

Chapter 4

Natural variation in avenin epitopes among oat varieties: implications for Celiac Disease

Cristina Mitea¹, Jorge R Mujico¹, Luud Jwj Gilissen², Arnoud de Ru¹,
Peter van Veelen¹, Marinus JM Smulders², Frits Koning¹

¹ *Department of Immunohematology and Blood Transfusion, Leiden University Medical Center, Leiden, The Netherlands.* ² *Plant Research International, Wageningen, The Netherlands.*

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ABSTRACT

Celiac disease (CD) is a chronic inflammatory disease affecting the small intestinal mucosa. The causative agents have been identified as gluten proteins from wheat, barley and rye, and the only available treatment for CD patients is a lifelong gluten-free diet. Non-gluten containing cereals would be a valuable contribution to the gluten-free diet. In this respect, oats are a good choice. However, commercial lots of oat flakes and flour frequently are contaminated with wheat, barley and rye, and two studies have reported that some peptides derived from the gluten-like avenin storage proteins of oat can trigger an immune response in some CD patients. In the present study we have initiated the investigation whether all oat varieties contain similar amounts of potentially harmful sequences by biochemical and immunological methods. We confirm that commercial oat preparations are contaminated with other cereals that contain gluten or gluten-like proteins. Moreover, our results demonstrate that contamination-free oat varieties differ in their capacity to stimulate an avenin-sensitive gamma-gliadin specific T cell line derived from a patient with CD, indicative for differences in the two known avenin epitopes among oat varieties, implying that selection and breeding of completely safe oat varieties for all CD patients may be a realistic possibility.