

Neuroplasticity Markers

Neuroplasticity is the ability of the nervous system to adapt, reorganize, and regenerate. **Neuroplasticity markers** are molecules indicating or mediating these changes.

1. Key Neuroplasticity Markers

Marker	Function	Notes
BDNF	Promotes neuronal survival, synaptic growth, plasticity	Upregulated by exercise, neurostimulation
GAP-43	Axonal growth and regeneration	High after nerve injury
Synaptophysin	Synaptic vesicle protein; synapse density marker	Synaptogenesis and remodeling
MAP2	Maintains dendritic structure	Dendritic remodeling indicator
PSA-NCAM	Promotes cell migration and plasticity	Regenerative processes
Nogo-A	Inhibits axonal growth	Target for enhancing regeneration
c-Fos	Immediate early gene for neuronal activity	Plastic change marker
CREB	Regulates plasticity-related gene expression	Crucial for memory and long-term plasticity

2. Neuroplasticity in Spinal Cord Injury (SCI)

- Positive markers (BDNF, GAP-43) increase during regenerative attempts. - Negative regulators (Nogo-A) inhibit axonal regrowth. - Therapies target enhancing positive markers and inhibiting negative regulators.

Summary

Neuroplasticity markers help track recovery, assess therapeutic interventions, and reveal mechanisms of nervous system adaptation.

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