

Research Highlights

Repairing DNA lesion

Repair of DNA lesion 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 ζ (Pol ζ) 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 Pol ζ plays an essential role in mammalian development by using a mutant mouse with defective Pol ζ 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 Pol ζ .

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 Pol ζ is essential for mammalian development including germ cell development via repair of DNA damage.

Reference:

- Authors: Maryam Khalaj, Abdolrahim Abbasi, Hiroshi Yamanishi, Kouyou Akiyama, Shuso Wakitani, Sotaro Kikuchi, Michiko Hirose, Misako Yuzuriha, Masaki Magari, Heba A. Degheidy, Kuniya Abe, Atsuo Ogura, Hiroshi Hashimoto, and Tetsuo Kunieda
- Title of original paper: A missense mutation in *Rev7* disrupts formation of Pol ζ , impairing mouse development and repair of genotoxic-agent-induced DNA lesions
- Journal, volume, pages and year: *Journal of Biological Chemistry*, **289**, 3811 (2014).
- Digital Object Identifier (DOI): 10.1074/jbc.M113.514752.
- Journal website: <http://www.jbc.org/content/289/6/3811.long>
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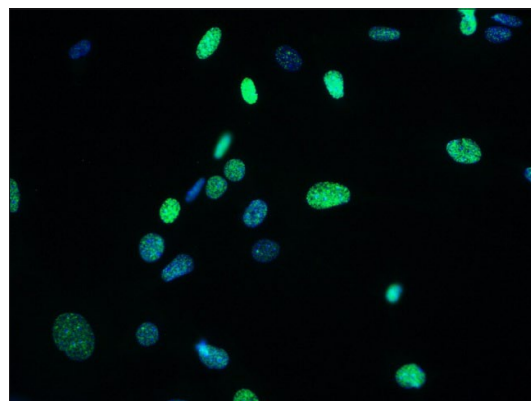


Figure caption: Accumulation DNA damages indicated by green color in cells of repro22 mouse.