

What Does the Science Say About **Hexavalent Chromium?**

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- A **2008 National Toxicology Program (NTP) 2-year drinking water study** was designed to determine whether hexavalent chromium (Cr6) can cause cancer at extremely high concentrations or doses – 60,000 and 180,000 parts per billion (ppb) Cr6 – concentrations far in excess of typical human environmental exposures. It reported that very high levels of Cr6 in mice caused small intestine tumors.
- However, **the study was not designed to examine mode of action (MOA)**, meaning how the chemical can cause cancer at the cellular level of an organism.
- To put these high NTP doses into perspective, the Agency for Toxic Substances and Disease Registry notes that **most U.S. drinking water supplies contain less than 5 ppb of chromium.**
- Thus, MOA studies were designed to investigate not only which levels of hexavalent chromium in drinking water can result in adverse effects like cancer, but also how hexavalent chromium can cause cancer in rodents.
- These **state-of-the-art, peer-reviewed studies** provide clear data that can help regulators confidently set safe drinking water standards for hexavalent chromium.
- Specifically, these studies examined high-, medium- and low-level exposures of hexavalent chromium in drinking water, including the **current EPA drinking water standard for total chromium of 100 ppb**, which assumes 100 percent hexavalent chromium.
- These studies show that there was no observed toxicity in rodents exposed to hexavalent chromium concentrations in drinking water at the current EPA total chromium drinking water standard.
- In fact, at hexavalent chromium concentrations of 1,400 ppb — **more than 10 times the current drinking water standard for total chromium** — there was no observed toxicity in rodents. Researchers did not observe toxicity in the rodents until the hexavalent chromium dose was 5,000 ppb — 50 times the total chromium drinking water standard.
- The researchers also found that the biochemistry, genetic, and pathology markers changed as the doses increased, supporting what scientists call a non-linear, dose-dependent response.
- The research has undergone robust review, including review by an independent third-party Science Advisory Board, multiple rounds of peer review, and the research findings and all data have been made publicly available at cr6study.info.
- To date, **this new research has resulted in the publication of over 30 state-of-the-art, peer-reviewed studies.**
- The data shows that **humans rapidly detoxify the low levels of Cr6 typically found in drinking water.**
- The MOA research concludes that the human gastrointestinal tract can detoxify hexavalent chromium to a much greater extent than the GI tract of a mouse.
- A mutagen is a toxicant that causes genetic mutation that changes the DNA and can be inherited by the next generation.
- The **MOA research indicates that Cr6 is not a mutagen** in the target tissues examined and drinking water containing less than or equal to 100 ppb total chromium would not be expected to cause intestinal hyperplasia, a precursor to the development of cancer, in humans.