

## Our services concerning olive include:

- ▶ Extraction of raw materials (olive leaves, fruits, paste, oil, mill wastes).  
Application of contemporary and "green" technologies (e.g. CO<sub>2</sub> extraction, Microwave & Accelerated solvent extraction).
- ▶ Protocols for the creation of standardized enriched fractions (Centrifugal Partition Chromatography).
  - ▶ Method development for the isolation of bioactive compounds from initial materials (e.g. hydroxytyrosol, oleuropein, oleacin).  
Structure elucidation (NMR, HR-MS).
- ▶ Large scale preparations - Formulation (lyophilization, spray drier).
  - ▶ Qualitative analysis of the secondary metabolites of olive extracts (leaves, oils, pastes, wastes) and enriched fractions.  
Quality control - metabolomic approach.  
HPLC-DAD-HR/MS (Q-ToF & Orbitrap),  
UPLC-DAD-MS, NMR.
- ▶ Quantitative determination of bioactive constituents in extracts (HPLC-DAD-HR/MS, UPLC-MS).
  - ▶ *In vitro* biological evaluation of bioactive molecules and enriched extracts (cell lines, liver microsomes, DPPH, tyrosinase).
  - ▶ Synthesis of most active components (oleuropein, oleocanthal, oleacin etc), as well as chemical modification and production of more bioactive analogues.
    - ▶ *In vivo* pharmacological evaluation (metabolic syndrome, osteoporosis, inflammation).  
Metabolomic approach.
- ▶ Toxicological studies.
  - ▶ Metabolism studies.



## Research Grants:

- ▶ LIFE 00 ENV/GR/000671 MINOS: "Process development for an integrated olive oil mill waste management recovering natural antioxidants and producing organic fertilizer" (2001-2004). Best life environment project award.
- ▶ FP7-PEOPLE-IAPP-2008 230763 Marie Curie Actions: "Bioactive natural compounds extracted and isolated from olive tree using modern technologies: Probing into their therapeutic potential -OLITEC" (2009-2013).



## Contact:

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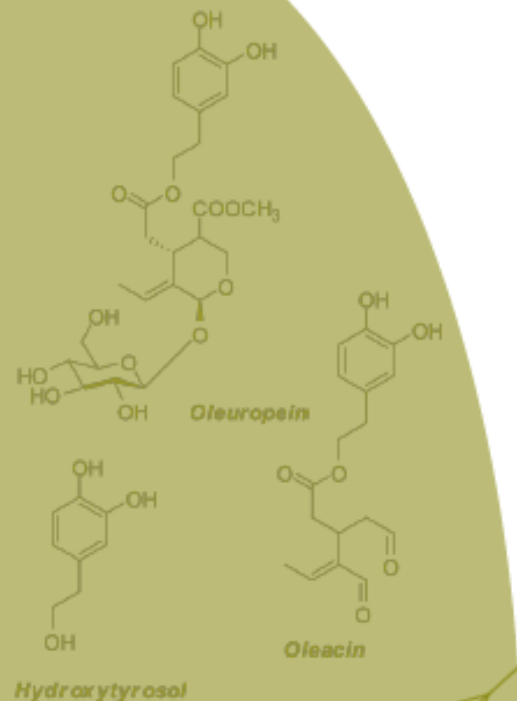
# Olive Research Group

Faculty of Pharmacy

Departments of  
Pharmacognosy / Natural  
Products and  
Medicinal Chemistry

## Who we are:

After twenty years of research on natural products, we have established a multidisciplinary team with extensive experience in all aspects of olive products investigation and exploitation. Our team consists of experts in the fields of extraction, analysis, synthesis and bioavailability of bioactive compounds from olive oil, olive leaves and olive agricultural byproducts.



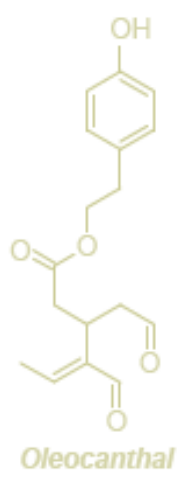
**Humans**  
Enriched extracts

**PK-PD**  
**Metabolism**  
**Metabolomics**

**Isolation**  
Isolated bioactive molecules  
Extracts  
Enriched extracts

**ASE**  
**Resins**  
**SFE**  
**FCPC**  
**Chromatography**

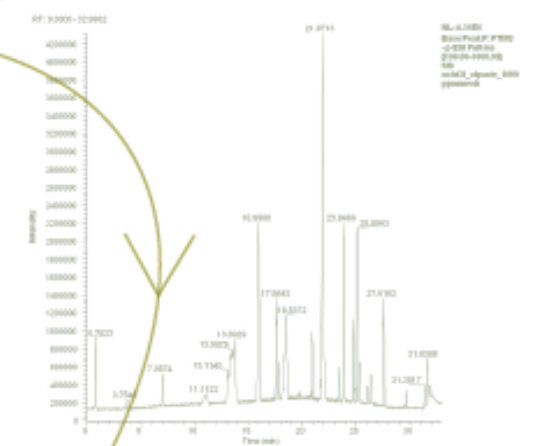
Small scale  
Medium scale  
Large scale



**Quality control**  
Oil  
Olives  
Chemical content  
Extracts  
Enriched extracts  
Herb medicinal products

**Structure elucidation**  
Molecules

**HPLC**  
**UPLC**  
**NMR** (200, 400, 600 MHz)  
**HRMS** (Orbitrap, Q-ToF)  
**SFC/MS**  
**GS**  
**GS/MS**



**In vitro pharmacological evaluation**  
Cell cultures/Biochemical tests  
DPPH  
Tyrosinase  
Liver microsomes

**In vivo pharmacological evaluation**  
Osteoporosis  
Metabolic syndrome  
Antioxidant activity  
Ischemia/Reperfusion  
Inflammation

**PK-PD**  
**Metabolism**  
**Metabolomics**

Rats  
Mice  
Rabbits

**Synthesis and development of bioactive analogues**

Microwave  
Combinatorial chemistry

**Metabolism**  
**Metabolomics**