

Preface

Yarrowia lipolytica is an outstanding yeast, phylogenetically distant from *Saccharomyces cerevisiae* or other well-studied yeast species and standing alone at the bottom of the tree of hemiascomycetous yeasts. It was formerly called *Candida lipolytica*, *Endomycopsis lipolytica*, and *Saccharomycopsis lipolytica* and finally reclassified by van der Walt and von Arx (1980) as the type species of the genus *Yarrowia*. This genus was newly created and dedicated to David Yarrow, who has identified this genus. To differentiate this and other yeasts from the two well-studied yeast species *S. cerevisiae* and *Schizosaccharomyces pombe*, the artificial group of “nonconventional yeasts” has been created and was first used in the title of the conference on “Genetics of non-conventional yeasts” held in Weimar (Germany) in 1987. In the meantime, *Y. lipolytica* is the best-studied organism of this group. The detection of sexual reproduction in this yeast by Wickerham and colleagues in 1970 has forced genetic investigations and development of genetic tools as well as construction of laboratory strain lineages in American, French, and German groups for comparative studies. The sequencing of the complete genome of this yeast to which groups from Canada, France, Germany, Japan, Korea, and Spain have contributed has further encouraged studies with this yeast since 2004.

Y. lipolytica is used now as model organism for several studies of academic interest like degradation of *n*-alkanes, utilization as well as accumulation of lipids, biosynthesis and degradation of peroxisomes, secretion of proteins as well as metabolites, stress response, dimorphism, alternative intron splicing, genome evolution, and analysis of mitochondrial respiratory chain complex I.

The special physiological features of *Y. lipolytica* and the acceptance of its generally recognized as safe (GRAS) status make this dimorphic yeast significant for biotechnological applications. Properties like intracellular accumulation of oil, production of hydroxyl or dicarboxylic acids, as well as secretion of large amounts of organic acids focus the interest on this yeast as a potential producer of basic commodities, fine chemicals, or building blocks for chemical industry in the post-alkane area. Furthermore, the high capacity for secretion of proteases and lipases favors this yeast as a producer of these enzymes as well as of heterologous proteins.

The aim of the two *Microbiology Monograph* volumes is to summarize the huge knowledge of the biology and applications of this fascinating yeast. The first volume covers the genetics, genomics, and physiology of *Y. lipolytica*. The second volume provides a broad survey of biotechnological applications of this yeast and discusses new developments.

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Yarrowia lipolytica

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