Oxidative Medicine and Cellular Longevity

Hindawi

Special Issue on

Oxidative Stress and Initiation of Translation in Cancer and Aging

CALL FOR PAPERS

Oxidative stress is known to elicit cellular signaling pathways and posttranslational protein modifications. By these means, oxidative stress not only affects the regulation of gene expression but also modifies protein function and turnover, both having a significant impact on the cell's protein inventory. In particular, the regulation of protein biosynthesis at the level of translational control is now recognized as a crucial factor in establishing the cellular proteome, hence controlling cell proliferation, differentiation, and development. Indeed, research suggests that changes in protein synthesis can be critical for the progression of aging and age-related diseases as well as cancer. Therefore, modifying the effects of oxidative stress on protein biosynthesis might be a strategy for delaying age-related diseases.

An important limiting step for controlling protein biosynthesis is the initiation of translation. This process comprises a highly organized sequence of interactions between the structural features of mRNA and eukaryotic translation initiation factors. These interactions are regulated by a number of molecular switches, often regulated by signaling pathways that are well-known effectors of longevity, such as TOR, MAPK-, or the insulin-like growth factor signal cascades, as well as oxidative stress or infection and inflammation. It has also become clear that translation initiation factors are employed to not only regulate translation in a quantitative manner but also have an impact on qualitative changes in mRNA translation; recent evidence shows that they can even control mRNA splicing. It is an actual challenge to unravel how oxidative stress and other related noxae regulate eukaryotic translation initiation and how this determines translation specificity and protein output and furthermore to understand how this drives carcinogenesis and aging.

In this special issue, we would like to invite researchers to present studies on the effect of oxidative damage and other issues on translational control, with a focus on translation initiation and its effects on carcinogenesis as well as in the progression of age-related diseases.

We particularly encourage the submission of original research papers dealing with, but not restricted to, the influence of oxidative stress on the molecular mechanisms of regulation and assembly of eukaryotic initiation factor-mRNA complexes and how this alters cellular physiology. Additionally, papers are invited providing evidence that translation initiation may represent a promising therapeutic target for age-related diseases and cancer. In an introductory part, we welcome review articles describing our current knowledge of regulation of translation and its role in age-related diseases and carcinogenesis.

Potential topics include but are not limited to the following:

- Role of oxidative stress on translation initiation factor regulation in aging and carcinogenesis
- Molecular pathways regulating initiation of translation under stress, especially oxidative stress
- Qualitative changes in protein synthesis mediated by translation initiation factors
- Energy metabolism and regulation of initiation of translation
- Oxidative stress and posttranslational modifications of translation initiation factors
- Feedback of protein degradation on initiation of translation
- Pharmacological interventions acting on translation initiation

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/omcl/ositc/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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