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### **68 genes for yeast Flavoproteoma: Updates of flavin biosynthesis, transport and catabolism in *Saccharomyces cerevisiae* mitochondria**

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Otto Warburg and his collaborators were the first to isolate a “yellow ferment” from yeast cells. The yeast genome contains 68 genes encoding for a flavin-dependent protein and thus 1.1% of all yeast protein (5885 protein-encoding genes) have a requirement for either FMN or FAD. *Saccharomyces cerevisiae* cells are known to be an excellent dietary source of riboflavin and to possess all enzymes required for riboflavin biosynthesis which are encoded by the RIB1-7 genes. We know little about the enzymes responsible for turnover of FMN and FAD and their sub cellular localization, despite the crucial roles of flavin cofactors in metabolism. The formation of holo flavoproteins by binding of a flavin prosthetic group to an apoflavoprotein depends on the availability of FMN and FAD. The homeostasis of riboflavin and flavin prosthetic groups may be altered by some factors such as defective FMN and/or FAD synthesis increased FMN and/or FAD catabolism by different susceptibility of holo and apoflavoproteins to proteolytic digestion and altered mitochondrial transport as was studied by Alex Tzagoloff’s lab. Mitochondria competence to metabolize externally added and endogenous FAD and FMN was investigated by spectroscopically and via HPLC. Thus, two novel yeast mitochondrial enzymatic activities, i.e. FAD pyrophosphatase (diphosphatase; EC 3.6.1.18) and FMN phosphohydrolase (EC 3.1.3.2), which catalyzes the reactions  $FAD+H_2O \rightarrow FMN+AMP$  and  $FMN+H_2O \rightarrow Riboflavin+Pi$  conversion respectively were reported.

#### **Biography**

Maria Luigia Pallotta is Assistant Professor/Researcher of Biochemistry. Her research topics are bioenergetics, metabolism and transport of metabolic bio molecules and cofactors. She also had Membership in SIB (Italian Society of Biochemistry) and Italian Group of Bioenergetics and Bio membranes (since 1999); member of the council of PhD in Applied Biochemistry and Chemistry, University of Molise (from 2003 to 2005) and in Health Science (since 2005). She taught different subjects which includes propedeutics, applied biochemistry, amino acid and nucleotide metabolism. She was member of Senate of University of Molise. She was visiting Researcher at Metabolism and Cancer susceptibility, Center for Cancer Research, NIH, MD United States from April to May 2014.

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