A large number of birch pollen-allergic patients develops food allergy in addition to respiratory symptoms. Clinical and immunological observations strongly indicate that birch pollen-related food allergy results from initial respiratory sensitization to the major birch pollen allergen, Bet v 1, and subsequent immunological cross-reactivity with structurally related food allergens. In addition to Bet v 1-specific IgE antibodies, Bet v 1-specific T lymphocytes cross-react with Bet v 1-homologous proteins in various foods. This cellular cross-reactivity results from the high amino acid sequence similarity of relevant T cell-activating regions in these proteins. In general, the major birch pollen allergen dominates the humoral and cellular response to its homologous food allergens. However, some Bet v 1-related food allergens, e.g. in hazelnut and carrot, represent exceptions and may bear sensitizing capacity themselves. As birch pollen-related food allergy results from the strong cross-reactivity of Bet v 1, one would expect that successful allergen-specific immunotherapy (AIT) which alters the immune response to Bet v 1 concomitantly alters the immune response to Bet v 1-related food allergens. However, this is not the case in all AIT-treated individuals. For example, birch pollen AIT often fails to induce cross-reactive IgG4 antibodies or peripheral tolerance of food-specific T lymphocytes. These immunological insights make this disorder an interesting model to assess the clinical consequences of cross-reactivity among allergens and are important for the development of efficient therapeutic interventions for birch pollen-related food allergy.