

The future of laboratory research on health effects of RF

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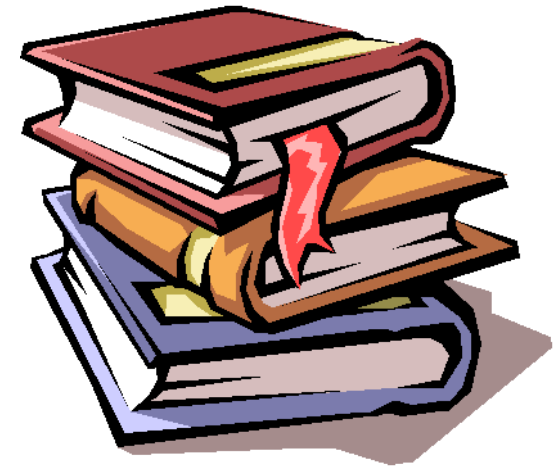
Health effects of RF

1. What do we know from laboratory studies?
2. Do we know enough to do health risk assessment and to cope with new signals?
3. Which are the key research issues to be addressed?
4. How much should research planning be influenced by political and public pressure?
5. Who is going to pay for new projects?
6. Is there a future for RF lab research?

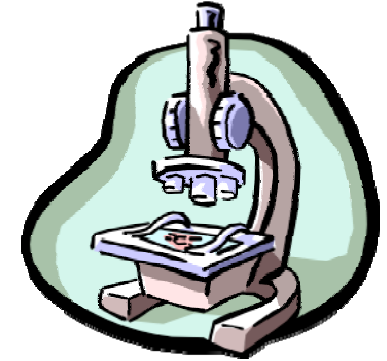
1. Quality sources of information

- “blue book” of ICNIRP (2009) www.icnirp.org
- AFSSET report (2009) www.afsset.fr
- EFHRAN report (2010) <http://efhran.polimi.it>
- Annual SSM report (2010)
www.stralsakerhetsmyndigheten.se

- *Monography of IARC (2011)*
- *EHC of WHO (2011?)*



1. What do we know from lab studies?



- Most of the data obtained with GSM signals
- Often at SAR levels up to 10^5 above ambient
- No well-established biological effects at low level, but:
 - EEG and sleep data in humans (no health effect foreseen)
 - Tillmann et al. results on an animal cancer model (pilot study)

1. What do we know from lab studies?

- Effects do occur at SAR levels (thermal) but no plausible mechanism for non thermal levels
- Data in phase with coming health-risk assessments (e.g. IARC), but
 - the ongoing NTP study in Chicago

2. Extrapolation to new signals?

- If it was certain that the established effects are all thermal in nature, extrapolation would be easy...
- If however there was a decision to test systematically the new signals, what should be the battery of tests?



3. Which are the key research issues to be addressed?

- Research recommendations:
 - ICNIRP's blue book
 - AFSSET report
 - WHO research agenda 2010
- Concerns
 - Low-level multiple exposures
 - Children



3. WHO research agenda



- Human
 - Further RF EMF provocation studies on **children** of different ages
 - Provocation studies to identify neurobiological **mechanisms** underlying possible effects of RF on brain function, including sleep and resting **EEG**

