel targets capable of altering the plasticity of post-mitotic adult neurons.

COMPETITIVE ADVANTAGE

- Potential first-in-class therapy for neuronal regeneration.
- Offer significant advantages over the use of siRNA through ease of delivery, access through protected blood-brain and blood-nerve barriers, lesser of target actions and avoidance of nucleotide degradation.

STATUS

- Patent pending.
- ["AI is a viable alternative to high throughput screening: a 318-target study." Scientific Reports 14, no. 1 \(2024\): 7526.](#)

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MORE INFORMATION

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