Is the risk of possible mutations induced by the new vaccination technology worth considering?

[1,2,3]I. Valentin Petrescu-Mag

[1] Bioflux SRL, Cluj-Napoca, Romania; [2] Department of Environmental Engineering and Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania; [3] University of Oradea, Oradea, Romania.
Corresponding author: I. V. Petrescu-Mag, zoobiomag2004@yahoo.com

With the spread of the new coronavirus, a new vaccination technology, based on messenger RNA, was implemented (Cohen 2020; Dai & Gao 2020). The opinions of scientists about the new technology of vaccine production are diverse, from very optimistic to very skeptical (Lawton 2020; de Vrieze 2021). I will not go into too much detail, because only an immunologist or virologist can express himself objectively in this context. I will develop here, as a biologist, only the idea of possible mutations that could occur as a result of vaccination with the new type of vaccine, mutations to which many scientists frequently refer (mass-media opinions). So, with this critical note, I propose to present my opinion in a simple way, for everyone's understanding, about the risk that these mutations caused by the messenger RNA reverse transcript could pose for the health of the vaccinated patient.

It is important to note that those who do not understand the genomics and evolution of the genome in eukaryotes should not comment on the mutations that the vaccine could produce, although these mutations are possible, at least in theory.

It is known that we, humans, are infected and populated with dozens of viral strains every moment of our existence. These viruses change our genome permanently, moreover, a large part of the human genome is viral DNA (Tang et al 2020).

So, with or without the messenger RNA-based vaccine, human DNA is constantly changing with some frequency. Although we have repair molecular systems that correct lesions and transcription errors (Tarsounas & Sung 2020), mutations caused by errors can remain irreversibly altered (McKinney et al 2020). Yes, they can be lethal, carcinogenic or not, but that is part of eukaryotic life (Sueoka 1988). If these permanent mutations would not happen, today we humans would still be poor bacteria.

If messenger RNA from the new type of vaccine causes mutations in our cells, the cells may just as well become mutant due to the pandemic virus or any other silent virus in the human flora. With these viruses, human being is born, lives and dies, and does not necessarily die because of viruses virulence.

Without claiming that the vaccine is perfectly risk-free for the patient's health (Wadman 2020), I would suggest to forget this genetic modification thing. Not for any other reason, but new conspiracy theories are being born for free.

The vaccine-induced mutation could be significantly harmful only if vaccine manufacturers premeditated gene therapy targeted at a carcinogenic locus, or responsible for the individual's firm personality, or fertility, but I hope it has not gotten there with human malice.

Conflicts of interest. There are no conflicts of interest. The author has no relationship with vaccine manufacturers and, as a personal opinion, does not consider it a priority to be vaccinated against the new coronavirus in the near future.

References

Cohen J., 2020 Effective vaccine offers shot of hope for pandemic. Science 370(6518):748-749. Doi: 10.1126/science.370.6518.748

Dai L., Gao G. F., 2020 Viral targets for vaccines against COVID-19. Nature Reviews Immunology, pp. 1-10.

de Vrieze J., 2021 Pfizer's vaccine raises allergy concerns. Science 371(6524):10-11. Doi: 10.1126/science.371.6524.10

Lawton G., 2020 How exciting is the Pfizer vaccine? New Scientist 248(3308):8-9.

McKinney J. A., Wang G., Mukherjee A., Christensen L., Subramanian S. H. S., Zhao J., Vasquez K. M., 2020 Distinct DNA repair pathways cause genomic instability at alternative DNA structures. Nature Communications 11(1):1-12.

Sueoka N., 1988 Directional mutation pressure and neutral molecular evolution. Proceedings of the National Academy of Sciences of the USA 85(8):2653-2657.

Tang D., Li B., Xu T., Hu R., Tan D., Song X., Jia P., Zhao Z., 2020 VISDB: a manually curated database of viral integration sites in the human genome. Nucleic Acids Research 48(D1):D633-D641.

Tarsounas M., Sung P., 2020 The antitumorigenic roles of BRCA1–BARD1 in DNA repair and replication. Nature Reviews Molecular Cell Biology 21(5):284-299.

Wadman M., 2020 Public needs to prep for vaccine side effects. Science 370(6520):1022. Doi: 10.1126/science.370.6520.1022

Received: 07 November 2020. Accepted: 02 December 2020. Published online: 18 December 2020.

Author:
Ioan Valentin Petrescu-Mag, SC Bioflux SRL Cluj-Napoca, 54 Ceahlau Street, 400488 Cluj-Napoca, Romania, e-mail: zoobiomag2004@yahoo.com

Petrescu-Mag I. V., 2020 Is the risk of possible mutations induced by the new vaccination technology worth considering? ELBA Bioflux 12(1):44-45.