Glyphosate in MMR: Does This Explain the Autism Link?

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“It is dangerous to be right in matters on which the established authorities are wrong.”

– Voltaire
Outline

• What is glyphosate?
• How glyphosate affects the gut barrier
• Glyphosate in vaccines
  – Glutamate and glyphosate synergy in MMR
• Autoimmune disease through molecular mimicry
• Summary
What is Glyphosate?

Roundup and GMO Crops

GMO Roundup-Ready corn, soy, canola, sugar beets, cotton, tobacco and alfalfa

What is glyphosate?
Roundup as a Desiccant/Ripener just before Harvest

Wheat, Oats, Barley, Rye, Sugar cane, Beans, Lentils, Peas, Flax, Sunflowers, Pulses, Chick Peas

Autism Prevalence: 6 year olds*

glyphosate is total of year indicated + 3 previous years

R = 0.9972, p <= 2.366e-07

* Figure 15, Seneff et al., Agricultural Sciences, 2015, 6, 42-70
Is Glyphosate Nontoxic?

• Monsanto has argued that glyphosate is harmless to humans because we don’t have the shikimate pathway which it disrupts in plants.

• However, our gut bacteria DO have this pathway:
  – They use it to supply us with essential aromatic amino acids (precursors to neurotransmitters, thyroid hormone and B vitamins).

• Other ingredients in Roundup greatly increase glyphosate’s toxic effects.

• Insidious effects of glyphosate accumulate over time:
  – Most studies are too short to detect damage.

How Glyphosate Affects the Gut Barrier
Glyphosate and the Gut

- Glyphosate has been found as a contaminant in digestive enzymes trypsin, pepsin and lipase
- Trypsin impairment prevents proteins like gluten in wheat from being digested
- Undigested proteins induce release of zonulin which opens up gut barrier
- Zonulin lingers because trypsin is defective


A Scenario

[Diagram showing the effects of Glyphosate in wheat on the gut and brain, including leaky barriers and autoimmune disease.]
What if glyphosate could insert itself into protein synthesis by mistake???

Any proteins with conserved glycine residues are likely to be affected in a major way.

Trypsin contains several glycine-rich regions that are essential for its function as a digestive enzyme.

Any proteins with conserved glycine residues are likely to be affected in a major way.
Glyphosate is a non-coding amino acid analogue of glycine

Extra Piece Sticks Out at Active Site

Substrate no longer fits in active site
Extra Piece Sticks Out at Active Site

This explains how glyphosate disrupts EPSPS in the shikimate pathway: Multiple bacteria have developed resistance by replacing active site glycine with alanine and this is the basis for GMO Roundup Ready crops*

*Funke et al., Molecular basis for the herbicide resistance of Roundup Ready crops. PNAS 2006;103(35):13010-13015.

Inhibition of EPSPS by glyphosate: Resistant E coli mutant*

*Figure 3, S Eschenburg et al. Planta 2002;216:129-135.
**Glyphosate in Vaccines**

**Glyphosate in Vaccines?**

- For MMR, flu vaccine, and rabies vaccine, live virus is grown on *gelatin* derived from ligaments of pigs and *fetal bovine serum*
  - Cows and pigs are fed GMO Roundup-Ready corn and soy feed
- Gelatin is derived from collagen which is highly enriched in *glycine* and also contains *glutamate*
  - These two neurotransmitters excite the NMDA receptors in the brain
- Glyphosate stimulation of NMDA receptors could cause neuronal burnout
Excess glutamate in synapse leads to neuronal burnout

Rats exposed to glyphosate perinatally exhibited depressive behaviors
Glyphosate Excites NMDA Receptors in Hippocampus*,**, 

Glutamate is elevated in the blood in association with autism, and blood glutamate levels correlate with brain glutamate levels.*


Autism, Glyphosate, Vaccine Reactions* 

*Data readily available from the CDC, FDA (VAERS) and USDA
Most disturbing is the presence of glyphosate in many popular vaccines including the measles, mumps and rubella (MMR) vaccine, which we have verified here for the first time.

