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TOXIC EXPOSURES

Cellphone Radiation Causes Cheek Cells to Die, Study Finds

Exposure to 3G cellphone radiation caused cell damage and death in the user's cheek tissue, which could lead to the development of cancer, according to a new peer-reviewed study.

by **Suzanne Burdick, Ph.D.**

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Exposure to 3G cellphone radiation caused cell damage and death in the user's cheek tissue, which could lead to the development of cancer, according to a new peer-reviewed study.

The study authors — including **Michael Kundi, Ph.D.**, with the Center for Public Health at the Medical University of Vienna, Austria — said they found “clear evidence for induction of acute **toxicity** and disturbance of the cell cycle (cytokinesis) as a consequence of exposure” to **radiofrequency (RF) radiation** levels used by 3G smartphones.

“These processes may possibly lead to the formation of neoplastic cells,” they wrote in their report, published in *Environmental Research*.

Malignant neoplasms are cancerous tumors, according to the Cleveland Clinic.

Kundi and his co-authors said their study — which used people, not mice — was the “first controlled human intervention trial concerning cytotoxic/genotoxic effects of mobile phone radiation.”

Dr. Rob Brown, a diagnostic radiologist with more than 30 years of experience, told **The Defender** that the cell damage found in the study “is significant and should be looked at with great concern.”

Brown is also the vice president of **scientific research** and clinical affairs for **Environmental Health Trust** (EHT), a nonprofit research and education group focused on the effects of **wireless radiation**.



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He said the study is “particularly valuable” because it is an **in-vivo** study. “Most research to date exploring the **biological effects** of electromagnetic fields and radiofrequency radiation has been performed on **in-vitro cell cultures**, plants and animal models,” Brown said. “Because of this, they have been easier to discount by industry and policymakers.”

Kundi and his co-authors undertook their study because prior research suggests that cellphone radiation “may cause **cancer** in humans but the underlying molecular mechanisms are currently not known.”

Their results shed light on the molecular mechanisms that may be involved.

For instance, they found that 3G cellphone radiation didn't cause chromosomal damage, but it did cause the formation of nuclear anomalies that are indicative of "acute cytotoxic effects" and "disturbed cytokinesis."

Devra Davis, Ph.D., MPH — EHT's founder and president emerita whose prior research cited "**substantial scientific evidence**" linking cellphone radiation to cancer — said that just because authors of the Austrian study didn't find chromosomal damage in the exposed cells shouldn't be interpreted as suggesting that cancer won't develop.

"In fact, chromosomal damage is not a necessary precondition for carcinogenesis," Davis told The Defender.

"Carcinogenesis can occur without mutagenesis," she said, "Factors contributing to cancer include damage to rates of **cellular signaling** and repair such as were found in this study."

She said the study — which she called "well-designed" — added to prior studies showing harms from RF radiation by elucidating "additional reasons why phones should not be used close to the head or body."

