



University
of Ioannina

Department of Chemistry

National Roadmap for Research Infrastructures

OPENSREEN-GR / Node UoI

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OPENSOURCE-GR

**An Open Access Research Infrastructure
of Chemical Biology, Target-based
Screening and Lead Discovery
for Human and Animal Health, Agriculture
and the Environment**

OPENSOURCE-GR partner institutions at a glance

ATTICA (ATHENS) AREA

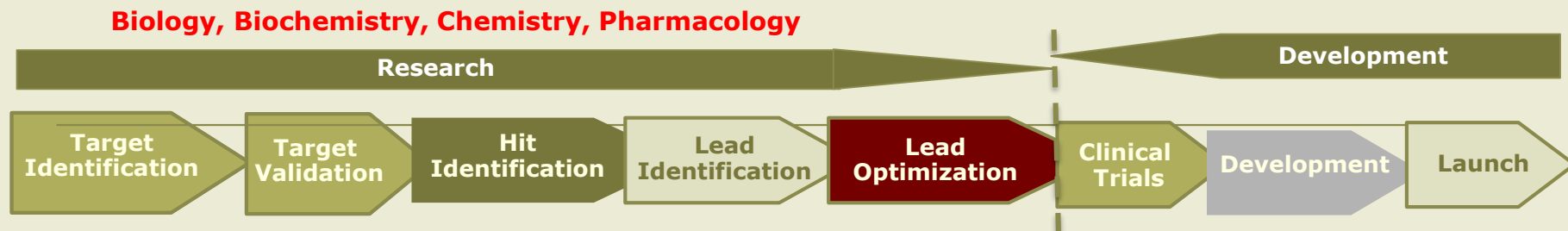
- NCSR “Demokritos”, Athens
- HNRF, Athens
- Hellenic Pasteur Institute, Athens
- BSRC “Alexander Fleming”, Athens
- BRFAA, Athens
- Agricultural University of Athens

REST OF GREECE

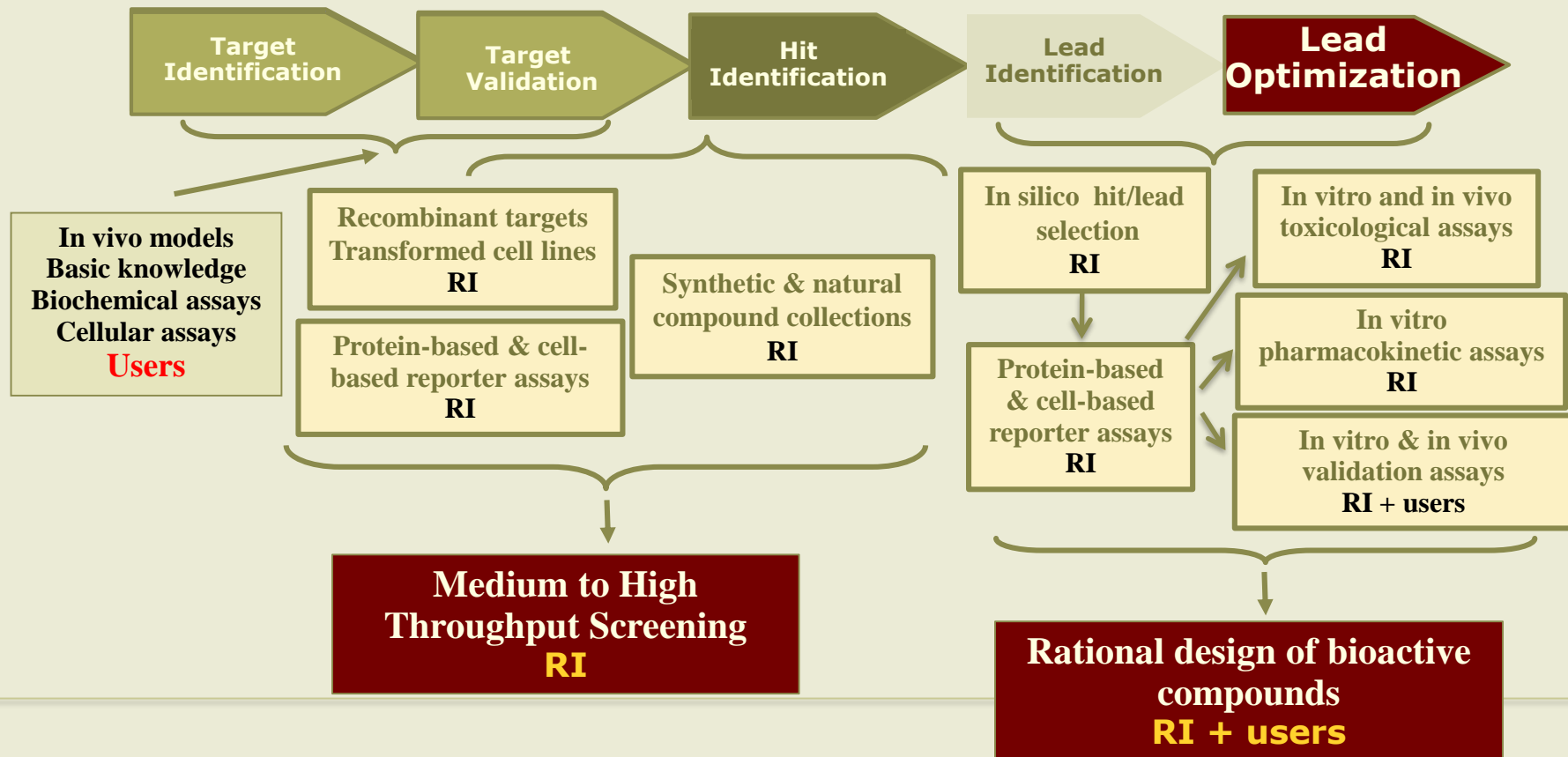
- University of Patras
- University of Crete
- University of Thessaly
- University of Ioannina
- University of Thessaloniki
- University of Thrace
- FORTH, Crete

