



centre for research  
in environmental  
epidemiology



Parc de Recerca  
Biomedica de Barcelona  
Doctor Aiguader, 88  
08003 Barcelona (Spain)

Tel. (+34) 93 214 73 00  
Fax (+34) 93 214 73 02

info@creal.cat  
www.creal.cat

**ISGlobal**  
Barcelona  
Institute for  
Global Health

In alliance with



# INSERM U1018 / Gustave Roussy, Villejuif France

- Children treated by radiotherapy for an hemangioma. 5.000 infants treated for hemangioma before 1973
  - Whole body dose reconstruction for all patients
  - Sent back a questionnaire in 2000-2010. Followed with National Hospital data base since 2006.
  - Existing blood biobank for about 350 patients (may be extended)
  - Our area of interest : Telomere (in coll CEA), GWAS or DNA methylation, in a possible pool on cancers or other non cancer disease following low and moderate dose in childhood.
- Children treated by radiotherapy for an childhood cancer. 13.000 children treated for a cancer before 2000.
  - Whole body dose reconstruction for 7890 patients. Planed for the rest.
  - Questionnaires sent since 2000. Followed with National Hospital data base since 2006.
  - Blood for 1000 patients, DNA from saliva for 2500 patients (on going extension).
  - Our area of interest : molecular epidemiology, Dose response assessment for cancers, and non-cancers diseases following childhood irradiation
- Thyroid cancer : 5 case-control studies in general pop : 2162 cases and 2571 controls, detailed questionnaires.
  - France (2), New Caledonia, French Polynesia, Cuba.
  - On going GWAS on DNA SNP with OncoArray SNPs + 10.000 SNPs covering Thyroid hormones synthesis, regulation and signaling pathways.
  - 102 cases with radiation therapy exposure
  - Area of interest : GWAS or DNA methylation, in a possible pool on thyroid cancer following childhood irradiation.

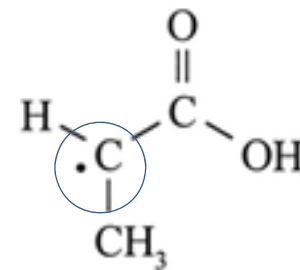
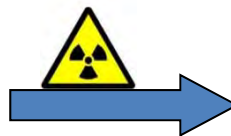
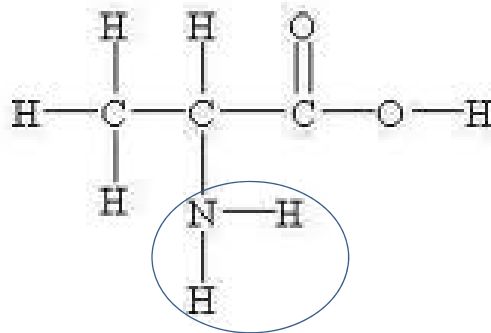
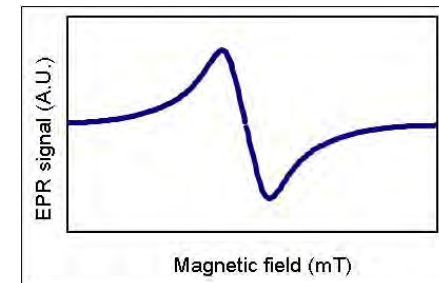
# EPR laboratory – Istituto Superiore di Sanità



Paola Fattibene  
Cinzia De Angelis  
Emanuela Bortolin  
Donatella Pietraforte  
Sara Della Monaca  
Maria Cristina Quattrini

# The Electron Paramagnetic Resonance technique

- EPR (Electron Paramagnetic Resonance) magnetic resonance technique allowing to detect paramagnetic centres (radicals, point defects...), i.e. generated by ionising radiation.



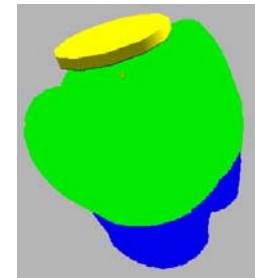
# Applications for individualized dosimetry on internal and/or external exposures in epidemiological studies

Cohorts: Workers of the Mayak PA and residents of the Techa River region



EPR dosimetry used to **validate the external doses provided by occupational dosimetry of workers and the environmental model**

For the Techa River cohort: combination of **external exposure and internal contamination**

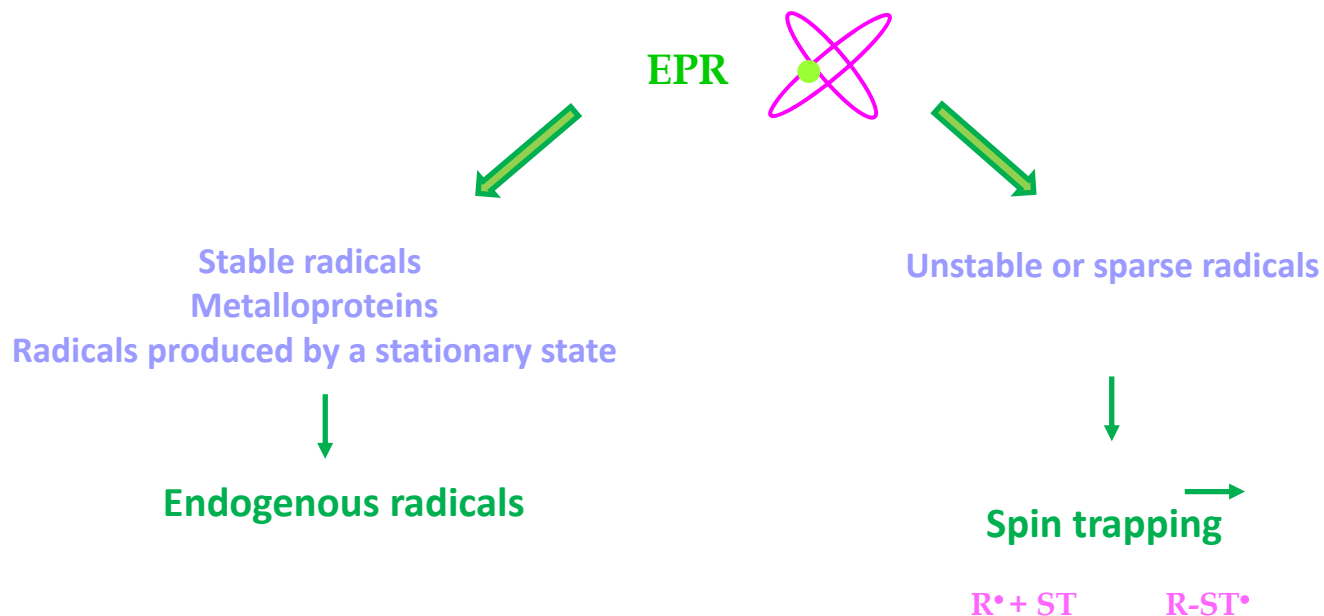


*Ferrari et al., Radiat. Meas. 2010*

Development of a unique approach to evaluate detection limits and to **harmonise** methods developed in different periods and in different laboratories

# Mesurement of radicals as biomarkers of radiation-induced oxidative stress

Cellular exposure to ionizing radiation leads to **oxidizing events** that alter atomic structure through direct interactions of radiation with target macromolecules or via products of water radiolysis.



**Thank you for your  
attention!**