P103

MITOCHONDRIAL DYSFUNCTION IN FOOD ALLERGY: EFFECTS OF *L. RHAMNOSUS* GG IN A MICE MODEL OF PEANUT ALLERGY

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Preliminary findings suggest that mitochondrial dysfunction (MD) could play a role in the pathogenesis of allergic diseases. We aimed to see whether if MD is also present in food allergy, and if it could be modulated by a nutritional intervention with an extensively hydrolyzed casein formula containing the probiotic *L. rhamnosus* GG (LGG).

4-Week-old female C3H/HeOuJ mice were sensitized by oral route with five weekly doses of peanut extracts (6 mg) plus cholera toxin (10 μg) as adjuvant in the presence or absence of a 14-day pre-treatment with an extensively hydrolyzed casein formula containing LGG (EHCF + LGG). Liver mitochondrial respiration rates were evaluated polarographically in isolated mitochondria in the presence of succinate or palmitoyl-L-carnitine using the Clark electrode,soon after oral food challenge. The carnitine-palmitoyl-transferase (CPT) and aconitase activities were measured spectrophotometrically. H_2O_2 yield was assayed by following the linear increase in fluorescence due to the oxidation of homovanillic acid in the presence of horseradish peroxidase.

Peanut sensitized mice showed a lower state 3 respiration rate in presence of succinate and decreased fatty acid oxidation than controls (−36%, $p < .05$). No difference in CPT activity was observed between these two groups. An increased oxidative stress in sensitized group was proven by inactivation of aconitase activity (−25%, $p < .05$) and higher H2O2 yield (+52%, $p < .05$). Pre-treatment with EHCF + LGG induced an improvement of mitochondrial function (+85%, $p < .05$) and redox state (−57%, $p < .05$), compared to sensitized group. No changes on CPT activity were observed in mice receiving EHCF + LGG.

Peanut allergy is characterized by mitochondrial dysfunction and increased oxidative stress. EHCF + LGG efficiently prevents both effects.

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P104

NO SIGN OF GLIADIN IMMUNOREACTIVITY INDUCED BY HYDROLYZED WHEAT FLOUR IN CELIAC DISEASE CHILDREN AFTER A SHORT ORAL CHALLENGE

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Background: Many efforts are going on to find new strategies to detoxify wheat flour in order to make it suitable for the diet of celiac disease (CD) patients. Fermentation of wheat flour with sourdough lactobacilli and fungal proteases has already been demonstrated to reduce gluten-induced inflammatory effects in celiac patients.

Aim: In this study, we evaluated the effect of detoxified flour on peripheral blood immune response after a brief oral challenge in subjects with treated CD.

Methods: Four CD patients on a gluten-free diet from at least 2 years were voluntarily enrolled in the study. They ate for 3 days bread made of fermented flour (12 g gluten/die). Immune reactivity to gliadin, either from detoxified or toxic wheat, was analyzed on peripheral blood cells by detecting INF-γ releasing cells before and 6 days after the challenge.

Results: No INF-γ secreting CD4+ T cells reactive to hydrolyzed gliadin with sourdough lactobacilli and fungal proteases were detected on day 6 of the challenge in any of 4 patients tested, instead of a consistent mobilization of T cells reactive to a pepsin-trypsin gliadin observed in celiac patients on a gluten-free diet consuming toxic wheat flour.

Conclusion: This in vivo challenge confirms that fermentation of wheat with sourdough lactobacilli and fungal proteases reduces gluten-specific immunoreactivity in PBMCs. Moreover, our data demonstrate that the in vivo procedure can be a good method to test new therapeutics approach in the future.

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P105

LONGITUDINAL GENE EXPRESSION ANALYSIS OF CANDIDATE GENES IN COELIAC DISEASE

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The ability to diagnose the CD in asymptomatic patients, and without having to resort to invasive methods, such as duodenal biopsy, would represent a major step forward in the prevention and in the clinical management of these patients. We aimed to assess genetic background in asymptomatic CD patients, performed a longitudinal analysis.

For 10 CD patients and 12 controls were evaluated the clinical and serological parameters, histology, HLA risk, and expression of candidate genes. Gene expression was assessed on PBMCs at 3 specific stages of growth: before the CD diagnosis, at moment of diagnosis, and at least of 1 year of Gluten Free Diet, and in controls comparable timing. A multivariate discriminant analysis has been performed to weight the discriminating capacity of each single