



# SCHIZOPHRENIA Factsheet March 2019

## What are neurometabolites?

Products of normal chemical metabolism may be altered in schizophrenia. Changes in metabolite levels may be indicative of altered biochemical activity. Magnetic resonance spectroscopy (MRS) has been used to measure levels of neurometabolites, such as N-acetylaspartate (NAA), creatine (Cr), trimethylamines/ choline containing compounds (Cho) and glutamine (Gln). These derivatives are indirect indicators of biochemical activity. Alteration in levels of NAA/Cr is associated with the protective myelin sheath surrounding neurons, which is used as a marker of neural cell viability. Decreased levels of NAA are associated with neuron death, or injury to the part of the neuron that connects to other cells, the axon. Gln is a metabolite of the neurotransmitter, glutamate (Glu).

## What is the evidence for neurometabolites?

Moderate and moderate to high quality evidence suggests NAA levels are reduced in people with schizophrenia compared to people without schizophrenia in the frontal lobe, temporal lobe, thalamus, hippocampus, cerebellum, and cingulate cortex. Lower quality evidence suggests NAA may also be reduced in the parietal lobe, basal ganglia, and occipital lobe (white matter only). NAA may be increased in the striatum and lenticular nucleus.

There are NAA reductions in the anterior cingulate and hippocampus of first-degree relatives of people with schizophrenia. People at clinical or genetic high-risk of schizophrenia show NAA reductions in the thalamus and NAA/Cr ratio reductions in the prefrontal cortex.

Moderate to low quality evidence suggests small to medium-sized reductions in glutamate, and increases in glutamine levels in the frontal cortex of people with schizophrenia, which may progress with age.

For more information see the technical table



*NeuRA (Neuroscience Research Australia) is one of the largest independent medical and clinical research institutes in Australia and an international leader in neurological research.*

*Diseases of the brain and nervous system pose the greatest health, economic and social burden of any disease group because they are chronic, debilitating and have no known cures.*

*Medical research is the cornerstone of efforts to advance the health and wellbeing of families and the community. Our dedicated scientists are focussed on transforming their research into significant and practical benefits for all patients.*

*While we hope you find this information useful, it is always important to discuss any questions about schizophrenia or its treatment with your doctor or other health care provider.*

## HOW YOUR SUPPORT HELPS

We are able to make significant advances due to the generosity of countless people. Your donation allows us to continue to work towards transforming lives. For information on how you can support our research, phone **1300 888 019** or make a secure donation at [neura.edu.au/donate/schizophrenia](http://neura.edu.au/donate/schizophrenia).