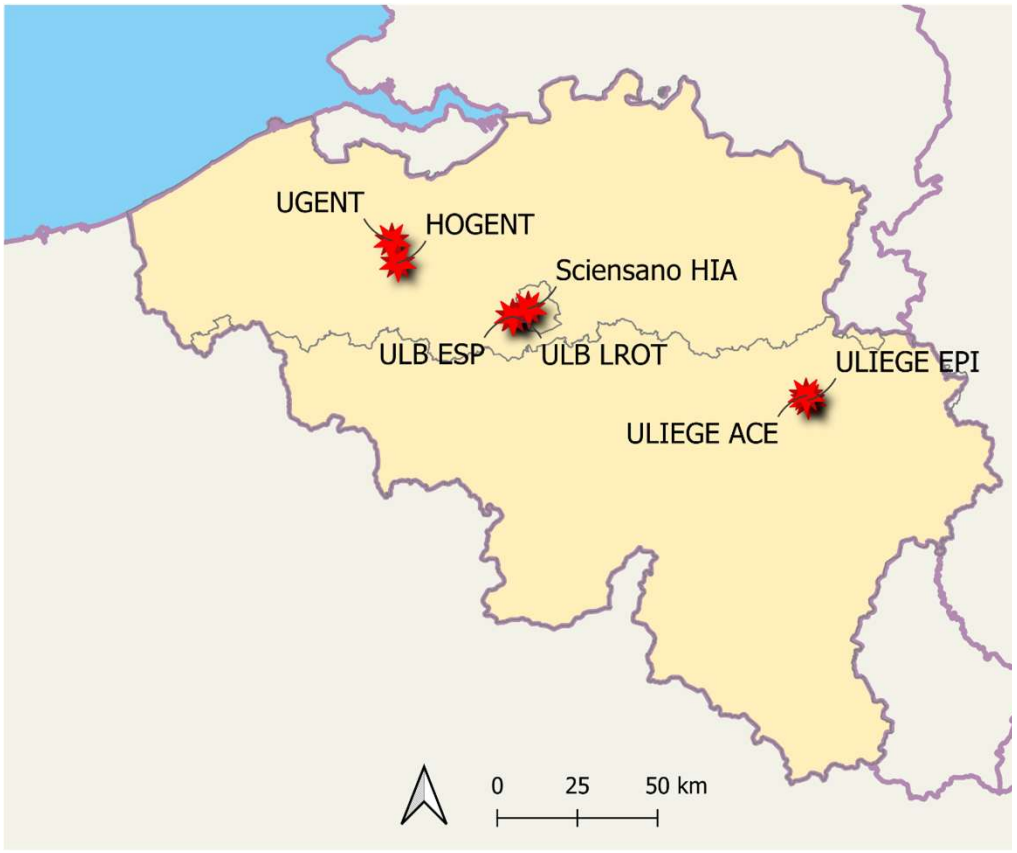
Three decades of research on EMF & Health in Belgium

