

New transplant method may allow kidney recipients to live life free of anti-rejection medication

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New ongoing research published today in the journal *Science Translational Medicine* suggests organ transplant recipients may not require anti-rejection medication in the future thanks to the power of stem cells, which may prove to be able to be manipulated in mismatched kidney donor and recipient pairs to allow for successful transplantation without immunosuppressive drugs. Northwestern Medicine® and University of Louisville researchers are partnering on a clinical trial to study the use of donor stem cell infusions that have been specially engineered to "trick" the recipients' immune system into thinking the donated organ is part of the patient's natural self, thus gradually eliminating or reducing the need for anti-rejection medication.

"The preliminary results from this ongoing study are exciting and may have a major impact on organ transplantation in the future," said Joseph Leventhal, MD, PhD, transplant surgeon at Northwestern Memorial Hospital and associate professor of surgery and director of kidney and pancreas transplantation at Northwestern University Feinberg School of [Medicine](#). "With refinement, this approach may prove to be applicable to the majority of patients receiving the full spectrum of solid organ transplants."

Leventhal authored the study along with Suzanne Ildstad, MD, director of the Institute of Cellular Therapeutics at the University of Louisville. It is the first study of its kind where the donor and recipient do not have to

be related and do not have to be immunologically matched. Previous studies involving stem cell transplants for organ recipients have included donors and recipients who are siblings and are immunologically identical, something that only occurs in about 25 percent of sibling pairs.

"Being a transplant recipient is not easy. In order to prevent rejection, current transplant recipients must take multiple pills a day for the rest of their lives. These immunosuppressive medications come with serious side effects with prolonged use including high blood pressure, diabetes, infection, heart disease and cancer, as well as direct damaging effects to the organ transplant," said Ildstad. "This new approach would potentially offer a better quality of life and fewer health risks for transplant recipients."

In a standard [kidney transplant](#), the donor agrees to donate their kidney. In the approach being studied, the individual is asked to donate part of their immune system as well. The process begins about one month before the kidney transplant, when bone marrow stem cells are collected from the blood of the [kidney donor](#) using a process called apheresis. The donor cells are then sent to the University of Louisville to be processed, where researchers enrich for "facilitating cells" believed to help transplants succeed. During the same time period, the recipient undergoes pre-transplant "conditioning," which includes radiation and chemotherapy to suppress the bone marrow so the donor's stem cells have more space to grow in the recipient's body.

Once the facilitating cell-enriched stem cell product has been prepared, it is transported back to Northwestern, where the recipient undergoes a kidney transplant. The donor stem cells are then transplanted one day later and prompt [stem cells](#) to form in the marrow from which other specialized blood cells, like immune cells, develop. The goal is to create an environment where two bone marrow systems exist and function in one person. Following transplantation, the recipient takes anti-rejection

drugs which are decreased over time with the goal to stop a year after the transplant.

"This is something I have worked for my entire life," said Ildstad, who pioneered the approach and is known for her discovery of the "facilitating" cell.

Less than two years after her successful kidney transplant, 47-year-old mother and actress Lindsay Porter of Chicago, is living a life that most transplant recipients dream of – she is currently free of anti-rejection medications and says at times, she has to remind herself that she had a kidney transplant. "I hear about the challenges recipients have to face with their medications and it is significant. It's almost surreal when I think about it because I feel so healthy and normal." Doctors are hopeful that Porter will not need [immunosuppressive drugs](#) long-term, given her progress thus far.

In order to qualify for this type of experimental kidney transplant, the donor and recipient pairs must be blood-type compatible and have a negative cross-match, which means that testing has been done to confirm the recipient does not have antibodies in the blood that would cause [rejection](#) of the kidney.

The clinical trial is ongoing. Researchers are also planning a second clinical trial, which would offer similar treatment for subjects who have already undergone a living donor kidney transplant.

Provided by Northwestern Memorial Hospital

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