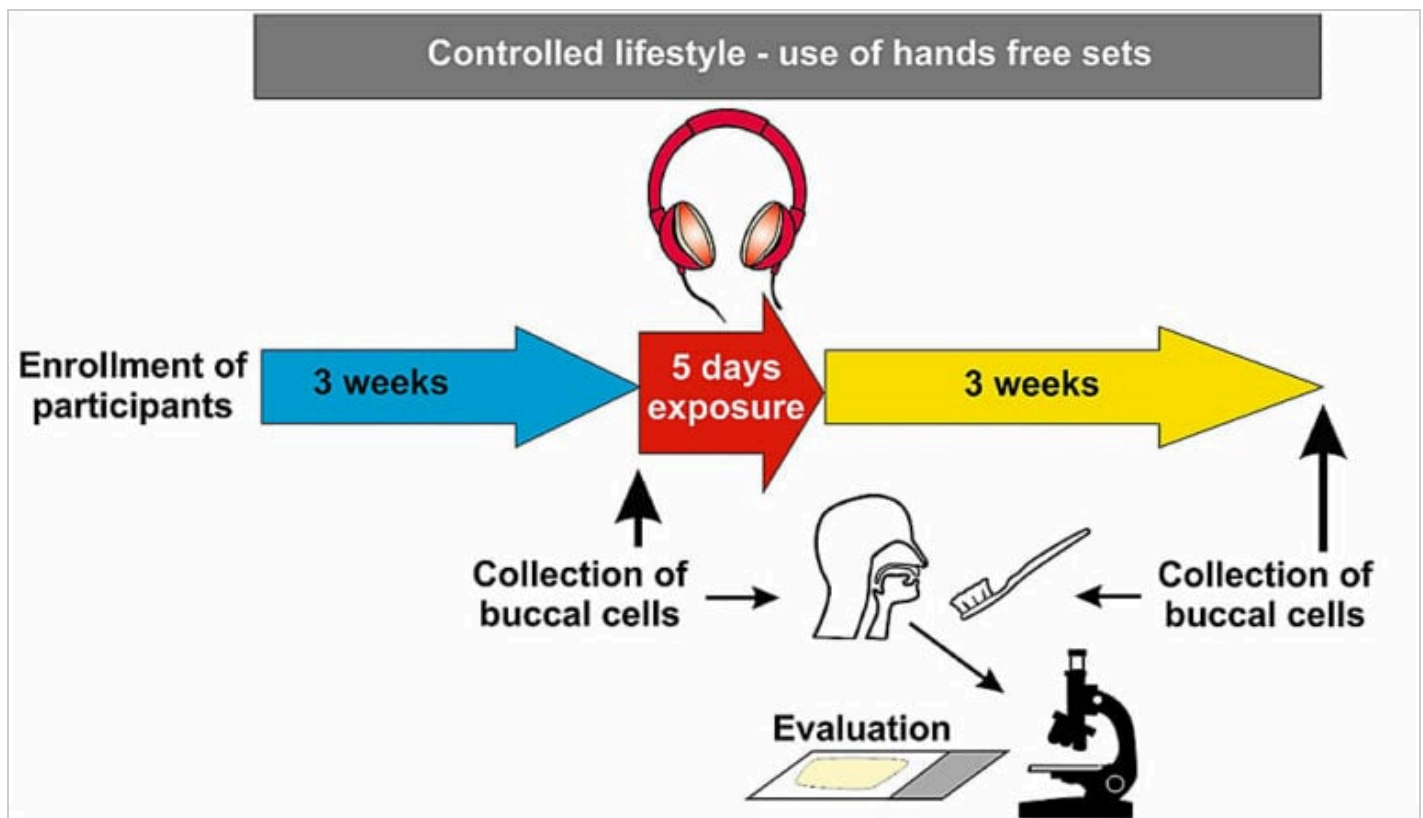
Participants wore RF radiation headsets mimicking cellphone radiation exposure

For the **study**, the authors randomly assigned 41 participants, whose average age was 29, to be in a high RF radiation exposure group — designed to simulate holding a cellphone using 3G next to their head — or a low RF radiation group, ostensibly designed to mimic other real-world exposures to RF radiation.

Participants wore a headset that emitted either high- or low-level RF radiation on one side of the head for two hours on five consecutive days.

The study authors collected **buccal smear** samples to examine the cells inside both cheeks just before and three weeks after the participants wore the RF radiation headsets.

The researchers also asked the participants to use hands-free devices three weeks before, during and three weeks after the intervention, to minimize other possible cellphone RF radiation to the cheek.



Credit: Michael Kundi, Armen Nersesyan, Gernot Schmid, Hans-Peter Hutter, Florian Eibensteiner, Miroslav Mišík and Siegfried Knasmüller.

The participants recorded in a journal any potential confounding factors such as **gingival bleeding**, eating a spicy meal or visiting the dentist during the study timeframe.

The journals showed such confounding factors were very rare or not present.

Through scientific analysis of the buccal samples, the researchers found that the cells from the cheeks of participants in the high RF radiation group showed “a significant increase of binucleated cells” — cells that contain two nuclei — “which are formed as a consequence of disturbed cell divisions, and of karyolytic cells, which are indicative for cell death.”

“No such effects were seen in cells from the less exposed side,” they said.

Their analysis revealed increased **chromatin** fragmentation in the cells, which prior research associated with two forms of cell death: **apoptosis** and **necrosis**.

“Both forms of cell death are preceded by condensation of chromatin,” they explained. “Notably in the present study we found also an increase of CC,” or condensed chromatin.

Brown said the findings provide “strong evidence that at least some frequencies emitted by the cellular phone passed through the entire thickness of the cheek’s soft tissue (typically 1 centimeter in thickness or more) to affect the sampled cells.”

He added, "A similar depth of penetration and perhaps even greater should therefore be expected in all parts of the body in which a cellphone may make contact."

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Many young people use a cellphone for more than 2 hours a day

The study authors noted that a limitation of their study was that the participants wore the RF radiation headset for only two hours during each exposure session.

Davis pointed this out, too. "The exposure times used in this study appear much less than those reported in surveys of phone use in many sections of the globe and in younger age groups."

"For instance," she said, "Gen Z users report about **6 or more hours** daily use of smartphones."

U.S. Americans on average spend 3 hours and 39 minutes a day on their smartphones, reported **ExplodingTopics.com** on June 4.

It's difficult to accurately determine how many of those hours are spent with the phone held close to the head, Davis said.



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