CRISPR Edited Cells May Cause Cancer According to Two Studies

Gene editing changes an organism's DNA. The technology allows genetic material inside a cell to be added, removed, or altered at specific locations within the genome. Many different gene editing technologies have been developed, including CRISPR-Cas9, short for "clustered regularly interspaced short palindromic repeats and CRISPR-associated protein 9." This gene editing method has generated tons of excitement in the scientific community because it was believed to be faster, less expensive, and much more accurate than other existing genome editing methods.

CRISPR-Cas9 was a much-hyped gene editing tool that was going to be a breakthrough for medicine. A Newsweek title read, "…Could Stop Cancer, Diabetes and Bioterrorism." But there's a problem. Editing a cell's genomes with CRISPR-Cas9 could have unintended consequences. According to two studies published in Nature Medicine, the CRISPR-Cas9 edited cells may seed tumors inside a patient. Those same cells that were intended to treat disease could be triggering cancer. Even though the stocks tanked upon the news, researches don't want to sound the alarm bells. Bernhard Schmierer, a researcher with the Karolinska Institutet, said that CRISPR-Cas9 is a "powerful tool with staggering therapeutic potential," before he went into possible risks,

> *Like all medical treatments however, CRISPR-Cas9-based therapies might have side effects, which the patients and caregivers should be aware of. Our study suggests that future work on the mechanisms that trigger p53 in response to CRISPR-Cas9 will be critical in improving the safety of CRISPR-Cas9-based therapies."*

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Dr. Emma Haapaniemi, a researcher at the Department of Medicine, Huddinge, Karolinska Institutet and co-first author of the study stated,

> *By picking cells that have successfully repaired the damaged gene we intended to fix, we might inadvertently also pick cells without functional p53. If transplanted into a patient, as in gene therapy for inherited diseases, such cells could give rise to cancer, raising concerns for the safety of CRISPR-based gene therapies."*
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> *P53 mutations are responsible for nearly half of ovarian cancers; 43 percent of colorectal cancers; 38 percent of lung cancers; nearly one-third of pancreatic, stomach, and liver cancers; and one-quarter of breast cancers, among others." – STAT*

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