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Advancements in Targeted Therapies for Allergic Diseases: Monoclonal Antibodies, Immunotherapy, and Emerging Innovations

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Allergic diseases, including asthma, anaphylaxis, allergic rhinitis, atopic dermatitis, and food allergies, represent a significant global health concern. Recent advancements in immunology and molecular biology have led to the development of novel therapeutic agents aimed at more effectively managing these conditions. Monoclonal antibodies, such as Omalizumab, an anti- IgE antibody, has shown efficacy in severe allergic asthma and chronic urticaria, while mepolizumab and benralizumab, which target interleukin-5 (IL-5), and recently in phase III trials depemokimab which block the IL5 from binding to its receptors, are beneficial in eosinophilic asthma.

In Europe, six new systemic therapies for AD have been approved: the biologics dupilumab (anti- interleukin- 4 receptor (IL- 4R) α in 2017), tralokinumab (anti- IL- 13 in 2021), lebrikizumab (anti- IL- 13 in 2023), and the oral janus kinase (JAK) inhibitors (JAKi) targeting JAK1/2 (baricitinib in 2020 in the EU) or JAK1 (upadacitinib in 2021 and abrocitinib in 2022) (MÜLLER et al.). Besides, the new phase III trials agents are demonstrated significant benefits in atopic dermatitis and asthma. Beyond monoclonal antibodies, advancements in allergen immunotherapy (AIT) have also emerged. Sublingual

immunotherapy (SLIT) and epicutaneous immunotherapy (EPIT) present less invasive alternatives to traditional subcutaneous immunotherapy (SCIT), offering improved patient compliance and safety profiles. Gene therapy and biologic agents that specifically target underlying genetic and molecular mechanisms of allergic diseases are also under investigation. These innovative approaches aim to provide long-term relief and possibly even a cure for certain allergic conditions. The integration of precision medicine and biomarker-driven treatment strategies is paving the way for highly personalized therapeutic regimens. In conclusion, by targeting specific immunological pathways, these advanced treatments offer the promise of improved efficacy, safety, and quality of life for patients, marking a significant leap forward in the field.

Biography

Amira Ali is a Senior Specialist in Allergy and Immunology at the Sudan Medical Specialization Board (SMSB) in Saudi Arabia. She holds an MBBS and MRCP and is an active member of SAAIS, SPOPI, APPACHI, and JAFCAA societies. Additionally, she is a member of the European Academy of Allergy and Clinical Immunology (EAACI). With extensive experience in allergic diseases and immunological disorders, Dr. Ali is dedicated to advancing research and patient care in her field.