

CULTIVATE

INTRO

Your mind's chemistry, a complex network of antioxidants, metals, and reactive species, shapes how neurons grow, connect, and endure. When balanced, it sustains clarity, memory, and resilience.

Rebalancing the Mind Garden through Antioxidant Design

A healthy garden flourishes through balance; in the brain, antioxidants and metals must stay in harmony to prevent decay.

Oxidative Stress
When defense systems fail, neurons wither and connections fade.

Protein Aggregates
Clumps of misfolded proteins that block healthy neural growth.

Metal Imbalance
Too much iron or copper fuels oxidative damage.

ROS
Free radicals that damage cells and trigger oxidative stress

NATURAL DEFENCES

The brain already tends its own garden, using natural antioxidants and metal-regulating molecules to keep chemistry in balance. These innate defenses protect neurons from daily oxidative stress and maintain clarity and energy.

RESTORING BALANCE

Our lab designs new antioxidant molecules inspired by nature's chemistry. These molecular "gardeners" capture harmful radicals, regulate metals, and help restore balance when the brain's defenses fade.



designing NEW DEFENCES

In the Green Lab, my current work focuses on designing and testing new antioxidant molecules inspired by nature's own chemistry. Building on our published indole-based designs, these new molecules explore how small structural changes affect reactivity, guiding the creation of next-generation "gardeners" that help restore balance in the mind's ecosystem.

DID YOU KNOW?
The Green Group has designed over a dozen antioxidant molecules to protect the brain from oxidative stress and restore balance.

STRUCTURAL CHANGES IMPACT MOLECULAR STABILITY, REACTIVITY, AND REDOX BALANCE

STRONGER DEFENCES

Quinoline-based antioxidants show greater stability and durability, better equipped to protect the mind's chemistry from oxidative stress.

TARGETED PROTECTION

Adjusting sites around the macrocycle helps the molecules better engage Nrf2, boosting the brain's natural antioxidant response.

Published Indole Antioxidants
Scan to read our recent study - the foundation for the new systems explored here.



SCAN ME

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The Welch Foundation
Advancing Chemistry, Improving Life