

Special Issue on

Interplay between ROS and Autophagy in Cancer and Aging: From Molecular Mechanisms to Novel Therapeutic Approaches

CALL FOR PAPERS

Aging and cancer are highly related biological phenomena. Many cellular processes including DNA damage responses, increasing oxidative stress, metabolic rewiring, and cellular senescence that underpin several malignant phenotypic traits also contribute to the aging phenotype. Reactive Oxygen Species (ROS) are persistently elevated in cancer cells as a result of their increased metabolic activity, mitochondrial dysfunction, and activation of oncogenes. Autophagy comprises salvaging processes, commonly triggered by metabolic stress responses, by which macromolecules and organelles are targeted by autophagic vesicles to lysosomes for degradation and recycling of their constituents. Many studies reveal that alterations in ROS and autophagy are implicated in cancer biology and aging. However, while it is established that high levels of ROS and impaired autophagy drive aging in mammalian cells, their role in regulating cancer cell death or survival is highly contextual and dependent on the source of stress, tumour particularities, and its metabolic status. Despite the fact that both ROS and autophagy can promote tumorigenesis and cancer development, their exacerbation may induce cell death following a nonspecific injury or an excessive degradation of macromolecules and cellular organelles required for cellular processes. Interestingly, many oncogenic stimuli that induce ROS generation also induce autophagy, including nutrient starvation, mitochondrial dysfunction, and hypoxia, suggesting the existence of the interplay between ROS and autophagy. The understanding of the molecular mechanisms linking ROS and autophagy may acquire exceptional significance to develop novel, tailored preventive and therapeutic strategies against cancer disease and aging processes.

In this special issue, we invite researchers to contribute original research articles describing, or related to, novel cellular and molecular mechanisms mediated by ROS, and autophagy, as involved in cancer biology and aging. Studies characterizing specific crosstalk principles between ROS regulation and autophagy are particularly encouraged. Review articles describing the current state of the art are also welcome.

Potential topics include but are not limited to the following:

- ▶ Role of ROS regulation in cancer biology, chemoresistance, and aging and molecular underpinnings thereof
- ▶ Molecular basis of the interplay between ROS, autophagy, and metabolic dysfunction in cancer cells: from signaling pathways to functional impact
- ▶ Role of ROS-driven lysosomal permeabilization as a mechanism for autophagy initiation
- ▶ Role of mitophagy in cancer biology and aging, mechanisms underlying the interplay between mitophagy and oxidative stress, and nanotherapeutic applications aimed at restoring mitophagy
- ▶ Innovative therapeutic approaches aimed at modulating and normalizing ROS levels and autophagy activation state in cancer cells: from nanotechnology to tailored medicine
- ▶ Systems-level surveys for the integration of ROS regulation and autophagy with cell homeostasis

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

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

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