Archives of Toxicology
https://doi.org/10.1007/s00204-026-04531-8

LETTER TO THE EDITOR, NEWS AND VIEWS

Between evidence and allegation: factual accuracy in discussions on fluoride toxicity and research integrity

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Received: 13 May 2026 / Accepted: 17 August 2026

In 2020, we published a review in this journal evaluating the potential adverse effects of fluoride (Guth et al. 2020, 2021). After systematically analyzing epidemiological studies, animal experiments, and in vitro data, we concluded that the available evidence does not support the assumption that fluoride exposure at levels typically encountered in Europe causes adverse health effects, including developmental neurotoxicity. Fluoride requires careful risk assessment because it occupies a unique position in public health: controlled exposure is recommended for the prevention of dental caries, whereas excessive exposure should be avoided because of the risk of dental or skeletal fluorosis. At the time, particular attention focused on the question of whether fluoride exposure at common environmental levels might impair neurodevelopment in children. Based on the available evidence, we found no convincing indication that fluoride acts as a developmental neurotoxicant at exposure levels relevant for European populations.

Recently, a publication by Neurath (2025) addressed our work not by engaging with its scientific arguments, but by alleging that the authors, as well as scientific organizations associated with them, were influenced by industry interests. Rather than engaging with the scientific arguments, the article makes a series of demonstrably false factual allegations about the authors and associated scientific organizations, thereby calling their scientific integrity into question without evidence. For example, the senior author of our review (J.G.H.) is accused of having received more than USD 500,000 from the tobacco industry. This allegation is demonstrably false. He has never received funding from the tobacco industry; all research funding received by his group originates from public sources and is publicly disclosed. The article further suggests that the German Research Foundation (DFG) and its Senate Commission on Food Safety (SKLM) serve as instruments through which industry influences scientific assessments. No evidence is provided to support these claims. Because these demonstrably false factual assertions directly impugn the integrity of individual researchers, and undermine confidence in evidence-based risk assessment, we consider it important to correct the record. A detailed point-by-point response is provided in the Supplementary Material.

The broader issue extends beyond the individuals concerned. Different interpretations of the same body of evidence are common in science and risk assessment and should be evaluated on the basis of data and methodology. The situation is fundamentally different when allegations are presented as factual statements. Factual claims are, by definition, verifiable and should therefore be held to the same standards of accuracy as scientific data. Publications in peer-reviewed journals are widely regarded as having undergone editorial and scientific scrutiny. Consequently, factual statements published in the scientific literature may be assumed by readers to have been checked for accuracy. When demonstrably incorrect allegations enter the scientific record, they can be propagated through citations, databases, and secondary reporting, potentially affecting the reputation of researchers and scientific institutions long after the original claims have been shown to be unfounded. Scientific criticism and disagreement are essential components of research. Demonstrably false factual assertions, however, should be corrected once identified.

After publication of our review, subsequent evaluations have reached broadly similar conclusions. Most notably, the European Food Safety Authority (EFSA 2025) conducted a comprehensive re-evaluation of fluoride in 2025, including the large body of studies published after our review.

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Published online: 01 September 2026

EFSA concluded that the available evidence was insufficient to establish an association between fluoride exposure and adverse neurodevelopmental effects at fluoride concentrations typically encountered in European drinking water supplies. Likewise, the German Federal Institute for Risk Assessment (BfR 2026) stated that, based on the totality of the available evidence, there is no reason to classify fluoride as a neurotoxicant. Both authorities nevertheless emphasized the need for further research to improve our understanding of fluoride kinetics and biological activity.

The question of fluoride toxicity remains a matter for scientific investigation. The question of factual accuracy should not.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s00204-026-04531-8.

Author contributions The main manuscript is written by all Authors.

Funding Open Access funding enabled and organized by Projekt DEAL.

Data availability No datasets were generated or analysed during the current study.

Declarations

Declaration of interests Author TG is on the scientific advisory board of the company Neotes and the Lebensmittelverband Deutschland. These relations are based on scientific advice and without any financial interests. A.M. is a member of the ILSI Board of Directors and has received research funding and/or honoraria from AGC Inc., Daikin Industries Co., Ltd., Nestlé, Tate & Lyle PLC, and Savanna Ingredients GmbH. None of these activities or relationships constitutes a conflict of interest relevant to this Letter to the Editor. All other authors declare no COI in the past five years.

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