Peptides helping researchers in search for Parkinson's disease treatment

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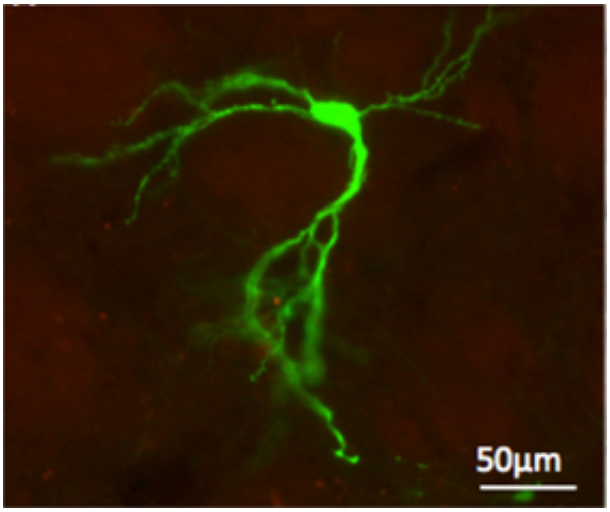


Neurons shown above, and below an image of the peptide tissue scaffold.

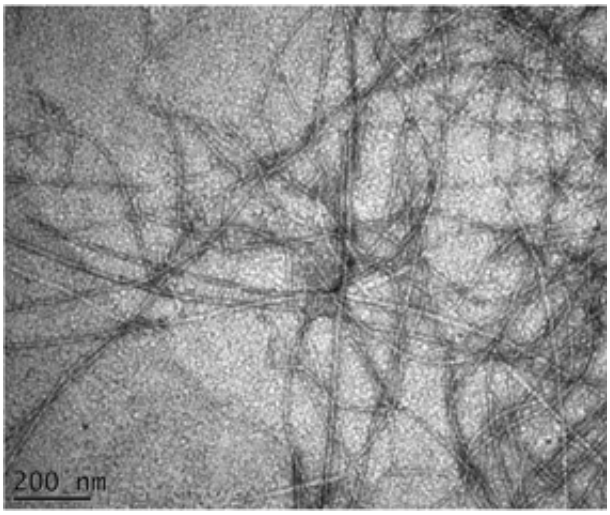
(Medical Xpress)—Australian researchers have taken the first step in using bioactive peptides as the building blocks to help 'build a new brain' to treat degenerative brain disease.

Deakin University biomedical scientist Dr Richard Williams is working in a team with Dr David Nisbet from the Australian National University and Dr Clare Parish at the Florey Neuroscience Institute to develop a way to repair the damaged parts of the brain that cause Parkinson's disease.

Parkinson's disease develops when the brain cells (or neurons) that produce the chemical dopamine die or are damaged. Dopamine neurons produce a lubricant that helps the brain transmit signals to the body that control muscles and movement. When these cells die or are damaged the result is the shaking and muscle stiffness that are among the common symptoms of the disease.

"We are looking at a way of helping the brain to regenerate the dead or damaged cells that transport dopamine throughout the body," Dr Williams said.

"Peptides help the body heal itself, providing many positive benefits for health, particularly in regenerative medicine; this is why the sports people were using them to recover more quickly in the current doping scandal."



Peptides are both the building blocks and the messengers of the body;

the team has used them to mimic the normal brain environment and provide the chemical signals needed to help the brain function.

"Peptides stick together like Lego blocks, so in the first stage of the project we have been able to make a three dimensional material or tissue scaffold that provides the networks cells need to grow; but the peptides also carry instructions in the form of chemical signals which tell the cells to grow into new neurons," Dr Williams explained.

"Importantly, this material has the same consistency as the brain, does not cause chronic inflammation and is non-toxic to the body.

"Our aim is to use this scaffold material to support the patient's own stem cells that could be turned into dopamine neurons and implanted back into the brain. We expect that when implanted the material and stem cells would be accepted by the brain as normal tissue and grow to replace the damaged or dead cells."

While the research is not yet complete, Dr Williams is excited by the possibilities this work offers to the treatment of degenerative conditions.

"It is no secret that we are living longer, and with this we are seeing an increase in many conditions that come about because of ageing such Parkinson's. By developing biomaterials, like the ones we are working on, it could be possible to help the body to regenerate and provide an improved quality of life to the older members of our community," he said.

"This work can also be adapted to other parts of the body which struggle to repair themselves, such as new cartilage for joints, muscle and heart cells, bones and teeth. Ultimately, it will be like taking your car to the garage to have new parts fitted to replace the worn out ones."

The results of the first stage of this Australian Research Council funded project will be published in the international journal *Soft Matter*.

Provided by Deakin University