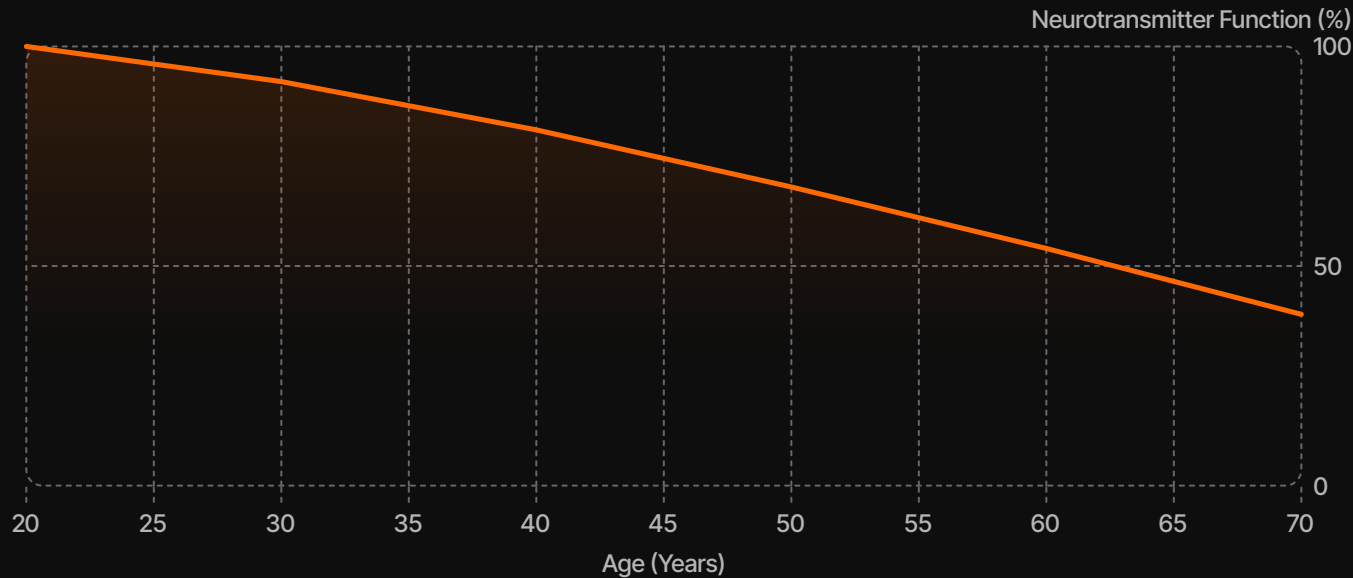




Longevity & Neurotransmitter Support

Why Neurotransmitter Balance Matters

Neurotransmitters are rarely "damaged" directly; instead, their delicate balance, production, and receptor response are disrupted by chronic stress, recreational and prescription drugs, poor nutrition, toxins, and neurodegenerative diseases.



Substance Abuse

Floods or depletes chemical pathways

Chronic Stress

Depletes serotonin and dopamine reserves

Poor Diet & Toxins

Blocks synthesis; heavy metals harm nerve cells

Key Neurotransmitter Systems in Aging

Neurotransmitters modulate lifespan and brain aging by regulating neural circuit activity, stress responses, and metabolic pathways. Lower or tightly controlled neural signaling often promotes longevity and protects against age-related cognitive decline.

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"Specific metabotropic GABA receptors trigger longevity pathways like DAF-16/FOXO, extending lifespan and calming age-related neural hyperexcitation."

— **GABA System**

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"Acetylcholine is crucial for plasticity and attention; its age-related dysfunction contributes heavily to cognitive decline and memory loss in older adults."

— **Cholinergic System**

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Mechanisms Linking Brain Activity to Lifespan

Our formulation targets the key biological levers that connect neurotransmitter health to longevity — from quieting hyperactive circuits to coordinating the brain's metabolic control of aging.



Neural Quietude

Suppressing hyperactive neural circuits via proteins like REST — elevated in human centenarians — reduces cellular stress and extends healthspan.



