

## **Lack of transgenerational effects of ionizing radiation<sup>1</sup> exposure in cleanup workers and evacuees of the Chernobyl accident**

The health effects of radiation exposure from the 1986 Chernobyl nuclear plant accident remain even today a topic of interest throughout the world. This study investigated whether or not children born to parents who were exposed to radiation either through cleanup work or environmental exposure (maximum dose estimate was about 4,000 milligray<sup>2</sup>) experienced increased frequencies of de novo mutations<sup>3</sup> in their genomes. Whole-genome sequencing<sup>4</sup> of 130 children and their parents was carried out in the past, but no effects in the offspring due to parental radiation exposure were observed.

### Notes

#### <sup>1</sup> Ionizing radiation:

Energy from natural or artificial sources with enough force to alter chemical bonds by ionization, phenomenon whereby one electron is emitted from an atom or molecule making up the exposed object. The radiation in this case refers to electromagnetic waves (X-rays, gamma rays) and particle rays (alpha rays, beta rays), having the potential for causing health effects in exposed individuals, depending on dose. Ultraviolet rays from the sun are not ionizing radiation because they do not cause ionization.

#### <sup>2</sup> Gray (Gy):

Gray (1 gray = 1,000 milligray) is a unit of radiation that represents the amount of radiation dose absorbed by a substance when it is exposed to radiation. The average dose of those who are members of RERF's LSS study is around 140–200 milligray (0.14–0.2 Gy). As reference, the average annual amount of radiation we are all exposed to in our daily lives, include medically, is estimated to be around 2–6 milligray (0.002–0.006 Gy).

#### <sup>3</sup> De novo mutations (DNMs):

A genetic alteration that arises anew in germ cells (either egg or sperm cell) of parents. The human genome consists of about 30 billion DNA base pairs, and even under normal conditions, 50 to 100 bases undergo mutation in each person every generation. Also understood is that the number of new mutations (base pair and other changes) increases as paternal age increases.

#### <sup>4</sup> Whole-genome sequencing:

A laboratory method based on computer technology used to understand the base sequences of the entire DNA of an organism, including humans.

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RERF's objective with this brief outline is to succinctly explain our research for the lay public. Much of the technical content of the original paper has been omitted. For further details about the study, please refer to the full paper published by the journal.