

Investigation of Lipids Associated with Wheat Gliadin Proteins using Electrospray Ionisation Mass Spectrometry

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Wheat gliadins are a group of peptides that have been implicated in coeliac disease or gluten sensitive enteropathy. The disease is known to be triggered by a toxic reaction by cells in the small intestine to a number of the digestion fragments of the gliadins¹. *In-vitro* tests have been used to identify some toxic fragments. The amino acid sequence for a number of these small peptides has been determined using conventional methods² and, while some common structural features have been found, attempts to understand the mechanism of the toxicity on the basis of a chemical model have not been fruitful.

In this work, matrix assisted laser desorption ionisation together with time of flight mass spectrometry (MALDI-TOF) has been used to produce ions from samples of the gliadins which have been extracted under varying conditions³. On-target digestion of reverse phase HPLC fractions of these compounds has shown that the major proteins are derived from only 2 basic peptide sequences. The extraction procedures have shown that a significant proportion of the mass difference in the gliadin species observed by MALDI are due to the presence of large proportions of lipid in the samples. The use of modified extraction procedures has allowed collection of a range of lipid materials that are bound to the gliadins under the traditional gliadin extraction procedures. We have used negative ion electrospray ionisation mass spectrometry with post separation derivatisation to identify lipids from the digest precipitates. Several unusual lipids have been identified from the extracts.

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