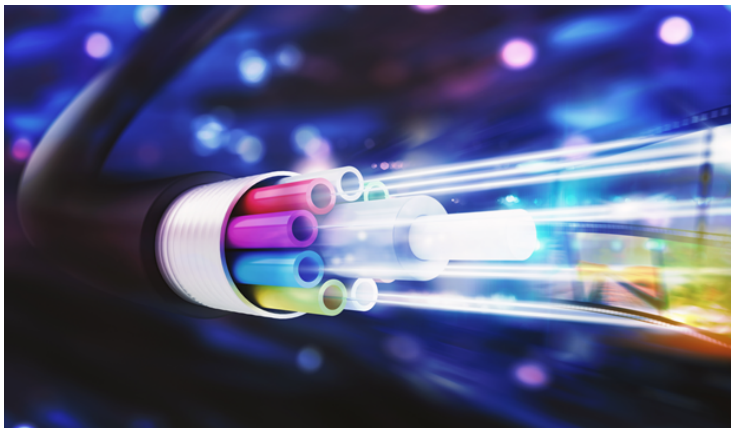
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ASIA EDITION

Korea develops brain-mimicking interface to study neurological diseases

July 15, 2021 | News

It has an electrode bundle to read brain signals and a microfluidic channel to deliver drugs to the brain



A research team and collaborators at the Korea Advanced Institute of Science and Technology has revealed a newly developed hydrogel-based flexible brain-machine interface.

To study the structure of the brain or to identify and treat neurological diseases, it is crucial to develop an interface that can stimulate the brain and detect its signals in real time.

However, existing neural interfaces are mechanically and chemically different from real brain tissue. This causes foreign body response and forms an insulating layer (glial scar) around the interface, which shortens its lifespan.

To solve this problem, the research team has developed a ‘brain-mimicking interface’ by inserting a custom-made multifunctional fiber bundle into the hydrogel body.

The device is composed not only of an optical fiber that controls specific nerve cells with light in order to perform optogenetic procedures, but it also has an electrode bundle to read brain signals and a microfluidic channel to deliver drugs to the brain.

“This research is significant in that it was the first to utilize a hydrogel as part of a multifunctional neural interface probe, which increased its lifespan dramatically,” said the research team. “With our discovery, we look forward to advancements in research on neurological disorders like Alzheimer’s or Parkinson’s disease that require long-term observation.”