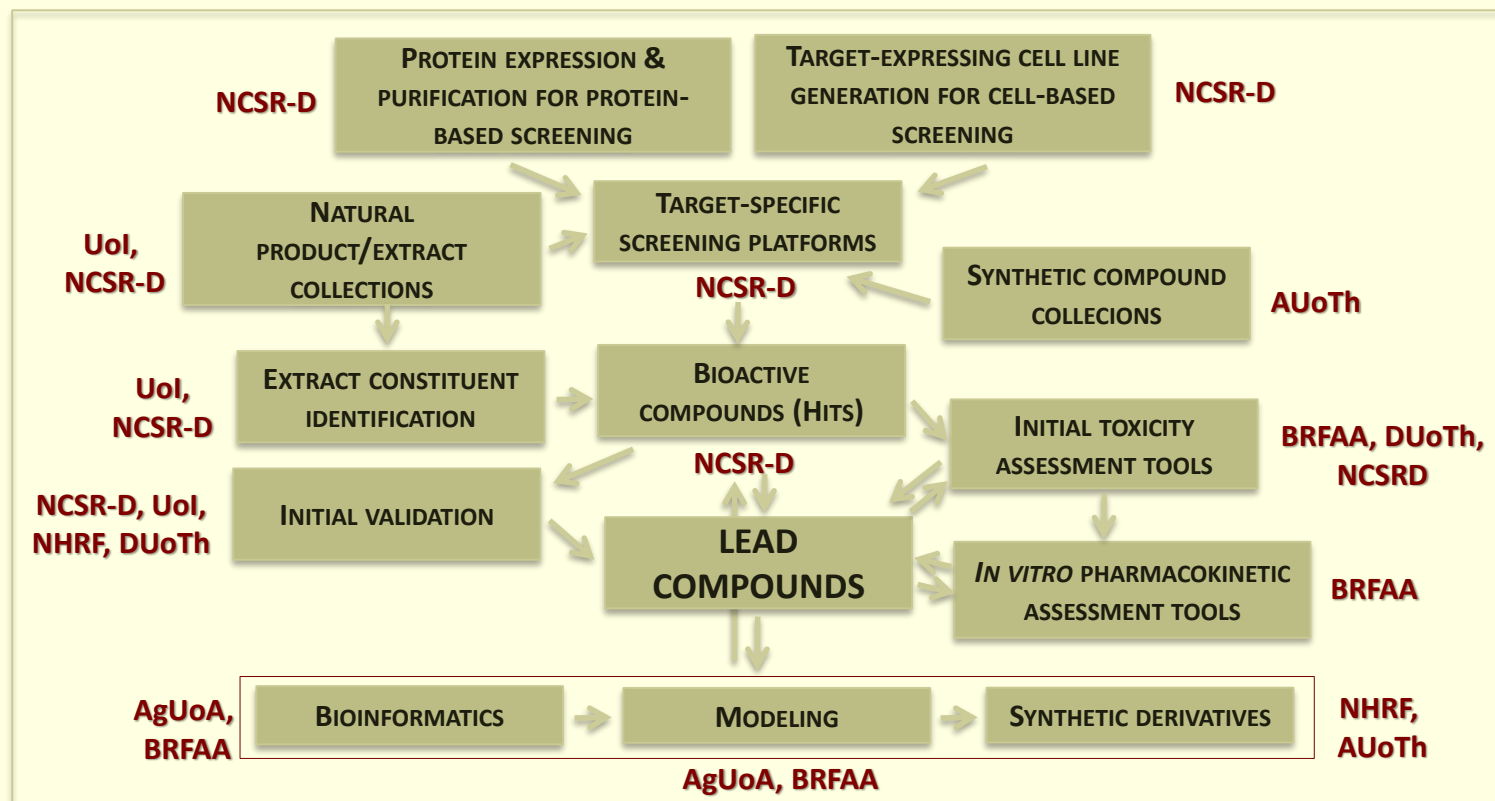
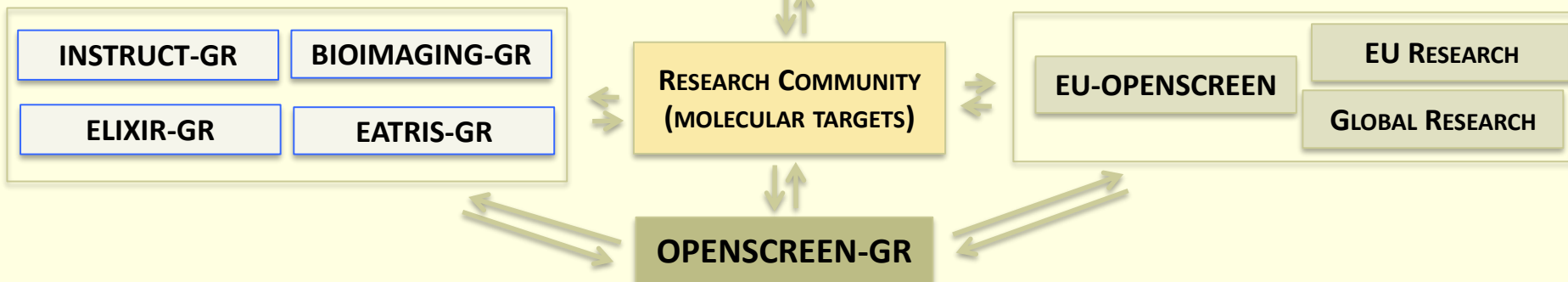


