The Neurobiology of Autism: A Comprehensive Overview from Johns Hopkins in Psychiatry and Neuroscience

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder that affects communication, social interaction, and behavior. It is estimated to affect 1 in 54 children in the United States. The exact cause of ASD is unknown, but it is believed to be caused by a combination of genetic and environmental factors.

The Neurobiology of Autism (The Johns Hopkins Series in Psychiatry and Neuroscience) by Joan Nathan

4.5 out of 5

Language	: English
File size	: 3298 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 419 pages

In recent years, there has been a growing body of research on the neurobiology of ASD. This research has helped to identify some of the brain structures, genetic influences, and environmental factors that contribute to the disorder.

Brain Structures

Several brain structures have been found to be abnormal in people with ASD. These structures include the amygdala, the hippocampus, and the prefrontal cortex.

The amygdala is a small almond-shaped structure located in the medial temporal lobe. It is involved in the processing of emotions, particularly fear and anxiety. Studies have shown that the amygdala is smaller in people with ASD than in people without the disorder.

The hippocampus is a seahorse-shaped structure located in the medial temporal lobe. It is involved in the formation and retrieval of memories. Studies have shown that the hippocampus is smaller in people with ASD than in people without the disorder.

The prefrontal cortex is located in the front of the brain. It is involved in a variety of cognitive functions, including planning, decision-making, and social interaction. Studies have shown that the prefrontal cortex is less active in people with ASD than in people without the disorder.

Genetic Influences

ASD is a highly heritable disorder, meaning that it is passed down from parents to children. Studies have identified a number of genes that are associated with ASD. However, no single gene is responsible for the disorder.

The most common genetic risk factor for ASD is a mutation in the CHD8 gene. This gene is involved in regulating the expression of other genes. Mutations in the CHD8 gene can lead to changes in the structure and function of the brain.

Other genes that have been associated with ASD include the FMR1 gene, the MECP2 gene, and the TSC1 gene. These genes are involved in a variety of cellular processes, including protein synthesis, cell growth, and cell division. Mutations in these genes can lead to changes in the development and function of the brain.

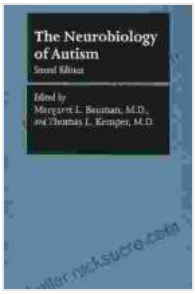
Environmental Factors

In addition to genetic factors, environmental factors are also thought to play a role in the development of ASD. These factors include prenatal exposure to toxins, such as lead and mercury, and maternal stress during pregnancy.

Prenatal exposure to toxins can damage the developing brain. Lead and mercury are both neurotoxicants, which means that they can damage the nervous system. Exposure to these toxins can lead to a variety of neurological problems, including ASD.

Maternal stress during pregnancy can also increase the risk of ASD. Stress can release hormones that can cross the placenta and reach the developing fetus. These hormones can affect the development of the brain and increase the risk of ASD.

ASD is a complex neurodevelopmental disorder that is caused by a combination of genetic and environmental factors. Research on the neurobiology of ASD has helped to identify some of the brain structures, genetic influences, and environmental factors that contribute to the disorder. This research is ongoing and it is hoped that it will lead to new treatments and interventions for ASD.



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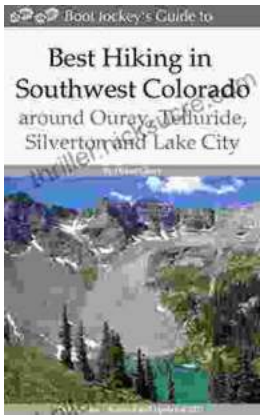

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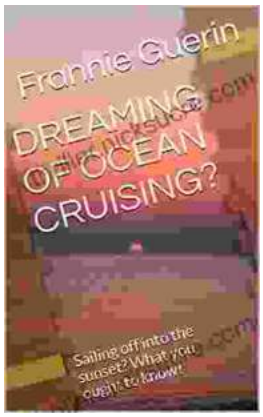

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