

In the test tube, teams reconstruct a cancer cell's beginning

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What prompts normal cells to transform themselves into cancerous cells? Researchers from Texas institutions, including the UT Health Science Center San Antonio, have identified factors in the very first step of the process and reconstituted this first step in the test tube. The latter accomplishment was reported Sunday [Nov. 21] in the top-tier journal *Nature Structural & Molecular Biology*.

The DNA molecule — the elegant, twin-stranded necklace of life in all [cells](#) — gets broken and repaired all the time. Breaks are caused by the body's metabolic activities such as energy consumption and environmental factors such as exposure to ultraviolet light. Cancer results when the repair response is absent or deficient.

"DNA breaks are considered to be a major instigator of cancer cell development," said Sang Eun Lee, Ph.D., associate professor of molecular medicine at the UT Health Science Center San Antonio.

"When a break is detected, signals are sent to cells that repair is needed."

The early initiating step of the break repair and signaling "has been quite elusive for some time because the factors were not known," Dr. Lee said. He was lead author of a paper published recently in *EMBO Journal* that identified a set of enzymes called Mre11 and Exo1.

In the *Nature* paper the researchers, who included the lab of Tanya Paull, Ph.D., at UT Austin, "repeated the process in a [test tube](#) because we now knew about Mre11 and Exo1," Dr. Lee said.

Provided by University of Texas Health Science Center at San Antonio

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