COST ACTION: MITOEAGLE

INFORMATION ABOUT YOUR WORK AND INSTITUTION

GENERAL INFORMATION

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INSTITUTION NAME: National & Kapodistrian University of Athens, Faculty of Biology

WEB PAGE LINK: http://en.biol.uoa.gr/

LABORATORY NAME: Group of "*Molecular-Cellular Ageing and Carcinogenesis* (MCAC)"

WEB PAGE LINK: http://ipt-mcac.biol.uoa.gr/

ABOUT YOUR INSTITUTION

SPECIALITY/ORIENTATION OF YOUR INSTITUTION:

The National and Kapodistrian University of Athens (UoA) is the main educational and research entity in Greece. The Faculty of Biology is part of the School of Sciences and,(among others) includes the Dept of Cell Biology & Biophysics.

INSTITUTION SIZE: <100 , 100-200 or >200

> 200

BRIEF DESCRIPTION OF FACILITIES (no more than 5-8 lines):

The Department of Cell Biology & Biophysics at the Faculty of Biology, UoA, provides state-of-the-art research facilities, including settings for molecular-cellular biology and biochemistry, as well as for insect and animal cells culturing. DCBB is equipped with instrumentation for measuring radiation exposure, a cryostat-microtome, two automatic ultramicrotomes, light and fluorescent microscopes, a TE2000S/ECLIPSE C-1 Nikon Confocal Laser Scanning Microscope and an image analysis unit, a Balzers rotary shadowing apparatus, a Scanning and a Transmission Electron Microscope. Recent technological advances include the purchase of state-of-the-art equipment for cryo-EM sectioning, live cell CLSM imaging, high throughput microplate reading (nanoquant UV-VIS-Fluorescence-TRF) and cell culturing at regulated O_2

concentration. A cold-room, an insect culture room and a small animal house are additional facilities of DCBB.

ABOUT YOUR WORK

SPECIALITY/ORIENTATION OF YOUR WORK:

The scientific efforts of the MCAC Group are focusing on the understanding of the molecular-cellular basis of ageing and cancer. Particularly, MCAC focuses on proteome stability alterations during ageing and in age-related diseases, as well as in the discovery of natural compounds that reduce proteome aggregation and prolong proteome stability and longevity at either cell-based and/or at *in vivo* experimental models. Specifically, we focus on cell signalling pathways and molecular mechanisms involved in proteome maintenance, stability and repair, including the main antioxidant responses (e.g. the Nrf2/Keap1 pathway), molecular chaperones (Clusterin, HSP70, HSF1) and main proteolytic systems (proteasome, lysosome), as well as on their functional alterations and implication in ageing and cancer; also, we study the functional cross-talk between proteostatic mechanisms and mitochondria homeostasis (mitostasis). Additional areas of ageing- and/or cancer-related research involve the identification of natural and/or synthetic compounds with anti-ageing or anti-tumor activity. Main tools and experimental models include several normal or genetically modified cell lines of mouse or human origin, while for *in vivo* studies the group is employing *Drosophila* flies, transgenesis in mice or studies on selected human cohorts.

SIZE OF THE GROUP: 10 people including Post-Docs, PhD and MSc students

BRIEF DESCRIPTION TECHNICAL SKILLS (no more than 5 lines):

Technologies applied by the MCAC group include a wide range of molecular-cellular biology and analytical biochemistry techniques, insect and mammalian cells culture, high throughput assays for transcriptome or proteome analyses, cell imaging by advanced Confocal Microscopy, state-of-the-art conventional and cryo-immuno-Electron Microscopy, etc. The MCAC Group is currently expanding its technological interests and expertise in the fields of screening of compounds with anti-ageing activity and transgenesis in flies and mice.

