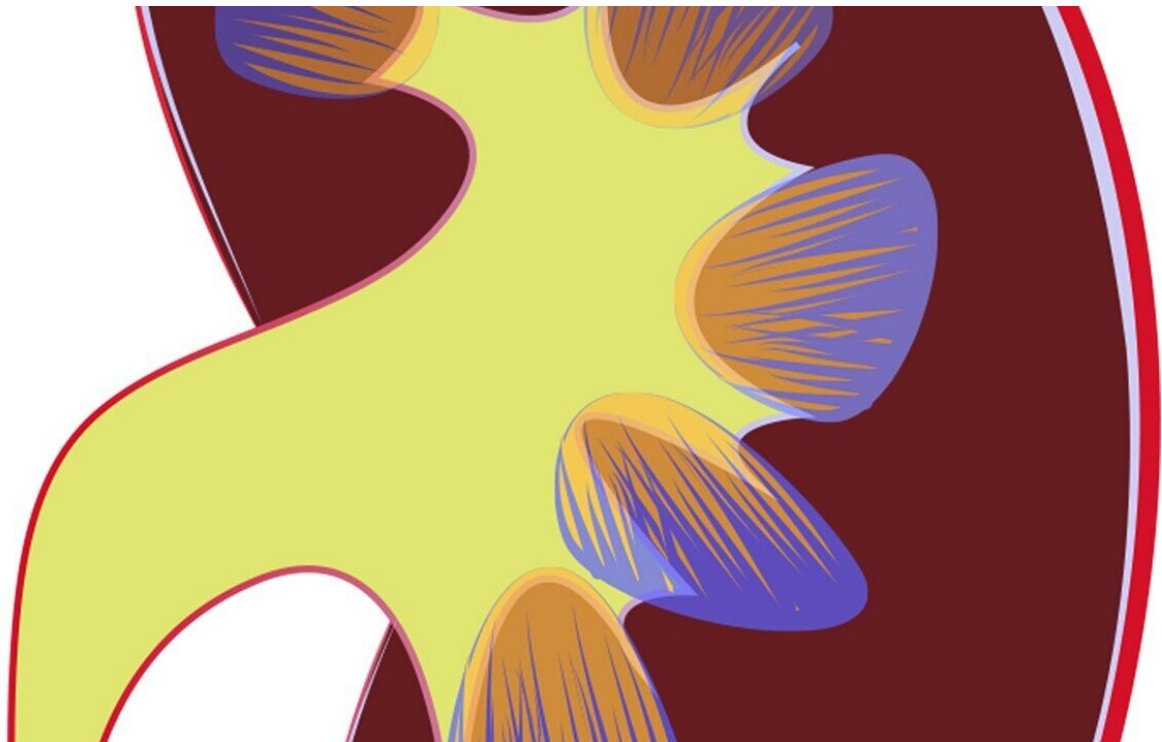


Scientists develop gel-based delivery system for stem cell-derived factors

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In ongoing research to find a treatment for acute kidney injury, Wake Forest Institute for Regenerative Medicine (WFIRM) scientists have further advanced a promising approach using therapeutic factors produced by stem cells by creating a more efficient delivery method that would improve tissue regeneration.

WFIRM researchers wanted to determine if any of the growth factors could lead to kidney function recovery. They developed a gel-based system that contained a cocktail of stem cell derived [growth factors](#).

"The results indicate that stem cell-secreted factors can mitigate kidney injury, and a well-controlled delivery system is needed to achieve maximized and sustained beneficial outcomes," said James Yoo, M.D., Ph.D., lead author of the paper and a professor of [regenerative medicine](#) at WFIRM.

The study was released today in the journal *Stem Cells Translational Medicine*.

Increasing incidence of acute kidney injury is contributing to the global health burden of chronic kidney disease. More than 30 million American adults are affected by the disease and millions more are at risk of developing it, according to the National Kidney Foundation. The current management for kidney failure is dialysis or organ transplantation. One possible approach for the treatment of kidney injury is to regenerate damaged tissues using therapeutic cells and cellular products.

For this study, a pre-clinical model of kidney failure was created. To test the feasibility of the controlled delivery, stem cell-derived conditioned medium was physically encapsulated within the gel and the release of the biological factors was assessed.

WFIRM researchers injected the growth factor gel into the model and observed significant improvement of kidney function over seven days using blood analysis.

"We found that using a growth factor cocktail significantly enhanced [cell proliferation](#) and survival in vitro, leading to a more rapid functional recovery," said Sunil George, Ph.D., a WFIRM research fellow and co-

author who has been a part of the studies.

Yoo said that future research will also help determine if stem cell-derived conditioned medium with a sustained and controlled delivery system can be developed as a therapy that could block the progression of [acute kidney injury](#) to chronic kidney disease.

More information: Hyung Eun Yim et al, Controlled Delivery of Stem Cell-Derived Trophic Factors Accelerates Kidney Repair After Renal Ischemia-Reperfusion Injury in Rats, *Stem Cells Translational Medicine* (2019). [DOI: 10.1002/sctm.18-0222](https://doi.org/10.1002/sctm.18-0222)

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