# Glyphosate Contamination in Vaccines (Parts Per Billion)*

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Vaccine</th>
<th>Glyphosate (ppb)</th>
<th>Condition</th>
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<tbody>
<tr>
<td>Merck</td>
<td>ZOSTAVAX</td>
<td>0.62</td>
<td>Shingles</td>
</tr>
<tr>
<td>Merck</td>
<td>MMR-II</td>
<td>3.74</td>
<td>Measles, Mumps and Rubella</td>
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<tr>
<td>Merck</td>
<td>VARIVAX</td>
<td>0.56</td>
<td>Varicella, Chicken Pox</td>
</tr>
<tr>
<td>MERCK</td>
<td>PNEUMOVAX</td>
<td>ND</td>
<td>Pneumococcal 18</td>
</tr>
<tr>
<td>MERCK</td>
<td>PROQUAD</td>
<td>0.66</td>
<td>Measles, Mumps, Rubella, Varicella</td>
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<tr>
<td>GSK</td>
<td>ENERGIX-B</td>
<td>0.34</td>
<td>Heptatitis B</td>
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# Symptoms of Adverse Reactions to MMR before and after 2002*

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Count Before 2002</th>
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<tr>
<td>joint pain</td>
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<td>hospitalization</td>
<td>71</td>
<td>319</td>
<td>0.0037</td>
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<td>seizures</td>
<td>203</td>
<td>462</td>
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<td>51</td>
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<tr>
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<td>51</td>
<td>120</td>
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<tr>
<td>autism</td>
<td>69</td>
<td>143</td>
<td>0.024</td>
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<tr>
<td>eczema</td>
<td>4</td>
<td>36</td>
<td>0.026</td>
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<tr>
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<td>56</td>
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<td>0.034</td>
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<tr>
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<tr>
<td>swelling</td>
<td>860</td>
<td>1018</td>
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Data analyzed from the VAERS database

Symptoms of Adverse Reactions to MMR before and after 2002*
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These are all characteristic symptoms of allergies to MSG

*Data analyzed from the VAERS database

Autoimmune Disease through Molecular Mimicry
Nobel Laureate Charles Richet demonstrated over a hundred years ago that injecting a protein into animals or humans causes immune system sensitization to that protein. Subsequent exposure to the protein can result in allergic reactions or anaphylaxis. This fact has since been demonstrated over and over again in humans and animal models.

Large Proteins in Vaccines: Allergenic*

“Vaccines clog our lymphatic system and lymph nodes with large protein molecules which have not been adequately broken down by our digestive processes, since vaccines bypass digestion with injections. This is why vaccines are linked to allergies, because they contain large proteins which as circulating immune complexes (CICs) or 'klinkers’ cause our body to become allergic.”

*Dave Mihalovic, ND, http://whale.to/v/vaccines_cause_allergies.html
The Purdue Vaccination Studies and Autoantibodies*

“The Purdue studies … found that vaccinated dogs were developing autoantibodies to their own collagen”

*A: http://www.dogsnaturallymagazine.com/purdue-vaccination-studies/

A Scenario

1. Child is vaccinated with MMR
2. Live measles virus infects gut
3. Measles haemagglutinin undigested
4. Induces leaky gut
5. Measles virus
6. Measles virus infects brain
6. Zonulin induces leaky brain barrier
7. Brain’s immune system produces antibodies
8. Autoantibodies attack myelin sheath
5. Zonulin
Measles Virus and Haemagglutinin*

- The measles virus synthesizes the protein haemagglutinin
  - Antibodies to haemagglutinin are essential following MMR vaccination to induce immunity
- Measles virus infects brain due to leaky barrier
- Haemagglutin bears a sequence resemblance to myelin basic protein (MBP) → potential for autoimmune reaction
- MBP is essential for the formation of the myelin sheath surrounding nerve fibers
- Autoantibodies to MBP along with excessive levels of antibodies to measles haemagglutinin are linked to autism**


Autism and Measles Haemagglutinin*

- 125 autistic children and 92 control children
- 60% of the children with autism had high levels of antibodies to measles haemagglutinin specific to the MMR vaccine
  - 90% of these had autoantibodies to myelin basic protein (MBP)
- 0% of the control children had high antibody titers to either haemagglutinin or MBP
- There were no elevations in antibodies detected against any proteins in the mumps or rubella viruses

Summary

• Glyphosate’s insidious cumulative toxicity may be due to its ability to get into proteins by mistake in place of glycine
• Glyphosate has been detected in multiple vaccines, with highest concentrations in MMR
  – Many vaccines include gelatin and fetal bovine serum as ingredients, both of which are contaminated with glyphosate
• Glyphosate and glutamate (from the vaccine) can excite NMDA receptors, and cause neuronal burnout
• Glyphosate contamination leads to resistance to breakdown and autoimmune disease through molecular mimicry
  – A causal link between MMR and autism can be explained through autoimmune attack on myelin basic protein via molecular mimicry with measles haemagglutinin
• Multiple large proteins found in vaccines are allergenic and they may be a causal factor in food allergies and anaphylaxis