Conformational epitope mapping of Pru du 6, a major allergen from almond nut.

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Abstract:
Tree nuts are a widely consumed food. Although enjoyed safely by most individuals, allergic reactions to tree nuts, including almond, are not uncommon. Almond prunin (Pru du 6), an 11S globulin (legumin), is an abundant nut seed protein and a major allergen. Conformational epitope mapping studies of prunin have been performed with a murine monoclonal antibody (mAb) 4C10. This mAb reacts with non-reduced but not reduced prunin in immunoblotting assays, indicating the recognition of a conformational epitope. 4C10 competes with patient IgE, as assessed by ELISA, indicating clinical significance of the epitope To characterize the 4C10 epitope, hydrogen/deuterium exchange (HDX) monitored by 14.5 T Fourier transform ion cyclotron resonance mass spectrometry (MS) was performed on the native prunin–4C10 complex and on uncomplexed native prunin. Several epitope candidate peptides that differ in deuterium uptake between the complexed and uncomplexed forms were identified. The epitope was further mapped by analyzing chimeric molecules incorporating segments of the homologous soybean allergen, Gly m 6, in immunoassays. These data indicate that the 4C10 epitope overlaps with a subset of patient IgE binding epitopes on almond prunin and further supports HDX-MS as a valid technique for mapping conformational epitopes.