



## Food Allergy: Current and Future Treatment Approaches

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### ARTICLE INFO

#### How to Cite:

Mehboob, R. (2024). Food Allergy: Current and Future Treatment Approaches. Pakistan BioMedical Journal, 7(03). <https://doi.org/10.54393/pbmj.v7i03.1054>

Human gut is abundantly populated with different immune cells responsible for protection against antigens entering the host through oral routes. It is perfectly developed to induce immunity against pathogenic antigens by maintaining non-responsiveness or immune tolerance against non-pathogenic antigens. A disruption in immune tolerance resulting in allergic reactions to different food items falls under the term food allergy. It affects different body organs such as gastrointestinal tract, skin, eyes and respiratory system. Food allergy is generally categorized into IgE mediated and non-IgE mediated food allergy. Food allergy is a global health concern affecting about 10% of children worldwide. According to the studies carried out in different western countries, the prevalence of food allergy in children under 5 years age in UK, Denmark and Norway is found to be 4%, 3.6% and 6.8% respectively. The increasing prevalence of food allergy has drawn our attention towards the significance of effective and safe therapeutic strategies for food allergy. Current treatments include gene therapy, probiotics, allergen-specific and non-specific immunotherapy, and anti-IgE therapy. Gene therapy for food sensitization is characterized by adenoviral vector mediated transfer of gene encoding omalizumab to provide lifelong immunity to the allergic reactions caused by food. The idea of using probiotics revolves around promoting the colonization of the gastrointestinal tract with healthy gut bacteria significantly reducing the IgE mediated food sensitization. In allergen specific immunotherapy, patients are frequently exposed to food containing increased doses of allergen causing food desensitization. For this purpose, approaches involving different administrative routes such as oral, sublingual and cutaneous immunotherapy are employed. In contrast, therapies involving anti-IgE, cellular targets, Toll like receptors and cytokines fall under the category of allergen non-specific immunotherapy. Despite the availability of treatment strategies, many challenges regarding the side effects and un-intended immune response associated with immunotherapies, that can pose safety concerns for patients. Due to high cost, not all individuals have the access to such therapies prohibiting them from availing advanced healthcare support. These challenges need to be addressed and require further research along with the collaboration of clinicians, researchers and regulatory authorities so the lifestyle of the individuals affected by food allergies can be improved.