Kenji Irie

Faculty of Medicine

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Theme

●Molecular Cell Biology

Keyword Molecular biology, Biochemistry, Yeast genetics, Regulation of gene expression, Signal transduction, Membrane traffic

Highlight

Major Scientific Interests of the Group

1) Post-transcriptional regulation of gene expression by RNA-binding proteins.

2) Molecular mechanism of mRNA localization and local translation regulating cell polarity, asymmetric cell division, and cell-fate.

3) Signaling pathway for the regulation of the endoplasmic reticulum stress response.

4) Developmental regulation for membrane traffic in meiosis.

Projects for Regular Students in Doctoral or Master's Programs

1) Post-transcriptional regulation of gene expression by Khd1, Ccr4, and Pbp1 in yeast.

2) Stability control of LRG1 mRNA by RNA-binding proteins.

3) Regulation of the endoplasmic reticulum stress response by protein kinases.

Other Faculty Members

Associate Professor Tomoaki Mizuno

Assistant Professor Yasuyuki Suda

Applications and Prospects

●Yeast is known for its commercial and industrial applications (fermentation and compound synthesis). Also, many biological processes are evolutionarily conserved from yeast to human, making it an ideal model organism for research. It is affordable and grows rapidly, making systems approach and high-throughput studies possible.

Literature, intellectual property, work

●Viet NTM, Duy DL, Saito K, Irie K, Suda Y, Mizuno T, Irie K. Regulation of LRG1 expression by RNA-binding protein Puf5 in the budding yeast cell wall integrity pathway. Genes Cells. 2018 Dec;23(12):988-997.

●Mizuno T, Nakamura M, Irie K. Induction of Ptp2 and Cmp2 protein phosphatases is crucial for the adaptive response to ER stress in Saccharomyces cerevisiae. Sci Rep. 2018 Aug 30;8(1):13078.

●Suda Y, Tachikawa H, Inoue I, Kurita T, Saito C, Kurokawa K, Nakano A, Irie K. Activation of Rab GTPase Sec4 by its GEF Sec2 is required for prospore membrane formation during sporulation in yeast Saccharomyces cerevisiae. FEMS Yeast Res. 2018 Feb 1;18(1).