



## BEYOND NUCLEAR BACKGROUNDER

Residents' blood uncovers industry lie at TMI  
Lessons from TMI  
February 25, 2014

Since the middle of the 20<sup>th</sup> century, radiation scientists have known that external whole body exposure to radiation produces changes in cells, some of which are very specific to radiation exposure *per se*. There is also evidence that radioisotopes ingested or inhaled internally, or a partial body exposure to radiation, can be measured using these changes, generally called *biomarkers*. Through successive technological development and experience the complexities and costs of searching for these biomarkers has decreased, making examination for them tempting in cases of worker and public exposure to radiation. Some of these biomarkers, although they decrease once radiation exposure has decreased, can still be used to determine how much radiation exposure a person received initially, even years later.

Residents around Three Mile Island were exposed to much more radiation from the nuclear accident than was claimed by either industry, or allowed for by the proscriptive research ordered by the court through the TMI Public Health Fund.

Wing, et al. referenced research that examined chromosomes taken from 29 residents around TMI 15 years after the accident. During the accident, these 29 people experienced erythema (skin reddening), vomiting and diarrhea-- symptoms indicating that they were exposed to much [higher radiation doses](#) that industry, government, and the court refused to recognize. The researchers were investigating a biomarker that is specific to radiation exposure called a dicentric.

Analysis for this biomarker estimated doses from the TMI accident were between 600-900 milligray (60-90 rad)--many times more than releases "measured" by industry. If those most exposed, received radiation doses in this range, many other people could have received lesser doses and still suffer from radiation-induced health problems years after this initial exposure. It also means that more longer-lived radionuclides could have been released to circulate through, and bio-accumulating in, the environment, continuing to expose people through inhalation and ingestion.

Biomarker tests done world-wide have divulge people's exposure to radiation from nuclear power. Inhabitants around the Kruemmel boiling water reactor in Germany had [elevated rates](#) of these biomarkers and Kruemmel had no recognized accident. [Radiation workers](#) often have higher incidence of these biomarkers as can people who have or are at [greater risk](#) for cancer and may be at a greater risk of other diseases as well.

Few studies have been published on biomarker formation in people who could have been, or continue to be, exposed to radiation from the continuing Fukushima catastrophe. There is no evidence that this technique is being used to its fullest advantage, either in Japan or other areas suffering nuclear contamination. Many chromosomal malformations can be captured in a photograph, allowing people to "see" radiation damage therefore ushering in a sensory component to radiation exposure that has here-to-fore eluded humans. Perhaps it is this stark presentation of radiation damage that makes radiation apologists eschew this method in favor of the current dose reconstruction methods which can be so fraught with inappropriate assumptions and incorrect measurements that they can be misleading or useless.