
The Medical Benefits of Camel's Milk

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Healing Provisions



Disclaimer

- The information provided is for educational purposes only. It is not to be taken as specific medical advice.
- Please discuss any and all interventions with your medical practitioner prior to initiating any new treatment.
- This presentation will be discussing the science and medical benefits of Camel's milk only. It is not to be utilized for specific dosing and/or procurement. Please reference the state laws pertaining to Camel's milk as they differ between states.



History of Camel Milk

- Camels have dated back to biblical times and lived in some of the harshest climates in the world.
- They have adapted over millennia to survive and thrive in these harsh conditions.
- The milk provided to their offspring has evolved over this time to provide unique and significant health benefits.



Benefits of Camel's Milk in Autism

Below are some of the quotes from families that have been treated with Camel's Milk:

- **"This is the first time my son has gained weight in 2 years."**
 - 3 months on 8oz Raw Camel's milk
- **"My son went from one word phrases to 3-4 word combinations."**
 - 6 weeks on Raw Camel's milk
- **"My child is so much calmer, more engaged."**
 - 2 weeks on 6-8 oz Raw Camel's milk
- **"My son had his first solid poop... ever!"**
 - 1 month low heat pasteurized Camel's milk
- **"He is eating foods that he wouldn't touch before."**
 - 4 months on 16oz Raw Camel's milk
- **"After starting Camel's Milk, his therapists are wondering what we are doing, his gains are coming faster and he is so much more aware."**
 - 6 months Camel's Milk



Benefits of Camel's Milk in Autism

- **"My son would not eat or drink anything due to his severe reflux. He was losing weight and had no energy. We started him on Camel's Milk and within a week he was tolerating over 6 oz. His reflux began to get under control and he started putting weight back on."**
 - 4 weeks Raw Camel's Milk
- **"After being on Camel's Milk off and on for upwards of 2 years, not only has my son regained conversational speech, but he is now showing empathy and remorse, all without being in any formal therapy!"**
 - 2 years 8 oz Raw Camel's Milk (intermittently)



Why are families seeing such gains with consuming a food?



Because Camel's Milk is unlike
any other Milk in the World. It is
why it has earned the nickname
“White Gold of the Desert!”



Outline

- Nutritional Benefits of Camel's Milk
 - Vitamins/Minerals
 - Proteins
 - Fats
- Medical Conditions treated with Camel's Milk
 - Gastrointestinal Healing
 - Allergies
 - Immunological
 - Diabetes
 - Blood Pressure
- Folate Receptor Homocysteinylation Folate Receptor Protein Substitution
 - Protein structure change due to Glyphosate mediated Folate receptor mutation.
- Folate Receptor Antibodies
 - Elevated homocysteine direct effect on Folate Receptor
 - Reactionary mechanism of Folate Receptor Antibody production to Homocysteinylated Folate Receptor



Nutritional Benefits

- **Vitamins**

- Contains vitamins C, A, E, D, and B group
- Higher amounts of vitamin C and Niacin (B3, niacinamide) than bovine (cow) milk
- Three times higher amount of Vitamin C
- Lower amounts of vitamin A and riboflavin than bovine milk.
 - There are conflicting reports on B12 amounts being lower and higher depending on report.



Nutritional Benefits

- **Minerals**

- Significantly higher amount of iron (Fe) than bovine milk. (up to 10X higher)
 - Iron plays an essential role in a number of biological systems, including oxygen transport and storage as well as DNA synthesis
- Also significantly higher amounts of Cu (copper)



Nutritional Benefits

- **Minerals**

- Similar amounts to Bovine Milk:

- Calcium
 - Sodium
 - Magnesium
 - Phosphorus
 - Potassium

- Soliman G. Comparison of Chemical and Mineral Content of Milk From Human, Cow, Buffalo, Camel and Goat in Egypt Egyptian Journal of Hospital Medicine, Vol. 21: 116-130



Nutritional Benefits

- **Proteins**

- Total proteins- Avg. 2.15-4.9%
- Two types: Casein and Whey
 - Whey
 - Significant source of Lactoferrin, albumin, immunoglobulins, and peptidoglycan recognition protein
 - Does not have β -Lactoglobulin, the major contributor to milk allergies in humans.
 - Casein
 - Does not have the same β -Casein structure as bovine milk.



