

Toxicologist says NAS panel 'misled the world' when adopting radiation exposure guidelines

August 13 2013

In two recently published peer-reviewed articles, toxicologist Edward Calabrese of the University of Massachusetts Amherst describes how regulators came to adopt the linear no threshold (LNT) dose-response approach to ionizing radiation exposure in the 1950s, which was later generalized to chemical carcinogen risk assessment.

He also offers further evidence to support his earlier assertions that two geneticists deliberately suppressed evidence to prevent the U.S. National Academy of Sciences (NAS) from considering an alternative, threshold model, for which there was experimental support. Calabrese's articles appear in the July 26 and August 4 issues of *Archives of Toxicology*.

Calabrese says, "The regulatory research community needs to hear about this. This isn't an [academic debate](#); it's practical, because all of our rules about chemical and low-level radiation are based on unvalidated assumptions and scientific panel decisions made without sound evidence. Now, after all these years, it's very hard when people have been frightened to death of any exposure whatsoever, to persuade them that we don't need to be scared by certain low-dose exposures."

The first of Calabrese's recent articles is a straightforward history of the LNT model for [ionizing radiation](#) mutation, a concept accepted by radiation geneticists in the 1950s and recommended by national and international advisory committees for risk assessment and human

exposure guidelines and later generalized to chemical carcinogens ever since. It is now used by public health and regulatory agencies worldwide, he notes.

In the second of the two articles, Calabrese repeats his earlier accusations that the distinguished radiation geneticist Hermann Muller, in his acceptance speech for the 1946 Nobel Prize, "made deceptive statements" intended to "promote the acceptance of the linear dose-response model for risk assessment for ionizing radiation" and that Muller's advocacy agenda was "masked" by long-time colleague Curt Stern. Their actions affected "key publications in the mutation literature," enhancing acceptance of the linear dose-response and hiding "Muller's deceptions," Calabrese adds.

His own career-long research on hormesis, which is a non-linear, threshold-based or biphasic approach to dose-response and risk assessment for ionizing radiation and toxic chemicals, provides evidence that low-dose exposure of some chemicals and ionizing radiation are benign or even helpful. In three "substantial validation tests" of the threshold, hormesis and linear no-threshold models, Calabrese and colleagues say, "only the hermetic (biphasic) dose-response made consistently accurate predictions."

The UMass Amherst toxicologist has argued for many years that a reappraisal of cancer risk assessment methods is urgently needed because the LNT model was incorporated into U.S. regulatory policy based on faulty assumptions and by Muller and Stern's manipulation of the scientific literature.

Calabrese's interpretation of this history is supported by letters and other materials he has compiled, many from formerly classified files. Muller and Stern had done many of the key experiments contributing to health risk assessment of ionizing radiation and Muller served on NAS's

Biological Effects of Atomic Radiation (BEAR) committee through which the linear dose-response approach to [risk assessment](#) became firmly entrenched, Calabrese related. He offers further evidence that the two successfully suppressed evidence from a key experiment with fruit fly sperm that challenged their views on dose-response.

More information: [link.springer.com/article/10.1...
1105-6/fulltext.html](https://link.springer.com/article/10.1007/s00204-013-1104-7)

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Provided by University of Massachusetts Amherst

Citation: Toxicologist says NAS panel 'misled the world' when adopting radiation exposure guidelines (2013, August 13) retrieved 1 May 2024 from <https://medicalxpress.com/news/2013-08-toxicologist-nas-panel-misled-world.html>

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