

Alessio Fasano, M.D.

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Biographical Information

Alessio Fasano, M.D., a world-renowned pediatric gastroenterologist, research scientist, and entrepreneur, is director of the Center for Celiac Research, and of the Mucosal Immunology and Biology Research Center at Massachusetts General Hospital for Children, and visiting professor of pediatrics at Harvard Medical School. Dr. Fasano's research focuses on the mucosal biology of the gut and transcends the disciplines of microbiology, molecular and cell biology, and physiology. By studying the "cross talk" between enteric pathogens and their hosts, Dr. Fasano's group has elucidated various organs and cell functions involved in health and disease, including inflammation and autoimmunity. Dr. Fasano has published more than 230 peer-reviewed papers and has filed more than 160 patent applications. An elected member of the American Society for Clinical Investigation, he has received numerous awards for his translational science and other achievements including the Harry Shwachman Award from the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition in 2012. He has been named as one of America's Top Doctors by Castle Connolly for five consecutive years (2007-2011) and was a 2005 finalist for the National Institute of Health (NIH) Director's Pioneer Award.

Presentation Abstract (4:30 pm presentation)

Gut-Brain Interaction in Autism Spectrum Disorder: What language do they speak, and do they understand each other?

Physiologists and clinicians alike tend to arbitrarily divide the human body into organs and systems. This approach does not do justice to the harmony and design of our body - a harmonized single entity that works in a very sophisticated, yet straightforward manner. Recently the functional connection between two apparently spatially and functionally distant organs, the intestine and the brain, has been conceptualized with the idea of a gut-brain axis. Many studies have now shown that specific events occurring in the gastrointestinal (GI) tract may have repercussions in the brain and vice versa. Autism Spectrum Disorder (ASD) may represent the archetype of this concept. We know that children with ASD very often suffer GI problems, including irregular bowel movements, gastroesophageal reflux, dysbiosis and food intolerances. It has also been recorded that ASD kids suffer from "leaky gut" and local intestinal inflammation. What remains unclear is whether these conditions are epiphenomena or an integral part of the pathogenesis of ASD. A possible theory that connects the dots and emphasizes the importance of the gut-brain axis in ASD is that a change in the composition of the gut microbiota in ASD kids can cause an increased permeability of the gut barrier with the consequent access of non-self antigens, including gluten and casein, which will instigate an activation of the immune system. As a consequence, immune cells will be activated, and if they stay within the gut mucosa, cause inflammation leading to GI symptoms. However, some of them may be programmed to leave the intestine and travel to specific areas of the brain, where they could cause neuroinflammation, leading to the behavior changes typical of ASD. This lecture will both present some evidence to support this overall theory and outline possible research directions to confirm this overall hypothesis.