Olga Naidenko
Environmental Working Group

March 12, 2018

Subject: Submitting public comments for the NTP March 26-28 meeting
Comment:

Good morning,

This is Olga Naidenko, submitting a letter of public comments on behalf of the Environmental Working Group for Session 1 and Session 2 of the upcoming NTP meeting. I am attaching my comments with this email. Can you kindly confirm that you have received our comment letter? I have tried twice to submit them through the NTP website, and I don't know if I succeeded, because I have not received a confirmation email or comment submission number.

Thank you very much for your kind attention to this inquiry,

With best regards

Olga Naidenko
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Environmental Working Group Comments on the National Toxicology Program Draft Technical Reports on the NTP Studies of Cellphone Radio-Frequency Radiation in Rats (Report TR-595) and in Mice (Report TR-596)

NTP Technical Report Peer Review meeting, March 26-28, 2018

The Environmental Working Group (EWG) is a nonprofit public health research and advocacy organization headquartered in Washington, D.C. EWG has been studying the human health effects of cellphone radio-frequency (RF) radiation since 2009, and has published extensive reviews and research summaries on this issue. EWG's work in this area draws on the latest research publications by national and international scientists, our in-depth knowledge of studies conducted in prior decades, and a close monitoring of regulatory approaches and recommendations on RF radiation made by government agencies around the world.

The core message EWG brings to the NTP Peer Review Panel is that the overall body of science around RF radiation raises justifiable concerns, and deserves full attention and a precautionary attitude from government agencies, researchers, and the medical community.

In EWG's assessment, the data collected by the NTP radio-frequency radiation research program are both authoritative and timely, and strengthen the earlier evidence that exposure to cellphone radiation triggers a variety of biological process and increases the risk of cancer. The implications of this research for understanding the effects of exposure to cellphone radiation should raise alarms for policymakers and awareness for all Americans. These studies should have been done before more than 90 percent of Americans, including children, started using RF-based technologies and devices day in and day out.

This letter addresses three aspects of the NTP study:

1. The type and amount of radiation to which the laboratory animals were exposed in the NTP study is relevant to current wireless technologies Americans use.
2. The NTP data, within the overall body of research on this topic, increase the level of concern for the cancer-causing effects of cellphone radio-frequency radiation.
3. NTP study results also highlight the potential for non-cancer effects of cellphone radiation, especially effects on the young, developing organism.

Details for our recommendations are provided below.

1. The NTP data are relevant for assessing human health risks from wireless devices

The NTP study examined health effects in laboratory animals exposed to one of two modulated types of cellphone radiation at 900 MHz and 1900 MHz, GSM and CDMA,[1] classified as the second-generation (2G) cellular wireless technology. Across the U.S., 2G

[1] GSM: Global System for Mobile Communications; CDMA: Code Division Multiple Access

networks have been largely replaced by 3G and 4G technologies, and the Federal Communication Commission anticipates a rollout of the fifth generation, or 5G, network technologies in the near future.

In order to transmit data, wireless technologies use distinct approaches to modify, or modulate, the electromagnetic radiation waves. Different technologies also rely on different frequency bands, from the 900-1900 MHz used in the 2G networks, to 5G networks that cover 2 GHz, 5GHz and higher frequency bands.

It takes decades to design, fund, and implement a large-scale animal toxicology study such as the NTP analysis of animals exposed to 2G cellphone radiation; meanwhile, wireless technologies are changing on a much faster timescale. This means that wireless technology users, parents looking for appropriate technology options for their children, entire communities, and regulatory agencies need to act based on the available, limited data.

EWG highlights several facts about the NTP study design. First, as stated in the 2017 publication from the IT'IS Foundation: "The system requirements for this second-year NTP cancer bioassay study were the tightly controlled lifetime exposure of rodents (1568 rats and 1512 mice) to three power levels plus sham *simulating typical daily, and higher, exposures of users of GSM and CDMA (IS95) signals*."[2] [Emphasis added.]

IT'IS Foundation was chosen by the NTP itself to do the exposure assessment for the study, and IT'IS provides a following statement on its website about this research:

> *The exposure modulation and levels were designed by the IT'IS Foundation in collaboration with the National Institute of Environmental Health Sciences (NIEHS) to mimic a cell phone user's exposure in the environment* for these two systems and to expose all of the animal tissues as uniformly as possible; the highest level of exposure investigated was at dosimetric levels as high as the thermal response of the animal permitted. As a result, local exposures were higher than the typical human exposure, *yet the overall exposure remained within normal levels* – a fact that was repeatedly reported wrongly in many news outlets.[3] [Emphasis added.]