The path to discovery of an "original" bioactive molecule



OPENSREEN-GR





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EPIRUS

Unique and rich
biodiversity

- NATURAL PRODUCT/EXTRACT COLLECTIONS
- EXTRACT CONSTITUENT IDENTIFICATION
- INITIAL VALIDATION

**From the > 6.000 species
Of Greek flora**



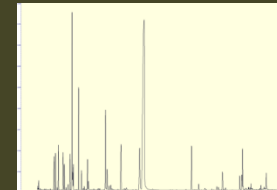
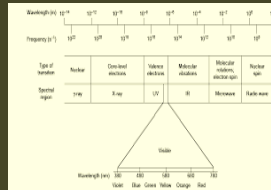
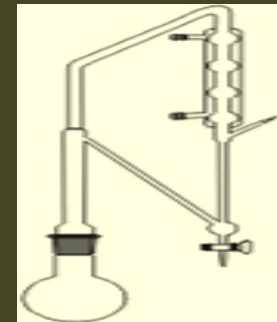
Epirus > 2600 species



**Pharmaceutical Plants and mushrooms
with biological activity**

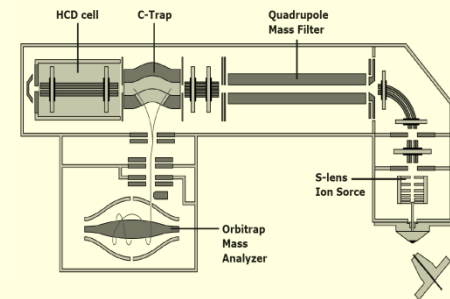
Laboratory organisation & activities

- Organogramme & work flow organisation
- *Herbarium* & photo gallery
- Protocols for the extraction, separation and chemical characterisation
- Identification of bioactive compounds
- Screening and evaluation of biological activities
- Exploration of mechanistic aspects of bioactivity



Analytical techniques, characterisation & quantitation

- HPLC- Diode array & fluorimetric detector
- LC-MSⁿ /Orbitrap
- GC-MS



Cell culture facility

- Laminar flow
- CO₂ incubators
- Microscopes
- Flow cytometer



Evaluation of Bioactivity

In vitro assays

- A549 cancer cells
- Normal fibroblasts

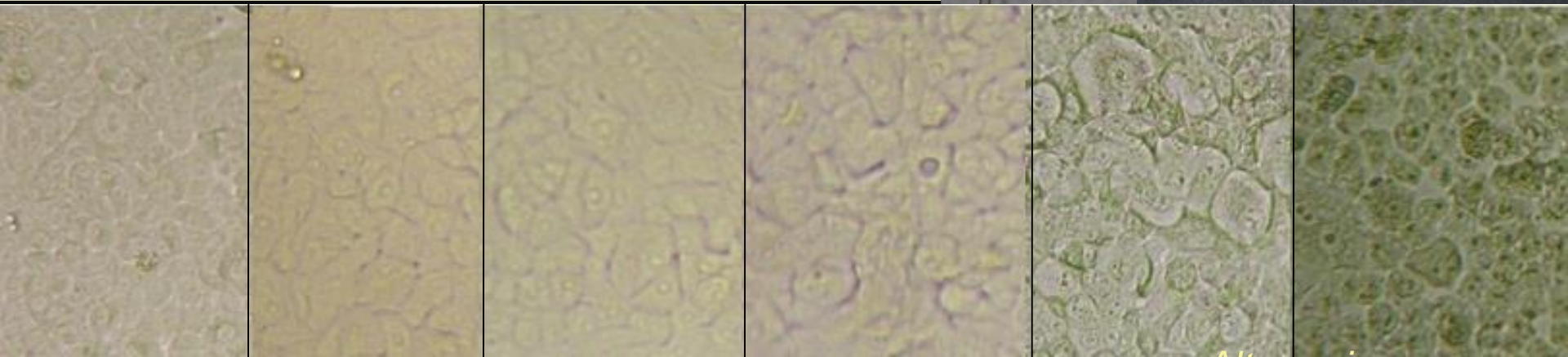
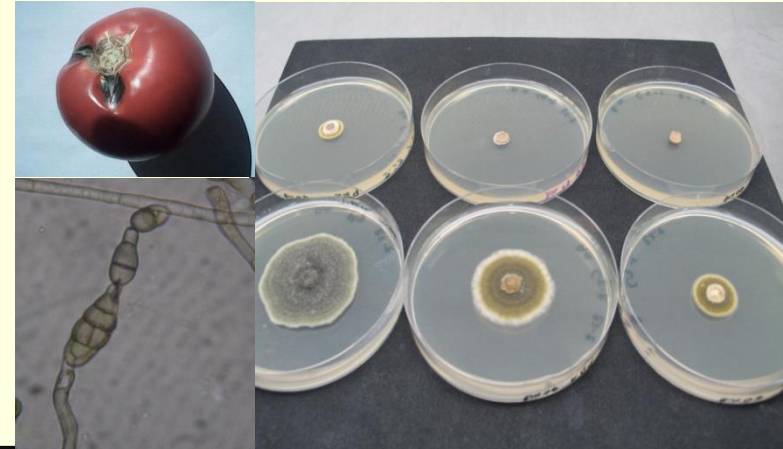