3. WHO research agenda

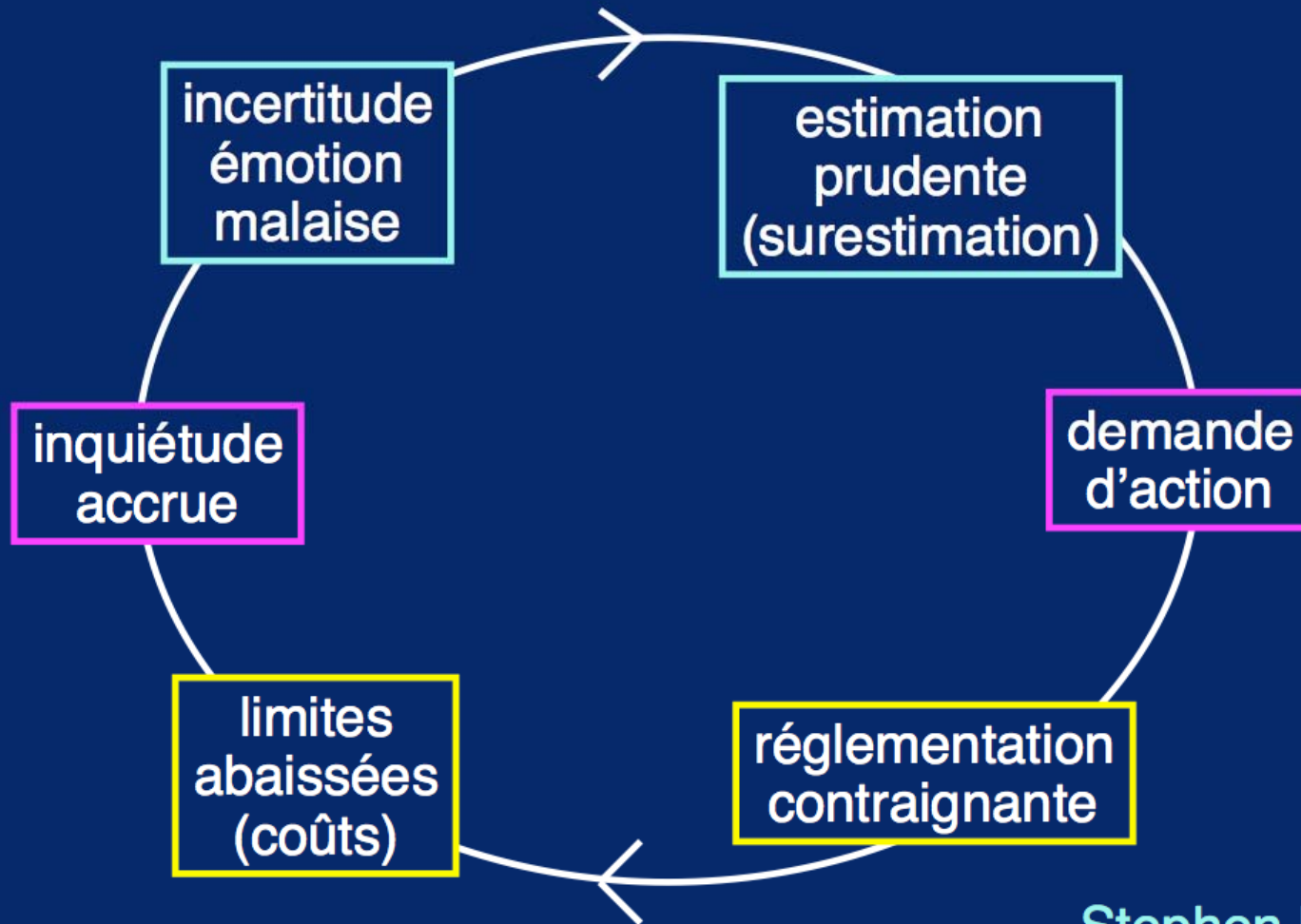


- Animal
 - Effects of **early-life** and **prenatal** RF exposure on development and behaviour
 - Effects of RF exposure on **ageing** and **neurodegenerative** diseases
- Cells
 - None
- Mechanisms
 - none

4. Political and public pressure and planning of research?

- Both national and European programmes have be set up or run under some political and/or public pressure
- Other structures do independent health risk assessment (e.g., WHO, ICNIRP)
- Both risk assessment and risk management asking for a reduction in the scientific uncertainty
- Hence more research is needed...

cercle vicieux



Stephen Breyer

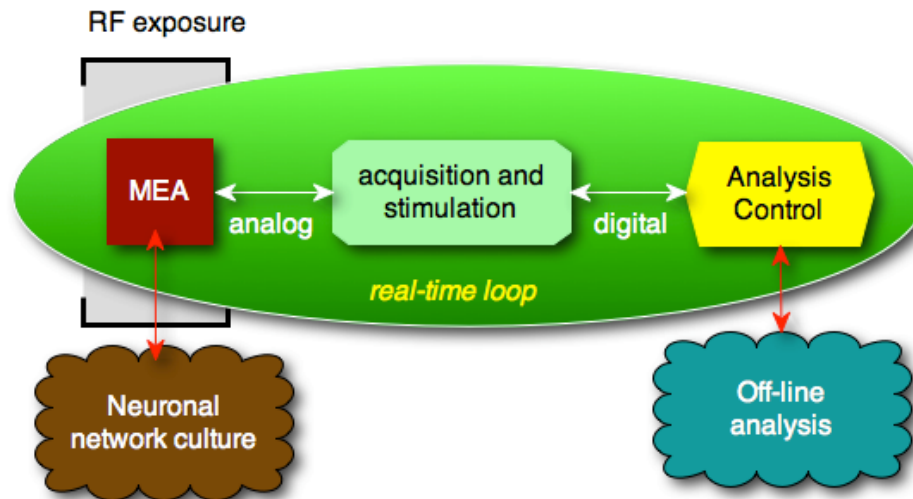
5. Who is going to pay for new projects?



- The funding worldwide is now at a low level:
 - in Germany: risk communication replaces research
 - in the UK, little funding for lab research
 - EC is funding RF projects at a low level within FP7
 - Industry's funding has decreased in the last years
- Why is that so?

6. The future of RF lab research

- The CNS still seems to be one of the few potential targets of RF



- Systematic testing of new signals awaits:
 - the observation of real effects
 - precautionary measures

Happy Christmas!

