

---

*Letter to the Editor*

---

---

**From: Prof. Giovanni Di Guardo**

Former Professor of *General Pathology and Veterinary Pathophysiology* at the Veterinary Medical Faculty of the University of Teramo, 64100 Teramo, Italy

\* **Correspondence:** E-mail address: [gdiuardo@unite.it](mailto:gdiuardo@unite.it);

***Caenorhabditis elegans*, a worm to which the whole mankind should be grateful!**

One year has gone by since the achievement of the Nobel Prize in Physiology or Medicine by Katalin Karikó and Drew Weissman for the messenger RNA (mRNA) technology, which has made feasible the production of the revolutionary anti-SARS-CoV-2 vaccines that have globally saved hundreds of millions of lives during the CoViD-19 pandemic (1).

In 2024 the central stage has once again been taken by RNA, since the Nobel Prize in Physiology or Medicine has been awarded to Victor Ambros and Gary Ruvkun for their discovery of “micro-RNAs” (miRNAs) (2). These are short, non-coding RNA sequences orchestrating human and animal genes’ activities, which may result either stimulated or silenced by them. And, while their current applications in human as well as in veterinary medicine concern the diagnostic field, with several miRNAs being employed as disease biomarkers (3), their potential use in human and animal cancer therapy appears to be promising, alongside the cure of cardiovascular and neurodegenerative disorders as well as of infectious diseases in people and animals. Still of interest, miRNAs were originally discovered thanks to the investigations carried out on a tiny, one-millimetre-long roundworm termed *Caenorhabditis elegans* and made up of a thousand cells, the number of which does not change throughout its life. This is the reason why the Scientific Community has developed during the last 60 years a growing interest into the aforementioned nematode, with special emphasis on the biological events and mechanisms underlying cell death, cell regeneration and cell differentiation. Thanks to these efforts, the key process of “programmed cell death” – alias “apoptosis” – was identified, with the pioneering investigations on the genes regulating it having been performed in *C. elegans*, fifty years ago, by Sydney Brenner, who in 2002 shared the Nobel Prize with Robert Horvitz and John Sulston. In conclusion, two highly deserved Nobel Prizes in Physiology or Medicine have been achieved throughout the last 22 years (alongside two additional ones, awarded for RNA interference- and green fluorescent protein-related investigations, respectively), thanks to the studies carried out on *C. elegans*, a minute worm to which the whole mankind should be forever grateful!

**REFERENCES**

1. Di Guardo G. (2023). The revolutionary mRNA technology: A fully deserved Nobel Prize! The BMJ (Rapid Response). <https://www.bmj.com/content/382/bmj-2023-075015/rr>
2. <https://www.nobelprize.org/prizes/medicine/2024/press-release>
3. Pazzaglia L., Leonardi L., Conti A., Novello C., Quattrini I., Montanini L., Roperto F., Del Piero F., Di Guardo G., Piro F., Picci P., Benassi M.S. (2015). MiR-196a expression in human and canine osteosarcomas: A comparative study. *Research in Veterinary Science* 99:112-119. DOI: 10.1016/j.rvsc.2014.12.017