

EMR and Health

Report on electromagnetic radiation, health and well-being

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Aussie No-Effects team finds no 5G effects

Australian scientists release two new papers on 5G radiation

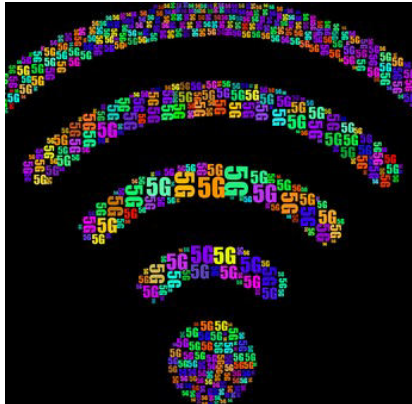
There's nothing to worry about from the high-frequency radiation used by 5G. Or is there?

Two papers on 5G radiation, by scientists from Swinburne University of Technology and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), were published online on 16 March.

On the one hand the authors of these papers claim that there is 'no confirmed evidence' that this radiation can be 'hazardous' to human health. On the other hand, they base their conclusions on some dubious assumptions.

In the first, Karipides et al ¹ conducted a review of 107 experimental studies and 31 epidemiological studies on the effects of radiofrequency radiation above 6 GHz. This includes some 5G frequencies (other 5G frequencies are below 6GHz) and millimetre waves (30—300 GHz) that are expected to be used in future generations of technology.

The authors concluded that their review 'provided no confirmed evidence that low-level MMWs [millimetre microwaves] are associated with biological effects relevant



to human health.'

In the second paper, Wood et al ² conducted a meta-analysis of 107 studies on millimetre microwaves in which exposures were lower than the occupational limits of international guidelines published by ICNIRP (International Commission on Non-ionizing Radiation Protection). ²

They concluded 'there is little consistent evidence to support the notion of biological effects from MMWs at levels below the ICNIRP occupational limits.'

Commenting on the papers, Dr Gillian Hirth ARPANSA's Deputy CEO and Chief Radiation Health Scientist said, 'ARPANSA is proud to continue our contribution to research and assessment of 5G radiation safety. The work is core to our involvement in the Australian Government's Electromagnetic Energy Program and helps us deliver on our vision of a safe radiation environment for the Australian Community.'

So both papers give 5G a clean bill of

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health – apparently.

But here are some of the problems with the papers and reasons why we shouldn't be too quick to accept their conclusions that 5G is safe.

Problem 1: ICNIRP

The authors of the two papers assume that radiation exposures are safe, as long as they comply with limits of the radiation guidelines published by the International Commission on Nonionizing Radiation Protection (ICNIRP).

But who or what is ICNIRP?

While ICNIRP promotes itself as an international authority on radiation protection, the body enjoys anything but universal respect. It is a private organisation that has been described as 'a privately constituted group, with self-appointed membership'³ and as a 'cartel' that 'systematically discredits all studies that show possible dangers to human health'⁴ and its members have links to the telecommunications industry.

Problem 2: ICNIRP Guidelines

Not surprisingly the Guidelines published by ICNIRP allow higher exposures than have been shown to cause harmful effects on the human body.

This is because ICNIRP argues that the only effects on the body of concern are those that occur when radiation causes a temperature rise in tissues of over 1 degree Celsius.

This is despite the fact that there is a large body of science showing that a considerable number harmful effects occur at exposures below these limits that could cause serious health problems and unpleasant symptoms.

There are other problems with the assumptions underlying the ICNIRP Guidelines which have been discussed extensively in previous issues of *EMR and Health*.

Because of problems such as these, hundreds of scientists from over 40 nations have endorsed an appeal to the World Health Organisation calling for stricter radiation standards.⁴

So, complying with ICNIRP Guidelines is no guarantee of safety at all.

Problem 3: Confirmed evidence

The Karipidis paper says that there was no 'confirmed evidence that low level MMWs are associated with biological effects relevant to human health'.

In other words, there was evidence, but not evidence that it was willing to accept or that has been 'confirmed'.

However, it's not always easy to confirm studies that have found evidence of harm, partly because funding is not made available to do so. An Australian study by Dr Pam Sykes is a case in point. Dr Sykes conducted a pilot study which found genetic changes in mice exposed to mobile phone radiation. The National Health and Medical Research Council, which included an advisor from Motorola, did not make funding available for a follow-up study to help 'confirm'



the results.⁵

Ignoring evidence of risk because it has not been 'confirmed' is to court disaster. The history of science teaches us the risk of ignoring scientific studies showing evidence of risk because they've failed to meet an arbitrary benchmark for conclusiveness and rolling out products that have later been found to be harmful. Asbestos, lead, thalidomide, tobacco, DDT are just a few examples.

Problem 4: Bias

Four of the five authors on the papers are employed by ARPANSA and the fifth, Dr Andrew Woods, has worked closely with the ARPANSA team.

