

# Repairing DNA lesions

June 25 2014

---

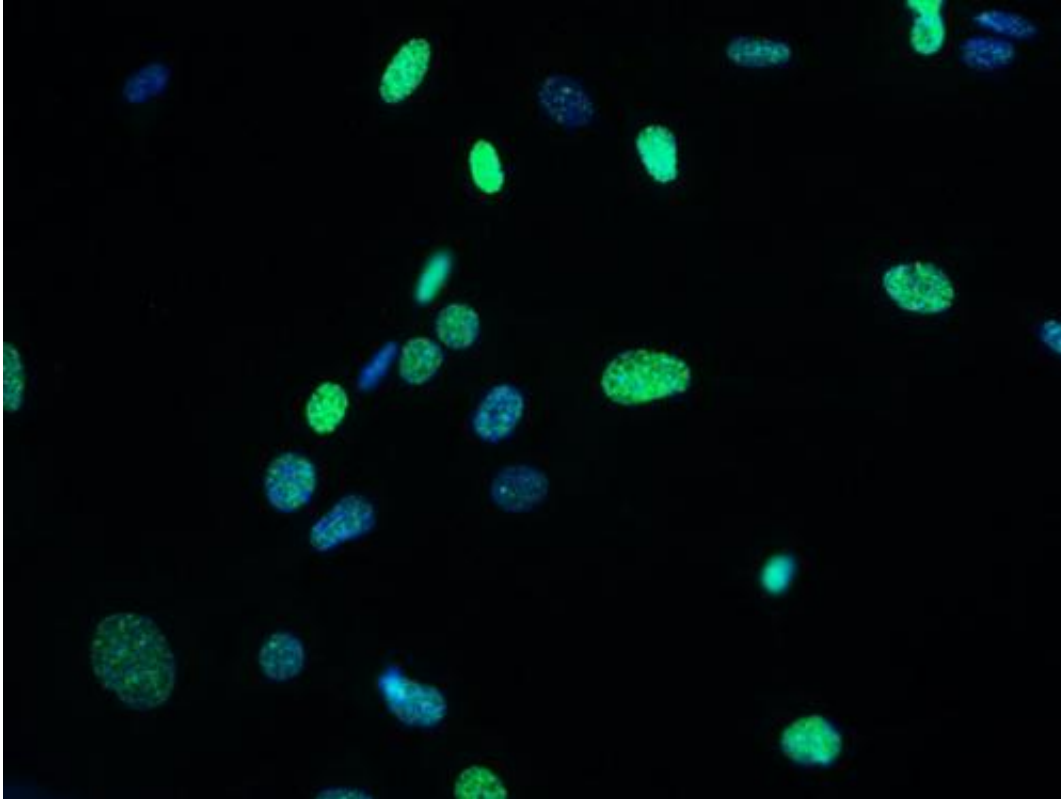


Figure caption: Accumulation DNA damages indicated by green color in cells of repro22 mouse.

Repair of DNA lesions is essential for mammalian development. Notably, DNA lesions in cells caused by genotoxic agents results in arrest of cell cycle and ultimately in cell death. In response, DNA polymerase  $\zeta$  (Pol $\zeta$ ) is a translesion DNA polymerases that repair DNA damage and relieve cell cycle arrest.

However, the role of translesion DNA synthesis in [mammalian development](#) is remains unclear.

Now, Tetsuo Kunieda and colleagues at Okayama University report that Polζ plays an essential role in mammalian development by using a mutant mouse with defective Polζ function.

The researchers found repro22—a chemically induced mutant mouse—showed sterility with germ cell depletion, decreased body weight, and partial lethality during embryonic development. The abnormalities of the repro22 mouse were identified as being caused by a mutation in Rev7 gene encoding a subunit of Polζ.

Furthermore, cells of the repro22 mouse showed decreased proliferation, increased apoptosis, and arrest of [cell cycle](#) with accumulation of DNA damage after treatment with the genotoxic agent.

These results demonstrated that Polζ is essential for mammalian development including germ cell development via repair of DNA damage.

**More information:** "A missense mutation in Rev7 disrupts formation of Polζ, impairing mouse development and repair of genotoxic agent-induced DNA lesions." Khalaj M, Abbasi A, Yamanishi H, Akiyama K, Wakitani S, Kikuchi S, Hirose M, Yuzuriha M, Magari M, Degheidy HA, Abe K, Ogura A, Hashimoto H, Kunieda T. *J Biol Chem*. 2014 Feb 7;289(6):3811-24. [DOI: 10.1074/jbc.M113.514752](https://doi.org/10.1074/jbc.M113.514752). Epub 2013 Dec 19.

Provided by Okayama University

Citation: Repairing DNA lesions (2014, June 25) retrieved 11 July 2024 from

<https://phys.org/news/2014-06-dna-lesions.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.