

Bone marrow stem cells may cure eye disease

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Adult bone marrow stem cells may help cure certain genetic eye diseases, according to University of Cincinnati (UC) researchers.

Scientists have completed a study using mice which showed that bone marrow stem cells can switch roles and produce keratocan, a natural protein involved in the growth of the cornea—the transparent, outer layer of the eyeball. This ability of marrow cells to "differentiate" into keratocan-producing cells might provide a means for treating abnormal corneal cell growth in people.

Winston Whei-Yang Kao, PhD, professor of ophthalmology, and Hongshan Liu, PhD, research scientist in the department of ophthalmology, will present their findings at the annual meeting of the Association for Research in Vision and Ophthalmology being held in Ft. Lauderdale, Fla., May 9 and 10.

In the laboratory, the researchers induced corneal abnormalities that mimicked genetic eye mutations and then injected bone marrow stem cells into the corneas to see if they altered the mutations.

The study showed that after only one week, the abnormal corneas of animal models injected with bone marrow stem cells began to change shape and heal.

"We found that bone marrow stem cells can contribute to the formation of connective tissues," Kao said. "If we can change the function of non-corneal bone marrow stem cells by introducing them into human

corneas, we can possibly repair the loss of visual sharpness caused by mutations."

Kao and his coworkers are now planning a clinical trial. If the trial succeeds, Kao said, the procedure could help prevent blindness in future generations who suffer from genetic corneal diseases.

He added that cornea transplants have been successful to some degree but do not always eliminate the problem.

"When the donor cells disappear after a few years, the corneal disease often reoccurs," he said. "However, if we can place the stem cells inside the cornea, they will repair the lost function of the mutated gene, and stem cells can presumably renew themselves and maintain effective treatment longer, if not forever."

Source: University of Cincinnati

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