Nutritional Benefits

- **Proteins**

- β -Casein

- β -Casein is present in most mammal milks.
 - The difference is the A1 variant and A2 variant.
 - The A1 variant is found in most western breeds of cows
 - In A1 variant, if protein is not broken down completely by beneficial bacteria (Lactobacillus) it can mimic protein structure of Morphine (Casomorphin.)
 - A2 is present in other breeds of Cow (Guernsey/Jersey), Camel, Donkey and Breast Milk.

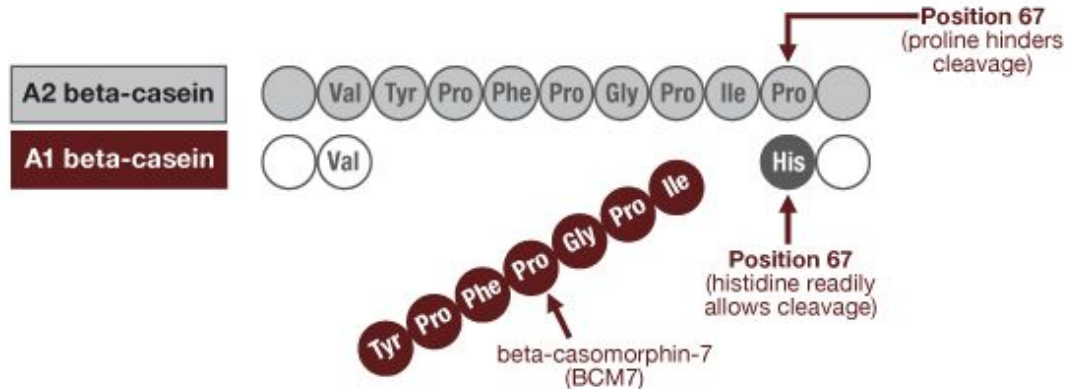


β -Casein Structure

Protein chain showing amino acids in A1 and A2 beta-casein



One amino acid difference at position 67 in the protein chain



Nutritional Benefits

- **Fats**

- Compared to bovine milk:
 - Lower percentage of short-chain fatty acids.
 - Higher percentage of long-chain fatty acids. Higher amounts of unsaturated fatty acids, especially the essential fatty acids



Nutritional Benefits

- **Probiotics**

- Significant amounts of Lactic Acid Bacteria
 - Prevents adhesion of *Staphylococcus Aureus* and inhibits pathogenic *E.Coli* in the GI Tract
 - *Camel's Milk as a natural source for Probiotics* Mutlag et. al, Research Journal of Microbiology 8 (2): 70-80, 2013
- Significant amounts of *Lactobacillis Plantarum*, *L. Pentosis*, and *L.Lactis*
 - *Isolation of Lactic Acid Bacteria with Probiotic Potential from Camel Milk* Yateem et. al, International Journal of Dairy Science 3 (4): 194-199 2008



