

Therapies to improve biochemical functions hold promise as treatments for autism

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Two promising new treatments to aid people with autism have shown effectiveness in pilot studies conducted by an Arizona State University professor and private researchers.

Several studies indicate that children with autism often have abnormalities in critical biochemical functions that help maintain health – specifically methylation, glutathione, and mitochondrial functions.

Methylation turns proteins in the body on and off – including [DNA](#) and [RNA](#) – a function that controls gene activity.

Glutathione, a primary antioxidant, provides a defense against toxic metals in the body. Mitochondria are essentially the "factories" inside body cells that produce energy.

The research team has been developing therapies aimed at restoring or improving these functions in people with autism experiencing abnormalities.

The complete study is published in the medical journal *Autism Insights*, and is available [online](#).

A common feature of the abnormalities the researchers are studying is that they are affected directly or indirectly by levels of specific substances produced by the body – ribose and nicotinamide adenine dinucleotide, or NADH.

Use of ribose and NADH supplements have been reported to boost levels of adenosine-5'-triphosphate, or ATP – a primary fuel source for the body and the brain. The supplements have also been shown to be helpful in treating chronic fatigue.

The research team explored use of ribose and NADH supplements as treatments for autism in two parallel studies using ribose and NADH.

One study investigated the effect of supplementation with NADH, an important co-factor for many enzymatic reactions in the body.

Another study investigated the effect of supplementation with ribose, a special sugar made by the body from glucose.

The studies found use of ribose and NADH supplements had similar effects, boosting levels of methylation, glutathione and ATP after only two weeks of therapy.

Levels of ribose and NADH also improved substantially, without adverse effects. After just two weeks of therapy, one child in each group was reported to have some improvement in energy level.

The biochemistry of both NADH and ribose is well-established, as well as how both affect production of ATP, glutathione and methylation. Details are provided in the article in *Autism Insights*.

Adams points out that both treatments use products that are available as over-the-counter nutritional supplements.

Larger and more formal studies are needed to confirm the benefits of ribose and NADH [supplements](#), Freeddenfeld says.

But "these therapies appear to be safe and effective supportive therapies

for restoring methylation, glutathione and ATP to near-normal levels in the body, and are likely to help children with [autism](#) who experience problems maintaining normal functions," he says.

Provided by Arizona State University

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