

Top 10 Ideas for Autism Researchers

by Seth Bittker, sbittker@yahoo.com, May 8, 2015

If you see an idea you want to work on, please pursue it. If you see an idea you would like to collaborate on, I would welcome this too.

1) *Double-blinded trial of **high sulfate mineral water** in autism.*

Motivation: Autism often feature low levels of sulfate in the blood (Adams, 2011) and high levels in urine (Waring, 2000). In addition many sulfur containing compounds have been shown to be efficacious (DMSA, NAC, Sulforaphane). High sulfate mineral water also helped the author's son.

Description: Behavioral testing should be done before and after the sulfate water / placebo is consumed. In addition measures of sulfate in urine and blood as well as glutathione, cysteine, metallothioniens, and vitamin D in blood should be taken before and after. This way behavioral and biological efficacy can be measured. A variant on this would be to just do such a trial with those where constipation is comorbid with autism as high sulfate mineral water is efficacious in chronic constipation (Dupont, 2014).

2) *Double-blinded trial of **mixed carotenoid** supplementation in autism.*

Motivation: Autism often feature low plasma carotenoids and high oxidative stress (Adams, 2011). Open-label trials of formulations including carotenoids have been highly successful (Theoharides, 2012; Taliou, 2013). It seems a double-blinded trial could establish efficacy.

Description: Behavioral testing should be done before and after, and measures of oxidative stress and carotenoids should be run before and after to analyze behavioral and biological efficacy.

3) *Biochemical effects of low sulfur diets on rat babies.*

Motivation: Evidence suggests that low plasma sulfate levels are involved in etiology of autism in many. What parts of typical autism biochemistry are connected to these low sulfate levels?

Description: Take two groups of baby rats. Measure behavior; measure metabolites in both including dysbiosis markers if possible. Put one group on a regular diet; put the other group on a low sulfur diet. Measure behaviors; measure metabolites and dysbiosis markers again. Metabolites measured should include those that are often extreme in autism biochemistry: sulfate, glutathione, cysteine, metallothioniens, SAM, 8OHdG, aspartate, glutamate, monoamines, etc.

4) *Biochemical effects of fairly large doses of **vitamins A and D** provided to rat babies.*

Motivation: Children in the developed world receive vitamin A and vitamin D drops in fairly large doses compared to those naturally available in most foods. This is deemed to be beneficial, but epidemiological data this author has looked at seem to suggest some negative effects in some. It would be good to know what the effects are in rats.

Description: Take two groups of baby rats. Measure behavior and metabolites in both including dysbiosis markers; provide the vitamins to one group and don't provide the vitamins to the other group; retest behavior and metabolites in both including dysbiosis markers after intervention.

5) *Effect on **intestinal villi** of fairly large doses of **vitamin D** provided to rat babies with gluten.*

Motivation: Very large doses of vitamin D induce sloughing of the intestinal villi in rats (Chavhan, 2011). This author has theorized that large doses of vitamin D may induce autism and celiac in some (Bittker, 2014, 2015). So it is relevant if more moderate doses have similar effects on intestinal health and dysbiosis.

Description: Take two groups of baby rats. Measure metabolites and behavior; provide vitamin D in conjunction with the gluten to one group and provide gluten but do not provide the vitamin D to the other group. Retest metabolites and behavior; sacrifice rats. Dissect and examine intestinal villi in each group.

6) *Biochemical effects of **acetaminophen** consumption on rat babies.*

Motivation: There are a number of studies pointing to the role of acetaminophen in autism (Bauer, 2013; Schultz, 2008). In addition given autism's sulfate deficit such a role makes sense.

Description: Take two groups of baby rats. Measure metabolites and behavior. Add moderate doses of acetaminophen to the water of one group and do not add anything to the water of the other group for a number of weeks. Measure metabolites and behavior again. Metabolites measured should include those that are often extreme in autism biochemistry: sulfate, glutathione, cysteine, metallothionins, SAM, 8OHdG, aspartate, glutamate, monoamines, etc.

7) *Detailed **parent survey** on conditions, feeding practices, diet, and especially supplement use.*

Motivation: Some have hypothesized that excessive vitamins provided in infancy may increase the risk of autism (Zhou, 2013). Others have suggested that vitamins are protective (Schamberger, 2011). Relatedly seemingly contradictory findings apply to breastfeeding. In addition while this author is persuaded that acetaminophen use is a risk factor for autism, others are not yet persuaded. A large well-designed parent survey may provide answers on how these factors increase or decrease risk of autism.

Description: Trial should cover time before birth though 3 years after birth. Two groups: parents of kids with autism and parents of kids without it.

8) *Small open label trial of **low dose vibramycin** in autism.*

Motivation: The author's son improved on vibramycin. Another tetracycline antibiotic (minocycline) has been shown to be efficacious in fragile-X (Leigh, 2013) and be modestly beneficial in Angelman's syndrome (Greico, 2014). An open label trial of minocycline with B6 in autism found negligible behavioral improvement but some cytokine levels were closer to normal (Pardon, 2013). B6 muddies the water of these results. Also minocycline is the most-fat soluble tetracycline and it may be that some of the therapeutic value is from the effect on bacteria in the gut. In other words fat-solubility may not imply greater efficacy.

Description: Trial would be low dose vibramycin alone – without B6.

9) *Epidemiological study examining prevalence of autism and **sulfur levels in drinking water** by geographic region.*

Motivation: Consuming sulfur containing supplements appears to affect behavior in those with autism. Perhaps low sulfur levels in drinking water is a contributing factor to autism in some.

Description: The key would be obtaining good data on sulfur levels in various states or regions and similarly good quality autism prevalence data in these same locations.

10) ***Vegan diet** with modest B12 supplementation for autism.*

Motivation: Autism often features high ammonia, high aspartate, and high glutamate. This suggests nitrogen load is too high. Meat proteins contain lots of amino acids and can contribute to dysbiosis. So a lower protein vegetable diet should lower the level of this load.

Description: This should be structured as an open label trial as it will require real commitment from those trying the diet and a double-blind trial is impractical. Measure changes in metabolites and behavior over the trial.