

Dr. Constanze Depp
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2025 Finalist: Dr. Constanze Depp

Constanze Depp studied Biosciences with a major in Neuroscience at the University of Heidelberg, Germany. She earned her PhD at the University of Göttingen, working in the laboratory of Klaus-Armin Nave at the Max Planck Institute for Experimental Medicine.

Her doctoral thesis, which revealed how myelin dysfunction drives amyloid deposition, was recognized with the Otto Hahn Medal of the Max Planck Society and the Peter-Hans Hofschneider Prize.

Her research focuses on the cellular and molecular mechanisms underlying Alzheimer's disease. She is currently a postdoctoral research fellow in Beth Stevens' laboratory at the Broad Institute of MIT and Harvard, and at Boston Children's Hospital/Harvard Medical School, where she investigates the role of microglial aging in neurodegeneration.

Essay: "White matters arising: Rethinking Alzheimer's disease through the lens of myelin"

Constanze Depp's research explores the role of myelin – the insulating layer around nerve fibers in the brain – and oligodendrocytes, the cells that produce it, in Alzheimer's disease. Alzheimer's disease is marked by the accumulation amyloid-beta plaque deposits, but why aging drives this remains unclear.

Using in vivo models, Constanze Depp identified myelin degeneration, which naturally occurs with age, as an upstream risk factor for amyloid deposition. When myelin deteriorates, axons become damaged, leading them to produce more amyloid-beta. At the same time, microglia – the brain's resident immune cells, which normally associate with amyloid plaques to limit their growth – become distracted by nearby myelin damage.

In collaboration with Andrew Octavian Sasmita, Constanze also investigated whether oligodendrocyte could play a more direct role in amyloid deposition by producing amyloid themselves – a process previously thought to occur only in neurons. Using a genetic approach, they demonstrated that oligodendrocytes contribute significantly to the pool of amyloid-beta. Constanze's work provides a new perspective in Alzheimer's research, placing oligodendrocytes at the center of disease