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**Dietary pectin induces different immune-modulatory effects
depending on mouse strain and pectin structure**

Hanna Steigerwald^{1}, Frank Blanco-Perez^{1*}, Maren Krause¹, Melanie Albrecht¹,
Dominic Stoll², Stefan Schülke¹, Hans-Ulrich Endreß³, Sabine Kulling², Melanie
Huch², Stefan Vieths¹, Stephan Scheurer¹*

**These authors contributed equally*

¹Paul-Ehrlich-Institut (PEI), Federal Institute for Vaccines and Biomedicines, Langen, Germany

²Max-Rubner-Institut (MRI), Federal Research Institute of Nutrition and Food, Karlsruhe, Germany

³Herbstreith & Fox KG, Neuenbürg, Germany

The dietary fiber pectin is a heteropolysaccharide that accumulates in cell walls and intracellular regions of higher plants. It is classified according to the degree of esterification (DE) into high methoxyl pectin (HMP; DE>50%) or low methoxyl pectin (LMP; DE<50%). Pectin is widely used in food industry as gelling and thickening agent and in addition, prebiotic and beneficial immune-modulatory effects are reported.

According to recent studies, we hypothesize pectin to also have a preventive effect on the manifestation of food allergy. The present study aimed to explore the immune-modulatory effects of pectin from different sources as apple (AP) and citrus (CP) in naïve mice. Three mouse strains (CBA/J, BALB/c and C57BL/6) were fed for two weeks with a high fiber diet containing different amounts (5 or 15%) of either AP (DE 57%), CP (DE 7.3%), or cellulose as control (CD; 20% cellulose). Mice were monitored in regard of their body weight, food consumption, and general health status. Feces and serum were subjected to microbiota and immunological analysis, respectively.

The results indicated, that dietary pectin supplementation exerts different effects in the respective mouse strains. Body weight was not affected by any pectin in C57BL/6 mice. However, 15% AP reduced body weight gain in CBA/J, but it was increased with CP in BALB/c mice. AP (15%) induced substantial increase in the size of the caecum in all mouse strains, and both pectins induced changes in the length of small and large intestine. In addition, AP (15%) diet led to remarkable changes in composition of the gut microbiota in all mouse strains investigated, mainly towards *Bacteroidetes*. In comparison, 15% CP shifted microbiota towards *Lactobacillus* in CBA/J but towards *Bacteroidetes* in C57BL/6. Interestingly, dietary supplementation with AP led to increased titers of serum total IgA and IgG in all mouse strains and reduced total IgE in BALB/c and C57BL/6, while in CBA/J serum total IgE was increased.

Our results suggest that immune-modulatory effects of pectin depend on the mouse strain and on the pectin characteristics. A 15% AP diet with high DE showed the strongest effects. Since *Bacteroidetes* are described as producer of beneficial short chain fatty acids (SCFAs) an AP-containing diet may be sufficient to prevent the immune response in allergics.

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