ARPANSA is anything but an impartial organisation. It has consistently denied evidence of risk, even though there is plenty of it.

The ARPANSA website says, 'There is no substantiated scientific evidence to support any adverse health effects from low-level exposure to RF EME associated with telecommunications and wireless technology below the limits set within the ARPANSA RF Standard.'⁶ Yet, the International Agency for Research on Cancer (IARC) has classed wireless radiation as a Class 2B carcinogen.

In stakeholder meetings, ARPANSA consistently argued that there was 'no evidence of risk' even when handed papers showing evidence of risk.

So the fact that ARPANSA's no-effects team has found no effects is hardly surprising.

Is 5G safe?

Does this mean that millimetre waves are safe?

Not according to some researchers.

In 2020, Professor Dariusz Lezczynski conducted a review of the relevant research on millimetre waves and concluded that there is insufficient scientific evidence to make definitive judgements about the safety of these exposures and that precautionary measures should be put in place to protect against potential risks.³

At the heart of the controversy is the importance of the skin to overall health and well-being. On the one hand, the ARPANSA paper appears to regard exposure of the skin as of little consequence. '...for frequencies above 6 GHz the depth of penetration is relatively short with surface heating being the predominant effect,' Karipides et al wrote.

However, the skin plays an important role in health, according to Vic Leach from the Oceania Radiofrequency Scientific Advisory Association (ORSAA).

He says, 'Skin as an organ is rich in nerves and is the body's first defence from chemical or mechanical exposures. The skin has receptors that carry out abundant innervation associated with the central nervous system and blood vessels which, in turn, are interconnected with other organs. Skin innervation is carried out by both branches of the peripheral and autonomic nervous systems. Skin also plays a role in regulation of immunity. The surface of the skin is a natural environment for thousands of protective microbial species.

'Skin performs endocrine functions and produces vitamin D in a chemical reaction that occurs when sunlight hits it. Ultra -Violet (UV), another form of non-ionising radiation, is used to make Vitamin D that our bodies need for health. Is this man-made 5G radiation going to change Vitamin D production? We don't know because nobody has studied this.

'Currently, it is difficult to predict the effects of millimetre waves on the effect of many skin diseases (e.g. eczema, psoriasis, abscesses) or on the development of tumour processes (e.g. melanoma, basal cell carcinoma, squamous cell carcinoma). ICNIRP or ARPANSA guidelines ignore all bioeffects except heating as having any health impact. I believe the current power density levels cannot be justified. Much lower intensity levels need to be adopted before the densification of the EMF background with the role out of 5G small cells on approximately every third power pole.

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Health, science and wireless radiation

One of the most respected figures in the world of electromagnetic research has published a paper in which he recommends keeping exposures to radiofrequency radiation as low as possible.

Professor James Lin, Emeritus Professor of the Department of Electrical and Computer Engineering at the University of Illinois in Chicago, has written about the politicisation of science, including science pertaining to wireless radiation, and how different organisations maintain hugely divergent views of it.

He points out that in 2011, the International Agency for Research on Cancer (IARC) classified radiofrequency (wireless) radiation as a class 2B carcinogen, based on limited evidence from animal research. Subsequently two major animal studies – one in Italy, one in the USA – both found increased cancer risks in the heart and brain of rodents, strengthening the evidence for carcinogenicity.

Nevertheless, the International Commission for Nonionizing Radiation Protection (ICNIRP) has dismissed these findings and continued to maintain that exposures are safe as long as they do not cause temperature rises in tissues above 1 degree Celsius.

Professor Lin describes ICNIRP as ‘a privately constituted group, with self-appointed membership’ and said that its ‘simultaneous penchant to dismiss and criticize positive results and the fondness for and eager acceptance of negative findings are palpable and concerning.’

He concluded that, ‘Cellular mobile communication and associated wireless technologies have proven, beyond any debate, their direct benefit to humans. However, as for the verdict on the health and safety of billions of people who are exposed to unnecessary levels of RF radiation over extended lengths of time or even over their lifetimes, the jury is still out. When confronted with such divergent assessments of science, the ALARA – as low as reasonably achievable – practice and principle should be followed for RF health and safety.’



Professor Lin’s conclusions are of considerable significance, given his importance in the field of bioelectromagnetic research. Professor Lin is Editor in Chief of the journal *Bioelectromagnetics*, a life member of the Institute of Electrical and Electronics Engineers (IEEE) and was formerly a member of International Commission on Nonionizing Radiation Protection (ICNIRP) and a President, of The Bioelectromagnetics Society. His further credentials and experience can be seen at <https://ece.uic.edu/profiles/james-lin-phd/>

James C Lin, ‘Science, Politics, and Groupthink’, *IEEE Magazine*, May 2021, <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9393739>

New York’s wireless bill

New York politicians have introduced a bill to establish a ‘commission to study the environmental and health effects of evolving 5G technology’. Its aim will be, not just to study the effects of 5G, but also earlier generations of wireless technologies.