Metabolic Control

Brain signaling coordinates peripheral energy usage, mirroring the longevity benefits seen in dietary restriction models.



Excitotoxicity Prevention

Suppressing excessive glutamate over-activation preserves brain health and shields neurons from premature age-related death.

Pregnenolone, L-Lysine, NAD & NMN



Pregnenolone

Boosts acetylcholine; modulates NMDA & GABA-A



L-Lysine

Antagonizes 5-HT4; activates GABA-A receptors



NAD & NMN

Fuels ATP synthesis; activates SIRT1/SIRT3

- **Pregnenolone:** Declines severely with age; foundational neurosteroid for memory consolidation and neuroplasticity
- **L-Lysine:** Reduces stress-induced anxiety and protects aging neurons from cortisol elevation

- **NMN:** Dose-dependent increase in norepinephrine, serotonin, glutamate, and GABA in aging models
- **NAD:** Drives mitochondrial electron transport chain to fuel rapid chemical messaging in neurons

Comprehensive Mechanism Summary

Compound	Target Neurotransmitter
Pregnenolone	Acetylcholine, Glutamate (NMDA)
L-Lysine	Serotonin, GABA
NMN & NAD	Serotonin, GABA, Glutamate, Norepinephrine

Together, these compounds optimize cellular energy, protect neurons from aging, and balance primary neurotransmitters like acetylcholine, GABA, and serotonin.



4 Systems

These compounds mitigate age-related cognitive decline by reinforcing the chemical systems of the brain through both direct receptor modulation and cellular energy optimization.

NAG, NAC & Chromium

1

NAG

Fortifies perineuronal nets to prevent structural decay and calm chronic glutamate overexcitation. Suppresses microglial neuroinflammation to protect neurotransmitter precursors.

2

NAC

Drives glutathione production to shield dopaminergic pathways from oxidative damage. Modulates the cystine-glutamate antiporter to downregulate toxic glutamate release.

3

Chromium

Elevates insulin sensitivity to maximize tryptophan transport across the blood-brain barrier, preserving hypothalamic catecholamine activity and mood-regulating serotonin into old age.

Alpha GPC, Choline, Luteolin & Rhodiola

These compounds support longevity by protecting and optimizing key neurotransmitter systems — primarily acetylcholine, dopamine, and serotonin — which naturally decline with age.