EVA M DE CLERCQ

NL FR

www.bbemg.be

Network of academic partners



UGent (Public Health)
L. Braeckman
E. De Waegeneer

HOGENT-UGent (Proefhoeve Bottelare)
J. Latré
S. Landschoot
K. Dewitte

Sciensano (Public Health)
E. De Clercq
O. Bobin

ULB-ESP (Public Health)
C. Bouland
A. Salmon

ULB-LROT (Erasmus Hospital)
M. Hinsenkamp
JF. Collard

ULIEGE EPI (Public Health)
O. Bruyère
C. Brabant

ULIEGE ACE (Electrical Eng. & Computer Sc.)
C. Geuzaine
V. Beauvois

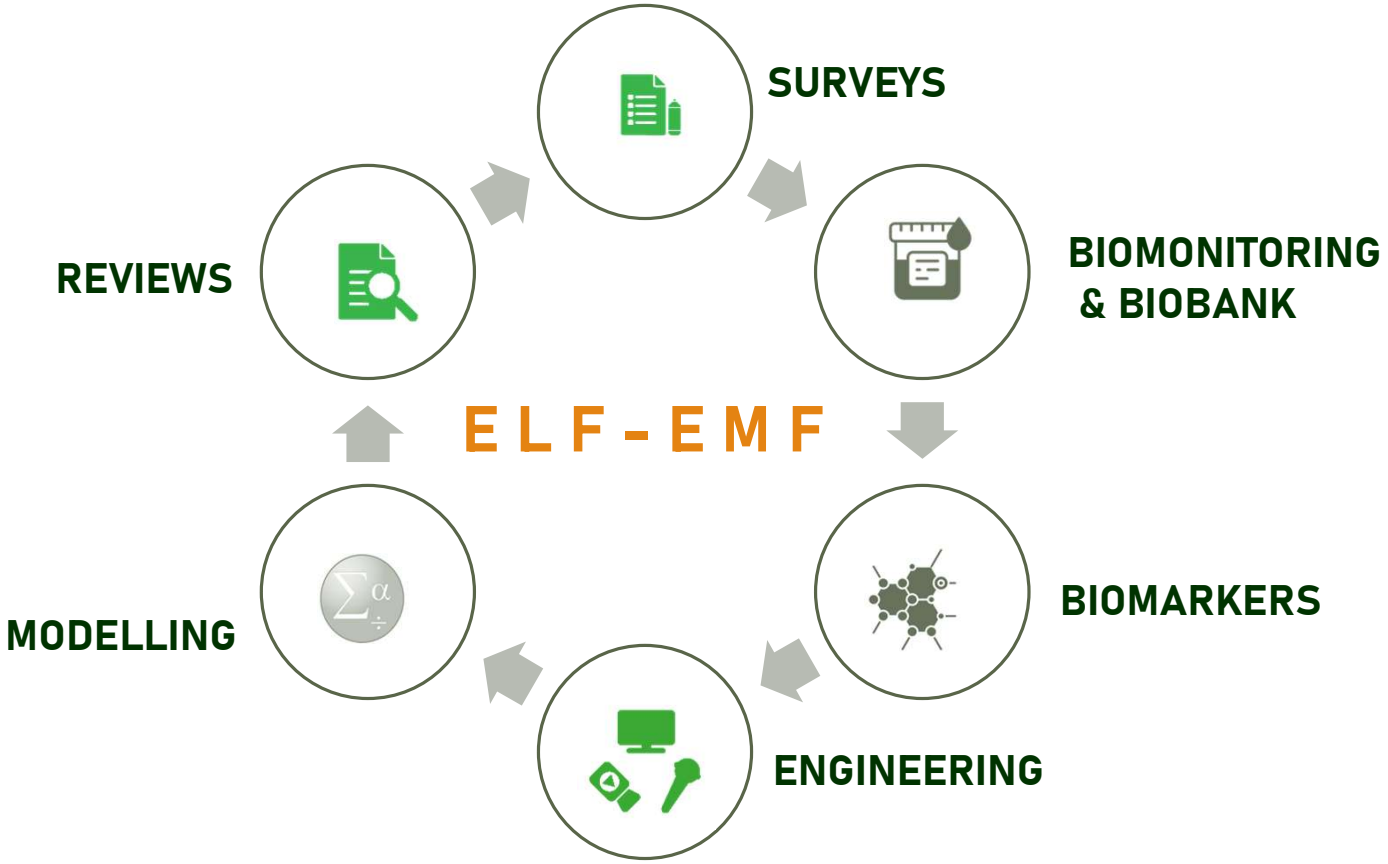
BBEMG expertise : OneHealth

UGent
Sciensano
ULB-ESP
ULB-LROT
ULiege-EPI

HoGent-UGent
ULiege-ACE

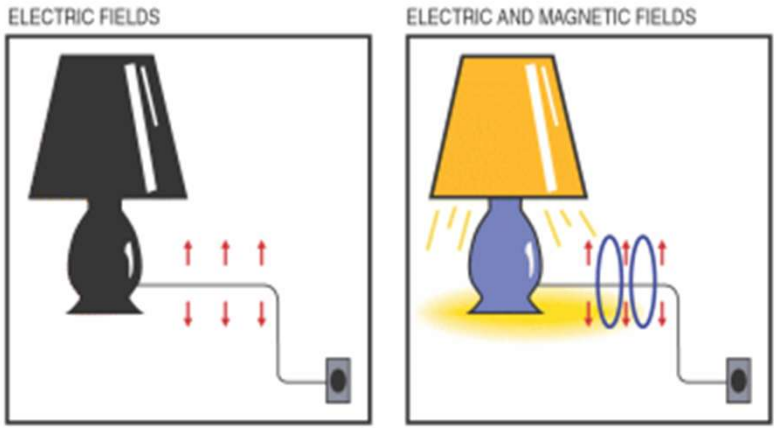
HoGent-UGent
UGent
Sciensano
ULiege-EPI

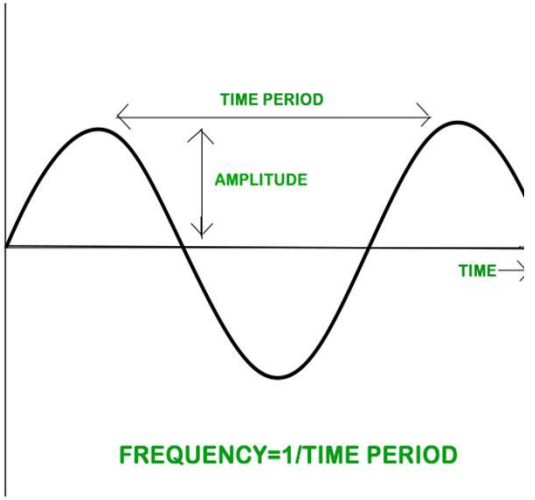
BBEMG expertise : Methods



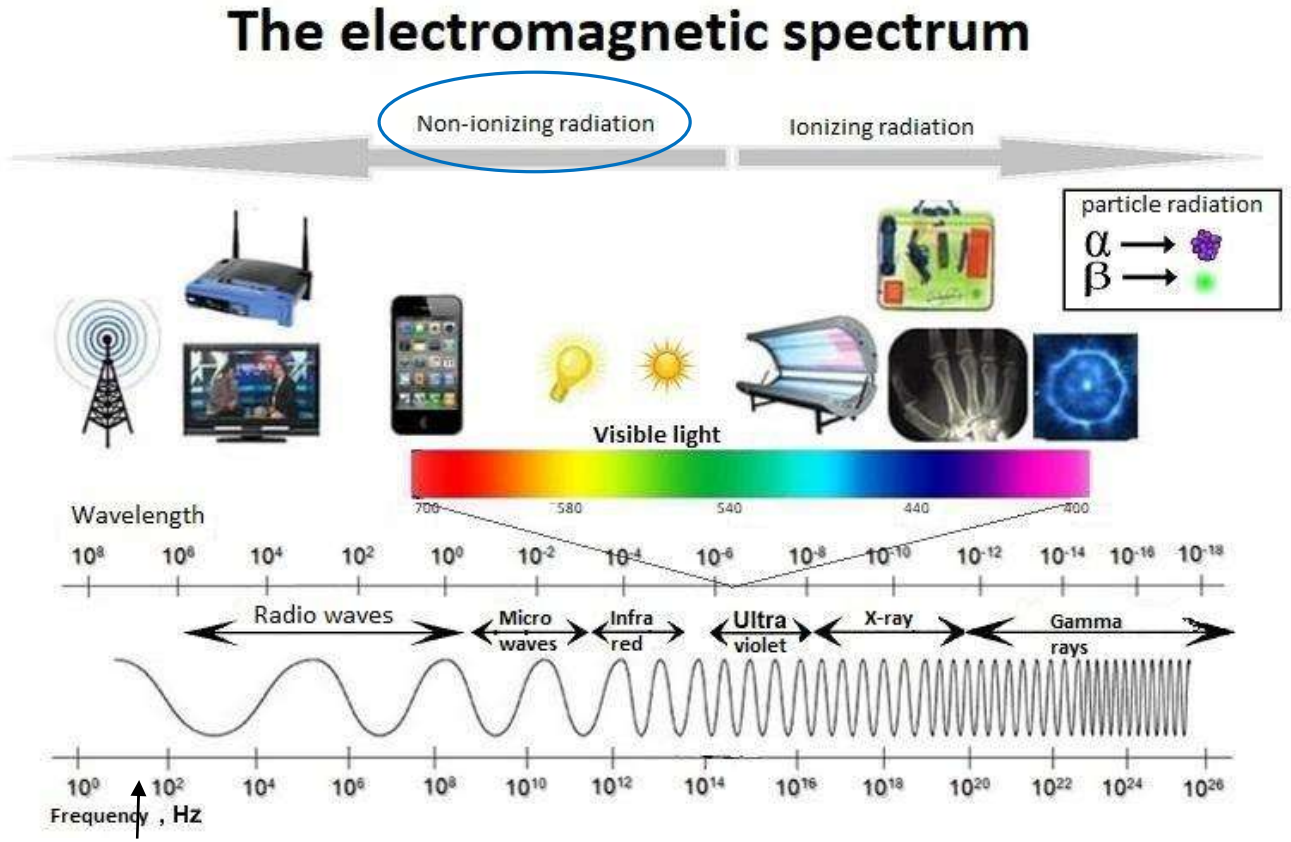
Electro Magnetic Fields (EMF)