The bill was introduced into the New York Senate by Senator Anna Kaplan and into the Assembly by Assemblyman Tom Abinanti. It proposes to include experts in public health, the environment, the effects of wireless radiation, representatives from state medical, conservation and information technology departments and members of the business community and telecommunications industry.

The Commission will consider:

- the health, behavioural and environmental impacts of wireless radiation from 300 kHz to 100 GHz.
- the short and long-term health and environmental impacts of 5G technology
- radiation standards in other countries.

It will invite feedback from the medical and scientific communities, the public and other stakeholders.

The commission will report the outcomes of its enquiry on or before December 31, 2022.

In 2019 the state of New Hampshire established a commission to study the health and environmental impacts of 5G technology which released a report with 15 recommendations.

Assembly: https://assembly.state.ny.us/leg/?de-fault_fld=&bn=A06448&term=2021&Summary=Y&Actions=Y&Text=Y&Committee Votes=Y&Floor Votes=Y#A06448

Senate: <https://www.nysenate.gov/legislation/bills/2021/s5926>

WLAN affects nervous system

Radiation from WLAN (wireless local area network) technologies affects the body by impacting the nervous system, according to new evidence from Professor Lebrecht von Klitzing.

Von Klitzing, who has worked extensively with people with electromagnetic hypersensitivity, published the results of a trial he conducted recently in the Journal of Biostatistics and Biometric Applications.

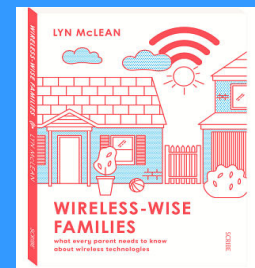
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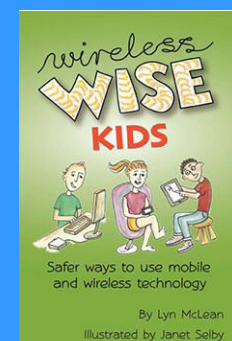
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In it, von Klitzing performed electromyograms (EMG) on three volunteers. EMG is a standard test that identifies how well muscles respond to brain signals via nerves using electrodes placed on the lower arm. The test produces a graph, similar to that produced by an electrocardiogram (ECG).

Each test was conducted in a shielded laboratory so that no extraneous radiofrequency signals could interfere with the results.

During the test, EMGs were conducted with a WLAN router in the laboratory turned ON and OFF and recordings were taken before, during and after exposure.

The results showed that the EMG readings during and after exposure were different to those before exposure. In other words, the WLAN signal affected the volunteer's nervous system and the effects persisted beyond exposure.

According to von Klitzing, the results indicate the importance of society engaging in 'a new discussion about healthy effects by low-energetic electromagnetic exposures.'

Von Klitzing, L, 'Artificial EMG by WLAN-Exposure,' J Biostatistics Biometric Applications, 6(1), 2021; <http://www.annexpublishers.com/articles/JBIA/6101-Artificial-EMG-by-WLAN-Exposure.pdf>

Wireless and DNA damage

Yes, wireless radiation *can* cause DNA damage. And probably cancer.

There's a common misbelief that wireless radiation can't damage DNA and cause cancer because it falls into the category of non-ionising radiation, as opposed to ionising radiation—such as X-rays and Gamma^λ rays—which are known to damage DNA and cause cancer.

Physicist Vic Leach explains that 'ionising radiation has wavelengths that are a billion times smaller than those used for wireless communication. And they're the same size as atoms, which means that they interact with atoms, dislodging electrons in their orbit and creating ionised molecules in air and tissue. Hence the label "ionising" radiation.'

By contrast, non-ionising radiation—such as ultraviolet (UV) light, mobile phone radiation, WiFi and 5G—doesn't have enough energy to knock electrons off atoms. However, this does *not* mean it's safe. There are other ways that non-ionising radiation can interact with atoms and cause damage such as cancer. Take UV light, for example. We know that it causes skin cancer.

There's a large body of scientific evidence that wireless radiation, even though it's non-ionising, can, in fact, cause both DNA damage and, most likely, cause cancer.

- In 2011 the International Agency for Research on Cancer classified radiofrequency radiation as a Class 2B (possible) carcinogen and since that time much more evidence linking it to cancer has been found, including data from animal experiments such as the \$30 million dollar [US National Toxicology Program](#) and the [Ramazzini Institute Italian study](#).
- An Italian court proclaimed that a plaintiff's brain tumour, a rare nerve tumour similar to those seen in animal studies, was caused by his mobile phone use.
- A recent review by Y Choi found that 17 minutes of mobile phone use a day over a

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'the WLAN signal affected the volunteer's nervous system and the effects persisted beyond exposure'



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5G legal case launched

The Government of the United Kingdom is facing a legal challenge on the rollout of 5G technology.

