

Yeasts as models in cell biology

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Yeast organisms have had a long history of success to address fundamental cell biological problems, with two main yeast models sharing the limelight, the budding yeast, *Saccharomyces cerevisiae*, and the fission yeast, *Schizosaccharomyces pombe*. Both of these belong to the same group of fungi, the ascomycetes, but exhibit wide divergence in terms of shape, physiology, and chromatin regulation, which provides complementary richness for discoveries. The vast array of genetic, genomic, biochemical and cell biological tools available to dissect biological problems in these organisms is probably still unparalleled in other species, and has made them the organisms of choice to dissect fundamental cellular processes.

In the past four decades, yeast researchers have been pioneers in unravelling the fundamental mechanisms driving signal transduction, the eukaryotic cell cycle, the organization and regulation of DNA in chromatin and the organization of organelles and molecules in the cytosol. In particular, this has been recognized in recent years by the award of three Nobel prizes in Physiology and Medicine to researchers having used yeast in their work to understand fundamental aspects of cellular life, which are generally true for all eukaryotic cells. These recognized in particular the discoveries of key regulators of the cell cycle in 2001, of the function of telomeres and telomerase in 2009, and of the machinery regulating vesicle traffic in 2013.

In this thematic issue “Yeast as models in cell biology”, we have assembled a panel of nine reviews that cover a broad range of fields in which yeast models continue contributing seminal discoveries. These cover very diverse topics, including DNA structure, from telomere function (Kupiec) to homologous recombination (Lisby); chromosome biology, from kinetochore assembly (Watanabe) to the effect of ploidy (Li); cellular organization, from the actin cytoskeleton (Balasubramanian) to cell polarization (Arkowitz and Martin); and physiology, from nutrient sensing (Thevelein) to aging (Barral) and the physiology of prions (Chernoff). While this topic choice represents only a fraction of those in which yeast models continue to uncover fundamental concepts, we hope that this thematic Issue will provide the readers of FEMS Microbiology Reviews with insights into the breadth of research using yeast models.

On behalf of all co-editors of this issue, I would like to express our heartfelt thanks to all authors. The writing of comprehensive review articles is a major investment, which is highly valuable to the community and beyond.

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