Celebrating 25 Years of Partnership with The Ted Lindsay Foundation
Understanding Autism — A Journey of Discovery, Hope, and Gratitude

2025 Research Update from The Johnson Center for Child Health and Development

Over the past 25 years, the research team at The Johnson Center has been committed to a simple but profound mission: to better understand the biological basis of autism and improve the lives of individuals and the families it affects. Thanks to the generous and unwavering support of The Ted Lindsay Foundation, we've made significant progress. We are proud to share highlights of what we've accomplished so far—and what lies ahead.

A New Way to Understand Autism

Autism is a complex neurodevelopmental condition that affects about 2% of children in the United States—a number that continues to rise. It's not just a behavioral or psychiatric diagnosis; it is a condition influenced by genetics, the environment, and their intricate interactions, especially during critical periods of brain development before and after birth. Our research has moved beyond simply observing behavior. We've explored the biological underpinnings of autism, especially the role of the immune system, the gut, and the environment. What we've found has the power to reshape how autism is diagnosed and treated.

Key Discoveries So Far

1. The Immune System Link

We discovered that children with autism often have signs of immune dysregulation, including higher levels of inflammation and imbalances in how the immune system responds to challenges. This means that their immune systems may be overactive in some areas and under-responsive in others. These imbalances can influence a child's overall health—affecting things like gastrointestinal function, sleep, behavior, and even how their brain develops and responds to environmental stressors. Understanding this link gives us new insight into autism as a whole-body condition, not just a neurological one, and opens the door to interventions that support immune health as part of a broader treatment plan.

2. Looking at Autism Through a Biological Lens

We've worked to identify biological markers—substances in the body that help diagnose conditions like autism. In one of our largest and most promising studies, we screened over 1,300 proteins in children's blood samples. We found a set of 12 proteins that identified autism with nearly 88% accuracy. This is a major step toward a future where we can identify autism earlier and more precisely—using a simple blood test, allowing clinical and behavioral interventions to begin at a much younger age.

3. Unlocking the Future: Validation Studies and Machine Learning in Autism Research

We are currently analyzing data from our most ambitious biomarker study to date—measuring over **11,000 proteins**, nearly half of the entire human proteome. This validation study builds directly on our earlier findings and is designed to refine and improve the specificity and overall quality of our existing biomarker panel for autism. By analyzing such an extensive range of proteins, we aim to identify those most specific to autism, enhance the **precision and reliability** of future diagnoses, uncover **biological patterns** linked to symptom severity or subtypes, and pinpoint **molecular pathways** that may serve as future therapeutic targets.

To make sense of this vast and complex dataset, we're using **machine learning**—an AI tool that enables intelligent analysis through data-driven learning. This approach allows us to integrate proteomic data with detailed clinical, behavioral, and developmental information to not only detect autism more accurately but also better understand symptom variability, co-occurring conditions, and individual risk profiles—especially when considered alongside genetic and environmental exposures.

Together, these advanced tools pave the way for **personalized, biologically-based autism interventions**, offering families more targeted and effective treatment options than ever before.

4. Ruling Out Unproven Treatments

Our team also conducted one of the first controlled studies on hyperbaric oxygen therapy (HBOT) for autism. While some earlier reports were hopeful, our research showed no consistent benefit. Sharing negative results is just as important—it helps protect families from investing time, energy, and hope into interventions that may not be effective.

5. Understanding Families' Real Experiences

During the COVID-19 pandemic, we explored how children with autism and their caregivers were impacted. We found that many children experienced increased anxiety driven by a range of factors including disrupted routines, loss of in-person therapies and supports, limited social interaction, difficulty communicating through digital platforms, and heightened uncertainty in daily life. Our findings and recommendations were shared with numerous local and national service providers and advocacy groups to highlight how essential ongoing support and services are—especially in times of crisis.

Studying the Exposome: The Next Frontier

With funding from The Ted Lindsay Foundation, our current research focus is to explore the exposome—a term that describes every environmental exposure a person encounters throughout their lifetime, even before birth. These exposures include air pollution, diet, household chemicals, and more. This is important because environmental factors, especially during pregnancy and early childhood, may influence autism risk and symptom severity. By studying the exposome, we hope to uncover environmental 'clues' that contribute to autism. The insights we gain may inform more tailored and effective approaches to care. This will be the first time this level of exposome testing is applied to autism research.

This work would not be possible without the unwavering support of The Ted Lindsay Foundation. From day one, their belief in the importance of our mission has strengthened our efforts and advanced our progress. Mr. Lindsay's legacy—his tenacity, compassion, and dedication—continues to guide us, and his presence is deeply missed.

To the Lindsay Family, the Foundation, its donors, and the entire autism community: Thank you. Your support fuels our work, brings hope to families, and gets us closer to a future where autism is better understood, earlier diagnosed, and more effectively treated.

Together, we are making a difference.

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