The case has been lodged in the High Court by eminent lawyer Michael Mansfield QC on behalf of the group Legal Action Against 5G. The group is a coalition of individuals throughout the UK, including medical practitioners, scientists and engineers.

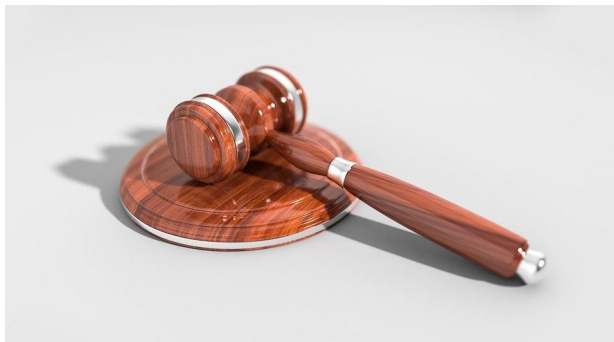
The Defendants are the Secretary of State for Health and Social Care, the Secretary of State for the Environment, Food and Rural affairs and the Secretary of State for Digital Culture Media and Sport.

The issues include:

1. 'the absence of due investigation of the nature and extent of the risks to the safety of individuals, and human health by the relevant United Kingdom authorities;
2. 'the absence of appropriate measures, systems and safeguarding steps to address the identified risks or potential risks; and
3. 'a failure to adopt and apply a precautionary principle, or informed foresight, to the exposure of non-consenting children and adults to a risk of harm.
4. 'The law provides a framework that demonstrates the unlawfulness of the inaction and errors of the executive bodies we have challenged.
5. 'Holding to account the executive or legislative authorities to comply with the law and legal duties is undoubtedly a proper and essential function for the Court, especially in the context of protection of individuals from harm that includes loss of life or serious injury.'

According to Legal Action Against 5G, the Defendants have breached legislation, including the Human Rights Act 1998 and the National Health Service Act 2006. They have also failed to consider the interests of children in rolling out 5G technology and have failed to both adequately investigate the risks of 5G or consider information on these risks with which they have been presented.

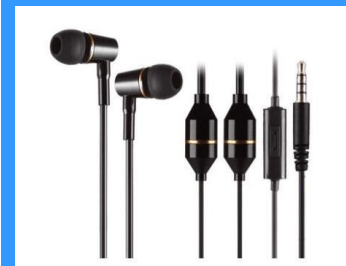
<https://actionagainst5g.org/blog/case-update-8/>



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'There's a large body of scientific evidence that wireless radiation, even though it's non-ionising, can, in fact, cause both DNA damage and, most likely, cause cancer.'

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ten-year period increased a person's risk of developing tumours by 60%.
(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7663653/>)

- A recent review by Professor Henry Lai, found wireless radiation damaged genes. (<https://www.tandfonline.com/doi/abs/10.1080/15368378.2021.1881866>)
- Wireless radiation causes "oxidative stress" which indirectly creates DNA damage, a precursor to cancer.

So next time you hear someone tell you that wireless radiation is safe because it's not ionising radiation, you will know they are not familiar with the science on this issue.

For more information see article by Professor Denis Henshaw: <https://betweenrockandhardplace.wordpress.com/2021/05/04/guest-blog-from-professor-denis-l-henshaw-on-the-myth-where-emfs-too-low-energy-to-break-chemical-bonds-is-automatically-equalled-to-no-meaningful-effects-possible/>

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ARPANSA's papers attempt to assure us that the rollout of 5G technology that has been allowed by the federal government and is being undertaken by industries that will profit from it, is not going to harm us.

The reality is that it will take more than these reviews to establish whether 5G is, in fact, safe and that no one, however young, old, pregnant, ill or sensitive will suffer as a result of exposure.

Time will surely tell.

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2. Andrew Wood, Rohan Mate, Ken Karipidis, 'Meta-analysis of in vitro and in vivo studies of the biological effects of low-level millimetre waves', Journal of Exposure Science & Environmental Epidemiology <https://doi.org/10.1038/s41370-021-00307-7>, <https://www.nature.com/articles/s41370-021-00307-7.pdf>
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8. Dariusz Leszczynski, 'Physiological effects of millimeter-waves on skin and skin cells: an overview of the to-date published studies', Reviews on Environ Health, 35 (4): 493-515, 2020.
9. ARPANSA's misinformation, Victor Leach, <https://betweenrockandhardplace.wordpress.com/2021/03/22/arpansas-misinformation-guest-blog-by-victor-leach-of-orsaa/> and correspondence

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'Wireless radiation causes "oxidative stress" which indirectly creates DNA damage, a precursor to cancer.'