1 — Choline & Alpha GPC: The Acetylcholine Boosters

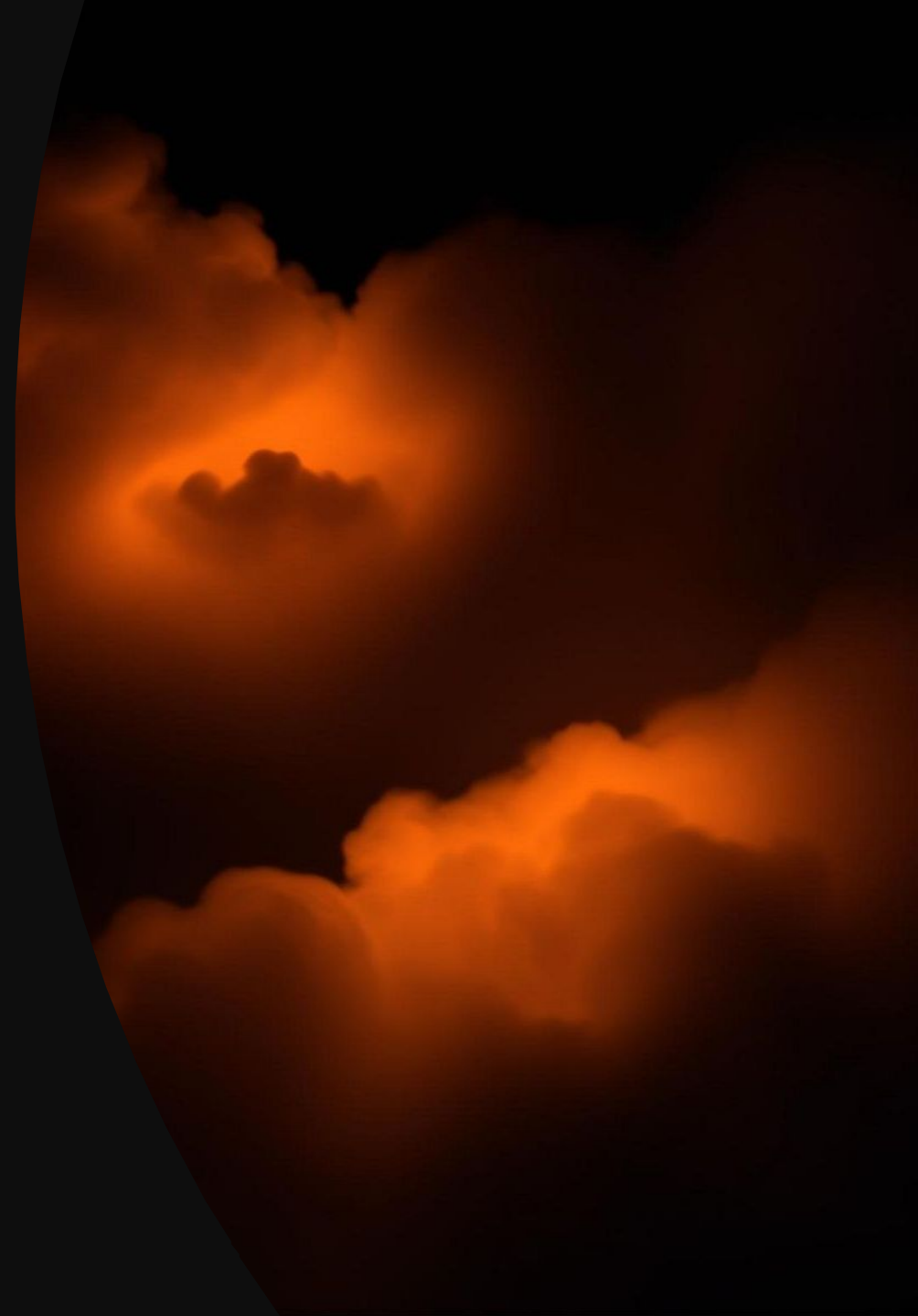
Choline provides the raw material for acetylcholine synthesis and builds neuronal membranes. Alpha GPC crosses the blood-brain barrier to rapidly elevate acetylcholine in the hippocampus, supporting memory retention and cell membrane repair.

2 — Luteolin: The Neuro-Protector

Suppresses microglial overactivation to protect dopamine and acetylcholine neurons. Preserves mitochondrial health to shield against glutamate excitotoxicity and promotes neurogenesis to maintain monoamine levels.

3 — Rhodiola Rosea: The Monoamine Regulator

Active compounds salidroside and rosavin inhibit MAO enzymes — which increase with age — slowing dopamine and serotonin breakdown. Regulates cortisol to shield neurotransmitter pathways from stress-induced depletion.



GABA, Glycine & Fisetin

These compounds maintain the delicate balance between brain excitation and inhibition, reducing neuroinflammation and preventing age-related excitotoxicity — where glutamate overactivation causes cellular burnout and cognitive decline.



GABA

Inhibitory brake; quiets hyperexcitation and regulates longevity pathways (FOXO/DAF-16) while reducing cortisol



Glycine

NMDA co-agonist preserving memory pathways; triggers autophagy via GNMT to clear toxic misfolded proteins like beta-amyloid



Fisetin

Senolytic that destroys inflammatory senescent brain cells; restores healthy dopamine, GABA, and glutamate levels; upregulates BDNF and CREB

Together, GABA, glycine, and fisetin create a comprehensive defense against brain inflammaging — preserving cognitive architecture and neurotransmitter homeostasis well into old age.

Pine Bark, Astaxanthin, Lion's Mane & Cordyceps

