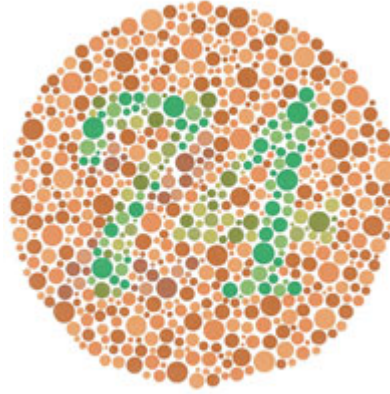




## Gene Therapy Cures Color-blind Monkeys

In a study published on September 16 by the journal *Nature*, scientists say they have used gene therapy to cure red-green color blindness in two adult male squirrel monkeys.

The scientists hail from the University of Washington in Seattle, the University of Florida in Gainesville, and the Medical College of Wisconsin in Milwaukee. The monkeys, who were named Dalton and Sam, are naturally colorblind from birth. The scientists confirmed the initial color blindness by training the monkeys to identify patterns of colored dots and rewarding them with grape juice. When the monkeys were presented with grey, green, and red dots, they were not able to distinguish the pattern that would reward them with juice.



The normal vision that the scientists were trying to restore, or create in the case of these monkeys, depends on the retina of the eye possessing three different types of cones, each one being receptive to a different portion of the visible light spectrum: red, green, and blue. Red-green color blindness is caused by the lack of a gene known as L opsin, which codes for the red-sensitive cone. Most red-green color blindness in humans results from the same genetic defect.

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What the scientists did was first modify a virus to carry the L opsin gene. The virus was then injected into the retinas of each monkey. After about five weeks, the infected cones began to develop greater sensitivity to red light. By the end of the study, Dalton and Sam had grown quite adept at discerning patterns of grey, green, and red dots in order to obtain their sweet reward. After two years, they are still seeing the colors.

“We knew right away when it began to work. It was as if they woke up and saw these colors. The treated animals unquestionably responded to colors that had been invisible to them,” Jay Neitz of the University of Washington declared in a statement published concurrently with the group’s findings.

It is hoped that this kind of gene-therapy technique could treat human color blindness. An estimated 3.5 million people in the United States are color blind, with most of them being men.

“People who are color blind feel that they are missing out,” Neitz said. “If we could find a way to do this with complete safety in human eyes, as we did with monkeys, I think there would be a lot of people who would want it.”

While a lot of people could be expected to want the treatment, the *Times of London* [published a list](#) of people who did not let their visual defect hold them back. As scientists take the time to perfect a safe therapy for humans, ponder those who saw beyond their own limitations: Mark Twain, Bing Crosby, Bob



Written by [Steven J. DuBord](#) on September 18, 2009

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Dole, Bill Clinton, and Keanu Reeves, among others.

Still, one can hope that scientists will eventually change the old saying from “monkey see, monkey do” to “monkey see, people too.”



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