

## **Research priorities within industry**

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The industry does not set priorities for biological research, but does participate in the WHO process with other stakeholders to develop a research agenda designed to develop a necessary and sufficient research database to allow a conclusive risk analysis of public health concerns. At the same time, the industry has strong views about how support for research should be allocated. Manufacturers share the concerns of WHO and others that research related to mobile phones and health be of high quality, address issues identified in the WHO agenda, and strengthen the database used for health risk assessments (IARC and WHO) and standard-setting. The industry sets related priorities for supportive physical science studies that may not be addressed by the WHO agenda.

All stakeholders -- including government agencies, industry, and the greater research community -- have roles and responsibilities in this area. The "process" by which research priorities are identified and pursued utilizes the expertise of all groups. There is general agreement, for example, that mobile communication technologies pose no demonstrated health risk as long as they operate within international standards. At the same time, scientific expert groups have cited a need for more research to address specific questions in more detail. The industry recognizes that a more robust research database, achieved through focused and globally coordinated research that adheres to the highest standards, can lead to more conclusive public health assessments about mobile telephony and health. The question is: What specific research is needed and can that research be delivered through currently funded programs?

This is a cooperative effort that requires the involvement of all funding sources and advisory bodies -- WHO, government and industry. The process should lead to a definition of needed research as well as the means of assuring that needed studies are properly funded and carried out with scientific rigor. Moreover, this must be viewed from a global perspective. National funding agencies may be inclined to demonstrate their commitment in this regard by establishing or otherwise favoring their own in-country research programs. This carries the risk of seeing programs funded for political reasons as opposed to scientific merit. Such national interests can be tempered by broad participation in the WHO process. Reluctance or

refusal to follow a common, science-driven agenda may lead to duplication of effort and/or special interest-driven research that provides marginal or no support for hazard identification.

Valuable expertise can be derived from the research community in developing any technical agenda. However, researcher interest must not drive this process. Every researcher believes that his or her work is important. The task of the WHO process is to utilize all available expertise, but subjugate the special interest in favor of the public health interest.

The WHO Research Agenda was established in about 1997 and has been periodically reviewed over the last few years. However, the original version of this agenda still appears on the WHO website. Much has been accomplished since 1997 and a great deal of the recommended research is complete or already underway. The WHO needs to take credit for this accomplishment and update the agenda. Further, the review process has identified additional items to be incorporated. There is a further need to evaluate the agenda to identify specific research tasks, if any, needed for the upcoming health evaluations by IARC, WHO and other health agencies. Definitive specifications on the website will aid in countering needless duplication and the funding of special interest driven research.

Although the WHO agenda does not list research in priority order, the evaluation procedures used, for example by IARC, provide an example of prioritization. IARC gives the greatest weight to evidence to strong epidemiological studies and also considers evidence from animal bioassays and other in vivo studies when the epidemiological evidence is weak. In vitro assays can be helpful in establishing mechanistic and predictive models once a hazard endpoint has been established by more conclusive epidemiological studies or animal bioassays. The WHO agenda goes a step further in calling for replication of certain well-cited in-vitro studies that have reported effects on biological endpoints that themselves do not directly translate into any adverse human health effect. This can be useful in addressing public concerns apart from the limited value of such in-vitro studies in hazard identification.

A prioritization process similar to that for cancer studies should be implemented for non-cancer health effects with a suggested prioritization as follows:

- Human (provocation) studies
- Animal studies (when appropriate disease models are available)
- In vitro supportive studies (to clarify issues raised by human and animal studies)

The Table below lists more than 300 completed and ongoing studies designed to address the questions of health and exposure to mobile telephony signals. These studies cover a large

range of frequencies in the telecommunications band as well as all of the currently used modulation schemes, thereby addressing possible modulation dependent or frequency dependent phenomena (non thermal effects). Most studies exclusively use exposure levels below current standards (non-thermal), although some studies include higher exposure levels to study the effect of RF induced temperature elevations or as part of a dose response analysis.

The MTHR program has contributed significantly to the high priority of epidemiology. They are to be congratulated for supporting (completing the funding requirements) of two studies that are a part of the INTERPHONE 5<sup>th</sup> Framework project as well as several other epidemiological studies including a pilot cohort study. The gold star given to MTHR is somewhat tarnished, however, in that there are no apparent funds to extend the pilot cohort study upon completion. The MTHR apparently felt that a prospective cohort study was an important compliment to the large number of case control and cohort studies completed or ongoing. Perhaps a reexamination of this issue is important in terms of future funding priorities for this program.

Examination of the cancer related studies listed in the Table on the WHO website database (<http://www-nt.who.int/peh-emf/database.htm>) will reveal that the majority of those studies completed show no effect. Completed replication of studies reporting effects have failed to confirm the original findings. The list of studies needs to be further examined to determine whether all reported effects are being adequately addressed.

The MTHR Program has provided support for work addressing questions raised by studies on cognitive function and other subjective disorders. One area that may need further examination to determine the adequacy of current and proposed research is EEG and sleep disturbance. Completed studies in this area (22) give a very mixed and confusing picture.

<b>Current Mobile Telephony-Related Studies</b>			
	<b>Completed</b>	<b>Ongoing</b>	<b>Total</b>
<b>• Cancer relevant or related</b>			
– <i>Epidemiological studies</i>	9	20	<u>29</u>
– <i>Standard bioassays</i>	6	8	<u>14</u>
– <i>Sensitized in vivo studies</i>	18	5	<u>23</u>
– <i>Acute in vivo studies</i>	20	5	25
– <i>In vitro studies</i> (REPLICATION, WHO 230)	52	27	79
– <b>Total Cancer Studies</b>	<b>105</b>	<b>65</b>	<b>170</b>
<b>• Non-cancer studies</b>			
– <i>Epidemiology</i>	6	1	7
– <i>Human studies</i>	49	18	67
– <i>Acute in vivo studies</i>	35	9	43
– <i>In vitro studies</i>	15	9	24
– <b>Total Non-Cancer Studies</b>	<b>105</b>	<b>38</b>	<b>143</b>
– <b>Grand Totals</b>	<b>210</b>	<b>103</b>	<b>313</b>
All studies are listed on the WHO web site: <a href="http://www-nt.who.int/peh-emf/database.htm">http://www-nt.who.int/peh-emf/database.htm</a>			

### Summary:

1. The industry does not set priorities for biological research but participates in a process to develop and support needed research.
2. This process should be lead by WHO and all funding agencies and stakeholders should participate.
3. The agenda should be periodically reviewed and updated on the WHO website to provide guidance to funding agencies.
4. The IARC evaluation and prioritization process should be used as guidance.
5. Current research should be evaluated to determine the need for:
  - a. Prospective cohort study(s)
  - b. Studies that need to be addressed through replication

The need for additional human provocation studies