



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Domestication of Yeast for Food and Beverages

2122-99R-YDom

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#### **Title**

**Domestication of Yeast for Food and Beverages**

#### **Teacher(s)**

Prof. John Morrissey

#### **Language**

English

#### **Short description**

##### *Overview*

Yeasts are widely used for the production of fermented foods and beverages. Some of these processes date by thousands of years and we now know that long before yeasts were identified, humans were selecting strains with improved traits, gradually leading to the establishment of unique lineages. These strains have particular genetic changes that make them more suitable for human processes and can be described as having been domesticated. Genomic techniques enable us to now identify these changes and to reconstruct the events that led to domestication. The links between human society and strain domestication are fascinating. We can also use the knowledge in a process called "synthetic domestication" to design and build new strains for food and industrial

biotechnology.

*Table of content:*

- Concepts of domestication
- History of brewing in Europe and the role of yeast in the brewing process. Will cover the basics of brewing as well as the role of yeast (biochemistry and metabolism). Will also discuss how societal changes in Europe in the early modern period influenced the development of beer
- Domestication of yeast for brewing. Will cover both the domestication of ale yeast and the emergence of lager yeast in the 1500 – 1600. Strong focus on genetic changes and emergence of new strains
- Hybrid yeast: how hybrids form and their role in domestication
- Domestication of other yeasts: *Kluyveromyces* case study (association with kefir, fermented dairy)
- Synthetic domestication – how to use modern techniques to create new strains for human applications

*The goals of this module are for students to:*

- understand the concepts of microbial domestication
- be able to explain the process of yeast domestication using specific examples and case studies
- be able to explain and to discuss the role of yeast in brewing

**TARGET AUDIENCE:**

PhD students without specific knowledge in yeast biotechnology or in fermented beverages but with an interest in understanding the historical as well as the genetic context of yeast domestication. Students should be interested in understanding how domestications happen and how we can use this information for future applications.

**CFU / Hours**

*1.5, with in itinere evaluations*

12 hours

**Teaching period**

March 7-11, 2022

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