

TITLE

Biochemical and biophysical methods addressing protein misfolding/aggregation, amyloid clearance by ubiquitin proteasome pathway, proteases and autophagy

DESCRIPTION

Accumulating evidences suggest that a derangement of proteome maintenance lies at the root of a myriad of different pathological conditions including cancer and neurodegeneration. Therefore, the interplay of pathways regulating proteostasis is rapidly becoming one of the most promising arenas for the discovery of novel drugs. Within this frame, the research will first focus on the role played by adverse environmental factors - as unbalanced metal ions and/or oxidative stress - in (dys)regulating the activity and cross-talk of some key players of intracellular proteolysis including ubiquitin, proteasome and cytosolic proteases as IDE. Next, in view of the identification and optimization of molecular scaffolds for the treatment of protein misfolding diseases as Alzheimer's and diabetes, the effect of several promising compounds (e.g. porphyrin, and/or peptide derivatives) on the ability of ubiquitin/proteasome/IDE to degrade some amyloid substrates will be addressed. During his/her educational path, the candidate will employ a multidisciplinary approach based on spectrometric (MALDI-TOF and high resolution ESI mass), spectroscopic (UV-Vis, fluorimetry, CD spectroscopy), thermodynamic (calorimetry), and biochemical/biological (microscopy, citofluorimetry and gel-electrophoresis) assays. Cell cultures and animal models will be eventually employed to test the efficacy of the most promising compounds.

SELECTION CRITERIA

Eligibility Criteria

- Academic degree: Applicants shall have a master degree in **Chemistry, Biology or Biomolecular Sciences**, corresponding to the second level of studies.
- Mobility rule: There will be no nationality restrictions. Applicants can be from any Country. However, according to the mobility rule, at the time of the application deadline researchers should not have resided or carried out their main activity (work, studies, etc.) in Italy for more than 12 months in the 3 years immediately prior to the reference date. Compulsory national service and/or short stays such as holidays will not be taken into account.
- Research experience: Applicants shall, at the time of the application deadline, be in the first four years (full-time equivalent research experience) of their research careers and not yet awarded a doctoral degree.

Full-Time Equivalent (FTE) Research Experience will be determined from the date when a researcher obtained the degree which would formally entitle him or her to embark on a doctorate, either in the country in which the degree was obtained or in Italy, irrespective of whether or not a doctorate is or was ever envisaged.

Evaluation Criteria

Step 1 -Evaluation of documentation provided by the candidate: a) Academic record and training b) Research activities c) CV/motivation letter; d) Level of English; e) Reference letters.

Step 2 - Interview: a) Scientific knowledge in the field of interest; b) Research experience in the field of interest c), Motivation; d) English proficiency.

Supervisor

Dr. Danilo Milardi

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