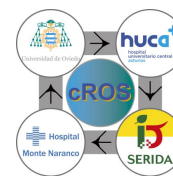




## PROFILE I+D+i & FACILITIES

*cellular Response to Oxidative Stress (cROS)*





## 1. MEMBERS

- Ana Coto Montes, Principal Investigator of cROS-Professor of Universidad de Oviedo
- Jose Antonio Boga, Senior researcher in Hospital Central de Asturias (HUCA)
- Juan José Solano, Head Service of Geriatric in Hospital Monte Naranco
- Jose Gutierrez. Head Service of Geriatric in Hospital Monte Naranco
- Manuel Bermudez de la Granda Associate Clinical Member of Hospital Monte Naranco
- Mamén Oliván, Senior Researcher in Meat Quality (SERIDA)
- Veronica Sierra Sanchez. Researcher in Meat Quality (SERIDA)
- Beatriz Caballero García, Junior lecturer in Universidad de Oviedo
- Ignacio Vega Naredo, Junior lecturer in la Universidad de Oviedo
- Yaiza Potes Ochoa, Pre-doctoral student in Universidad de Oviedo
- Carlos Bermejo Millo, Pre-doctoral student in Universidad de Oviedo
- Zulema Pérez Martínez, Pre-doctoral student in Universidad de Oviedo
- Ana Corao, Lab technician in Universidad de Oviedo

## 2. PROFILE

cROS belongs to the Biomedicine Cluster of University of Oviedo, Institute of Neurosciences of Asturias (INEUROPA) and Instituto de Investigación Sanitaria del Principado de Asturias (ISPA). It is a multidisciplinary group with a basic and clinical research profile, in which are involved professors and researchers from several institutions as University of Oviedo, Regional Service of development and Agri-Food Research (SERIDA), University Central Hospital of Asturias (HUCA) and Monte Naranco Hospital.

This multidisciplinary, seal of quality of our research group, allowed us to participate in different types of research projects focused on the cellular effects of toxic and drugs, mainly melatonin, as well as physiological and pathological processes in aging (fragility, sarcopenia, Hip fracture, obesity, metabolic syndrome, neurodegeneration, differential biomarkers of mental diseases, viral infections, etc.). Together with these studies, another research line to highlight is our study at the cellular and molecular level of muscle tissue for a greater control and traceability of the quality and tenderness of beef cattle IGP "Ternera Asturiana".



### 3. OFFERED SERVICES

#### Characterization of cell and mitochondrial toxicity induced by compounds in vitro and in vivo

- ✓ Cell death: apoptosis, autophagy & necrosis
- ✓ Inflammation
  - ✓ Cytokines
  - ✓ Nuclear factor kappa-light-chain-enhancer of activated B cells (NF- $\kappa$ B) Activation
  - ✓ Nitric oxide, nitrites & nitrates
- ✓ Mitochondria:
  - ✓ Cellular respiration
  - ✓ Mitochondrial complexes
  - ✓ Membrane potential
  - ✓ Mitochondrial permeability transition pore
  - ✓ ATP synthesis

#### Measuring of antioxidant capability in vivo & in vitro

- ✓ Antioxidant enzyme activities: Superoxide dismutase, Catalase, Glutathion reductase, Glutathion peroxidase
- ✓ Protein oxidative damage
- ✓ Lipoperoxidation
- ✓ Redox signalling
- ✓ Total Antioxidant Activity (TAA)



## Interactome studies

---

- ✓ Protein synthesis
- ✓ Endoplasmic reticulum stress
- ✓ Unfolded protein response
- ✓ Golgi apparatus
- ✓ Lysosomes
- ✓ Mitochondria
- ✓ Autophagy
- ✓ Association study

## Characterization of neurodegeneration in vivo & in vitro

---

- ✓ Neurodegenerative markers
  - ✓ Tau hypophosphorylation
  - ✓ Alpha-synuclein
  - ✓ Neurofibrillary tangles
  - ✓ B-Amyloid peptides
- Reactive astrocytes (astrogliosis)
- Activated microglia
- Neuronal death



## Characterization stem cells differentiation

---

- ✓ Senescence cells
- ✓ Satellite cells
- ✓ Cancer stem cells
- ✓ Proliferation, differentiation...

## Morphology studies

---

- ✓ Staining
- ✓ Fixation
- ✓ Optic microscopy
- ✓ Electron microscopy

## Blood

---

- ✓ Blood fractionation: plasma, serum, peripheral blood mononuclear cells
- ✓ Exosomes: isolation, characterization, cultures

## Blood markers: Aging alterations and associated diseases

---

- ✓ Cell variations
- ✓ Oxidative damage
- ✓ Inflammation
- ✓ Interactome

## Muscle quality

---



- Aerobic and anaerobic metabolism
- Fat measures
- Anthropometric measures
- Tanita
- Fast-Twitch and Slow-Twitch muscle fibers types
- Sarcopenia assessment

### Clinical markers in aging

---

- Frailty
- Sarcopenia
- Depression
- Cognitive alteration
- Obesity
- Metabolic syndrome

### Viral infection in cell lines

---

- ✓ Infection diagnoses
- ✓ Viral load
- ✓ Cell response
  - Cell death
  - Oxidative stress
  - Inflammation



## Trazability & Beef Meat Quality “IGP Ternera Asturiana”

---

- ✓ Organoleptic studies

### 4. METHODOLOGIES

- Spectrophotometric analysis
- Fluorometric analysis
- Colorimetric analysis
- Western blot
- Immunohistochemistry
- Immunocytochemistry
- Immunofluorescence
- Real time PCR (RT-PCR)
- ELISA (Enzyme-linked immunosorbent assay)
- Cell cultures
- Microtomy and paraffin sections and cryostat on frozen tissues
- Optic and fluorescence microscopy
- Electron microscopy
- Flow Cytometry
- Clack -Oxygraph Electrode (Oxygen consume and mitochondrial complexes)



## 5. CONSULTING & ANALYSIS

Assessment and management of own or foreign biological results with study of the interrelationship, potential roles and hypotheses of action. Statistical significance analysis and study of potentiality as biomarker.

Biological and research consulting. Result reporting