Yeast is an invaluable model organism to study fundamental biological processes and to be used for biotechnological purposes. Our group is specialized in the use of Saccharomyces cerevisiae to gain insight into the molecular mechanisms and functions of specific cellular components and signalling pathways under physiological and stress conditions.

The main research activities focus on:

- **Mitochondria-nucleus communication in cell death and survival**
  We study the role of RTG pathway, conserved from fungi to plants and activated by mitochondrial dysfunction, its interplay with nutrient sensing and other stress response pathways in a model of proliferating yeast cells treated with acetic acid to induce regulated cell death.

- **Biotechnological exploitation of yeast strains**
  We study yeasts isolated from different kinds of food and beverages for species identification through genotypic characterization; to explore stress response mechanisms in S. cerevisiae indigenous wine strains; to identify potential biotechnological properties via genome sequencing and comparative genomic analysis at genus and species level in non-Saccharomyces indigenous wine strains.

- **Humanized yeast to study the oncosuppressor BRCA2**
  We aim to dissect the role of BRCA2 in regulated cell death processes induced by different stimuli. We have discovered a new function of BRCA2 as a modulator of anoikis through an evolutionary conserved molecular mechanism involving the regulation of ROS production and/or detoxification by BRCA2 during cell death processes. The response of chemo-resistant-cancer cells to several analogs of clinically-approved drugs and its dependence on a functional BRCA2 protein is also under experimentation.

- **Yeast used as a tool to study RNA (+) virus**
  S. cerevisiae is a powerful model to study positive strand RNA viruses, including pathogens responsible for a number of diseases in humans, animals and plants. We have expressed the viral protein CIRV p36 to study its role in cell stress response and mitochondrial function. We have found that CIRV p36 can change the nature of regulated cell death towards necrosis and alter the number, morphology and cytoplasmic distribution of mitochondria.

**References:**

Keywords: mitochondria, signaling, humanized yeast.

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Other: link to YEAST poster for 2020 DSB conference (https://dsb.cnr.it/contributions/docs/abs/IBIOM/Poster_YEAST.pdf)