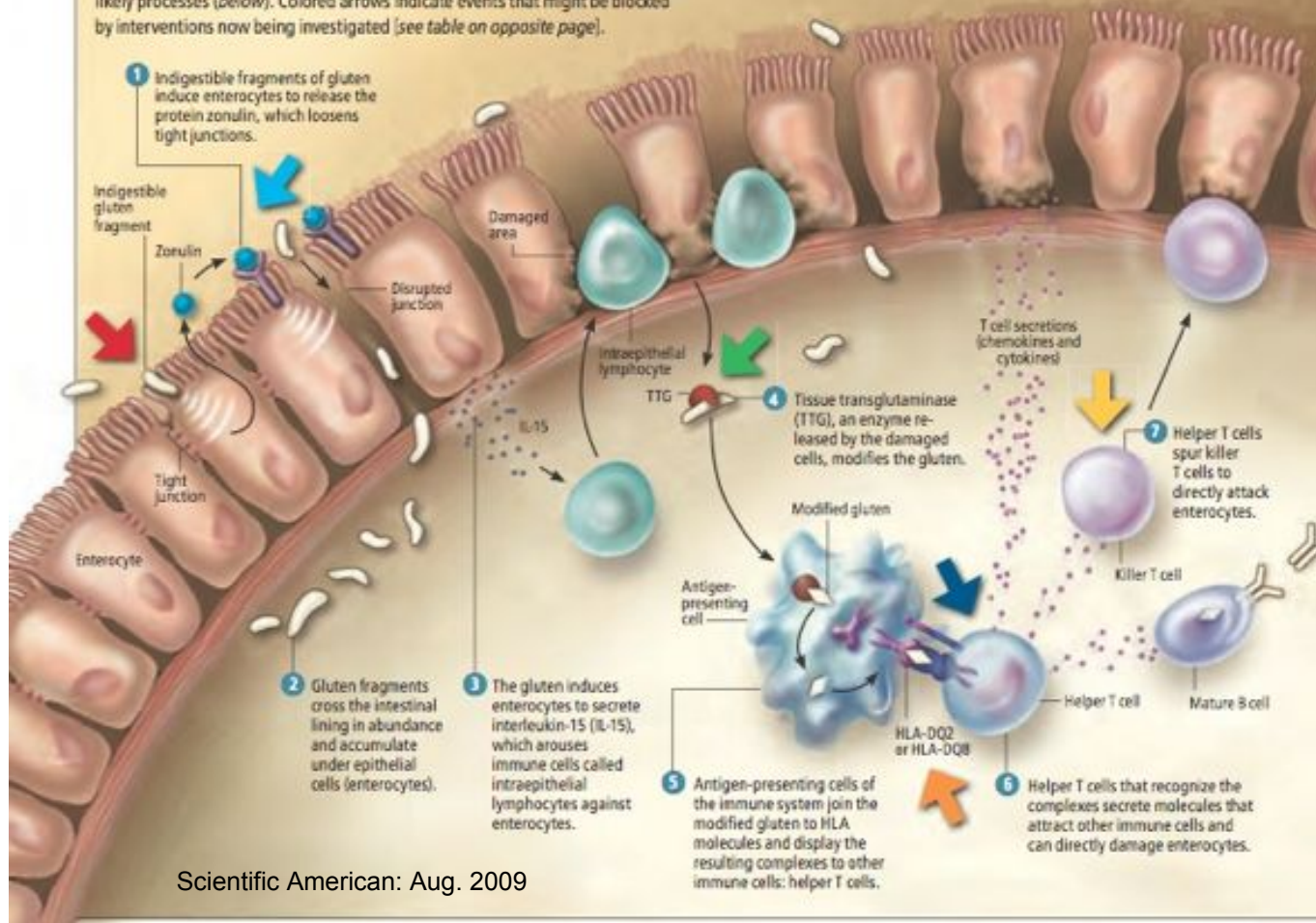
Medical Benefits of Camel's Milk

- **Gastrointestinal Healing**

- Camel milk contains significant amounts of:
 - **Immunoglobulins- Nanobodies**
 - **Lactoferrin**
 - **Lactoperoxidase**
 - **Peptidoglycan Recognition Protein**
 - **Lysozymes**
 - All of which help to restore the normal mucous lining of the intestine, improve the protective abilities of the mucous lining and indirectly bring down inflammation.



Investigators do not know every detail of how the immune system wreaks havoc with the intestinal lining of celiac patients, but they have identified a number of likely processes (below). Colored arrows indicate events that might be blocked by interventions now being investigated (see table on opposite page).



Scientific American: Aug. 2009



Effects of Pasteurization on Camel's Milk

- High heat pasteurization ($>90^{\circ}\text{C}$) has a significant effect on both the antioxidant content, probiotics, and immunoglobulins
- Low heat pasteurization ($>60^{\circ}\text{C}$) preserves most of the antioxidants, but does have an effect on the probiotics and immunoglobulins
- Listing of best forms of Camel Milk (from most nutrient preserved to least.)
 - Fresh Raw/Kefir
 - Frozen Raw/Kefir
 - Low heat Pasteurization
 - Camel milk powder
 - High Heat Pasteurization



