From: PPSI@aol.com [mailto:PPSI@aol.com]
Sent: Thursday, August 25, 2016 4:25 PM
To: Nambiar, Madhusoodana; steve.woods@cdph.ca.gov
Subject: Fwd: Medscape: Do Cell Phones Cause Cancer?

Madhusoodana Nambiar
Regulations Staff
Office of the Center Director
Center for Devices and Radiological Health,
U.S. Food and Drug Administration
Building WO66, 5572
10903 New Hampshire Avenue
Silver Spring, MD 20993

Dear Mr. Nambiar:

Please add the following to our FDA Citizens Petition on Cell Phones, Docket # FDA-2013-P-1374,

Also, can you please send copies of all our submissions and additions to the following,

Steve Woods, Division Chief
Food, Drug and Radiation Safety
California Department of Public Health
1500 Capitol Avenue, MS 7600
Sacramento CA 95814
916-440-7883
fax : 916-440-5421
email : steve.woods@cdph.ca.gov

I met with him last month, who also is chief of Radiation and Safety for California.

Please tell me where our Citizens Petition is on Cell Phone, **Docket # FDA-2013-P-1374, are there hearings coming up and when will they be ?**

Best-

Fred

Frederick S. Mayer, R.Ph. ,MPH,FACA
PPSI CEO, Gray Panthers
300 Deer Valley Road, Suite 2F
San Rafael, CA 94903
415-302-7351
ppsi@aol.com
www.ppsinc.org
==========

From: jmm@berkeley.edu
To: cheemf@lists.healthandenvironment.org
Sent: 8/24/2016 2:32:48 P.M. Pacific Daylight Time
Subj: Medscape: Do Cell Phones Cause Cancer? Maybe Yes and No

Do Cell Phones Cause Cancer? Maybe Yes and No

Roxanne Nelson, BSN, RN, Medscape Oncology, August 24, 2016

Does using a mobile phone increase the risk of developing brain cancer?

As many times as it has been asked, there is seemingly no simple answer to that question, as studies continue to produce conflicting results.

But the answer may lie somewhere in the middle between a yes and a no, according to Dariusz Leszczynski, PhD, adjunct professor of biochemistry, University of Helsinki, Finland.

In an article on the *Conversation* website, Dr Leszczynski poses the intriguing question: What if both views are correct?

It could be possible that mobile phone radiation itself does not cause cancer but that long-term exposure increases the risk of developing cancer when other causes are part of the picture.

This hypothesis of cocarcinogenicity may explain the apparent discrepancy that has been seen in previous studies of this issue, says Dr Leszczynski.

However, two experts approached by *Medscape Medical News* were not convinced.

IARC Status: "Possibly Carcinogenic"

Approximately 30 epidemiologic studies have attempted to evaluate the association between cell phone use and the risk for brain and salivary gland tumors, as previously reported by *Medscape Medical News*.

In 2011, the International Agency for Research on Cancer (IARC) declared that cell phones are "possibly carcinogenic" (Dr Leszczynski was on the IARC working group that came to this conclusion). That conclusion was based largely on the results of the large INTERPHONE international case-control study (*Int J Epidemiol*. 2010 Jun;39:675-94) and a series of Swedish studies led by Hardell Lennart, MD, as previously reported by *Medscape Medical News*.

In addition, there have been a number of experimental studies involving cell cultures and animal models, and data from the animal studies lend support for Dr Leszczynski's hypothesis.

Findings from the experimental models that were evaluated by IARC experts in 2011 suggested that mobile phone radiation alone does not cause cancer, but there may be "cocarcinogenic" properties. Mobile phone radiation increased the development of cancer in animals

simultaneously exposed to low doses of known chemical carcinogens in five studies, he pointed out.

Cocarcinogenicty Hypothesis

The idea of cocarcinogenicity is not brand new — it "has been around for a number of years," Dr Leszczynski told *Medscape Medical News*, "but the use of it to reconcile discrepancy between opposing views is a novel one."

One of the animal studies, he noted, was recently replicated and confirmed the cocarcinogenic effect of mobile phone radiation (*Biochem Biophys Res Commun*. 2015 Apr 17;459:585-90).

To date, there has only been a handful of cocarcinogenicity studies in which animals or living cells were simultaneously exposed to chemicals and to mobile phone radiation, "so there is not much to go on," he said. "This poses a serious problem for proper risk estimation."

On the basis of very limited, currently available knowledge, it does appear possible that mobile phone radiation might not cause cancer in and of itself. Instead, it might activate regulatory processes and accelerate development of the disease, he speculated.

Using this hypothesis, it is possible to explain several of the "inexplicable" contradictory scientific results, he said.

Epidemiologic case-control studies show an increase in the risk for brain cancer not because mobile phone radiation causes it but because it accelerates the development of brain cancers caused by other carcinogens or that occur because of spontaneous gene mutations.

Simultaneously, the incidence of brain cancer in the population is low compared with the high rate of mobile phone use because the increases are solely due to cocarcinogenic effects of mobile phone radiation. Not all users are in danger of developing brain cancer, only those who have other carcinogenic or genetic factors.

The US National Toxicology Program (NTP) recently released results from an ongoing rodent study that looked at the risk for carcinogenesis in studies of radiofrequency radiation at frequencies and modulations used in the US telecommunications industry.

The findings thus far show a low incidence of tumors in the brains and hearts of male rats but not in female rats. Overall, there was a lack of brain cancer in the control group and a very small number of brain cancer cases among the exposed rats.

