


# Health-Risk-Model Idolization Is Unscientific

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Health-risk-model idolization is a characteristic of some low-dose-radiation researchers; mainly some epidemiologists and other scientists involved in cancer risk assessment. Model idolization relates to, for example, obtuse (ie, imperceptive) and continual employment by epidemiologists of the linear-no-threshold (LNT) model when assessing cancer risk (if any) for very small radiation doses (eg, < .01 Gy). Linear-no-threshold for cancer is inconsistent with fundamental radiobiological mechanisms (eg, protective adaptive responses) at the molecular, cellular, tissue, and systemic levels.<sup>1</sup> The obtuse employment of LNT by epidemiologists (perhaps motivated by profiting from multiple well-funded epidemiologic studies) has provoked radiation phobia, which led to adverse health outcomes related to the emergency response to the 2011 Fukushima radiological incident. More than 1000 relocation-stress-related deaths<sup>2,3</sup> occurred because of the chosen radiological-emergency response; based on the false belief by many that any amount of radiation no matter how small is harmful (ie, carcinogenic). *Without LNT idolization, the indicated lives lost and other suffering due to the radiological-emergency response would likely not have occurred.* Emergency-response actions would likely have been far less stressful, especially if based on a scientifically-credible threshold radiation dose (or doses for multiple organs) for harm to our health.

Model idolization sometimes also happens among radiation-hormesis researchers. Hormesis (a generalized phenomenon rather than a specific biological mechanism) relates to low-dose stimulation (eg, protective) and high-dose inhibition (eg, harmful), irrespective of the biological or health endpoint considered.<sup>4</sup> Hormetic outcomes of radiation exposure mechanistically relate to the chemico-biological interactions in the body and their adaptive-response consequences.<sup>1</sup> Some hormesis proponents unintentionally promote the mistaken belief that beneficial health effects (eg, cancer prevention) occur for everyone when exposed to a low radiation dose, no matter how small; a consequence of *hormesis idolization*. As there are likely individual- and endpoint-specific radiation dose thresholds (possibly stochastic with restricted range)<sup>5</sup> for hormetic benefits, hormesis idolization is also unscientific even though

*stochastic thresholds allow for health benefits from natural background radiation for some* (but not all). Because both LNT and hormesis idolizations are unscientific, radiation researchers (especially health risk assessors) should strive to be more scientifically credible in describing expected health consequences (including possible health benefits) of low radiation doses to humans. Doing so, in my opinion, would help bring about worldwide acceptance for low-dose-radiation therapy (alone or in combination with one or more other therapeutics) for a variety of diseases including some cancers<sup>6</sup> and possibly also Alzheimer's and some other neurodegenerative diseases.<sup>7</sup>

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## References

1. Scott BR, Tharmalingam S. The LNT model for cancer induction is not supported by radiobiological data. *Chem Biol Interact.* 2019;301:34-53. doi:10.1016/j.cbi.2019.01.013
2. Sutou S. A message to Fukushima: nothing to fear but fear itself. *Gene Environ.* 2016;38:12. doi:10.1186/s41021-016-0039-7
3. Sarma A, and Wendland AV. Ten years of Fukushima disinformation. *Skeptical Inquirer.* July/August 2021;45(4).

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4. Calabrese EJ, Bachmann KA, Bailer AJ, et al. Biological stress response terminology: Integrating the concepts of adaptive response and preconditioning stress within a hormetic dose-response framework *Toxicol Appl Pharmacol.* 2007;222:122-128. doi:[10.1016/j.taap.2007.02.015](https://doi.org/10.1016/j.taap.2007.02.015)
5. Scott BR. It's time for a new low-dose-radiation risk assessment paradigm—one that acknowledges hormesis. *Dose-Response.* 2008;6:333-351. doi:[10.2203/dose-response.07-005](https://doi.org/10.2203/dose-response.07-005)
6. Farooque A, Mathur R, Verma A, et al. Low-dose radiation therapy of cancer: role of immune enhancement. *Expert Rev Anticancer Ther.* 2011;11(5):791-802. doi:[10.1586/era.10.217](https://doi.org/10.1586/era.10.217)
7. Cuttler JM, Abdellah E, Goldberg Y, et al. Low doses of ionizing radiation as a treatment for alzheimer's disease: a pilot study. *J Alzheim Dis.* 2021;80(3):1119-1128. doi:[10.3233/JAD-200620](https://doi.org/10.3233/JAD-200620)