Medical Benefits of Camel's Milk

- **Allergies**

- Camels Milk
 - No A1 β -casein
 - No β -Lactoglobulins
 - High amount of immunoglobulins, higher than bovine and breast milk.
 - Reduce the amount of allergic reactions
 - Protective proteins- lactoferrin, lactoperoxidase, NAGase, and PGRP
 - Has been shown to even reverse allergies in severely allergic children to cows milk.
 - Shabo Y, Barzel R, Margoulis M, Yagil R. "Camel Milk for Food Allergies in Children." IMAJ (2005) Vol. 7: 796-798



Medical Benefits of Camel's Milk

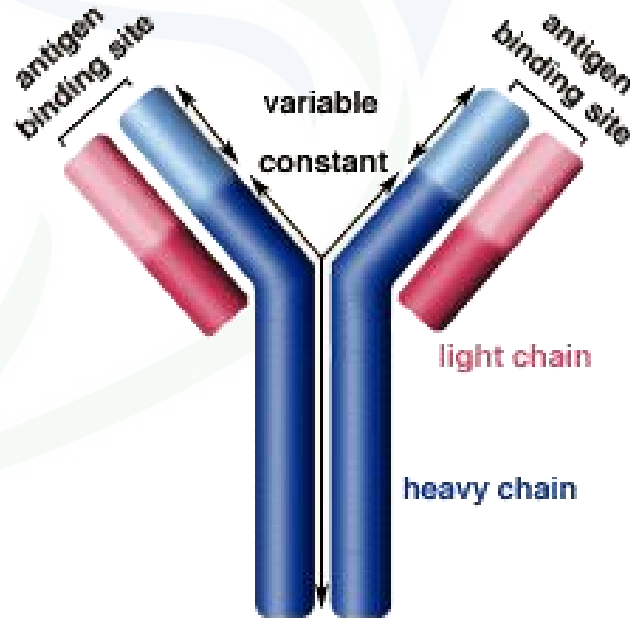
- **Immunological**

- Antibodies are classified as IgM, IgG, IgE. □
 - These antibodies are a part of the adaptive arm of the immune system and work with the innate immune system to identify and remove antigens within the body.
- Camels have unique antibodies called Nanobodies.
 - 2x the amount of antibodies than Breast Milk!
 - The smaller shape of the antibodies allow them to reach areas of the body that our own antibodies cannot reach to find stealth infections
 - Nanobodies are small enough to cross the Blood Brain Barrier!



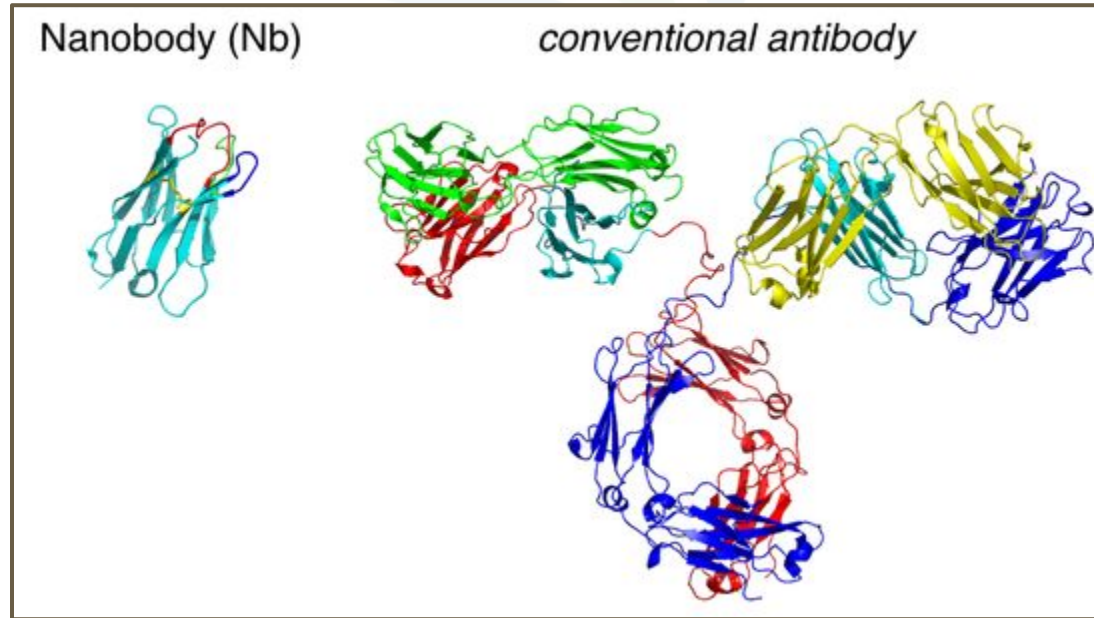
Immunological

- The basic structure of the antibody is a y-shape comprised of heavy-chain and light chain proteins



