

## **Genetics, paternal age and the gut microbiome: latest research in autism**

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We have known for decades that genetic factors are the primary reason why some people receive a diagnosis of autism spectrum disorder (ASD) and others do not. In recent years, large-scale genetic studies, including genome sequencing in families with a child on the spectrum, have identified many genes that contribute to the disorder. These discoveries are providing glimpses of the underlying biology of autism, and will increasingly facilitate screening for known genetic variants in the clinic. Genetic studies are also shining light on the role of advanced paternal age in ASD. The prevailing view is that the higher rate of ASD in children of older fathers is due to newly arising ("de novo") mutations, which occur more frequently in older men, but other factors may also contribute. For example, delayed fatherhood may be a by-product of carrying a higher than average number of ASD gene variants. Finally, the potential role of the gut microbiome in ASD is gaining attention due to evidence that the gut-brain axis is involved in brain development, and because gastrointestinal conditions are common in children with ASD. This talk will provide an overview of recent progress in these three important areas of autism research, and will discuss where the field is headed next.