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Researchers in Australia Ã¢â?¬Å?bioprintÃ¢â?¬Â• living brain cell networks in lab

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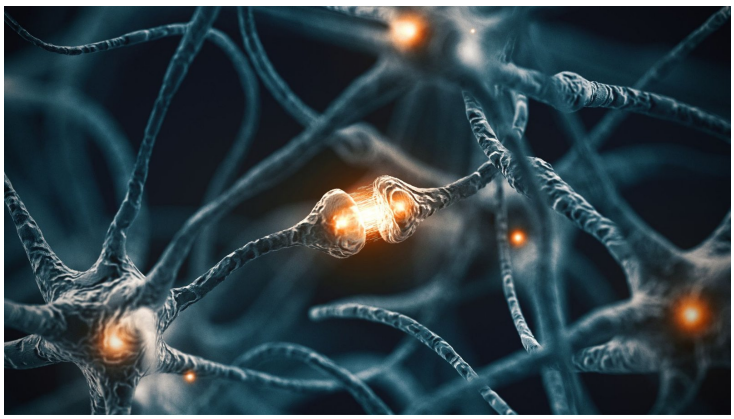
Bioprinted 3D neural networks are likely to be a promising platform for studying how nerve networks form and grow



Engineers at Australia's Monash University have successfully used “bioinks” containing living nerve cells (neurons) to print 3D nerve networks that can grow in the laboratory and transmit and respond to nerve signals.

Using a tissue engineering approach, and bioprinting with two bioinks containing living cells and non-cell materials respectively, the researchers were able to mimic the arrangement of grey matter and white matter seen in the brain.

While two-dimensional nerve cell cultures have previously been used to study the formation of nerve networks and disease mechanisms, those relatively flat structures don’t reflect the way neurons grow and interact with their surroundings.

The networks grown in this research closely replicated the 3D nature of circuits in a living brain, where nerve cells extend processes called neurites to form connections between different layers of the cortex.

The presence of detectable electrical activity in tissue engineered 3D networks represents a significant step forward in the field of neuroscience and bioprinting.

Bioprinted 3D neural networks are likely to be a promising platform for studying how nerves and nerve networks form and grow, investigating how some diseases affect neurotransmission, and screening drugs for their effects on nerve cells and the nervous system.