



# 68<sup>Th</sup> HiHA Webinar

Organizer: Hiroshima Research Center for Healthy Aging (HiHA)  
Hiroshima University

## 「Yeast as a model for cell death, drug and disease research」

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The fission yeast (*S. pombe*), a unicellular eukaryotic model organism, bears resemblance to the mammalian cells at the molecular level in terms of regulation of cell cycle, programmed cell death subroutines, DNA repair mechanisms, mitochondrial metabolism and regulation of gene expression. In addition, yeast energy metabolism is very similar to reprogrammed energy metabolism evolved in cancer cells. While these similarity constitutes a great opportunity for molecular cancer research, this ideal eukaryotic model also presents a potential anti-cancer therapeutic screen model. There are several programmed cell death subroutines in the fission yeast: Apoptosis, necrosis, and autophagy. Although autophagy is under debate whether it is a form of cell death or a form of cellular stabilization, there are numerous researches focusing on fission yeast apoptosis and necrosis, in which those studies contributed to the molecular understanding of cell death in eukaryotes.

Our experiments focused on inhibition of yeast DNA repair mechanisms in combined therapy and activation of programmed cell death subroutines using natural and derived chemicals, such as terpenes and terpenoids. The markers of cell death including chromatin condensation and fragmentation, impairment of mitochondrial and cellular membranes, excessive ROS production, and inhibition of colony formation can also be monitored in yeast. Furthermore, our research has proved that most of those chemical agents also worked in cancer cell lines in the same or a similar way and signaling. However, though yeast study for cancer treatment is limited due to the fact that the only apoptotic way in yeast is the intrinsic apoptosis, yeast cells still present rapid, reliable and inexpensive alternative systems to test the effects of drug candidates at the molecular, physiological and genetic levels.

**QR code for the  
Teams webinar link**



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This seminar is counted as one 'Science Seminar' provided by Biomedical Science program, Graduate School of Integrated Sciences for Life, Hiroshima University

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