



Know your environment.
Protect your health.

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To: Oregon Health Authority

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Environmental Working Group, or EWG, is a nonprofit organization with a focus on public health research and advocacy, with headquarters in Washington, D.C. Since 2009, EWG has analyzed the published scientific literature on the human health effects of exposure to radiofrequency radiation, or RFR, emitted from wireless devices. EWG expertise in this area draws on the peer-reviewed publications by national and international scientists, thorough knowledge of studies conducted in previous decades, and regulatory approaches and recommendations from health agencies around the world.

Given the substantial scientific evidence demonstrating that RFR exposure can negatively affect the brain and the heart, EWG is calling for the Oregon Health Authority, or OHA, to revise its report “Wireless Technology Health Risks” by including the latest findings from human and animal studies that demonstrate the risks of RFR for children’s health and public health generally. The OHA report, released in December 2020, did not provide a comprehensive review of relevant RFR literature and should be corrected.

In the OHA report, both *in vitro* and animal studies were omitted without any scientific justification. Among the studies that should have been included are those from the National Toxicology Program, or NTP, and the Ramazzini Institute, in Italy. The OHA report should also refer to the 2011 classification of RFR as a Possible Carcinogen (Group 2B) by the World Health Organization’s International Agency for Research on Cancer, or IARC. This classification reflects the cancer risk of RFR exposures. Omission of these important documents from the OHA report weakened the scientific quality of the OHA analysis and defeated the goal of Senate Bill 283 – to protect children’s health.

Human health risk assessment should rely on findings from both animal toxicology and epidemiology studies to provide health-based guidelines for public health protection, as recommended by public health agencies, the National Academy of Sciences and the World Health Organization (1, 2). Therefore, EWG urges the OHA to update its report with references to findings from animal studies, especially the NTP (3) and Ramazzini Institute studies (4). These are long-term animal studies that document RFR health effects.

The NTP study found clear evidence of tumors in the heart, called schwannomas, as well as tumors in the brain, adrenal medulla, pancreatic islets, prostate and pituitary gland. There was also evidence of DNA damage and non-neoplastic effects, especially damage

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to the heart, known as cardiomyopathy, which was detected in both early phase of the study and at study termination. The Ramazzini Institute study found similar results showing an increased risk of malignant schwannomas in exposed rats. Tumors in the heart are rare in humans and rats, so the detection of heart schwannoma in both the NTP and the Ramazzini studies reinforces the significance of the effects of RFR on the heart.

The findings from the NTP and Ramazzini studies agree with evidence from epidemiological studies, which reported an increased risk of gliomas and acoustic neuromas among long-term cell phone users (5, 6). These epidemiological findings were the basis for the IARC classification of RFR as a possible carcinogen (7).

In addition to the NTP and the Ramazzini Institute reports, other toxicological and in vitro studies provide evidence of carcinogenic, genotoxic, reproductive, developmental, and neurological effects of RFR exposures. In vitro and toxicological studies also point out potential mechanisms of RFR-mediated impacts, which include changes in the function of calcium channels (8-10), levels of reactive oxygen species (10-15), intracellular enzymes, gene expression (16) and membrane permeability (17), and interference with DNA repair processes (18). The findings of these mechanistic studies substantiate the capacity of RFR to elicit biological effects.

Existing evidence indicates that children absorb more RFR and are more susceptible to the adverse effects of RFR than adults. With multiple sources of radiofrequency radiation, including Wi-Fi networks, wireless devices, cell phones and cell towers, protecting children's health from avoidable RFR exposures should be a priority. Hence the conclusion drawn from a systemic review should account for the possible cumulative risk of adverse effects associated with exposures to multiple RFR sources.

It is important for the OHA report to recognize that there are guidelines from several agencies, including the [California Department of Public Health](#), [American Academy of Pediatrics](#), [New Hampshire State 5G Commission](#) and [Maryland Commission on Children's Environmental Health](#) about how children could be protected from the adverse effects of RFR exposures. These recommendations are based on extensive research showing how children are more susceptible than adults to toxic chemicals and other exposures that affect human health. There are also studies showing combined adverse effects resulting from simultaneous exposures to chemical contaminants and RFR (19, 20). References to the reports cited here should be included in the revised OHA report.

The OHA report failed to include some important findings on the adverse impacts of RFR exposures in a school setting, such as the study by Meo et al. (21), which found that RFR exposures from cell towers adjacent to school buildings was associated with delayed development of fine and gross motor skills, spatial working memory and attention.



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Finally, despite the mandate of Senate Bill 283 to review independently funded studies, we noted that industry-funded research was included in the OHA report. Example is citation of study by Elliott et al 2010 (“Mobile phone base stations and early childhood cancers: case-control study”). The funding source for this study included the mobile telecommunications industry.

In conclusion, EWG urges the OHA Oregon Health Authority to conduct a more comprehensive evaluation of RFR research and update its report to reflect the evidence of adverse effects associated with RFR exposures.

Submitted on behalf of the Environmental Working Group,

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