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# Immune Function & Autism

**A 2018 study at UC Davis MIND  
Institute found that children with  
autism spectrum disorder (ASD)  
have reduced immune system  
regulation, as well as shifts in their**

# gut microbiota.

## Biomarkers & ASD

A half-day symposium providing insight into research and current trials that point to the potential benefit of medical treatments to address environmentally-triggered impairments associated with autism spectrum disorders.

*Recorded June 1, 2013 at UC Davis MIND Institute Auditorium in Sacramento, California. Videos are courtesy of Autism Research Institute, UC Davis MIND Institute & Autism Speaks.*

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**Is There a Connection Between  
the Immune System and  
Autism?**

## **The ideal immune system will:**

- Recognize all foreign organisms (bacteria, viruses, parasites, fungi, worms).
- Efficiently and rapidly destroy invaders.
- Prevent a second infection with the same microbe (have a good memory).
- Never cause damage to self.

## **Things that can go wrong:**

- Immune deficiency/dysfunction: defective or ineffective response.
- Hypersensitivity: Over-reaction to innocuous foreign material, out of proportion to potential damage (allergy).
- Autoimmunity: Inappropriate reaction towards self, loss of self-recognition.
- Inflammation: Too-vigorous attack against invaders with “bystander” damage to normal tissue.

Dysregulation of immunity in people with autism can lead to any of these four problems.

There is a tendency towards a positive family history of autoimmunity in families – Rheumatoid Arthritis, Thyroiditis – with an ASD child. Many, many types of autoantibodies (against “self” tissues) have been found in ASD children but the significance of the many types of anti-brain antibodies is not yet clear. Several

studies find that some ASD children have low immunoglobulins (IgG, IgM, IgA), and/or low T cell numbers, altered cytokine profiles, and/or low-normal functioning and/or low NK cells; a subset of children have true immunodeficiency. Some children have low serum IgA, predisposing them to respiratory and GI infections.

## **Antibodies are divided up into classes:**

- **IgA:** Mucosal surfaces – if this is low, it predisposes to respiratory and GI infections as well as autoimmunity; it is sometimes low in ASD children
- **IgM:** Rapid response bloodstream antibody made at the beginning of an infection; can be high or low in ASD
- **IgG:** Slower but longer lasting bloodstream antibody; can be high or low in ASD
- **IgE:** Allergy; can be high or normal in ASD

**Conclusion #1:** A child on the autism spectrum with recurrent infections deserves an immune evaluation for immunodeficiency.

**Conclusion #2:** A child on the autism spectrum with eczema, chronic nasal symptoms, asthma,

significant GI symptoms, or recurrent respiratory infections deserves an allergy evaluation for IgE inhalant and food allergies.

## **A few studies published on the immune system and autism:**

The role of immune dysfunction in the pathophysiology of autism

Autoimmune and gastrointestinal dysfunctions: does a subset of children with autism reveal a broader connection?

Association of family history of autoimmune diseases and autism spectrum disorders.

Plasma cytokine levels in children with autistic disorder and unrelated siblings.

Behavioral Correlates of Maternal Antibody Status Among Children with Autism.

Increased serum levels of anti-ganglioside M1 auto-antibodies in autistic children: relation to the disease severity.

Detection of autoantibodies to neural cells of the cerebellum in the plasma of subjects with autism spectrum disorders.

Altered gene expression and function of peripheral blood natural killer cells in children with autism.

Reduced Levels of Immunoglobulin in children with autism correlates with Behavioral Symptoms.

Autoantibodies to cerebellum in children with autism associate with behavior.



## Research on Maternal Immune Activation, Pregnancy & Covid-19

June 1st, 2021 | [COVID-19](#), [Immune Issues](#), [Pregnancy](#), [Webinar](#)

Learn about emerging

## PANS/PANDAS in Children with Autism

August 26th, 2020 | [Health](#), [News](#), [PANS/PANDAS](#)

The information below is from the 2019 ARI webinar, PANS/PANDAS - Research Updates In

## Immunological Issues in ASD - Gestational Influences

November 18th, 2015 | [Genetics](#), [Pregnancy](#), [Webinar](#)

Judy Van de Water, Ph.D., discusses immunological

findings on maternal immune activation and Covid-19. About the speaker: Judy Van de Water, PhD, joined the faculty in the

rare cases, some children may experience the sudden onset of Obsessive-Compulsive Disorder or eating disorders. This pediatric acute-onset

dysregulation during gestation. She examines the etiology of autism and explores the interplay of genetic markers and environmental factors by examining correlations in infections, gestational immune

## **Gastrointestinal Issues and Autism Spectrum Disorders: Serotonin as a Potential Brain-Gut Link**

November 18th, 2014 | [Gastrointestinal, Gastrointestinal, Health, Immune Issues, Nutrition, Webinar](#)

Handouts are online at: <https://www.ariconferenc>  
Free certificates of

## **Inflammation and Novel Therapeutics**

April 30th, 2014 | [Environmental Factors, Health, Immune Issues, Nutrition, Webinar](#)

Certificates of participation are available upon completion of a brief knowledge quiz available online at: <https://www.classmarker.test/start/?>

## **Cross Talk Between Gut & Brain in Autism: Do they understand each other?**

April 23rd, 2014 | [Gastrointestinal, Gastrointestinal, Health, Immune Issues, Nutrition, Webinar](#)

Dr. Fasano considers the interplay of environmental factors and the gut

participation are  
available online  
following successful  
completion of a brief  
knowledge quiz at:  
<https://www.classmarker.com/test/login/> Kara Gross  
Margolis is a pediatric  
gastroenterologist  
whose clinical  
subspecialty

quiz=6ma535fea63d9e38  
Autism is characterized  
by impairment of social  
cognition and  
repetitive behaviors, as  
well as language  
impairment. Evidence

microbiome in autism  
presentation and  
pathogenesis. He  
explains intestinal  
permeability and  
highlights the role that  
environmental factors  
like gluten play in the

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