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Maryland Children's Environmental Health and Protection Advisory Council
Maternal & Child Health Bureau
Prevention & Health Promotion Administration,
Dept. of Health & Mental Hygiene
Herbert R. O'Connor State Office Building,
201 West Preston St.,
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October 27, 2016

RE: Information on the National Toxicology Program Radiofrequency Radiation Study for the Maryland Children's Environmental Health and Protection Advisory Council Recommendations to Reduce Children's Exposure to Radiofrequency Radiation

Dear Dr. Clifford S. Mitchell, Chair of the Maryland Children's Environmental Health and Protection Advisory Council;

We are writing in strong support of the Maryland Children's Environmental Health and Protection Advisory Council's recommendations to reduce children's exposure to radiofrequency radiation.

In this letter we would like to clarify the importance of the recent findings of the National Toxicology Program Study of Radiofrequency Radiation detailed in the [Report of Partial findings from the National Toxicology Program Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley® SD rats \(Whole Body Exposure\)](#) in regards to the upcoming recommendations of the Council.

When the study was [nominated by the FDA](#) little was known about possible health effects of long-term exposure to non-thermal levels of cell phone RFR. Guidelines for RFR exposure established by the Federal Communications Commission (FCC) in 1997 were at that time and to this day based largely on protection against acute injury from thermal effects.

Therefore, the NTP study was designed to test the null hypothesis. The objective was to test the hypothesis that radiofrequency radiation (RFR) *could not cause* adverse health effects (i.e., hazard ID) and to provide data to characterize dose-response relationships for any detected toxic and/or carcinogenic effects of cell phone radiofrequency radiation (RFR) in Sprague-Dawley rats and B6C3F1 mice exposed unconstrained in reverberation chambers. The resulting data could then be used to assess risks to human health.

The NTP study is the largest most carefully designed animal study ever done on radiofrequency radiation. Approximately four thousand rodents were used in the NTP studies to evaluate the potential toxicity and carcinogenicity of RFR in animal models. First, pilot studies and subchronic studies were conducted to determine the maximum intensity of RFR radiation that could be employed without inducing any heating effect. Then the final two year chronic studies exposed rodents prenatally and for the majority of their lifetime (up to 24 months) utilizing the information from the pilot and subchronic studies. Exposure conditions in the chronic study were carefully established to provide uniform RFR intensities to rats (1.5, 3, and 6 W/kg) that are similar to or slightly higher than the FCC localized exposure limit of 1.6 W/kg, and which have been reported to be emitted by many cell phones. These levels were determined not to change the body temperature of the animals.

Exposed male rats had statistically significant increased numbers of very rare tumors--malignant gliomas and schwannomas of the heart. These findings provide consistency with epidemiological reports of increases in gliomas and acoustic neuromas (schwann cells) among humans exposed to cell phone radiation. The cells that become cancerous in the rats were the same types of cells as those that have been reported to develop into tumors in human epidemiological studies.

Not only were cancers of the brain and heart statistically increased in the male rats but the NTP also reported statistically significant evidence of DNA damage from nonthermal exposure in mice as well as in rats (male rats: frontal cortex, hippocampus, liver, blood; male mice: frontal cortex; female rats: frontal cortex; female mice: liver, blood).

As a senior scientist with the National Toxicology Program, Ron Melnick PhD was one of 22 experts who participated in the World Health Organization (WHO) International Agency for the Research on Cancer (IARC) evaluation of RFR five years ago. At that time, IARC classified RFR as possibly carcinogenic to humans largely based on positive associations that had been observed between long term cell phone use and malignant brain tumors and tumors of Schwann cells that surround the auditory nerve leading from the inner ear to the brain (acoustic neuroma). Brain cancer risks were increased significantly after 10 years of use, and risk levels were greatest on the side of the head on which users held their cell phones. Based on the evidence available in 2011, a causal relationship was considered to be credible, and deemed by IARC as "limited evidence of carcinogenicity."

However, the IARC working group did not conclude that there was "sufficient evidence of carcinogenicity" (i.e., causal relationship had been firmly established), because recall bias in the case-control studies could not be fully ruled out as a possible contributing factor. At that time there was not sufficient evidence of carcinogenicity in experimental animals because no comprehensive research had been done that adequately tested for long term effects in an animal study. *That* was 2011.

Now in 2016, the National Toxicology program provides us with significant new scientific evidence of carcinogenicity in experimental animals. In addition to the NTP, additional experimental research has found a tumor promoting effect. A [2015 study](#) (replicating a [2010 study](#)) found that weak RFR can promote the growth of lymphomas, lung and liver tumors in mice. The human evidence has increased as well with more published research finding associations between long term RFR exposure and brain cancer ([Coureau et. al., 2014](#), [Hardell et al., 2014](#), [Morgan et al. 2015](#).)

Conclusions:

The NTP tested the hypothesis that low level RFR radiation could not cause health effects and that hypothesis has now been disproved. The NTP study results clearly show that low level RFR can cause adverse health effects. According to NIEHS, the majority of NIH scientists who reviewed the NTP data agree that the RFR exposure caused the tumors in exposed rats.

Our federal government has based RFR exposure limits on the now invalidated assumption that RFR at low levels is unable to cause health effects. Cancer, genotoxicity and organ damage are serious health effects shown to be caused by non-thermal RFR exposures in the NTP study. This study, in the context of the current body of research where hundreds of studies also find adverse biological effects at seemingly low levels, *has shifted the paradigm*.

It is likely that health risks would be higher for children because of greater penetration and absorption of cell phone radiation in the brains of children and because of increased susceptibility of the child's developing nervous system. It is also important to note that actively used cell phones are not the exclusive source of exposure to RFR, other sources of daily exposures include cell phones powered on even when not communicating, Wi-Fi devices, cordless phones and cell towers.

Based on this new information, regulatory agencies should make strong recommendations for the public to take measures to reduce RFR exposure. The recommendation to take precautions "if you are concerned" or "if you are worried" is inadequate. A policymaker's recommendation for children and pregnant women to reduce exposure to cell phones and wireless devices is responsible action informed by the best available science.

We are writing you in strong support of the Maryland Children's Environmental Health and Protection Advisory Councils recommendations to inform schools, clinicians and the public on this critically important environmental health issue. Radiofrequency radiation exposure should be reduced as much as possible in schools and at home where children spend most of their time to protect their health and well being.

Sincerely,

Ron Melnick PhD

Senior Toxicologist and Director of Special Programs in the Environmental Toxicology Program at the National Institute of Environmental Health Sciences (NIEHS), National Institutes of Health, now retired.

Devra Davis, PhD MPH

President and Founder Environmental Health Trust

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