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PhD Program in Applied Biotechnologies

“**Saccharomyces cerevisiae as a model organism for mitochondrial diseases**”

April 18, 2013 - h. 15.00

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Abstract:

Saccharomyces cerevisiae has played an important role as a model system to understand the biochemistry and molecular biology of mammalian cells. The genetic tools available have also made *S. cerevisiae* a powerful system to identify the relationship between genes and diseases. Furthermore, the possibility to duplicate as haploid or diploid makes this organism a flexible tool for assessing the dominant or recessive nature of a mutation.

Provided the ability of yeast to survive without a functional mitochondrial respiratory chain, a particular class of pathologies extensively studied in yeast are mitochondrial pathologies. Mitochondrial biogenesis results from the coordinate cooperation of the nuclear and mitochondrial genomes. Therefore, mitochondrial diseases can be produced by mutations either in mitochondrial or nuclear DNA.

The ease of yeast molecular genetics opens big opportunities, and even the major difference existing between human and yeast, i.e. the predominant heteroplasmy of human and the homoplasmy of yeast, can result in an easier identification of the pathogenic mutations. The heteroplasmic yeast cells, containing both intact and mutated mtDNA molecules, segregate the homoplasmic progeny during zygote outgrowth. Cells carrying mutated mtDNA are the petite mutants. A genetics condition that causes the instability of mtDNA can be easily identified because it produces petite mutants. A few chosen examples of mitochondrial diseases for which yeast played a critical role in identifying the causative mutations and/or characterizing their pathogenic mechanisms will be discussed. Moreover, yeast can also be used to unravel potential rescuing mechanisms and some simple examples of this strategy will be discussed.

The lecture will take place in the **room Verde** of **Cà Vignal - Strada Le Grazie, 15 - Verona**

Local organization and contact: Prof. Massimo Delledonne
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The seminar is compulsory for students of the PhD Program in Applied Biotechnologies

For attending this seminar will be recognized 2 of 150 CFR provided for the specific activities of PhD Program in Applied Biotechnologies.
