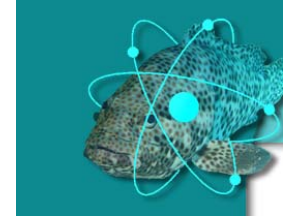




12th Workshop on European Collaboration for Higher  
Education and Research in Nuclear Engineering &  
Radiological Protection



FROM  
PARTICLE PHYSICS  
TO  
MEDICINE  
FOR A  
BETTER HEALTH

29 May – 1 June 2016 Cervia, Italy



# UBIMEDICAL



Is a space to promote the connection between the university and the business world. Created to streamline the transference of knowledge in the quest for new technologies, it allows companies to develop the research and the laboratorial tests needed for the effective selling of new products, adding value to the economy.





This structure came to enrich the Portuguese health cluster, acting as a spill-over in the connection between the university and the market and also promotes technology transfer between the scientific/academic world and the business community, applying the concept of translational research in response to the challenge that involves passing the basic knowledge to their clinical applications and to the general people.

## LABoratório de E estudos de EXPOsição ao RADão



The main objective of our laboratory is to study the different aspects of population exposure to radon and the arising health risks.

**We have several strands...**





# OUTREACH



Radiation Environment Project

Scientific Occupation for high school students

Science at Primary Schools

Masterclasses in Particle Physics – Hands on Particle Physics





## SERVICES PROVIDER



Characterization parameters of public health, in the area of analysis of the effects of exposure to radon in public health.

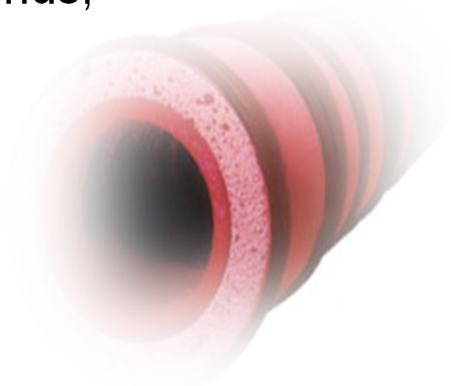


Measurement and certification of radon effective dose and concentration in air, water and soil.

# RESEARCH

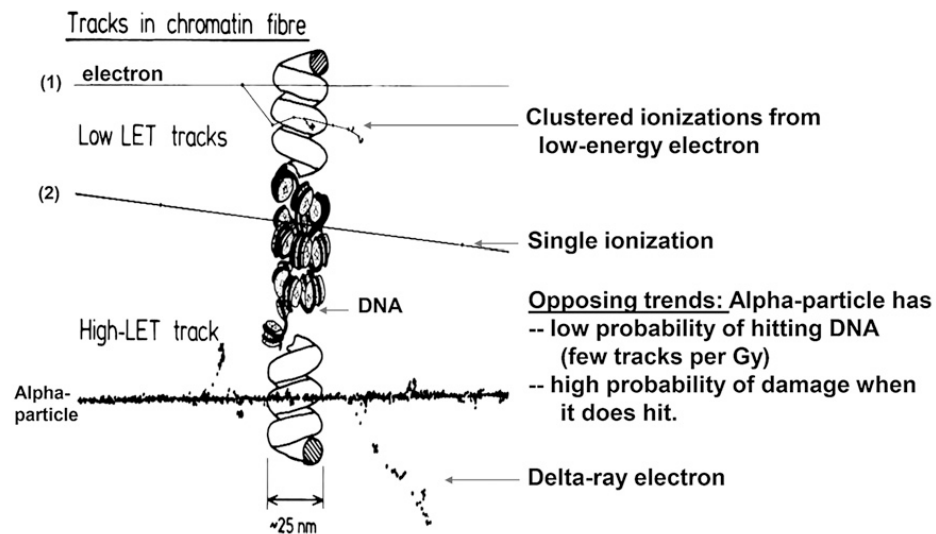
## 1. Microdosimetric study with Monte Carlo simulations

- a) Build a microdosimetric model of the human lung tree;
- b) Develop a dedicate alpha particle transport MC code;
- c) Study alpha particle interactions with human lung acinus;
- d) Assess radio-induced cancer risk on the site.



