

Researchers in Australia have successfully harnessed the power of seaweed to help repair damaged brain tissue caused by injury or stroke.



The remarkable study, published by **Nature Scientific Reports**, successfully used the sugars in the marine algae to develop new techniques to assist the brain in healing itself naturally after trauma. The researchers combined a natural anti-inflammatory **polysaccharide**, or sugar molecule, found in seaweed with short peptides (proteins) to create a scaffold that matches the structure of healthy brain tissue.

Healthy cells exist in this scaffold that is mostly water with proteins forming a web, known as hydrogel.

The “hydrogel scaffold” was created by Dr. Richard Williams from RMIT University and Associate Professor David Nisbet from the ANU, which stops scar tissue from forming, while promoting healing at the same time.

“Traumatic brain injury results in devastating long-term functional damage as the natural inflammatory response to injury prevents regrowth,” says Williams. “This stops or prevents the healing process. So, it’s critical that you find a natural way to stop the inflammation and scarring, yet encourage healing.”

The study used fragments of the seaweed proteins to form an artificial hydrogel that the body recognizes as healthy tissue. The web like tissue was then formed with sugars found in

the algae to create the anti-inflammatory hydrogel system.

They were then able to inject the hydrogel scaffold into a damaged brain, with results they surprised even the researchers.

“Incredibly, it had a positive effect on cells a long way from the wound. This potentially allows an entirely natural, biomaterial approach to treat the damage caused by traumatic brain injury and stroke by allowing the brain to repair itself,” Williams says.

The breakthrough study revealed that seaweed not only tastes delicious but that it has medicinal purposes as well. The seaweed properties are remarkably able to stop scar tissue forming and the scaffold lets the cells grow, hopefully reversing the brain tissue damage caused by trauma or a stroke.



“For the first time ever we have shown that we can engineer a tissue construct that allows regrowth in damaged brain tissue, increasing for repair and regeneration,” Nisbet says.

The two researchers are now taking the successful results of their study and exploring how the treatment can be applied to other technologies, such as 3D bioprinted implants. This would help to replace damaged muscles, nerves, and bones.

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Summary



Article Name

Is Seaweed the Answer to Brain Damage?

Description

Two researchers in Australia have discovered that properties in seaweed can be used to help reverse brain tissue damage and encourage healing.