

Cenegermin (rhNGF – Recombinant Human Nerve Growth Factor) Overview

Overview:

Cenegermin is a recombinant human nerve growth factor (rhNGF). It's the first NGF-based treatment approved by the FDA for neurotrophic keratitis, a rare degenerative corneal disease that causes loss of corneal innervation and impaired healing.

Mechanism of Action:

- Cenegermin binds to TrkA receptors (tropomyosin receptor kinase A) and the p75NTR receptor on corneal sensory nerves and epithelial cells.
- This triggers intracellular signaling cascades (MAPK/ERK and PI3K/Akt pathways) that:
- Promote neuronal survival and regeneration.
- Enhance corneal healing.
- Increase tear production and epithelial cell integrity.

Physiological Functions in the Body:

Neurotrophic Support: Stimulates growth, survival, and maintenance of sensory neurons.

Corneal Healing: Restores nerve density and epithelial integrity in the cornea.

Anti-Apoptotic Effects: Prevents cell death of damaged corneal cells.

Clinical & Research Use:

FDA-Approved Use:

Neurotrophic Keratitis: Cenegermin is marketed as Oxervate® for treatment of moderate to severe neurotrophic keratitis.

Research Uses: Investigated for neurodegenerative diseases (e.g., Alzheimer's, peripheral neuropathies), but currently approved only for ocular use.

Dosing (FDA-Approved Context):

0.002% Cenegermin eye drops (20 µg/mL).

1 drop in affected eye(s), 6 times daily (every 2 hours) for 8 weeks.

Treatment is typically not repeated unless directed by an ophthalmologist.

Conclusion:

Cenegermin is a unique, FDA-approved peptide therapy that promotes corneal nerve regeneration and healing in neurotrophic keratitis. By acting on TrkA and p75NTR receptors, it restores corneal health and function, offering a breakthrough treatment for a previously difficult-to-manage condition.

