

Free Executive Summary



Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication

Committee on Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communications Devices, National Research Council

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In recent years there has been a rapid increase in the use of wireless communications devices and a great deal of research has been carried out to investigate possible biological or human health effects resulting from their use. The U.S. Food and Drug Administration asked the National Research Council to organize a workshop to identify research needs and gaps in knowledge in the areas of dosimetry and exposure, epidemiology, human laboratory studies, mechanisms, and animal and cell biology. The workshop did not include the evaluation of health effects or the generation of recommendations relating to how identified research needs should be met. Some needs and gaps identified at the workshop include: (1) characterization of exposures from wireless devices and RF base station antennas in juveniles, children, fetuses, and pregnant women and (2) evaluation of devices that use newer technologies (e.g., texting, web-surfing).

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Executive Summary

The U.S. Food and Drug Administration (FDA) of the Department of Health and Human Services asked the National Academies to organize a workshop of national and international experts to identify research needs and gaps in knowledge of biological effects and adverse health outcomes of exposure to radiofrequency (RF) energy from wireless communications devices. To accomplish this task, the National Academies appointed a seven member committee to plan the workshop.¹ Following the workshop, the committee was asked to issue a report based on the presentations and discussions at the workshop that identified research needs and current gaps in knowledge. The committee's task did not include the evaluation of health effects or the generation of recommendations relating to how the identified research needs should be met.

For the purposes of this report, the committee defines research needs as research that will increase our understanding of the potential adverse effects of RF energy on humans. Research gaps are defined as areas of research where the committee judges that scientific data that have potential value are presently lacking, but that **closing of these gaps is either ongoing and results should be awaited before judgments are made on further research needs, or the gaps are not judged by the committee to be of as high a priority with respect to directly addressing health concerns at this time.**

The research needs and gaps identified by the committee are presented in abbreviated form in the report Summary and in more detail in the text.

¹Committee on Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communications Devices.

These needs and gaps are committee judgments derived from the workshop presentations and discussions, and the report does not necessarily reflect the views of the FDA, individual workshop speakers, or other workshop participants.

The committee judged that important research needs included, in order of appearance in the text, the following:

- Characterization of exposure to juveniles, children, pregnant women, and fetuses from personal wireless devices and RF fields from base station antennas.
- Characterization of radiated electromagnetic fields for typical multiple-element base station antennas and exposures to affected individuals.
- Characterization of the dosimetry of evolving antenna configurations for cell phones and text messaging devices.
- Prospective epidemiologic cohort studies of children and pregnant women.
- Epidemiologic case-control studies and childhood cancers, including brain cancer.
- Prospective epidemiologic cohort studies of adults in a general population and retrospective cohorts with medium to high occupational exposures.
- Human laboratory studies that focus on possible adverse effects on electroencephalography² activity and that include a sufficient number of subjects.
- Investigation of the effect of RF electromagnetic fields on neural networks.
- Evaluation of doses occurring on the microscopic level.
- Additional experimental research focused on the identification of potential biophysical and biochemical/molecular mechanisms of RF action.

²*Electroencephalography* is a neurological diagnostic procedure that records the changes in electrical potentials (brain waves) in various parts of the brain.

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OR ADVERSE HEALTH
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COMMUNICATION DEVICES**

Committee on Identification of Research Needs Relating to Potential
Biological or Adverse Health Effects of Wireless Communications Devices

Nuclear and Radiation Studies Board

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Reviewers

This report has been reviewed in draft form by persons chosen for their diverse perspectives and technical expertise in accordance with procedures approved by the National Research Council's Report Review Committee. The purposes of this review are to provide candid and critical comments that will assist the institution in making the published report as sound as possible and to ensure that the report meets institutional standards of objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following for their participation in the review of this report:

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse, nor did they see the final draft of the report before its release. The review of this report was overseen by May R. Berenbaum, University of Illinois and Daniel E. Wartenberg, University of Medicine & Dentistry of New Jersey. Appointed by the National Research Council, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the National Research Council.

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