Anti-oxidant activity

- DPPH assay

Anti-inflammatory activity

Anti-mycotic activity



Mechanistic aspects

Cytotoxic activity

- MTT assay

Pro-apoptotic activity on cancer cells

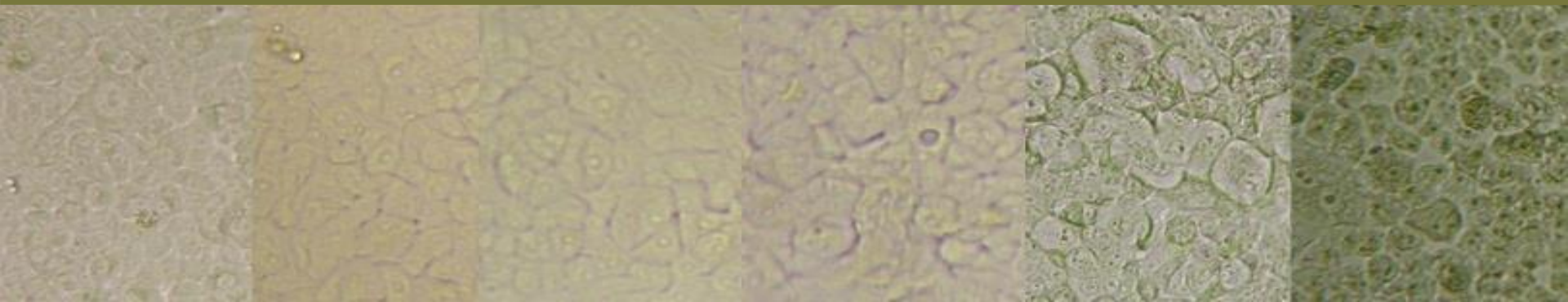
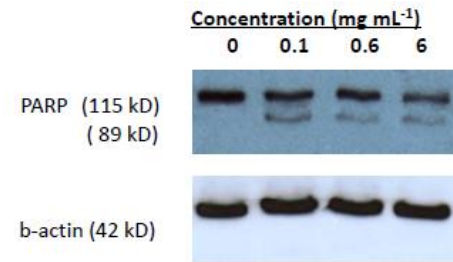
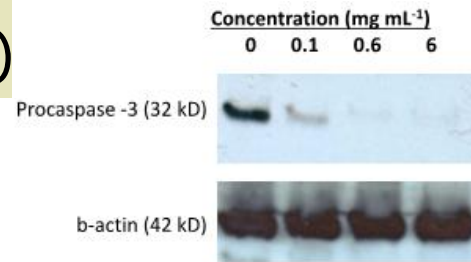
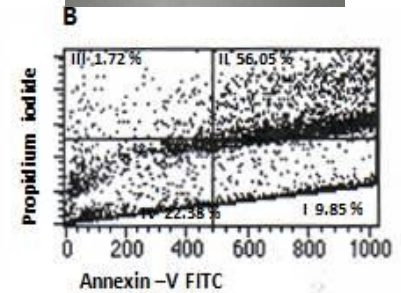
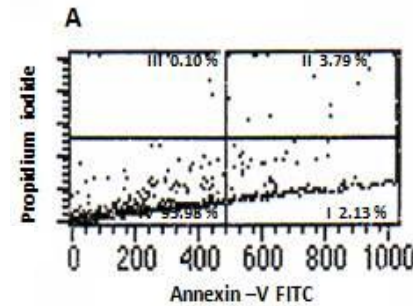
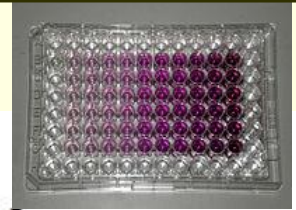
- Flow cytometry