## Alpha particle radiobiology

All radiation tracks are highly structured on the scale of DNA



In the studied regions, we paid special attention to the **nuclei of cells** where the DNA is located.

We only studied cells that are **radiosensitive** to alpha particles.

Goodhead DT. Talk 23, Alpha Emitters, from Session 6, Effects from Specific Sources of Internal Radiation. Presented at: CERRIE Workshop; July 21–23, 2003; Oxford, U.K.



## 2. Radiobiology

Observe the **induced effects**, as a consequence of alpha particle deposition, on algae and on nasturtium officinale cultures



## Toxicological Response of the Green Alga *Chlorella vulgaris*

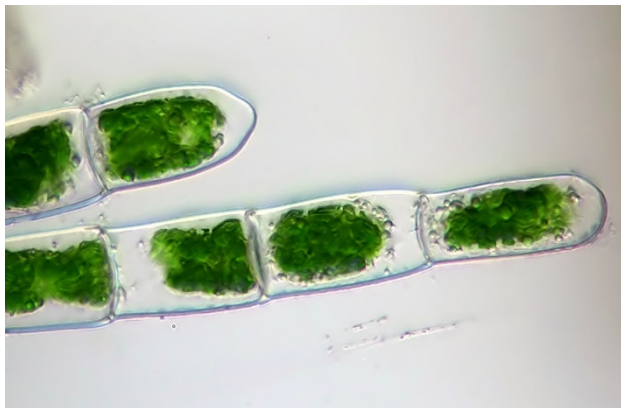
**Cellular viability** in green algae - The unicellular green algae are subjected to a variety of stress conditions and toxicological atmosphere





## Algal counting:

Cell number was determined using a hematocytometer chamber (Neubauer) and a fluorescence microscope.



## We also analyse

Chlorophyll (spectrophotometer)  
Cell size (Zetasizer)  
Cytotoxicity (MTT)

Examine:

- **antioxidative properties** of aqueous and ethanolic extracts of the leaf of *Nasturtium Officinale*;
- **bioaccumulation** of heavy metals in the watercress **leaves**.

Determination of **total phenols and flavonoids**

contents were measured following a spectrophotometric method.



Extracts were evaluated for total **antioxidant activity** by DPPH.





LABORATÓRIO DE INSTRUMENTAÇÃO E  
FÍSICA EXPERIMENTAL DE PARTICULAS

L isboa C oimbra M inho



HOME PROJECTS EVENTS OUTREACH SEMINARS RECRUITMENT PROCUREMENT LIP USERS

30 anos LIP

EXPOSIÇÃO  
**PARTÍCULAS**  
do bóson de Higgs à matéria escura



**CHERNE**  
COOPERATION FOR HIGHER EDUCATION ON RADIOLOGICAL AND NUCLEAR ENGINEERING

An open European academic network for cooperation in Higher Education on Radiological and Nuclear Engineering

### European Radon Association



Improving Awareness and Reducing Risk of Radon Exposure Across Europe



Thank you  
for your  
attention

# European Radon Day

7th November

Your journey to radon awareness

Radon is: The second leading cause of lung cancer, after smoking\*  
*(World Health Organisation)*

Where is radon found?  
Found in any building, in any location

Radon Testing: Is the only way to know. It is cheap & easy to do

Radon can be: Found in any building, in any location

Is my building affected?

Can high radon levels be reduced?  
High radon levels: Can be reduced by recognised mitigation methods

Radon protection: Can be installed in new buildings during construction

Are new buildings safe?  
New legislation: Requires all EU countries to develop a radon action plan

Are there laws about radon?

Find out more  
Visit: [www.radoneurope.org](http://www.radoneurope.org) to see what is happening in your country

Sharing Is Caring!  
Spread the message by sharing this information with friends & family