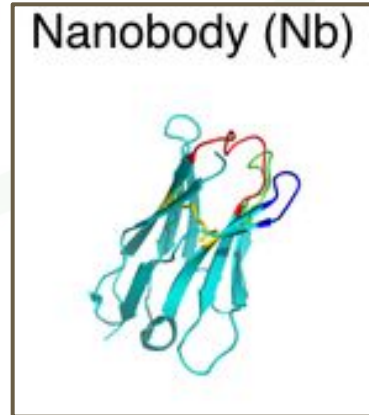
Immunological

- Camels have a unique structure of antibodies called nanobodies, which are made up without the light protein chains.



Immunological

- □ These nanobodies are up to 10x smaller and can penetrate deeper into tissues than conventional antibodies □
- Are a part of the IgG class of antibodies
- Have the potential to cross the Blood Brain Barrier (BBB) □
- Camel nanobodies have been shown to treat ***viral, bacterial, and mycoplasma*** infections.



Medical Conditions treated by Camel's Milk

- **Diabetes**

- Regulates Insulin levels in type I and type II diabetics □
 - High level of insulin in ruminant (cow, camel, etc.) milk. Especially in colostrum. □
 - Although “it is concluded that all milks had insulin, the fact that only camel milk is unaffected by gastric acid allows it to pass into the intestines where it is apparently absorbed.” □
 - Zagorski et al. Insulin in Milk- A Comparative Study (1998) International Journal of Animal Science vol 13: p. 241-244



Medical Conditions treated by Camel's Milk

- **Blood Pressure**

- “Fermented” camels milk contains an exopeptidase that cleaves certain peptide substrates that have ACE inhibitory effects. □
 - Omar A. Al H, Hamad A. Al K. Compositional, Technical and Nutritional Aspects of Dromedary Camel Milk- A Review International Dairy Journal (2010)
doi:10.1016/j.idairy.2010.04.003



Folate Receptor Autoantibodies

- FRAA's have been associated with milk in the diet and Autism Spectrum Disorders.
 - "A Milk-Free Diet Downregulates Folate Receptor Autoimmunity in Cerebral Folate Deficiency Syndrome" □
 - Raemakers V , Sequiera J, Blau N, Quadros E. Developmental Medical Child Neurology (2008) (50) 5: 346-352
 - "Cerebral Folate Receptor Autoantibodies in Autism Spectrum Disorders" □
 - Frye RE, Sequiera JM, Quadros EV, James SJ, Rossignol DA. Molecular Psychiatry (2012) 1-13



Folate Receptor Autoantibodies

- What we know:
 - Folate receptor autoantibodies (FRAA's) are present in human placenta, breast milk, Camel, Goat and Cow's milk.
 - There has been one sample of camel's milk tested by Dr. Quadros showing similar amounts of antigens as bovine milk
 - It is presumed that the FR antigens pass into the body via the GI system.
 - A compromised immune barrier in this system can be considered as the potential cause of the autoimmune response.



Folate Receptor Autoantibodies

- *“Cerebral Folate Receptor Autoantibodies in Autism Spectrum Disorders”* □
 - Frye RE, Sequiera JM, Quadros EV, James SJ, Rossignol DA. Molecular Psychiatry (2012) 1-13
 - This study was a benchmark for Autism Treatment with High Dose Folinic Acid.
 - Families were told to avoid all milk due to the presence of FRAA's.
 - FRAA's tested on Cow's Milk, Goat's Milk, Breast Milk, and Camel Milk by Dr. Quadro's Lab.
 - Found in all of the samples
 - No other milks or food was tested per Dr. Quadros.



Folate Receptor Autoantibodies

Where do the Antibodies come from?

Why are they elevated?

Why are they affecting Folate Receptors?

WHY?