5 MOST IMPORTANT PUBLICATIONS IN THE LAST 5 YEARS.

Tsakiri EN, Iliaki KK, Höhn A, Grimm S, Papassideri IS, Grune T, **Trougakos IP**. (2013). Diet-derived advanced glycation end products or lipofuscin disrupts proteostasis and reduces life span in Drosophila melanogaster. ***Free Radic Biol Med.*** 65, 1155-63.

Evangelou K, Bartkova J, Kotsinas A, Pateras IS, Liontos M, Velimezi G, Kosar M, Liloglou T, **Trougakos IP**, Dyrskjot L, Andersen CL, Papaioannou M, Drosos Y,

Papafotiou G, Hodny Z, Sosa-Pineda B, Wu XR, Klinakis A, Ørntoft T, Lukas J, Bartek J, Gorgoulis VG. (2013). The DNA damage checkpoint precedes activation of ARF in response to escalating oncogenic stress during tumorigenesis. ***Cell Death Differ.*** 20, 1485-97.

Tsakiri EN, Sykiotis GP, Papassideri IS, Terpos E, Dimopoulos MA, Gorgoulis VG, Bohmann D, **Trougakos IP**. (2013). Proteasome dysfunction in Drosophila signals to an Nrf2-dependent regulatory circuit aiming to restore proteostasis and prevent premature aging. ***Aging Cell*** 12, 802-13.

Tsakiri EN, Sykiotis GP, Papassideri IS, Gorgoulis VG, Bohmann D, **Trougakos IP**. (2013). Differential regulation of proteasome functionality in reproductive vs. somatic tissues of Drosophila during aging or oxidative stress. ***FASEB J.*** 27, 2407-20.

Sideridou M, Zakopoulou R, Evangelou K, Liontos M, Kotsinas A, Rampakakis E, Gagos S, Kahata K, Grabusic K, Gkouskou K, **Trougakos IP**, Kolettas E, Georgakilas AG, Volarevic S, Eliopoulos AG, Zannis-Hadjopoulos M, Moustakas A, Gorgoulis VG. (2011). Cdc6 expression represses E-cadherin transcription and activates adjacent replication origins. ***J Cell Biol.*** 195, 1123-40.

YOUR H INDEX: 25 (source *Google Scholar*)

BRIEF DESCRIPTION OF HOW ARE YOUR CURRENT AND FUTURE PROJECTS FUNDED FOR THE NEXT 5 YEARS. (National funds, EU funds, private funds…)

MCAC is currently funded from several Hellenic and International (EU) research grants, as well as from private sources (Hellenic, EU and US companies). We anticipate funding from similar sources in the coming years.

PRESENTATION AND ORGANIZATION

We are exploring different ways to integrate all members of our consortium.
Do you see your work in any of the following Working Groups. If so, fill the corresponding box.

[X] **WG1. Standard operating procedures and user requirement document: Protocols, terminology, documentation**

[X] **WG 2: MITOEAGLE data repository in muscle and other tissues**

[X] **WG3. MITOEAGLE data repository on fat tissues and other tissues**

[X] **WG4. MITOEAGLE data repository for blood cells and cultured cells**

ABOUT YOUR INTERACTIONS

1. **Indicate previous collaborations in EU projects with the partners of this COST initiative**

2. **Please include any publication you have produced in collaboration with other members of this COST initiative**

3. **Indicate previous collaborations among partners in other networks (national and international)**

4. **Indicate your experience in EU funded collaborative projects**

- Have participated in several EU grants as a Researcher (e.g. Post-Doc).

- Partner (as a PI) in the following EU collaborative projects:
  EU COST Action BM0703 (MC member)
  EU COST Action CM1001 (MC substitute)
  INsPiRE (EU, REGPOT) (Deputy Coordinator)
  EU COST Action CM1004 (MC member)
  MICROSMETICS (EU, PEOPLE)
  TASCMAR (H2020)
  MediHealth (H2020)

5. **Indicate previous, present and/or future collaborations with companies of the areas of this COST initiative.**

Collaborations with Greek, EU (France) and US companies