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SPIN vs FACT: *National Toxicology Program* report on cancer risk from cellphone radiation

The National Toxicology Program (NTP) of the National Institutes of Health reported partial findings from their $25 million study of the cancer risk from cellphone radiofrequency radiation (RFR). Controlled studies of rats showed that RFR caused two types of tumors, glioma and schwannoma. The results "…could have broad implications for public health." Below are some biased statements, or "Spin," about the study that tend to create doubt about data quality and implications, as well as "Facts" from decades of previous research.

SPIN	FACT
Conclusions are faulty. Dr. Michael Lauer, deputy director for extramural research at the National Institutes of Health, "I am unable to accept the authors' conclusions."	The NTP is world-renowned for toxicology research. This is "by far … the most carefully done cell phone" toxicology study of RFR carcinogenic effects. Criticisms by Dr. Lauer and other scientists who reviewed the study were rebutted in the study report.
Study reports a "low incidence" of tumors in the brain and heart in rats exposed to RFR.	The study found that one in twelve (8.5%) of the 540 male rats exposed to cellphone radiation developed cancer or pre-cancerous cells as compared to none of the 90 rats in the control condition.
Relevance of animal studies to humans is questionable.	The cells that developed tumors are the same cells that display elevated tumor risk in studies of long-term, heavy cellphone users. Rats are the preferred animal model for carcinogenicity studies.
International Agency for Research on Cancer (IARC), rated cellphone radiation a "possible'' human carcinogen (Group 2B), the same rating given to coffee, pickled vegetables, and talc.	The report provides strong evidence that RFR exposure causes cancer. Major studies published since the 2011 IARC meeting consistently find that long-term, heavy cellphone users have increased risk of brain tumors. Group 2B carcinogens also include DDT, lead, and diesel fumes.
Prior research contradicts NTP study results (e.g., Danish Cohort Study, British Million Women Study).	The Danish study has been criticized by many scientists for excluding heavy cellphone users. The British Study has also been criticized; but, it found evidence for acoustic neuroma (a form of schwannoma).
Epidemiological studies fail to show an increase in brain tumor incidence since 1992 even though cellphone use has mushroomed.	The incidence of nonmalignant tumors has significantly increased in the U.S. since cellphones. Moreover, the incidence of glioblastoma multiforme, the most serious type of brain cancer, has increased in parts of the brain proximal to where cellphones are held. Brain cancer can take decades to develop, so it is premature to see overall increases in malignant tumors in the general population.
There is no mechanism to explain how cellphones could cause cancer. Unlike ionizing radiation, *non-ionizing* radiation from cellphones cannot damage DNA.	A review paper reported that in 93 of 100 studies RFR produced a cellular stress response which can lead to DNA damage and cancer. The NTP study also found evidence of DNA damage. Several published papers present evidence for different mechanisms by which RFR may cause cancer.
The research has not been peer-reviewed.	The NTP report has been peer-reviewed by experts. Some reviews appear in the report along with the authors' responses.
Findings are preliminary, it is premature to conclude we should take precautions or change policy.	These are not preliminary findings. According to NTP, the effects of RFR on these two tumors, glioma and schwannoma, are final. The federal government released this partial report because the results "could have broad implications" for the public due to widespread cellphone use. The NTP posted on its website a link to the FDA's recommendations on how to reduce cellphone radiation exposure.