

VEGF for the Treatment of Peripheral Nerve Damage

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Background & Unmet Need

- Peripheral nerve injury is a major neurological disorder that can cause severe motor and sensory dysfunction
- Unlike the central nervous system (CNS), the peripheral nervous system (PNS) is capable of significant regeneration, but often in an incomplete fashion
- Vascular endothelial growth factor (VEGF)-B is known as an angiogenic factor, and provides neuroprotection in the CNS, but its affect on the PNS is poorly understood
- **Unmet Need:** New therapeutics that hasten the regeneration of peripheral nerves with appropriate return of function

Technology Overview

- **The Technology:** Methods to treat damage to the PNS using VEGF-B alone or in combination with VEGF-A
- **Discovery:** VEGF can mediate peripheral neuron growth and accelerate the return of sensory and trophic functions of damages nerves
- VEGF-B induces extensive dendrite growth and branching in neurons, which was distinct from VEGF-A
- VEGF-B increases nerve regeneration, sensation recovery, and trophic function of injured corneal peripheral nerves without observed off-target effects
- The combination of VEGF-A and VEGF-B resulted in improved neuro-regeneration compared to monotherapy

Inventors:

Mark I. Rosenblatt
Victor H. Guaiquil
Zan Pan
Natalia Karagianni

Patents:

US Patent [9,987,329](#)

Publications:

[Pan et al. FASEB J.](#) 2013.

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Technology Applications

- Therapeutic for PNS damage caused by accident, neurotoxins, or neurodegenerative disease
- Treatment of injured corneal peripheral nerves

Technology Advantages

- Improves function of injured nerves without affecting uninjured nerves or inducing unwanted neovascularization
- May be administered as recombinant VEGF proteins or as gene therapy

Supporting Data / Figures

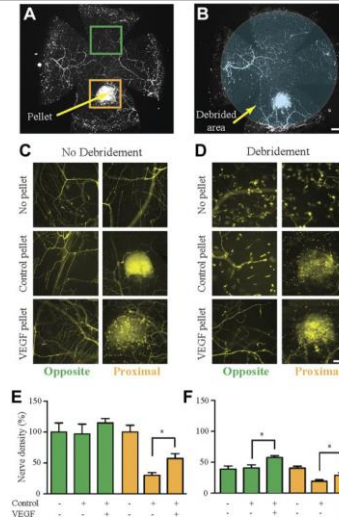


Figure 1: Sustained delivery of VEGF stimulates corneal nerve regeneration in injured corneas. Quantification of corneal nerve densities using NeuroLucida 9 demonstrates that VEGF induces nerve regeneration only in corneal nerves injured by micropocket creation (E) or epithelial debridement (F).

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