

Natural product

- Efficacy of vaccination therapy in newly diagnosed and recurrent glioblastoma patients: a meta-analysis
- Phyllanthin from *Phyllanthus amarus* exerts neuroprotective effects against spinal cord injury in experimental rats
- Carotid endarterectomy and blood-brain barrier permeability in subjects with bilateral carotid artery stenosis
- Ugonin P mitigates osteolytic bone metastasis by suppressing MDK via upregulating miR-223-3p expression
- Birch Sap Preserves Memory Function in Rats by Enhancing Cerebral Blood Flow and Modulating the Presynaptic Glutamatergic System in the Hippocampus
- A Polysaccharide-Based Fluorescent Polymer Carrier for Natural Product Delivery and Gastric Cancer Inhibition
- Convergent large-scale network and local vulnerabilities underlie brain atrophy across Parkinson's disease stages: a worldwide ENIGMA study
- Ultraviolet radiation induces caspase cleavage and nuclear translocation of heme oxygenase 1 (HO-1) to activate autophagy in skin keratinocytes

In a [review](#) article (mechanistic overview on mitochondrial regulation by natural products) Qin et al. from the Qingdao Medical College & Qingdao University, Pharmaceutical University, Nanjing published in the [Neural Regeneration Research](#) journal to summarize how natural products modulate mitochondrial dysfunction (biogenesis, dynamics, transport, mitophagy, apoptosis, oxidative stress) for [stroke treatment](#), and identify barriers to [clinical translation](#). Natural products act via multi-target mechanisms on mitochondrial processes to exert [neuroprotection](#) in both ischemic and [hemorrhagic stroke](#) models, but [clinical translation](#) is impeded by product complexity, [lack of standardization](#), insufficient multicenter data, and unclear long-term safety. Future directions include advanced technologies (single-cell sequencing, organoid models) and multicenter trials ¹⁾.

Critical review

Strengths

- Comprehensive mechanistic mapping: the article clearly organizes effects into six mitochondrial regulatory domains and links specific natural compounds (e.g., Cordyceps, ginsenosides, Gypenoside XVII, Ginkgolide K, Scutellarin, Chrysophanol) to distinct pathways of protection.
- Provides molecular insights: for instance, Cordyceps activates PGC-1 α /NRF-1 to enhance biogenesis; Gypenoside XVII activates PINK1/Parkin mitophagy to protect the BBB.
- Identifies translational challenges—standardization issues, safety gaps, and absent systemic trials are analyzed realistically, demonstrating awareness of clinical hurdles.

Weaknesses

- Lacks summary of methodological rigor: no discussion of dosage, sample sizes, or statistical quality of cited in-vivo/in-vitro studies.
- Minimal critical evaluation: the review treats molecular mechanisms as established without weighing conflicting data or study bias.
- Omits pharmacokinetic/toxicology details: crucial for natural products, but not addressed.

Rating

Score: 7/10 – Strong mechanistic organization and translational awareness, but limited methodological critique and insufficient attention to pharmacokinetics and evidence quality.

Takeaway for practicing neurosurgeon

Natural compounds show multi-faceted neuroprotection via mitochondrial modulation in animal/stem cell stroke models. However, they are not yet ready for clinical use due to regulatory, safety, and reproducibility gaps. Neurosurgeons should await human data before considering these agents.

Bottom line

A well-structured mechanistic review that identifies promising mitochondrial-targeting natural products, but lacks [rigorous evaluation](#) of experimental quality and clinical feasibility—future translational efforts are needed.

¹⁾

Qin N, Liu R, Deng R, Shi L, Wang L, Zhu T. Modulation of [mitochondrial dysfunction](#): Mechanisms and strategies for the use of [natural products](#) to treat [stroke](#). Neural Regen Res. 2025 Jul 5. doi: 10.4103/NRR.NRR-D-25-00016. Epub ahead of print. PMID: 40618255.

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