Folate Receptor Autoantibodies

- The reason for the question:
 - Folate Receptor Autoantibodies are found in Cow's Milk and Camel's Milk.
 - Folate Receptor Autoantibodies are correlated with Cerebral Folate Deficiency per Raemaker and Frye's studies.
 - I have treated hundreds of patients with Camel's Milk and have seen amazing gains, not regressions in communication, growth, awareness, allergies, and development.
 - I have patients that have been tested and came up positive for FRAA's and have made significant gains whether on or off of Folinic Acid concurrently.

Is there more to the picture?



Folate Receptor Autoantibodies

In a Word:

YES



Folate Receptor Autoantibodies

- Where do the Autoantibodies come from.
 - The mechanism of Folate Autoantibody initiation is not well understood.
 - The studies demonstrating elevations of FRAA's in Autism did not look at cause of elevation or a complete reduction down to zero when all forms of dairy was removed.
 - FRAA's have been found in Breast Milk as well.
 - Looked into mechanisms of Folate Receptor dysfunction in Neural Tube Defects.

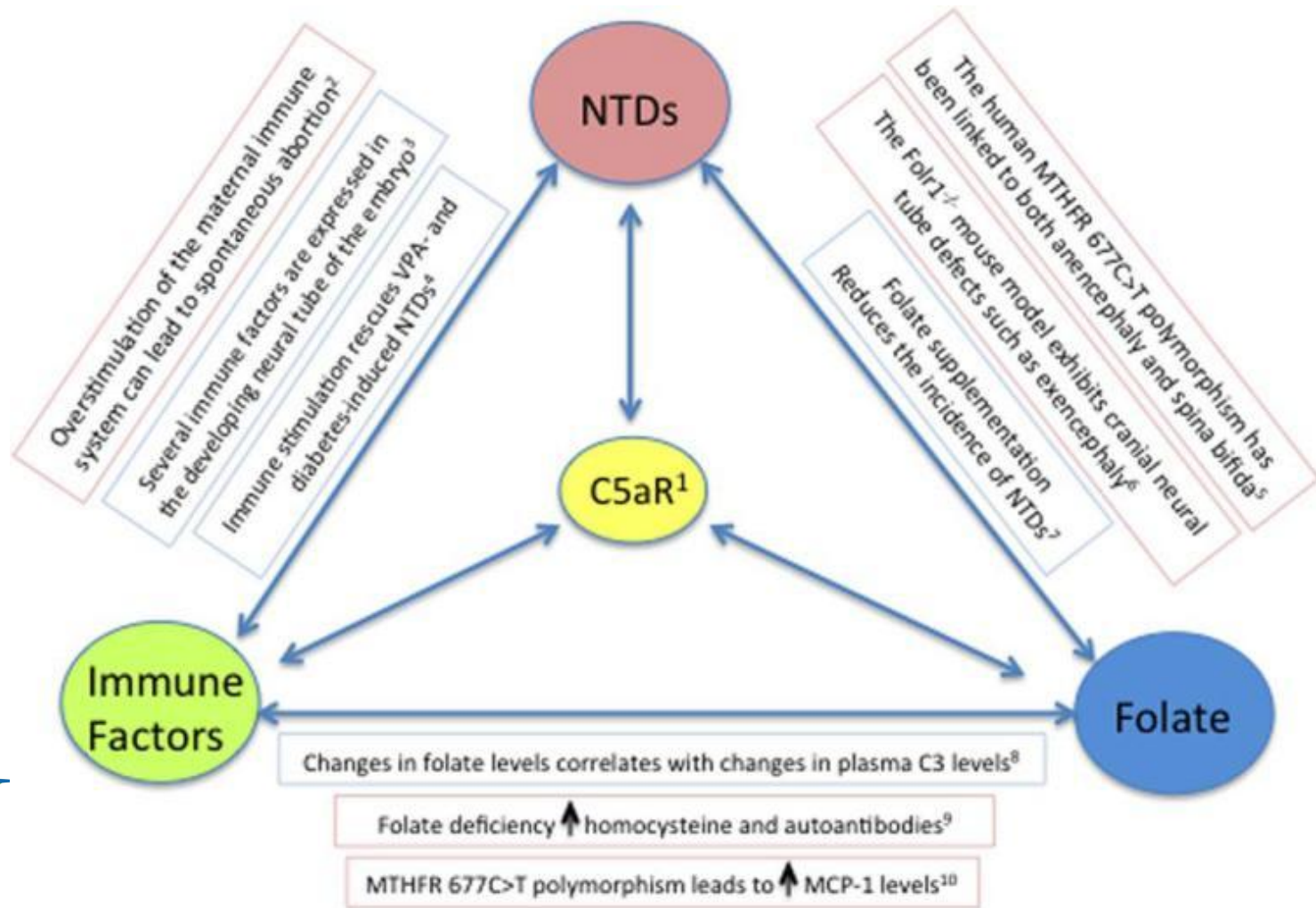


Folate Receptor Dysfunction in Neural Tube Defects

Neural Tube Defects, Folate, and Immune Modulation

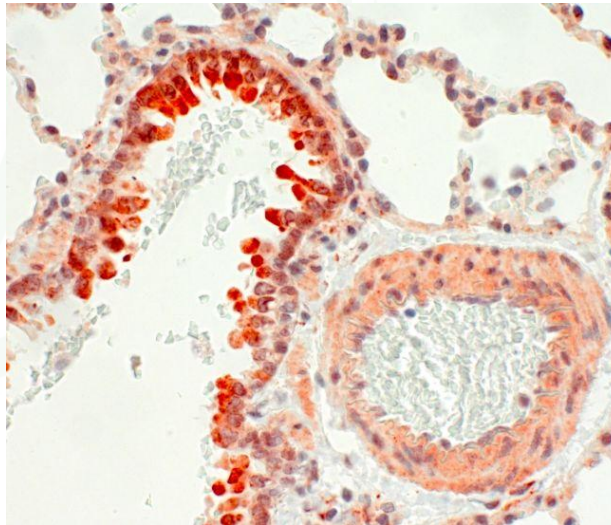
Denny KJ, Jeanes A, Fathe K, Finnell RH, Taylor SM, Woodruff TM. Neural Tube Defects, Folate, and Immune Modulation. *Birth defects research Part A, Clinical and molecular teratology*. 2013;97(9):602-609. doi:10.1002/bdra.23177.





Multiple Mechanisms of Folate Deficiency

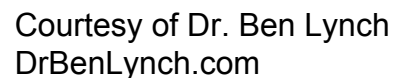
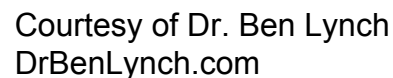
- In the study, the theory of Homocysteinylolation of the Folate Receptor leaving amino acid residues in the folate receptor, stimulating antibody production.

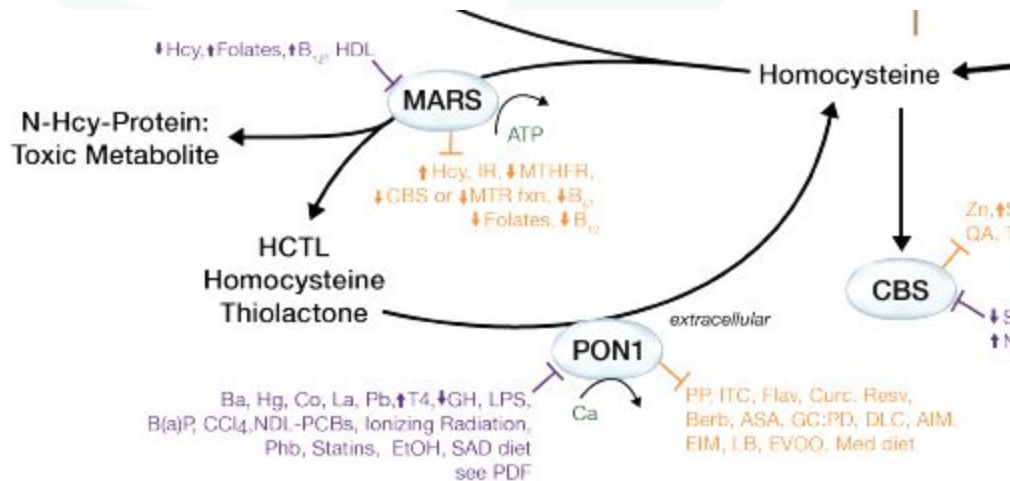


Homocysteinylation

- Elevations of Homocysteine can be a result of poor nutrition, malabsorption, epigenetic variants, or increased demand for methylation (pregnancy, infection, chronic inflammation.)