Some have questioned the significance of these results, because the number of brain cancers was so small; Dr Leszczynski noted that his cocarcinogenicity hypothesis could explain the results of this study.

The rats exposed to mobile phone radiation developed cancer, but not solely because of that one stimulus. Rather, exposure to the radiation accelerated the development of cancers caused by spontaneous mutations.

In the control group, the same brain cancers, which would also be caused by spontaneous mutations, did not have time to develop because there was no extra stimulus to accelerate them.

More Study Needed

Much more research is needed to prove this hypothesis, Dr Leszczynski commented. "But what is needed will cost a lot of money, like the $25 million NTP study."

To prove that the hypothesis is plausible, animal studies with rats or mice or both will need to be conducted in which animals will be exposed to a known carcinogen plus mobile phone radiation. This is the only way to prove that the hypothesis is plausible.

"However, to be certain, we need human studies," Dr Leszczynski explained. "Obviously we cannot purposefully expose people to carcinogens, but people often do it to themselves."

Tobacco smoke and ultraviolet radiation are two known human carcinogens, and millions of people willingly expose themselves to both of them separately or concurrently, he pointed out.

"We need to design epidemiological studies where exposures to tobacco smoke and to ultraviolet radiation in combination with mobile phone radiation would be explored," Dr Leszczynski said.

It would be almost impossible to find a control population of people who do not use mobile phones. This would be slightly problematic because a control group of people who smoke or sunbathe and who rarely or never use mobile phones would be needed.

"Exposures to tobacco, such as using the number of cigarettes smoked, and ultraviolet exposure by pigmentation of exposed vs unexposed skin could be determined fairly accurately, but radiation exposure is a problem," he said. "However, there might be a solution for how to measure exposure to phone radiation — by using an app on smart phones. Such apps are already available (eg, Quanta, by Cellraid in Finland) and are being developed.

"There would be a lot of biases and confounders necessary to consider, but in an imperfect world, this imperfect study would be of some help," Dr Leszczynski added.

Not Convinced

Approached for comment, John E. Moulder, PhD, professor and director of radiation biology at the Medical College of Wisconsin in Milwaukee, pointed out this is "hardly a new hypothesis."

"Basically it is restatement of the possibility that mobile phone RF radiation might be an epigenetic carcinogen, or a promoter or a cocarcinogen in older terminologies," he told *Medscape Medical News*.

This hypothesis was very popular in the 1990s, and a number of major animal studies published from 2000 to 2010 were designed to test the hypothesis for brain cancer. "None of them found any effect," he said.

Other studies published from 1997 to 2003 also looked at possible epigenetic effects. These focused on mammary tumors, lymphoma, colon cancer, liver cancer, and skin cancer. They were also largely negative, he said.

"Epigenetic activity can also be assessed in cell culture. Such studies go back at least to 1985, and there were lots of them until about 2010," Dr Moulder said. "The cell culture studies reported some epigenetic effects, but as far as I know, none of these effects could be confirmed."

Dr Moulder added that "interest in this hypothesis has tailed off," but several articles were published after 2009 that assessed the epigenetic potential of radiofrequency radiation. "They are

mostly negative, and as far as I can tell, none of the positive studies have survived replication attempts," he said.

Causes Initiation and Promotion

Another expert is also not convinced. "I think he overstates the case for tumor promotion and understates the role of tumor initiation," commented Joel M. Moskowitz, PhD, director, Center for Family and Community Health, School of Public Health, University of California, Berkeley, who also runs a website on electromagnetic radiation safety.

"Cell phone radiation can cause cancer initiation as well as cancer promotion," he told *Medscape Medical News*.

"The NTP demonstrates that long-term exposure to 2G cell phone radiation causes cancer initiation in male rats, and the preliminary NTP studies found evidence of DNA damage in male and female rats and mice, a precursor to cancer initiation," said Dr. Moskowitz. "Contrary to mainstream media reports, the incidence of cancer was not 'low,' as 1 in 12 male rats exposed to cell phone radiation developed cancer or precancerous cells as compared to none of the controls."

He noted that the NTP study was not the first randomized controlled trial to find cancer initiation in rats from wireless radiation exposure.

As for human trials, the Interphone Study reported substantially increased glioma risk among heavy cell phone users who used the phones for only 4 or fewer years, Dr Moskowitz pointed out. "Thus, much of the increased brain cancer risk observed in this study and perhaps in other case-control studies may be due to tumor promotion rather than initiation.

"With tumor promotion, the cell phone radiation is a cocarcinogen, and we cannot rule out tumor initiation," he continued. "Both processes may be taking place, and longer-term studies may be necessary to observe more tumor initiation, because solid tumors take a long time to grow."

***Dr Leszczynski is a chief editor of* Radiation and Health*, specialty of Frontiers in Public Health, Lausanne, Switzerland, and a former member of the working group of the IARC that in 2011 classified cell phone radiation as a possible carcinogen. He receives occasional conference travel funding from Pandora Foundation and Competence Initiative, Germany; Cellraid, Finland; Telstra, Australia; the Swinburne University of Technology, Australia; and from conference organizers. Dr Moskowitz oversees a website on electromagnetic radiation safety. Dr Moulder has received grants from the National Institutes of Health, the American Cancer Society, and the US Department of Veterans Affairs*.**

***The Conversation*. Published online August 8, 2016. Full text**

www.medscape.com/viewarticle/867838

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Joel M. Moskowitz, Ph.D., Director
Center for Family and Community Health
School of Public Health
University of California, Berkeley

Electromagnetic Radiation Safety

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