- The **electric field** is linked to the voltage (V), measured in Volt per meter (V/m).
- The **magnetic field** is linked to the current (A), measured in Ampere per meter (A/m); the Tesla (T or million of T, µT) can be used as well, with a direct relationship between both.





Extremely Low Frequency EMF (ELF-EMF)



50 Hz

Exposure values 50Hz (µT)

- Homes and offices
  - 0,01 - 0,2 µT
  - 0,3 - 0,5 µT
- Public transport
  - 1 µT
  - 10 µT during operation
- Industrial areas
  - > 10 µT
- Agricultural fields
  - < 0,05 µT
- Distribution lines
  - 0,05 – 0,3 µT beneath line
  - < 0,05 µT at 20-30 m
- Transmission lines
  - 1- 10 µT beneath line
  - < 0,2 µT at 50-100 m

Research ELF-EMF & Health

AMERICAN JOURNAL OF EPIDEMIOLOGY
Vol. 109, No. 3
Printed in U.S.A.

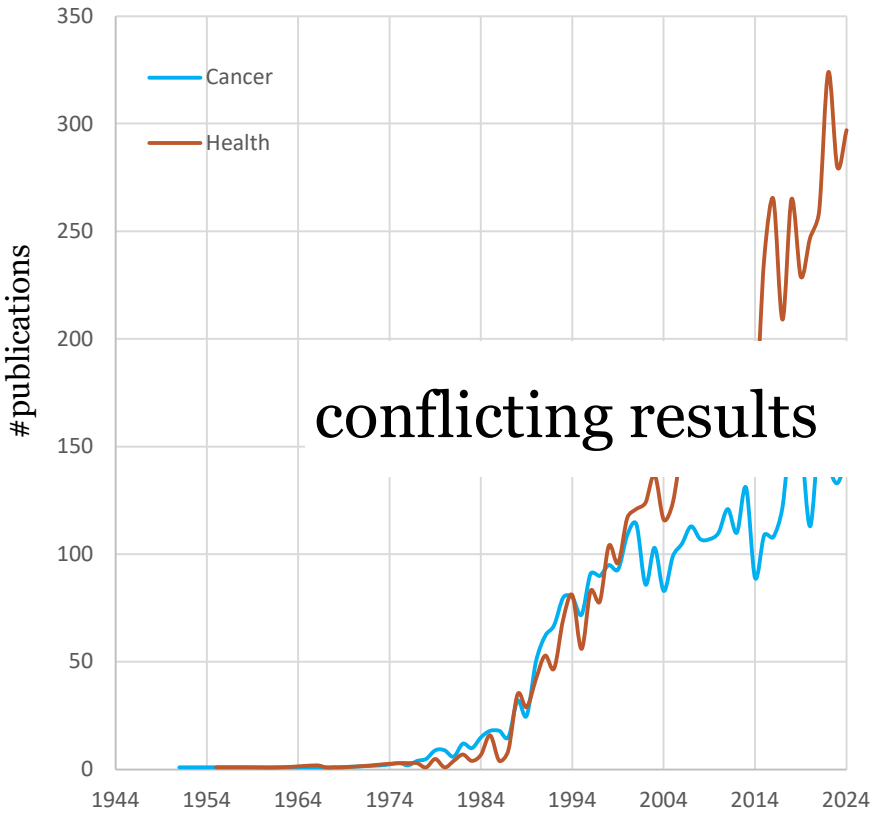
Original Contributions

ELECTRICAL WIRING CONFIGURATIONS AND CHILDHOOD CANCER

NANCY WERTHEIMER[1] AND ED LEEPER

Wertheimer, N. (Dept. of Preventive Medicine, U. of Colorado Medical Center, Box C-245, Denver, CO 80262), and E. Leeper. Electrical wiring configurations and childhood cancer. *Am J Epidemiol* 109:273–284, 1979.

An excess of electrical wiring configurations suggestive of high current-flow was noted in Colorado in 1976–1977 near the homes of children who developed cancer, as compared to the homes of control children. The finding was strongest for children who had spent their entire lives at the same address, and it appeared to be dose-related. It did not seem to be an artifact of neighborhood, street congestion, social class, or family structure. The reason for the correlation is uncertain; possible effects of current in the water pipes or of AC magnetic fields are suggested.



Pubmed

BELGIUM

- **1988**: Interdisciplinary commission of experts investigated the complaints of negative effects with cattle near overhead lines
- **1990**: a 3-year research "Effects of EMF on Heath" was granted to the University of Liege (Ulg) by Federal administration

Creation of the BBEMG

- **1995**, 8 teams from 5 institutes (ULB, RUG, KUL, ULG & Vito) joined to create the Belgian **BioElectroMagnetics Group** (BBEMG)

  Launched a multidisciplinary research program to:

