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## Radiation damage passed through generations

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By Merritt McKinney

NEW YORK (Reuters Health) - When radiation damages the DNA of mice, the damage is not limited to the animal exposed to the radiation, researchers in the UK report. The results of a new study show that this radiation-induced damage to DNA is passed on not only to the mouse's offspring, but to the next generation of mice as well.

The findings have potential implications for human health, according to Dr. Yuri E. Dubrova of the University of Leicester, UK, although he said that confirming the results in people will be technically difficult. He noted that no one has conducted similar studies in people who have been exposed to radiation.

In an earlier study, Dubrova and colleagues found that an increased mutation rate caused by radiation exposure can be passed down to the next generation of mice. This so-called genomic instability affects "germ line" genes, which are contained in a male's sperm and a female's eggs and are passed on to future generations.

In the new study, Dubrova's team found that when male mice from several different strains were exposed to high levels of radiation, the resulting boost in mutation rate was passed on to their offspring, even when the offspring had not been exposed to the radiation--and the mother had not been irradiated. What's more, these higher mutation rates persisted in the "grandchildren" of the mice that had been exposed to the radiation, they report.

The researchers made the discovery by studying the mutation rate in a noncoding region of DNA with no apparent function, they explain in the May 14th issue of the journal Proceedings of the National Academy of Sciences.

"We were absolutely surprised," Dubrova said in an interview with Reuters Health. "When you go to the second generation you see the same level of instability that you see in the first generation of offspring," the researcher stated.

He added that the genetic instability "doesn't show any sign of decline."

Whether a radiation-induced mutation rate can be passed down to later generations of offspring remains uncertain, Dubrova said. Right now, the investigators do not have any plans to continue studying the persistence into future generations. Instead, they intend to try to figure out how radiation damage is passed on from radiation-exposed mice to their offspring and "grand" offspring, he said.

There is "strong evidence" that DNA damage to germ line cells--sperm and eggs--could have several

harmful health effects, including predisposition to cancer and mortality.

Fortunately, exposure to levels of radiation similar to those studied in the mouse experiment "seldom happens to humans," according to Dubrova. And when it does, the question of whether a mutation rate will be passed on to future generations is often moot, he said, since such radiation usually sterilizes humans.

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A small graphic consisting of the number '1668765' displayed in a stylized, glowing font. The digits are white with a blue and purple gradient glow, set against a dark background within a rectangular border.