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Variations in key gene predict cancer patients' risk for radiation-induced toxicity

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Key genetic variants may affect how cancer patients respond to radiation treatments, according to a study published this week in *Nature Genetics*. The research team, which included researchers at the Icahn School of Medicine at Mount Sinai, found that variations in the TANC1 gene are associated with a greater risk for radiation-driven side effects in prostate cancer patients, which include incontinence, impotence and diarrhea.

The current results are based on a genome-wide association study, a type of study in which researchers examine numerous genetic variants to see if any of them are associated with a certain type of complication, which could sometimes emerge years after treatment was completed.

"Our findings, which were replicated in two additional patient groups, represent a significant step towards developing personalized treatment plans for prostate cancer patients," said Barry S. Rosenstein, PhD, Professor, Radiation Oncology, Genetics and Genomic Sciences, Icahn School of Medicine at Mount Sinai, the lead Mount Sinai investigator on the study. "Within five years, through the use of a predictive genomic test that will be created using the data obtained in the recent study, it may be possible to optimize treatment for a large number of cancer patients."

For the study, Dr. Rosenstein and his team obtained blood samples from nearly 400 patients who were receiving radiotherapy treatment for prostate cancer. The blood samples were screened for roughly one million genetic markers, and each patient was monitored for at least two

years to track incidents of side effects from the radiation. Data analysis showed which genetic markers were consistently associated with the development of complications following radiotherapy.

"The next step is to validate the results, and see if the same markers predict similar outcomes in patients with other forms of cancer," said Dr. Rosenstein. Using the genomic test being developed, treatment plans can be adjusted to minimize adverse effects thereby allowing for an improved quality life for many cancer survivors.

Provided by The Mount Sinai Hospital

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