

# Genetic research develops tools for studying diseases, improving regenerative treatment

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Research from a Kansas State University professor may make it easier to recover after spinal cord injury or to study neurological disorders.

Mark Weiss, professor of anatomy and physiology, is researching [genetic models](#) for spinal cord injury or diseases such as Parkinson's disease. He is developing technology that can advance [cellular therapy](#) and regenerative medicine -- a type of research that can greatly improve animal and human health.

"We're trying to build tools, trying to build models that will have broad applications," Weiss said. "So if you're interested in [neural differentiation](#) or if you're interested in response after an injury, we're trying to come up with cell lines that will teach us, help us to solve a medical mystery."

Weiss' research team has perfected a technique to use stem cells to study targeted [genetic modifications](#). They are among a handful of laboratories in the world using these types of models for disease. The research is an important step in the field of [functional genomics](#), which focuses on understanding the functions and roles of these genes in disease.

The researchers are creating several tools to study functional genomics. One such tool involves developing new ways to use fluorescent transporters, which make it easier to study proteins and their functions. These fluorescent transporters can be especially helpful when studying neurological disorders such as Parkinson's disease, stroke and spinal cord

injury.

"People who have spinal cord injury do not experience a lot of regeneration," Weiss said. "It is one of the problems of the nervous system -- it is not great at regenerating itself like other tissues."

The researchers want to discover a way to help this regenerative process kick in. By studying signals from fluorescing cells, they can understand how [neural stem cells](#) are reactivated.

"We want to try and make these [genetic markers](#), and then we can test different kinds of treatment to see how they assist in the regenerative process," Weiss said.

Weiss' stem cell research has appeared in two recent journals: *Stem Cells and Development* and the *Journal of Assisted Reproduction and Genetics*. His research has been funded by the National Institutes of Health and university funds, including the Johnson Cancer Research Center.

Weiss' seven-member research team includes a visiting professor, two full-time researchers, a graduate student and three undergraduates. He has also been collaborating with researchers from the University of Kansas Medical Center.

Weiss was also part of a Kansas State University research team to find and patent a noncontroversial source of stem cells from a substance in the umbilical cord.

Provided by Kansas State University

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