Radiofrequency electromagnetic fields (RF-EMF) classified in Group 2B “Possibly carcinogenic to humans”

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Radon-222 reaffirmed “carcinogenic to humans” Group 1

- Radon-222 is a radon isolate that emits α-particles.
- Inhalation of radon daughter products with the capacity to penetrate tissue (≤ 0.1 mm).
- Health hazards occur after internal deposition.
- Indoor exposure: mainly through contaminated indoor air by radon released from soil and building materials.
- Occupational exposure: in uranium and uranium-haematite mining.
- Radon is one of the main causes of lung cancer after tobacco smoke.

Burden of cancer

- "Sufficient evidence" for lung cancer after exposure to indoor-residential exposure.
- Cohort studies on uranium and haematite miners confirmed previous assessments of an increased risk of lung cancer.
- Combined analyses of case-control studies on indoor-residential exposure now provided clear evidence of an increased risk of lung cancer.
- Risk of lung cancer attributed to radon in Europe and North America about 1 in 10.
- Radon is one of the main causes of lung cancer after tobacco smoke.

Radiodiodes including iodine-131 reaffirmed “carcinogenic to humans” Group 1

- In vivo studies using animal models.
- Ionising radiation from alpha particles (iodine-131).

Epidemiological studies

- "Sufficient evidence" for cancer of thyroid increased in thyroidectomised children and adolescents related to exposure to radiodioides after nuclear accident.
- In the previous IARC evaluation (2001) the evidence for cancer of the thyroid was only for child exposure.

All types of ionizing radiation are “carcinogenic to humans” Group 1 based on mechanistic evidence

- All types of ionizing radiation transfer and deposit their energy to biological material through free electrons-mediated mechanisms resulting in different molecular lesions.
- Cells: chromosomal aberrations, mutations, genomic instability and bystander effects.
- All these events contribute to the carcinogenesis process.

Neutrons reaffirmed “carcinogenic to humans” Group 1

- Produced by nuclear reactions.
- Main component of cosmic radiation.
- Highly penetrating and highly damaging to tissue.
- Medical use in radiotherapy.
- "Inadequate evidence" from epidemiological due to co-exposures to other types of radiation (α+β).
- "Sufficient evidence" in animal studies for lymphoma, leukaemia, lung, mammary gland, ovary, liver, Hesdian gland in mice; mammary gland, lung in rats and kidney in monkeys.

Physical and mechanistic data

- Neutrons cause more biological damage than X- and γ-radiation.
- Their energy is released in clusters of ionizing events.
- Non-repairable damage including clustered and complex DNA lesions.

Dissemination, impact and regulations

- RF-EMF: IARC Monograph announcement at the day of Press Conference for INTERPHONE.
- Outcomes: the IARC RF-EMF and mobile phone evaluation were covered worldwide in all types of media, often on front page.

UV-emitting tanning devices classified in Group 1 “carcinogenic to humans” Solar radiation reaffirmed “carcinogenic to humans”

- UV-emitting tanning devices.
- Solar radiation: main cause of skin damage.
- Inadequate evidence in experimental animals.
- IARC Working Group classified RF-EMF as “possibly carcinogenic to humans” Group 2B.

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Epidemiological studies

- Skin cancer epidemiology.
- Meta-analysis of risk of skin melanoma by age and duration.
- In line with known susceptibility to carcinogenic effects of solar radiation at any age.

Radiation and cancer incidence in atomic bomb survivors, medical patients.

- (atomic bomb survivors, medical patients).
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Traditional epidemiological studies

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