Cologne Seminar Series on Ageing

Kyoko Miura
Kumamoto University, JPN



Monday, 08th July 2024
at 1:00 pm

CECAD, Joseph-Stelzmann-Str. 26
Lecture hall, ground floor

Host: Jane Reznick

Scientific Background:

Professor Kyoko Miura is a faculty member at the Department of Aging and Longevity Research, Kumamoto University, Kumamoto, Japan. Her research primarily focuses on elucidating the mechanisms underlying resistance to cancer and aging in NMRs. Along with her team, Prof. Miura aims to identify the molecular mechanisms and genes that contribute to the resistance to aging and cancer in NMRs, and to understand their relationship with evolutionary adaptation to their natural habitat. Prof. Miura also aims to extrapolate findings from the NMR model to several disease models of laboratory mice and, potentially, human diseases in the future. She is a member of several international research societies and has been recognized for her exemplary work, which has been published in various peer-reviewed journals.

Cell Death and Senescence Regulation in the Longest-Lived Rodent, the Naked Mole-Rat

About Miura´s talk:

The naked mole-rat (NMR) is the longest-lived rodent with remarkable resistance to aging and cancer. We have previously demonstrated several mechanisms that likely contribute to the NMR's resistance to carcinogenesis and delayed aging. NMR iPS cells exhibit tumor-resistance due to species-specific activation of the tumor suppressor ARF and a loss-of-function mutation in the oncogene ERAS (Miyawaki et al., Nat. Commun. 2016). NMR neural stem cells (NSCs) are more resistant to gamma-irradiation than mouse NSCs (Yamamura et al., Inflamm. Regen. 2021). Upon induction of cellular senescence, NMR fibroblasts progressively undergo cell death through activation of the INK4a-RB pathway and serotonin metabolism, which may function as "natural senolysis" to inhibit the accumulation of senescent cells (Kawamura et al., EMBO J. 2023). We have also discovered that NMR tissues exhibit remarkable resistance to chemical carcinogenesis induction through a dampened inflammatory response. As a mechanism, we have identified an inability to induce necroptosis, a type of inflammatory programmed cell death, due to loss-of-function mutations in RIPK3 and MLKL (Oka et al., Commun. Biol., 2022). Recently, we have started to breed Damaraland mole-rats, a relative of the NMR, for comparative studies. In this seminar, I will discuss our previous research and recent progress.

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