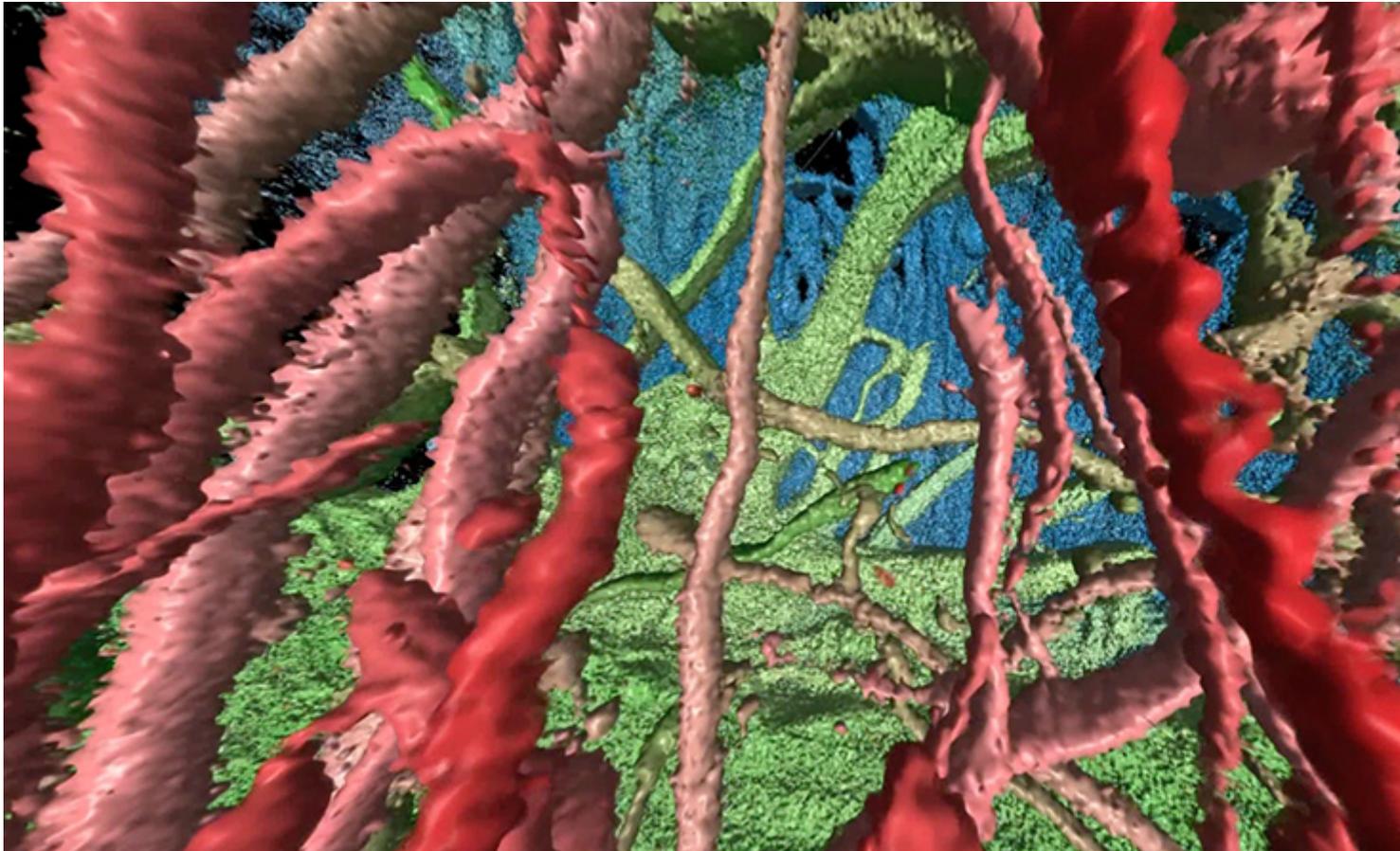


Neuroscience research at Novartis ^[1]

Meeting the challenges of treating neurodegenerative, psychiatric and neurodevelopmental diseases with science and technology.

Imagine being able to recreate a piece of your brain in a lab to understand how your brain really works. Our neuroscience researchers are harnessing revolutionary new technologies - including the ability to grow mini-brain organoids in the lab - to build human models of neurological disease.



A super-resolution microscopy image of astrocytes in a brain organoid. Credit Max Salick

Psychiatric and neurodegenerative diseases place a heavy physical, emotional and economic burden on patients and their families. We believe that we can make new treatments that will modify the course of disease and dramatically improve patient lives.

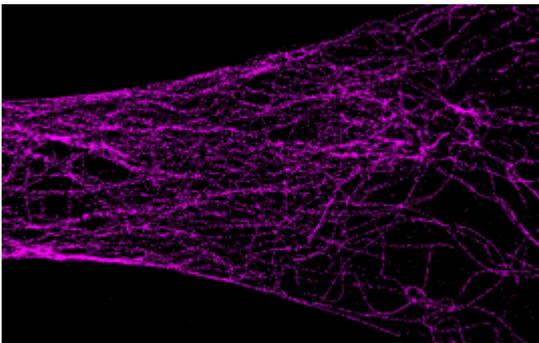
Neuroscience research at Novartis is focused on three primary areas of research:

- In children, we are focusing on spinal muscular atrophy (SMA), Rhatt syndrome, autism

spectrum disorders, intellectual disabilities and epileptic encephalopathies.

- In adult psychiatry, we are focusing on bipolar disorder, depression, substance use disorders and schizophrenia.
- In neurodegeneration, we are working on Alzheimer's disease [2], Parkinson's disease, frontotemporal dementia and several rare monogenic diseases. We are also working to improve the treatment of multiple sclerosis.

To guide drug discovery and research efforts, we use technologies that enable us to develop models of disease that are more predictive by making them more human. For instance, we take skin or blood cells from patients and, using our induced pluripotent stem cell platform, convert them into neurons and then into miniature brain-like organoids [3]. In parallel, we also have the capacity to manipulate neural circuits using optogenetics - the use of light to control the activity of single neurons.



Discovery [4]

Using Super-Resolution Microscopy To See Neurodegeneration [2]

We are also developing gene therapies [5] to address genetic conditions, especially diseases caused by the mutation of a single gene. Gene therapy works by replacing a missing or defective gene with a working copy that makes a functional protein, thereby halting disease progression.

“We now have the scientific tools to detect the earliest steps of brain pathologies and to ask what influences them. What genes? What pathways? If we can understand how disease starts, or what accelerates the disease, we have a hint at how to stop it,” says Fiona Elwood, an expert in neurodegeneration who co-leads neuroscience research along with Gopi Shanker, an expert in psychiatry.

To succeed, we need to be daring and we need the best people to work on these problems. It won't be easy or fast, but we believe it's possible and we are committed to helping patients in need.

Reimagine medicine with Novartis

[Learn about opportunities to join our team](#) [6]

Source URL: <https://www.novartis.com/our-science/research-disease-areas/neuroscience>

Links

[1] <https://www.novartis.com/our-science/research-disease-areas/neuroscience>

[2] <https://www.novartis.com/stories/discovery/using-super-resolution-microscopy-see-neurodegeneration>

[3] <https://www.novartis.com/stories/from-our-labs/building-brain-organoids-shed-light-disease>

[4] <https://www.novartis.com/stories/discovery>

[5] <https://www.novartis.com/our-focus/cell-and-gene-therapy/delivering-promise-cell-and-gene-therapy-patients>

[6] <https://www.novartis.com/careers/career-search#division=NIBR&keyword=Neuroscience>