NATIONAL TOXICOLOGY PROGRAM
FACT SHEET
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Studies on Radiofrequency Radiation Emitted by Cellular Phones

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Personal (cellular) telecommunications is a rapidly evolving technology that uses microwave radiation to communicate between a fixed base station and a mobile user. Until recently, most systems employed analog technology, where low frequency speech signals are directly modulated onto a high frequency carrier in a manner similar to a frequency-modulated (FM) radio. These second-generation systems, widely used in Europe, USA and Japan, employ digital technology where the low frequency speech is digitally coded prior to modulation. Most systems employ hand-held cellular telephones, which means that the radiating antenna is close to the head of the user.

Over 100 million Americans currently use wireless communication devices with over 50 thousand new users daily. This translates into a potentially significant public health problem should the use of these devices even slightly increase the risk of adverse health effects. Cellular phones and other wireless communication devices are required to meet the ***r**adio**f**requency **r**adiation* (RFR) exposure guidelines of the Federal Communications Commission (FCC, August 1996). The existing exposure guidelines are based on protection from acute injury from thermal effects of RFR exposure. Current data are insufficient to draw definitive conclusions concerning the adequacy of these guidelines to be protective against any non-thermal effects of chronic exposures.

Studies in laboratory animals are considered crucial for understanding whether exposure to RFR is adverse to human health because meaningful data from epidemiological studies (human population studies) of cellular phone use will not be available for many years. This is due to the long latency period between exposure to a carcinogenic agent and the diagnosis of a tumor. Most scientific organizations that have reviewed the results from laboratory studies conducted to-date, however, have concluded that they are not sufficient to estimate potential human cancer risks from low-level RFR exposures and long-term, multi-dose animal studies are needed.

Currently there is an international effort underway to develop and conduct long-term toxicology studies on the potential health effects associated with cellular phone RFR emissions. This includes studies by a consortium of European investigators and cellular phone manufacturers under the auspices of the European Union (PERFORM-A), and by investigators at the Cancer Research Center of the European Ramazzini Foundation of Oncology and Environmental Sciences Commission in Bologna, Italy.

What is the NTP Doing?

The **F**ood and **D**rug **A**dministration (FDA) nominated RFR emissions of wireless communication devices to the **N**ational **T**oxicology **P**rogram (NTP) for toxicology and carcinogenicity testing. The NTP has carefully evaluated the efforts already underway and concluded that while they have an excellent probability of producing high quality research results; additional studies may be warranted to more clearly define any potential health hazard to the U.S. population.

Because of the technical complexity of such studies, NTP staff is working with RFR experts from the **N**ational **I**nstitute of **S**tandards and **T**echnology (NIST). With support from the National Institute of Environmental Health Sciences, one of the agencies of the National Institutes of Health, scientists at NIST have been testing the suitability of various RFR exposure systems for use in these studies. The studies at NIST have demonstrated the feasibility of using specially designed reverberation chambers as the exposure

system to evaluate potential long-term health effects, including carcinogenicity, of cellular phone RFR in unrestrained laboratory animals. Ongoing studies at NIST are addressing issues relevant to the design of these animal studies. The NTP plans to conduct studies in rats and mice at two frequencies (~900 and 1900 MHz) that are at the centers of the primary cellular bands used in the US.

Special Session on RFR Laboratory Studies at BEMS

The NTP is sponsoring a special session, "Carcinogenicity Studies of Cell Phone Radio Frequency Radiation in Laboratory Animals," on July 27, 2003 at the 25th Annual Meeting of the Bioelectromagnetics Society (BEMS). The purpose of this session is to discuss the utility of completed, ongoing, and planned laboratory studies for characterizing the potential for cellular phone RFR to cause human health effects and to identify the need for any additional studies. Platform presentations will address the exposure conditions and experimental designs from individual studies and how they will contribute to our understanding of potential health effects of RFR associated with the use of cellular phones. Following the platform presentations, an expert panel will lead a general discussion on the adequacy of the planned and ongoing studies, with respect to their exposure scenarios, dosimetry, duration, and animal models, for identifying and characterizing risks of cancer or other health effects that may be associated with long-term exposure to cellular phone RFR.

For further information, contact:
Dr. Ron Melnick, NIEHS, P.O. Box 12233, MD B3-08, Research Triangle Park, NC, 27709
Phone: 919/541-4142; E-mail: melnick@niehs.nih.gov