  - get a better understanding of the interactions between electromagnetic fields and biological activity;
  - contribute to the development and diffusion of scientific knowledge on the potential health effects of electric and magnetic fields.

  So creating expertise and information centers accessible to the public, scientists, governing authorities and electricity companies.

- Support of the electricity sector
  - Public funding lacking
  - Financial support from CPPTE (Electrabel – SPE) in 1995
  - In 2001 Elia (unbundling) was created & the first research agreement of 4 years was signed

Research agreement with Elia

- **20 years of cooperation**
  - Contract renewal every 4 years: in 2021, for the 7th time (2025-'29)
  - Research topics and team are adjusted - scientific evolution & questions stakeholders
  - Need to continue research & develop expertise as electricity use will increase

- **Scientific independency & integrity**
  - Academic liberty guaranteed in the agreement
  - Publication of the results in scientific peer reviewed journals is required
  - Agreements signed with the universities/institutes, not with the individual researchers
  - Researchers need to comply with the ethical code for scientific research in Belgium

Past before present

BBEMG study days

- 2004 May 15th
- 2006 April 27th
- 2009 May 13th
- 2013 September 18th
- 2017 September 22nd
- 2022 March 21st
- 2025 November 20th

Time	Topic	Speaker
09:00	Welcome coffee & registration	
10:00	Welcome note	Eva De Clercq
10:05	Three decades of research on ELF-EMF & health in Belgium	Eva De Clercq
10:15	Presenting the BBEMG website	Océane Bobin
10:30	Dealing with health risks of ELF-EMF: Design and validation of a theoretical framework on risk perception and avoidant behavior in the general public	Els De Waegeneer
10:45	Evaluating crop performance and productivity near High-Voltage Power Lines	Sofie Landschoot
11:00	ELF-EMF exposure & risk perception in the farming community	Océane Bobin
11:10	Short break	
11:20	A study of genetic damage in an urban population and EMF exposure	Agathe Salmon
11:35	Magnetic fields and cancer: data from recent meta-analyses	Christian Brabant
11:45	Tools: ELF sensors & modelling	Christophe Geuzaine
11:55	Q&A	All speakers
12:15	Perspectives	Eva De Clercq
12:30	Lunch	