

# Cell-based therapy success could be boosted by new antioxidant

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Cell therapies being developed to treat a range of conditions could be improved by a chemical compound that aids their survival, research suggests.

Lab tests found that the man-made molecule - a type of antioxidant - helps to shield healthy [cells](#) from damage such as would be caused when they are transplanted into a patient during cell [therapy](#).

Such procedures are already used to treat people with blood disorders as well as to grow skin grafts for patients with severe burns.

The newly tested compound is 10 times more effective at protecting cells from damage than the most powerful antioxidant found in nature, the study found.

As many as 90 per cent of cells can be damaged or killed during the transplantation process. This can affect the likelihood of the treatment's success.

Experts say that pre-treating cells before they are transplanted into patients could help to improve success rates of cell-based therapies.

Researchers are seeking to develop such approaches to treat conditions including Parkinson's disease and multiple sclerosis.

Scientists at the University of Edinburgh exposed cells to a toxic

substance, mimicking the shock that cells experience when transplanted. They then tested whether treating cells with antioxidants could protect them from damage.

They found the new synthetic compound - called Proxison - rescued as many as 90 per cent of cells from death. Studies with zebrafish also found the man-made super-antioxidant can protect cells from death in a living animal.

More than 10 times the concentration of the most powerful natural antioxidant tested was needed to achieve the same result.

Researchers are interested in whether antioxidants can help boost the chances that a range of cell therapies will work. Many more patients may be able to benefit from these treatments if cell survival could be significantly improved.

Proxison was developed by the Aberdeen-based biotechnology company Antoxis, which provided funding for the study.

The new antioxidant was designed based on a natural compound found in fruit and vegetables. The team made small modifications to the chemical structure to generate a super-antioxidant that they hope to develop into a potential new drug.

The research is published in the journal *Scientific Reports*.

Lead researcher Dr Tilo Kunath, of the Medical Research Council Centre for Regenerative Medicine at the University of Edinburgh, said: "We found Proxison to be a potent antioxidant that is very effective at protecting cells from oxidative stress and free radical damage."

Professor Andy Porter, Chair of Antoxis Ltd, said: "Scientists from both

academic and commercial spheres are at the forefront of developing new cell based therapies for a range of debilitating diseases. However, there remain a number of hurdles that we need to overcome before we can fully exploit the potential of this exciting approach in patients.

"This excellent work in Edinburgh provides a significant step forward in removing one of these hurdles with the potential to increase the efficacy of [transplanted cells](#) in patients and allow more [patients](#) to be treated from precious resources."

**More information:** Nicola J. Drummond et al, A synthetic cell permeable antioxidant protects neurons against acute oxidative stress, *Scientific Reports* (2017). [DOI: 10.1038/s41598-017-12072-5](https://doi.org/10.1038/s41598-017-12072-5)

Provided by University of Edinburgh

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