

Cognitive and Cerebrovascular Effects Induced by Low Dose Ionising Radiation

Summary



CEREBRAD, Cognitive and Cerebrovascular Effects Induced by Low Dose Ionizing Radiation, is a collaborative European project funded in 2011 within the 7th EU framework programme of EURATOM, Nuclear Fission and Radiation Protection (GA n° 295552). CEREBRAD aims to identify the potential cognitive and cerebrovascular risks of radiation doses below 500 mGy when delivered to a young child (pre- or postnatally). Health risks will be assessed via epidemiological studies of patients exposed in their young age to radiotherapy treatment and receiving low doses to the brain or whose mother was pregnant or new mother during the Chernobyl accident. Complimentary data will be gathered using animal models exposed to radiation at different stages of brain development. Emphasis will be put on the effects of internal and external exposures, as well as the combined effect of radiation and environmental pollutants. Brains of phenotypically relevant animals will be subjected to deep cellular and molecular analyses to decipher the biological mechanisms underlying the cognitive and cerebrovascular effects induced by low dose radiation.

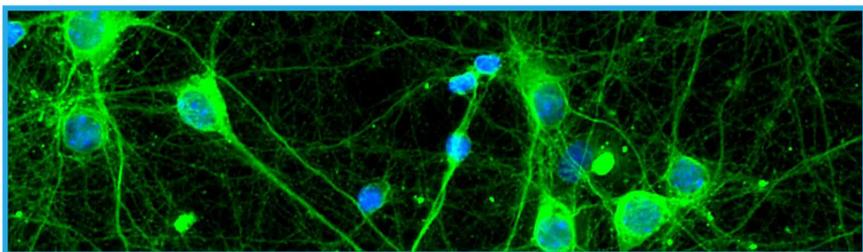
Consortium

- SCK•CEN
Belgian Nuclear Research Center
Belgium
- ENEA - Italian National Agency for New Technologies, Energy and the Environment
Italy
- NRIRR - Frédéric Joliot -Curie National Research Institute for Radiobiology and Radiohygiene
Hungary
- RCRM - Research Centre for Radiation Medicine of the National Academy of Medical Sciences of **Ukraine**
- Erasmus University Medical Center Rotterdam
The Netherlands
- HMGU
Helmholtz Center for Environmental Health
Germany
- URV - University Rovira i Virgili
Spain
- UU - Uppsala University
Sweden
- AUTH - Aristotle University of Thessaloniki
Greece
- IGR - Institute Gustave -Roussy
France
- University of Birmingham
UK



Objectives

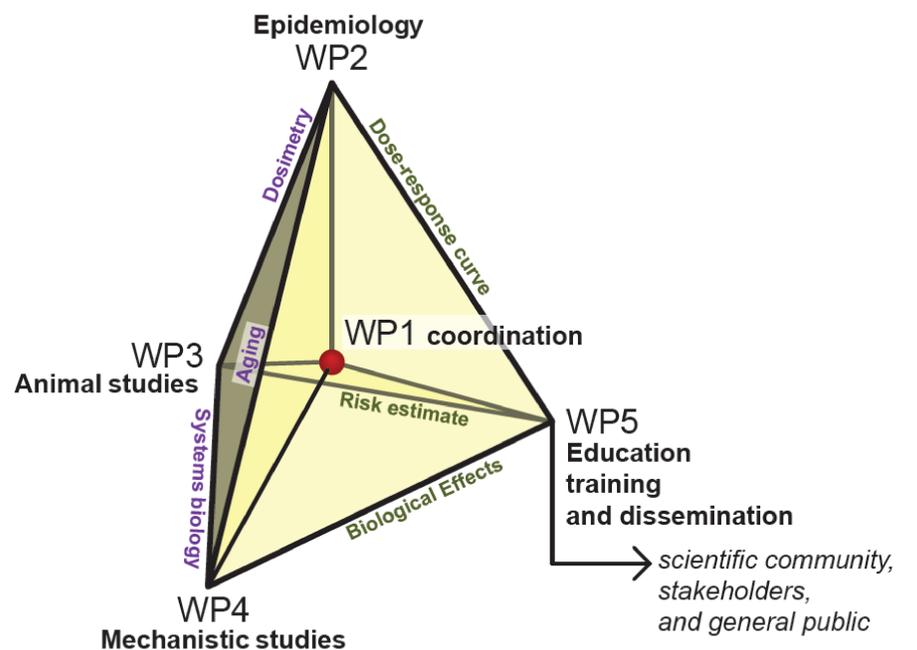
- To increase the statistical power of epidemiological data about cognitive and cerebrovascular diseases.
- To provide experimental evidence on the shape of the dose-response curve for cognitive and cerebrovascular effects.
- To use appropriate dosimetry calculations for correct evaluation of absorbed doses to the brain structures.
- To use an integrated systems biology approach to identify the molecular pathways and regulatory networks underlying the effects of low-dose irradiation.



Impact

- CEREBRAD is designed for a better understanding of non-cancer effects of radiation such as cognitive and cerebrovascular diseases.
- CEREBRAD will evaluate the effect of low dose radiation on the central nervous system at different stages of its development.
- CEREBRAD will identify novel signatures using an integrated systems biology approach to estimate the risk in diagnostic, therapeutic and accidental situations.
- CEREBRAD will improve the risk estimates and protection measures of the fetus in utero and young children.

Organisation



Information

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