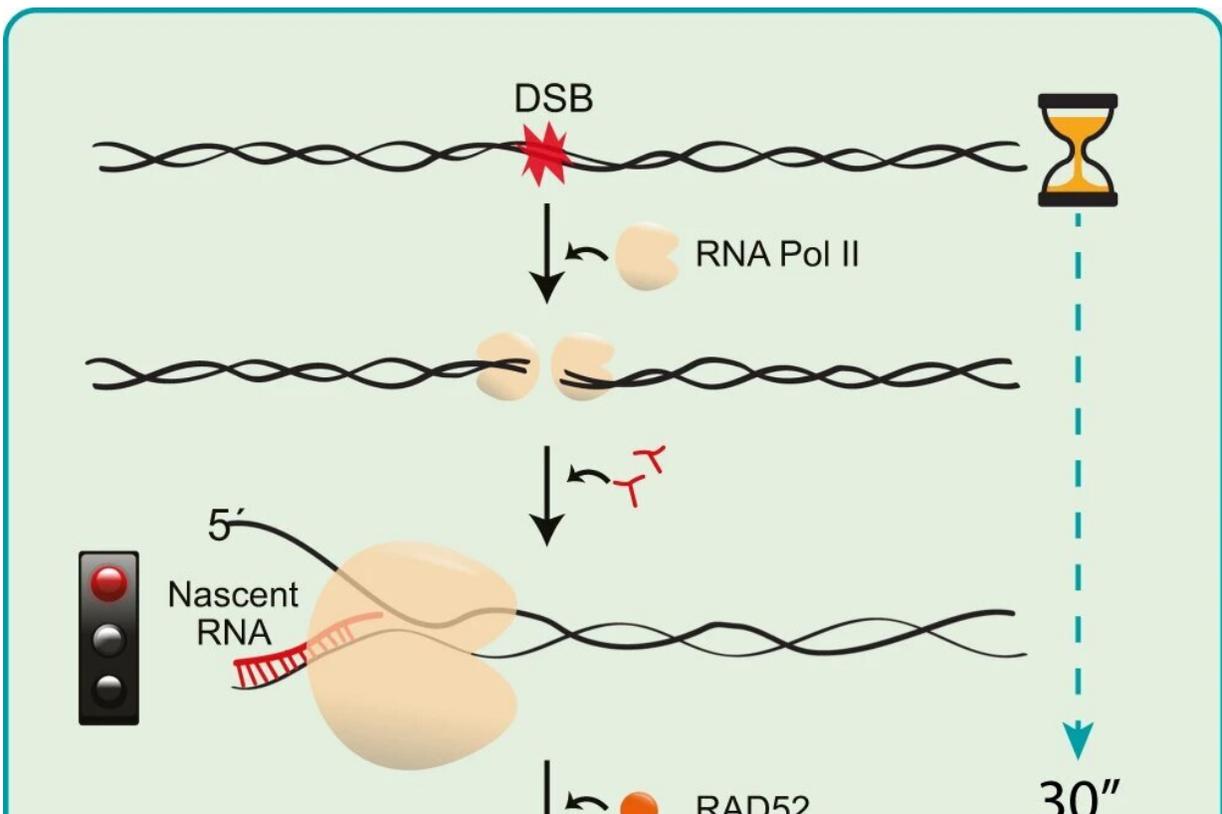


The origin-of-life molecule, a key to cancer research

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Schematic model of the regulation and role of RNAPII-generated nascent RNA to guide DNA end resection and DSB repair by HR. Credit: *Nature Communications* (2022). DOI: 10.1038/s41467-022-33027-z

RNA, the molecule that gave rise to life, has been shown to be essential for repairing human genetic material and preventing mutations that

might lead to developing cancer. Recent advances in research, such as those published by the research team of Daniel Gómez Cabello at the University of Seville, propose this compound as a therapeutic target for developing tailored strategies for treating cancer.

The RNA polymerase enzyme, the RNA production machine in cells, is essential for repairing breakages in human DNA safely and reliably. RNA production is essential for [healthy cells](#) but especially for tumor cells, which require much more activity by this enzyme to grow uncontrolled.

The study revealed that RNA synthesis inhibition with the THZ1 compound and analogs after therapies that cause DNA breakages, such as [radiation therapy](#), greatly increases tumor cells' sensitivity to death.

"This study provides clues on how to improve conventional therapies and achieve a higher success rate with treatments. Although there is still a long way to go to be able to use these RNA polymerase inhibitors in the [clinical setting](#), [clinical trials](#) are currently underway based on this enzyme for treating cancer," explained the Principal Investigator, Daniel Gómez-Cabello.

"Increasing the knowledge on how to use these compounds in a safer and more tailored manner allows us to address as best as possible the treatment of cancer," added the researcher Diana Aguilar-Morante, the study's co-author.

This research by the Biomedical Institute of Seville and the University of Seville, in collaboration with the Danish Cancer Society, has been published in *Nature Communications*.

Currently, these researchers are working on the mechanisms of how RNA, the original molecule that enables life, can serve as a tool for

treating diseases.

"Once we have observed that selectively inhibiting RNA production boosts the utility of radiation therapy in [cancer cells](#) and does not drastically affect the rest of the cells, we will start researching it in various types of cancer, such as glioblastoma and pediatric neuroblastoma," commented Diana Aguilar-Morante.

"At this point, our challenge will be to improve the efficiency of these new RNA production inhibitors and reduce the side effects that can occur in patients with [cancer](#)," stated Gómez-Cabello.

More information: Daniel Gómez-Cabello et al, CtIP-dependent nascent RNA expression flanking DNA breaks guides the choice of DNA repair pathway, *Nature Communications* (2022). [DOI: 10.1038/s41467-022-33027-z](#)

Provided by University of Seville

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