Analysis of pro-apoptotic proteins

- Immunoblotting (Procaspases, PARP)

Gene expression

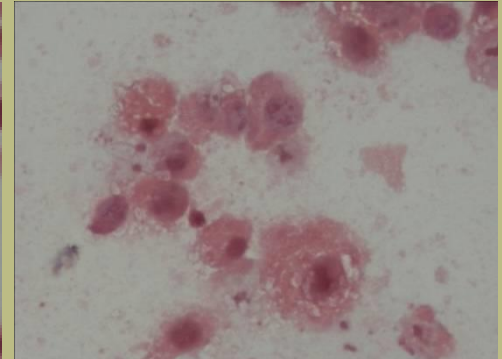
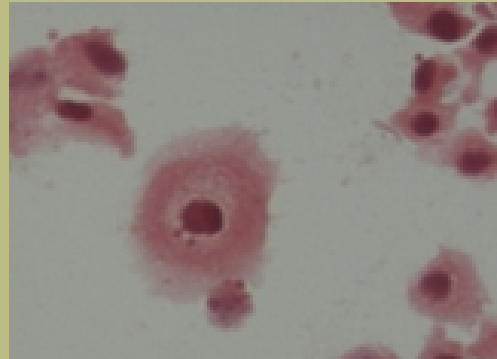
- RT-PCR



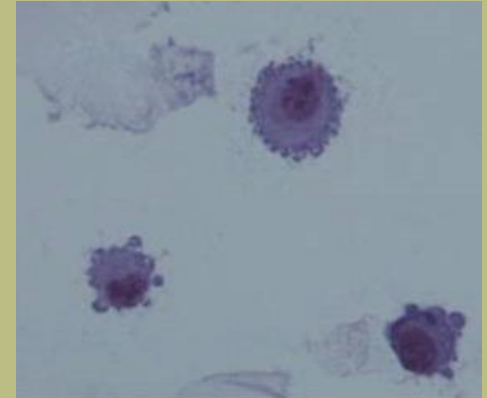
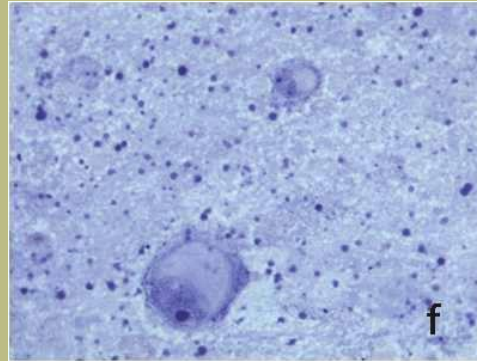
Morphological evaluation

Cytoplasmic stains

Eosin-Haematoxylin

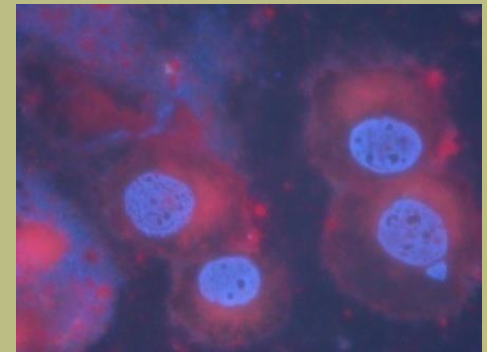
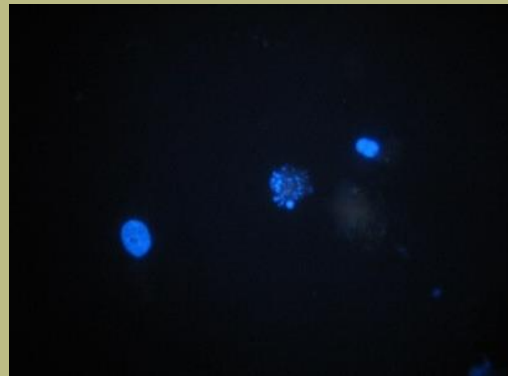


