



# NeuRA

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## BIPOLAR DISORDERS Factsheet

April 2019

### What is oxidative stress?

While oxygen is a vital component of life, some oxygen-based compounds called free radicals can be toxic due to their highly unstable nature. The key free radical classes are the reactive oxygen species and reactive nitrogen species, and they are formed as by-products of normal metabolism. Under normal conditions, these free radicals are tightly monitored and controlled by stringent protective barriers, such as their rapid removal from cells and antioxidant enzymes that break them down.

At tightly maintained concentrations, free radicals play an important role in cellular signalling, immune responses and cell growth. However, excess free radicals can result from interruption of the antioxidant defense barrier, or from excess production. This can cause oxidative stress, resulting in structural damage to cellular proteins, fats, carbohydrates and nucleic acids (DNA and RNA). Severe oxidative stress can result in failure of cell growth, apoptosis and cell necrosis.

### What is the evidence for oxidative stress in people with bipolar disorder?

High quality evidence suggests a small increase in glutathione in the anterior cingulate of people with bipolar disorder, particularly bipolar II disorder.

Moderate quality evidence suggests large effects of increased lipid peroxidation, nitric oxide and DNA/RNA damage in people with bipolar disorder compared to controls, with no increases in superoxidedismutase, catalase, protein carbonyl, glutathione peroxidase, or 3-nitrotyrosine.

For more information see the technical table



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*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 bipolar disorder 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](http://neura.edu.au).

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