

## **Oligosaccharides Of Prebiotic Nature Are Able To Inhibit The Oxidative Phosphorilation Chain In Mitochondria**

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Prebiotics have been defined as microbial non-digestible food ingredients able to improve host health selectively, through its interaction with a limited number of bacteria. Although prebiotic effects on gut are well studied, little is known about its interaction with biological surfaces, as mitochondrial membranes. The aim of the present work was to assess the prebiotic properties of oligosaccharides (inulin – IN, mananoligosaccharides – MOS, fructooligosaccharides – FOS, and kefir growth factor – KGF) on the mitochondrial respiratory functions (Complex I and II). Mitochondria suspensions (300µg protein/mL) isolated from rat liver were incubated with the oligosaccharides in phosphate buffer 50mM pH 7.4 containing 1mM EDTA, 5mM MgCl<sub>2</sub>, and different carbon sources (50mM Glu, 100mM malate, 50mM pyruvate, and 100 mM succinate). Decreases in absorbance at 340nm after NADH 2mM addition, and changes in 520 nm after 5 mM potassium ferricyanide in 50mM KCN solution, was monitored up to 40min, using 100mM malonic acid and 1M metformin as inhibitory markers for Complex I and II, respectively. The inhibition of Complex I showed values of 26.9±5.2% for MOS (80µg/mL), 29.5±6.5% for FOS (15mg/mL), 53.2±4.3% for KGF (50µg/mL), and 36.5±2.3% (320µg/mL) for IN. The inhibition of Complex II showed values of 23.3±7.4%, 68.5±7.4%, 53.8±5.4% and 38.1±3.6%, for MOS, FOS, KGF and IN, respectively. A mitochondrial swelling test also reveled a mean increased value of 13% for all the oligosaccharides tested. The overall results points to a inhibitory effect for the prebiotic carbohydrates tested on the oxidative phosphorilation chain of mitochondria.

Key words: mitochondria, oligosaccharides, prebiotics.

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