



Autism BrainNet

Advancing research through the gift of brain donation

April 6, 2023

Message from David G. Amaral, Scientific Director of Autism BrainNet



As I'm sure many of you know, April is Autism Awareness Month or, if you prefer, Autism Acceptance Month. Because of much coverage in various forms of media, the characteristics of autism are becoming more familiar to the general public and acceptance and accommodation of autistic individuals is improving. One area that has not received much attention is the value of brain research as a step toward decreasing disability in autism. In particular, the value of studying donated postmortem brain tissue.

Autism BrainNet believes that by working with investigators around the world who are using donated tissue for state-of-the-art research, new targets for treatment will be found.

[Read more](#)

SCIENCE

A postmortem brain study pinpoints specific cell types in the temporal cortex where gene expression is altered in autism – revealing changes in neuronal communication and neuroinflammation



A postmortem brain study uncovered autism-related changes in gene expression in specific neurons of the superior temporal gyrus (STG) — an area of the temporal cortex implicated in autism, language processing, and social perception.

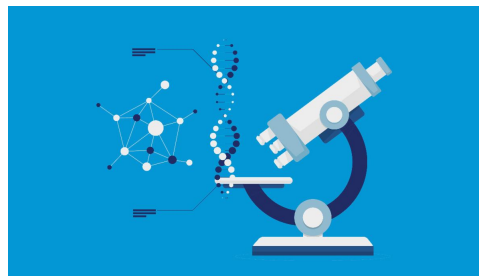
The collective findings help pinpoint pathways and genes directly linked to autism, and lead to a better understanding of the development of autism over the human lifespan.

[Read more about this study](#)

Postmortem brain study compares immune-related gene alterations across six brain disorders including autism

The immune system and the brain have a close relationship.

A study of over 2,000 postmortem brain samples identified alterations in immune system–related genes that are specific to autism and other changes that are shared across brain disorders.



[Read more about the study](#)

Autism: Findings from postmortem brain tissue research

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Autism: Findings from Postmortem Brain Tissue Research
Autism spectrum disorder is a neurodevelopmental condition defined by challenges in social interactions and restricted or repetitive behaviors and interests. Autism is linked to changes in the structure and function of the brain. Research using donated postmortem brain tissue helps researchers identify cellular, genetic, and molecular changes in the brains of autistic people.

**Cellular Research: Key Findings**
Different types of cells in the brain have been implicated

- Neurons – cells of the nervous system that process information^{1,2}
- Glial cells – cells that support the function of neurons and support the brain's response to injury and inflammation^{3,4}

Neuron structure, number, connectivity, and neurotransmission

- Changes in the number and size of neurons in several regions of the brain^{5,6}
- Changes in the number of connections on individual neurons⁷
- Changes in neurotransmitters, which are brain chemicals that send or inhibit communication between neurons⁸
- Changes in brain chemicals, such as enzymes that regulate social behavior, sleep, appetite, and emotion^{9,10}

¹These findings suggest that autism affects a variety of cell types and circuits, that control brain communication and the immune response in the brain.

**Genetic and Molecular Research: Key Findings**
DNA sequence and activity

- Changes in the DNA of brain cells that occur during fetal brain development. These changes, which are called "somatic mutations," can affect parts of the DNA that control the activity of genes and may increase a person's chance of having autism.¹¹
- Changes in DNA sequence that result in altered proteins.¹²
- Decreased activity of genes that control neural communication.¹³
- Increased activity of genes that regulate immune functions.¹⁴

Gene regulation

- Changes in epigenetic processes that affect how genes are turned on and off.¹⁵

¹¹These findings suggest that in autism, changes in gene activity can affect different aspects of brain functioning, such as neural communication and immune responses. Some changes may be due to genetic mutations, whereas others, called epigenetic changes, may be caused by interactions between the genes and the environment.

Autism BrainNet facilitates innovative, high-quality research on donated postmortem brain tissue to better understand the biological causes of autism and related neurodevelopmental conditions.

This new information handout provides an overview of what researchers are learning by studying postmortem brain tissue and the goals of future research.

We are grateful to all the donors and their families whose generosity makes this research possible.

[Read and download the research findings handout](#)

COMMUNITY EVENTS

Thank you to all the families who stopped by the Autism BrainNet booth to learn more

Autism BrainNet joined families at multiple community events nationwide, including the Autism Society of North Carolina conference, the CARD of Florida conference, the Children's Hospital of Philadelphia resource fair, the EIs for Autism Foundation conference, and the Autism Science Foundation Day of Learning.

We are grateful to all the families and providers who stopped by the Autism BrainNet booth to learn more about our mission.



[Learn more](#)

DONOR RESOURCES



Autism BrainNet makes the [donation process](#) as simple as possible for every family. Donor families are treated with respect and compassion and provided with ongoing support.

We have developed resources to help you and your family plan and communicate your intent to become a brain donor for Autism BrainNet.

We hope you find these resources helpful. [Learn more](#)

HELPLINE

Contact us, we are here to help.

If you have questions about making a donation or the donation process, call our 24 hour helpline:

1-877-333-0999

If you have questions about Autism BrainNet, email us at:

info@autismbrainnet.org

STAY CONNECTED



<https://autismbrainnet.org>

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