Thus, EWG firmly believes that the radio-frequency radiation exposure scenarios used with the reverberation chamber exposure system in the NTP study are relevant for human health.

2. The NTP data confirms earlier evidence about cancer risks of cellphone radiation

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[2] Capstick et al. A radio frequency radiation exposure system for rodents based on reverberation chambers. IEEE Trans Electromagn Compat. 2017; 59(4):1041-1052. Available at doi.org/10.1109/TEMC.2017.2649885

[3] IT'IS Foundation. NTP Press Conference: Draft Technical Reports of the National Toxicology Program's Radiofrequency Radiation Studies in Rodents. February 5, 2018. Available at www.itis.ethz.ch/news-events/news/other-news/2018/telephone-press-conference-on-draft-technical-reports-of-the-national-toxicology-programs-radiofrequency-radiation-studies-in-rodents/#current

As the NTP study showed, male rats exposed to RF radiation had a greater chance of developing malignant brain cancer, tumors in the heart, and tumors in other organs. Various tumors were also observed in mice exposed to radio-frequency radiation.

These NTP results are in agreement with the classification by the World Health Organization's International Agency for Research on Cancer of cellphone radiation as a "possible carcinogen," based on human epidemiological studies that found increased gliomas and acoustic neuromas in long-term cellphone users.

In fact, the NTP results go deeper than what could have been observed in human epidemiological studies, because the NTP study examined various organs and detected a variety of tumors in experimental animals. For example, in male rats, increased frequency of tumors were found in the heart, brain, pancreatic islets, pituitary gland, prostate gland and the adrenal gland.

EWG especially highlights the analysis conducted by Dr. Joel Moskowitz, a scientist from the School of Public Health at the University of California, Berkeley, who reported that "the strongest finding in the NTP reports was increased cancer incidence in Schwann cells of the hearts in male rats exposed to cellphone radiation."[4] The Ramazzini Institute experimental study on animals exposed to radio-frequency radiation, at levels far lower than the NTP study, is currently in press and expected for release in March of this year and will provide additional data on chronic low level exposures.

Overall, EWG finds that the NTP data, within the overall body of research on this topic, heighten the concern for the cancer-causing effects of cellphone radio-frequency radiation.

3. The NTP study results are especially relevant for children's health

In December 2017, the State of California officially issued guidelines advising cellphone users to keep phones away from their bodies. When the groundbreaking guidelines were made public, California Department of Public Health Director Karen Smith said:

> Simple steps, such as not keeping your phone in your pocket and moving it away from your bed at night, can help reduce exposure for both children and adults … Children's brains develop through the teenage years and may be more affected by cell phone use. Parents should consider reducing the time their children use cell phones and encourage them to turn the devices off at night.[5]

[4] Analysis by Dr. Joel Moskowitz available at www.saferemr.com/2016/05/national-toxicology-progam-finds-cell.html
[5] CDPH [California Department of Public Health] Issues Guidelines on How to Reduce Exposure to Radio Frequency Energy from Cell Phones. December 13, 2017 Available at www.cdph.ca.gov/Programs/OPA/Pages/NR17-086.aspx

EWG fully agrees with the now-official California guidelines. In fact, EWG has been at the forefront of public interest organizations raising concerns about the human health impact of radio-frequency radiation, starting with our 2009 Science Review on Cancer Risks and Children's Health, [6] and continuing to the present.

As EWG, Environmental Health Trust,[7] and other organizations and expert groups have reported, exposure studies show that the head and brain of a small child absorb significantly more radiation than those of an adult. This means that the health effects associated with exposure to cellphone radiation would likely be more pronounced for those who started using phones at a young age and will likely continue using them for a lifetime.

Our organization takes the potential human health risks of radio-frequency radiation very seriously, yet EWG staff continues using cellphones. We just use them differently, keeping the phones away from our bodies so as to minimize radiation absorption, and we recommend that parents take similar precautions when it comes to kids using cellphones and other wireless devices.

In summary, EWG views the NTP study results as an essential addition to the body of research on the biological effects of cellphone radiation, and we consider them fully relevant to the human health assessment of not just the 2G technologies, but wireless network devices and radio-frequency radiation exposures overall. As new wireless networks are built around the country, an in-depth assessment of children's health risks is essential, and the NTP study provides the necessary information for doing so.

Presented on behalf of the Environmental Working Group,

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[6] EWG 2009 report on cellphone radiation available at www.ewg.org/research/cell-phone-radiation
[7] Environmental Health Trust. 2015. Best Practices with Children and Wireless Radiation: A Review of Science and Global Advisories. Available at ehtrust.org/wp-content/uploads/2015/12/Schools-and-Wireless-Briefing-October-2015.pdf