

Cindy Russell, MD

March 12, 2018

Response to NTP report on Cell Phones and Brain Cancer

Dear Researchers and Scientists at the NTP:

I am writing to comment on your work at NTP and also to thank you for your ongoing important research into the adverse effects of radiofrequency radiation we are now almost continuously exposed to from cell phones, cell towers and wireless devices. More independent research needs to be funded in this field.

The National Toxicology Program Report on Cell Phones and Brain Cancer has been important in supporting evidence of harm from RFR, highlighting that glioma and Schwann cells in the brain, nervous system and heart as well as other organs are a target for radiofrequency radiation through whole body exposure.

According to your report, the study found a statistically significant increase in tumors of the heart and brain as well as an increase in tumors of the prostate gland, pituitary gland, adrenal gland, liver, and pancreas. The report also states there were increases in non-neoplastic lesions in the heart, brain, and prostate gland of male rats, and of the heart, thyroid gland, and adrenal gland in female rats with exposure to GSM cell phone RFR at 900 MHz. There were also consistent reports of perinatal effects in both the 28-day and 2-year studies, including lower dam body weights in late gestation and lactation, lower pup body weights and lower pup survival rates.

The research supports both an association and causation for cancer from RFR. In addition, findings indicate that RFR was associated with increases in an unusual pattern of cardiomyopathy in exposed male and female rats. Reproductive abnormalities were also identified.

It is notable that rat studies do have some limitations. There is variability in rat strains and cancer incidence and viability. Sprague Dawley rats were used in the NTP study over the inbred Fischer rats as they have a lower spontaneous background tumor rate. There is a known decrease in survival of SD rats compared to Fischer rats which have been used in prior NTP studies. Rats that died early are at less risk of developing tumors than rats that died late.

Spontaneous primary cardiac tumors are rare in rats, occurring with an apparent frequency overall of 1.8%, according to your report.

Some elements of the NTP study were criticized, stating these indicated a faulty study.

1) **Only males developed brain tumors:** The literature indicates that there is often gender differences in outcomes in animal carcinogenicity studies. This could be due to differences in hormone levels. The literature also indicates that the estrogen produced in females seem to provide neuroprotection. This could be due to the antioxidant protective effects of estrogen on the brain. (6,7,8) It appears that 17 beta-estradiol (E2) is also cardio-protective in females. (9)

2) **None of the controls developed tumors:** This could be explained by the fact that these rats were housed in very clean environments, free of any confounding radiation. This unexpected result may give more strength to the association between ambient chronic low level radio frequency radiation and cancer.

While your research supports adverse effects from wireless radiation, it is not the only research to identify harm. Yakymenko et al. in 2016 (<https://mdsafetech.org/cellular-mechanisms-oxidation/>) looked at 100 currently available peer-reviewed studies on oxidative effects of low-intensity microwave radio frequencies. He found that 93 of the 100 studies confirmed that these wireless radio frequencies induced oxidative effects in biological systems. Studies have also identified the protective effects of vitamin C, E and other antioxidants with exposure to radio frequencies. It is perhaps this oxidative effect which caused the cardiomyopathy. Mitochondria could be the target of biological harm. Careful studies have shown adverse cellular effects with non-thermal RFR exposures.

With acute exposure to higher levels or chronic exposure to lower levels of non-ionizing radiofrequencies cumulative tissue damage can occur. Genetics, age, chronic disease and synchronous exposure to other toxins influence the repair abilities of cells and thus additional toxic exposure from RFR can enhance biologic harm. This needs to be taken into account in real life exposures and studied in the lab.

Many studies have shown an association of RFR and brain cancer.
<https://mdsafetech.org/science/cancer/>

Many studies show RFR damages nerve cells. (<https://mdsafetech.org/nervous-system/>) This is likely an effect from RFR of creating damaging reactive oxygen species which affect proteins and DNA.

Many studies show damage to sperm and reproduction.
(<https://mdsafetech.org/science/reproductive/>) .

Many studies show that people are developing electrosensitivity in the presence of wireless devices. This often comes after a toxic high exposure to RFR or an infectious agent, likely damaging mitochondria and making the person vulnerable to harm from RFR, even at low levels. (<https://mdsafetech.org/science/es-science/>)

RFR from wireless devices appears to act as a common toxic exposure similar to other chemical toxins and metals. In this increasingly wireless environment more people will be developing chronic diseases. It will take decades (if it is even possible) to sort out the additive contribution of harm from wireless technology. Your research indicates that guidelines need to be based on biological cellular effects and not thermal effects. Precaution is warranted. Reduction of exposure to RFR is a preventative public health measure.

Please continue this critical research for the health and wellbeing of future generations and the environment.

Sincerely,
Cindy Russell, MD

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11) **NTP TECHNICAL REPORT ON THE TOXICOLOGY AND CARCINOGENESIS STUDIES IN Hsd:SPRAGUE DAWLEY SD RATS EXPOSED TO WHOLE-BODY RADIO FREQUENCY RADIATION AT A FREQUENCY (900 MHz) AND MODULATIONS (GSM AND CDMA) USED BY CELL PHONES.** Scheduled Peer Review Date: March 26 to 28, 2018.

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