

## Researchers Link Stem Cells, Diabetic Blindness

UF stem cell scientists have prevented blindness in monkeys afflicted with a condition similar to one that robs thousands of diabetic Americans of their eyesight each year.

The researchers, led by Edward Scott, director of the Program in Stem Cell Biology and Regenerative Medicine at UF's College of Medicine, are focusing on a link between a protein known as SDF-1 and retinopathy, a complication of diabetes and the leading cause of blindness in working-age Americans.

Diabetic retinopathy causes 12,000 to 24,000 cases of blindness each year, according to the American Diabetes Association. When diabetes causes

blood vessels in the eye to leak, SDF-1 triggers uncontrolled growth of new vessels, ultimately clogging the eye and damaging the retina. Scientists stopped this destructive growth by using antibodies that block formation of SDF-1 in the injured eye.

Even though stem cells have the seemingly magical property of being able to transform into any cell of the body, in the closed quarters of the eyeball they wreak havoc, Scott says.

"SDF-1 is the main thing that tells blood stem cells where to go," Scott said. "But the eye is such a unique place, you've got this bag of jelly — the vitreous — that just sits there and it fills up with SDF-1. It continues to call the new blood vessels to come that way, causing all the problems."

The researchers injected an SDF-1 antibody directly into the afflicted eyes, disabling SDF-1's ability to summon stem cells and effectively halting the growth of almost all new blood vessels.

Maria Grant, a UF professor of pharmacology and therapeutics, says the researchers envision injecting SDF-1 antibody into the eyeballs of patients. Current treatments use lasers to destroy parts of the retina that are not needed for precise vision.

The research was supported by RegenMed, a company founded by Scott and Dennis Steindler, a leading stem cell researcher and director of UF's McKnight Brain Institute.

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## Southern Children Face Higher Health Risks

Children living in the South are up to three times more likely to battle poor health and its consequences — including obesity, teen pregnancy and death — than those in all other regions of the United States, even if they receive the same medical care, a new study reveals.

"Hurricane Katrina gave the world a glimpse of the disparities in the South," says Dr. Jeffrey Goldhagen, the study's lead author and an associate professor of community pediatrics at the UF

College of Medicine — Jacksonville. "Our research documents just how profoundly these disparities impact the health of children in the region."

The study, published in the journal *Pediatrics*, is the first to statistically relate region of residence to measures of child health, Goldhagen says.

"In fact, we now believe that where a child lives may be one of the most powerful predictors of child health outcomes and disparities," he says.

The poor health outcomes researchers documented included low birthweight, teen pregnancy, death and other problems such as mental illness, asthma, obesity, tooth decay and school performance.

Researchers computed a Child Health Index that ranked each state in the nation according to five routine indicators of physical health in children — percentage of low-birthweight infants, infant mortality rate, child death rate, teen death rate and teen birth rates. The scores revealed that eight of the 10 states with the poorest child health outcomes in the nation — Mississippi, Louisiana, Arkansas,

Tennessee, Alabama, Georgia, North Carolina and South Carolina — are in what the researchers defined as the Deep South. The remaining Deep South states, Kentucky and Florida, are in the lowest quarter.

Living in the Deep South proved to be the best predictor of poor child health outcomes, more than any other factor commonly used to describe health differences among groups of children, including poverty, parents' employment status or single-parent households.

"We weren't really surprised by the results because I think most people thought this might be the case," says co-author William Livingood, a UF associate professor of pediatrics and director of the Duval County Health Department's Institute for Health, Policy and Evaluation Research. "But we were able to apply epidemiological principles to assess, clarify and map the problem and then document this intuitive feeling by making it scientific and evidence-based."

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