

New drug transforms transplant surgery

Divya Gandhi

City scientist part of team that used hydrogel to prevent organ rejection

In a discovery that could possibly revolutionise the complex process of organ transplant, a scientist from city-based inStem (Institute for Stem Cell Biology and Regenerative Medicine) along with an international team, has shown it is possible to stop graft rejection, using a simple water-based gel.

Vulnerable to disease

The first prerequisite in transplant surgery – whether of limbs, kidneys or other organs – is to switch off the body's immune response to prevent organ rejection.

But immunosuppressant drugs, which often have to be taken for life, hugely impact the body, making it vulnerable to disease and damaging certain organs in the long term.

But a “hydrogel”, developed by Principal Investigator, inStem, Praveen Kumar Vemula and his team, resolves both issues: the gel delivers immunosuppressant drugs “on-call” – precisely where and when it is needed – therefore saving the body from being saturated with drugs, he told *The Hindu*.

He co-authored the paper on this discovery, published in the latest edition of *Science Translational Medicine*.

Localised treatment

When injected under the skin in a limb-transplant site in rats, the hydrogel released drugs when it detected an immune response, protecting the transplanted organ for 100 days, compared to 33.5 days in those who only received the drug.

“If we have succeeded with transplanted limbs, which have multiple types of tissues like skin bone and muscle, we should be able to succeed with less complex organ tissue systems such as kidneys,” he said.

In fact, the hydrogel should theoretically be useful in localised treatment of other diseases that have an inflammation component, such as cancer and arthritis, Dr. Vemula said.

His team has now started researching the use of hydrogel to deliver drugs for arthritic inflammation.

“Drugs are already being injected, but there is always the chance of these drugs dispersing intra-articularly. The gel can prevent this movement,” he said.