Multiple Mechanisms of Folate Deficiency

- Could there be any other environmental exposures that could affect the folate receptor and induce autoimmunity other than Homocysteinylation?
 - - I rewatched the presentation by Dr. Stephanie Seneff Phd. MIT CSAIL from Autism One last year.
 - - She discussed the insertion of Glyphosate (Round-up) into peptides and one of the diseases listed was Neural Tube Defects
 - - So I messaged her and asked, **from your research and expertise regarding the protein and changes to folate, could this be a possibility that the Glyphosate induced changes to the receptor and not the presence of the antibody in the milk be the issue?**



Multiple Mechanisms of Folate Deficiency

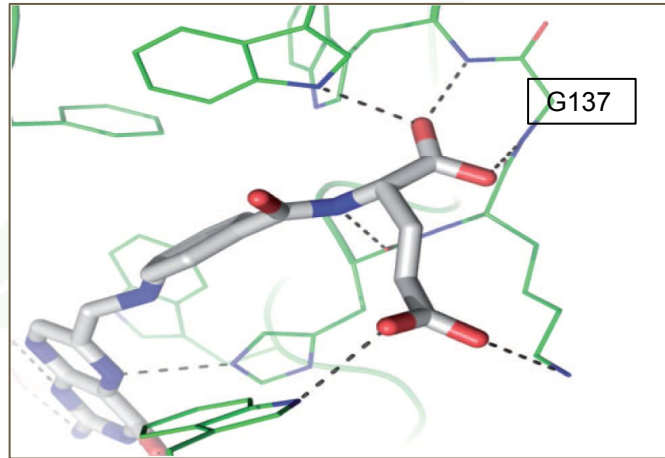
Dr. Seneff's Reply:

- "You may well be right! You inspired me to dig around, and I found the attached article. The important thing to note is that G137 is one of the residues that surrounds the binding site of folic acid/folate.
(see Figure 2c)
- So if G137 gets displaced by glyphosate, it would probably make the receptor both work poorly and be more allergenic."



Multiple Mechanisms of Folate Deficiency

- Not only could it be possible, she went to the next step and showed me exactly where it would happen on the receptor.
- **Study:** *Structural basis for molecular recognition of folic acid by folate receptors* ChenChen1,2*, JiyuanKe1*, X.EdwardZhou1, WeiYi3, JosephS.Brunzelle4, JunLi5, Eu-LeongYong5, H.EricXu1,3&KarstenMelcher1doi:10.1038/nature12327



Folate Receptor Deficiency

- With the multiple mechanisms that can possibly create a Folate Deficiency, is there any relevance of the FRAA's?
 - FRAA's are still an important biomarker of folate receptor changes that are happening, but do not take into account for the multiple mechanisms of causation.
 - The milk that contains FRAA's (Cow, Goat, Breast, Camel) is more of an indicator of the folate and methylation status of the source of the milk.
 - FRAA's are more of a Reactionary mechanism to folate receptor dysfunction then a cause and by restoring proper function or bypassing altogether, improvements can be made.



Folate Deficiency, Methylation, and Autism

- What treatment would improve:
 - Methylation factors (B vitamins, antioxidants, iron)
 - Immune Dysregulation (Autoimmunity)
 - Chronic Infections
 - Gut absorption and Probiotics
 - Glucose regulation (Insulin)





CAMEL'S MILK

THE WHITE GOLD OF THE DESERT!



Camel Milk in the USA

- Camel Milk is produced in the US by a number of farms.
- Questions to ask each individual farm:
 - What do the Camels eat?
 - Grass-fed vs. grain-fed
 - What grains? Gluten-free, Soy/Corn- free, GMO, Organic?
 - Antibiotics/Hormones/Steroids given?
 - Testing
 - Do they test individual batches for contamination, pathogenic bacteria?
 - How often? Is it available to the customer?
 - Ethical Treatment of Camels
 - Where are the camels kept? Pastured, indoors, confined in fenced area?
 - How long are the Camel's milked?
 - How often are the Camel's pregnant?

