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NEUROSCIENCE AND METABOLOMICS

Functional markers for neurological diseases and disorders can be elusive. Characterizing the brain phenotype can be difficult or impossible for many studies since brains cannot be sampled from living cohorts, and bypassing the blood-brain barrier can be challenging.

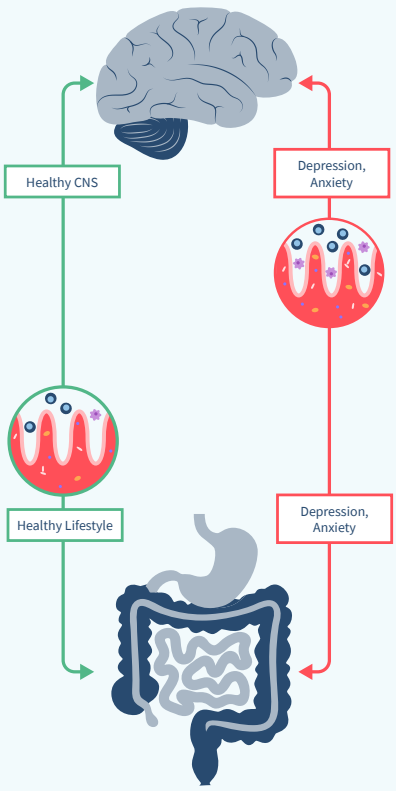
Find More with Metabolomics

Metabolomics provides a functional endpoint that neurological researchers can easily incorporate into their studies. Small molecule biochemistry can help elucidate the association and significance of a metabolomic pathway and its correlating impact on the presence and severity of neurological conditions. With markers present in all tissues, and access to the increasingly important microbiome to explore associations across the gut-brain axis, what more can you find with metabolomics?

Metabolomics is a technology for comprehensively measuring all the small molecules (metabolites or biochemicals) in a living system. As the products of biological networks, the microbiome, or exposure (diet, drugs, etc.), metabolites serve as a proxy to the physiological changes accompanying disease and drug response. This data makes metabolomics a key ally for driving decisions in pharmaceutical R&D.

METABOLOMICS APPLICATIONS TO NEUROSCIENCE RESEARCH

- Biomarker discovery
- Understanding disease mechanisms
- Personalized medicine research
- Drug development
- Nutritional neuroscience
- Monitoring treatment efficacy
- Systems biology insights
- Early disease detection
- Comparative studies



Understanding the influence of the microbiome on the brain is just one area that can be examined using metabolomics.

METABOLOMICS EXPANDS THE NEUROSCIENCE RESEARCH TOOLBOX

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Better Neurological Disease Diagnoses and Treatments are Needed

According to the World Health Organization (WHO), neurological disorders affect up to 1 billion people worldwide. Of the one billion people affected worldwide, 50 million suffer from epilepsy and 24 million from Alzheimer's disease and other types of dementia. Unfortunately, by the time most neurological disorders are diagnosed, significant neuronal damage has occurred. Moreover, current therapies only act to slow disease progression without reversing neurological damage. Therefore, battling neurological diseases requires more effective and reliable diagnosis to combat disease progression and implement effective treatment.

Metabolomics is a promising approach that can assist with the discovery of disease-specific biomarkers. Biomarkers can assist with brain disease diagnosis or be used in monitoring treatment.

This pivotal tool for biomarker discovery can lead to earlier prediction, detection, and diagnosis of neurological illnesses, giving us more time to administer therapies to improve the quality of life for anyone affected with neurological disorders. Therefore, more metabolomics studies are needed to better understand the mechanisms involved in neurological diseases.

Brain Biomarkers and Therapies

Biomarker identification via global metabolomics can highlight the connection between metabolomics and neurological disease as well as open the door to new therapies.

We are already starting to see drugs directed toward metabolic targets entering clinical trials. Metabolon has contributed to some of this work at biopharmaceutical companies. Results from a Phase 2 trial of metabolic targeting in subjects with Alzheimer's disease were striking. Combined metabolic activators (CMA) improve fatty acid uptake and oxidation and reduce oxidative stress. CMA administration led to a significant improvement in cognitive function compared to the placebo group. These changes correlated with protein and metabolite levels and brain measurements based on imaging.[1]

Leveraging global metabolomics as a wide-angle tool will support the development of non-invasive diagnostics and therapeutics that have the capability to improve the lives of patients.

With our industry-leading library of over 5,400 metabolites, Metabolon has the broadest coverage and capability to see potential biomarkers in your data. Metabolon's deep experience in metabolomics plays a vital role in future advancements in the neuroscience field.

Supporting References

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Metabolon Technology Powering Publications in Neuroscience

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