May-Grünwald Giemsa



Nuclear Stain

Dapi



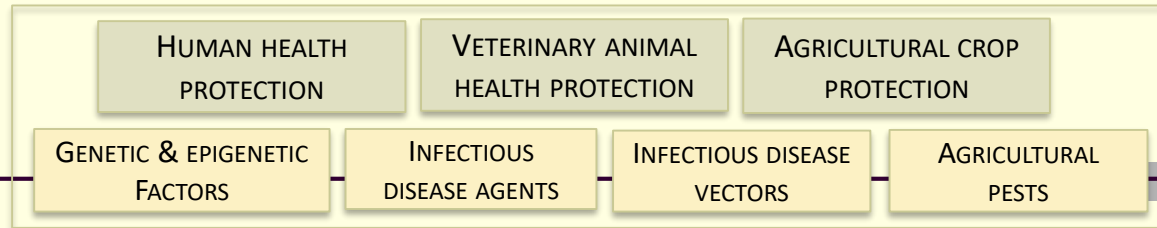
So far, among others, we have proceeded to:

- Organization of the work-flow
- Collection of aromatic/medicinal plants:
Origanum vulgare ssp. *hirtum*, *Satureja montana* (*Satureja horvatii* ssp. *Macrophylla*), *Salvia triloba*, *Matricaria chamomilla*, *Laurus nobilis*, *Rosmarinus officinalis*, *Helleborus cyclophyllus*, *Cichorium intybus*, *Asplenium ceterach* ŕ *Ceterach officinalis*, *Melia azedarach*, *Arbutus unedo*, *Taraxacum officinalis*, *Euphorbia myrsinites*, *Orchis morio*, *Orchis pallens*, *Orchis mascula*, *Sonchus oleraceus*, *Tordylium apulum*, *Spartium junceum*, *Eriobotrya japonica*, *Syringa vulgaris*

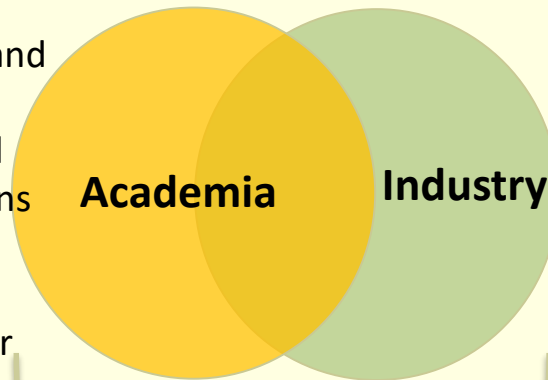
So far, among others, we have proceeded to:

- Extraction of the above plants
- Distillation of essential oil (*Origanum vulgare* ssp. *hirtum*, *Satureja montana*, *Satureja horvatii* ssp. *macrophylla*, *Rosmarinus officinalis*)
- Tested for Antioxidant activity (with DPPH assay) (*Origanum vulgare* ssp. *hirtum*, *Rosmarinus officinalis*, *Orchis morio*, *Orchis pallens*, *Orchis mascula*)

OPENSREEN-GR MISSION



- Support of excellent academic research projects (collaborative and individual)
- Support of high-impact industrial research efforts and collaborations with academic researchers
- Support of collaborations with countries of S-E Europe and other Eastern Mediterranean countries
- Service provision (limited)



- Joint training courses (industry and academia)
- Thematic meetings for academic and industrial researchers
- Support to industry for achieving enhanced innovation strategies
- Development of a common legal framework

Enhanced competitive capacity (patents, publications, data bases)

Research innovation (methods, services, added-value products)

Reduction in expenditures from minimization of resource duplications

Contribution to economic growth and development of the country (strengthening existing and generation of new RI companies, enhanced regional development, new employment opportunities)

ACKNOWLEDGEMENTS

- GSRT: National Roadmap for Research Infrastructures
- Region of Epirus
- UoI Network of Research-Supporting Laboratories (NRSL)

RESEARCH GROUP

