

A New Theory on Autism?

Many autism families find their way to Go Dairy Free in search of dietary help with the gluten-free / casein-free (GFCF) diet. As such, we like to keep abreast of studies and news related to autism for viewers. This month, Foods Matter (a magazine for food allergies and intolerances) featured a very interesting article on a new study that may help to connect some of the pieces in the autism puzzle ...

Scientists at Albert Einstein College of Medicine of Yeshiva University have proposed a sweeping new theory of autism that suggests that the brains of people with autism are structurally normal but dysregulated, meaning symptoms of the disorder might be reversible ...

The central tenet of the theory, published in the March issue of Brain Research Reviews, is that autism is a developmental disorder caused by impaired regulation of the locus coeruleus, a bundle of neurons in the brain stem that processes sensory signals from all areas of the body. The new theory stems from decades of anecdotal observations that some autistic children seem to improve when they have a fever, only to regress when the fever ebbs.

Einstein researchers contend that scientific evidence directly points to the locus coeruleus-noradrenergic (LC-NA) system as being involved in autism. "The LC-NA system is the only brain system involved both in producing fever and controlling behaviour," says co-author Dr Dominick Purpura, dean emeritus and professor of neuroscience at Einstein.

The locus coeruleus has widespread connections to brain regions that process sensory information. It secretes most of the brain's noradrenaline, a neurotransmitter that plays a key role in arousal mechanisms, such as the "fight or flight" response. It is also involved in a variety of complex behaviours, such as attentional focusing (the ability to concentrate attention on environmental cues relevant to the task in hand, or to switch attention from one task to another); indeed it activates almost all higher-order brain centres that are involved in complex cognitive tasks.

Drs Purpura and Mehler hypothesise that in autism, the LC-NA system is dysregulated by the interplay of environment, genetic, and epigenetic factors (chemical substances both within as well as outside the genome that regulate the expression of genes). They believe that stress plays a central role in dysregulation of the LC-NA system, especially in the latter stages of prenatal development when the foetal brain is particularly vulnerable.

As evidence, they point to a 2008 study, published in the Journal of Autism and Developmental Disorders, that found a higher incidence of autism among children whose mothers had been exposed to hurricanes and tropical storms during pregnancy. Maternal exposure to severe storms in mid-gestation resulted in the highest prevalence of autism.

Drs Purpura and Mehler believe that, in autistic children, fever stimulates the LC-NA system, temporarily restoring its normal regulatory function. "This could not happen if autism was caused by a lesion or some structural abnormality of the brain," says Dr Purpura. The researchers do not advocate fever therapy (fever induced by artificial means), which would be an overly broad, and perhaps even dangerous, remedy. Instead, they say, the future of autism treatment probably lies in drugs that selectively target certain types of noradrenergic brain receptors or, more likely, in epigenetic therapies targeting genes of the LC-NA system. "If the locus coeruleus is impaired in autism, it is probably because tens or hundreds, maybe even thousands, of genes are dysregulated in subtle and complex ways," says Dr Mehler. "The only way you can reverse this process is with epigenetic therapies, which, we are beginning to learn, have the ability to coordinate very large integrated gene networks."

Read more on this study at The Medical News. Above logo from the Autism Speaks website - a great resource for autism information, news, and events.