

Researchers recreate stem cells from deceased patients to study present-day illnesses

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Research scientists have developed a novel method to re-create brain and intestinal stem cells from patients who died decades ago, using DNA from stored blood samples to study the potential causes of debilitating illnesses such as inflammatory bowel disease.

The lab research, published in the journal *Stem Cells Translational Medicine*, could yield new therapies for people who suffer from aggressive motor-neuron and gut-related conditions that proved fatal to the deceased patients who long-ago volunteered their blood samples.

"The potential implications of this research are vast," said Dhruv Sareen, PhD, the study's lead author, and assistant professor and director of the David and Janet Polak Foundation Stem Cell Core Laboratory in the Board of Governors Regenerative Medicine Institute.

By using a deceased patient's stored [blood samples](#), Sareen and his colleagues found that they can develop stem cells known as iPSCs in a [petri dish](#) - essentially reanimating diseased cells from patients long after they have died.

This approach allows researchers to connect the dots between a deceased patient's symptoms, genetic information contained in DNA and the behavior of stem cells in the lab. This, in turn, enables investigators to study the biological mechanisms behind diseases and potentially design

new therapies.

The technique also allows physicians to replace invasive biopsy procedures typically required of living patients to create iPSC cells.

"These novel developments allow us to create new lines of [stem cells](#) from literally millions of patient samples stored in large repositories," said Clive Svendsen, PhD, director of the Board of Governors Regenerative Medicine Institute. "Some of these deceased patients were diagnosed with rare and important diseases."

The Cedars-Sinai research represents a step forward in the quest to advance personalized and precise medical treatments for patients battling many types of diseases. Crohn's disease is among the first to be studied this way in the lab.

"Our researchers can now make an entire gut in the petri dish from deceased patients with a specific type of Crohn's disease caused by a rare mutation," said Robert Barrett, PhD, first author of the study and a scientist in the F. Widjaja Foundation Inflammatory Bowel and Immunobiology Research Institute at the Board of Governors Regenerative Medicine Institute. "This development will allow us to better understand how these mutations affect the gut."

More information: "Reliable Generation of Induced Pluripotent Stem Cells From Human Lymphoblastoid Cell Lines." *Stem Cells Translational Medicine*, 2014.

Provided by Cedars-Sinai Medical Center

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