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An EAACI Task Force Scoping Review: Human Monocytes and Macrophages in Allergy – Implications for AllergoOncology

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Abstract

AllergoOncology explores the intersection of allergic diseases and cancer, focusing on shared immune mechanisms mediated by monocytes and macrophages. These cells exhibit high heterogeneity, plasticity, and functional diversity across tissues and disease progression, yet their roles in allergic disorders remain unclear. This scoping review systematically analyzed 138 articles, identifying 451 molecules associated with monocyte and macrophage responses in allergic diseases, including Allergic Asthma, Atopic Dermatitis, and Allergic Rhinitis. Our findings revealed a research bias toward blood-derived samples, underrepresentation of tissue-resident macrophages and limited inclusion of non-coding RNAs. Semantic similarity and pathway enrichment analyses identified shared molecular signatures across major allergic disorders, highlighting interleukin signaling and immune activation pathways. Less-studied conditions, such as Allergic Alveolitis and Food Allergy, displayed distinct molecular profiles, emphasizing the need for broader investigations. To enhance data accessibility, we developed [ALO*HA](https://rebollidorioslab.shinyapps.io/aloha/), a web application for interactive analysis. [ALO*HA](https://rebollidorioslab.shinyapps.io
fosters reproducibility and translational potential for both researchers and clinicians. Our findings highlight the need for integrative approaches, combining omics technologies and human-based studies, to better characterize monocyte and macrophage phenotypes in allergy. This work advances the understanding of allergy-immunity interactions, bridges allergy and oncology,

addresses critical gaps and opens new opportunities for therapeutic development.

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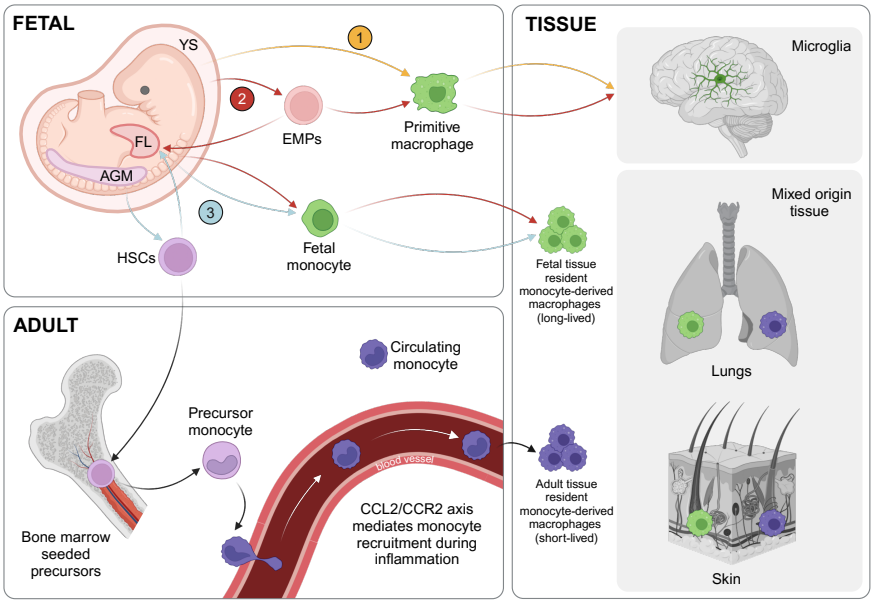

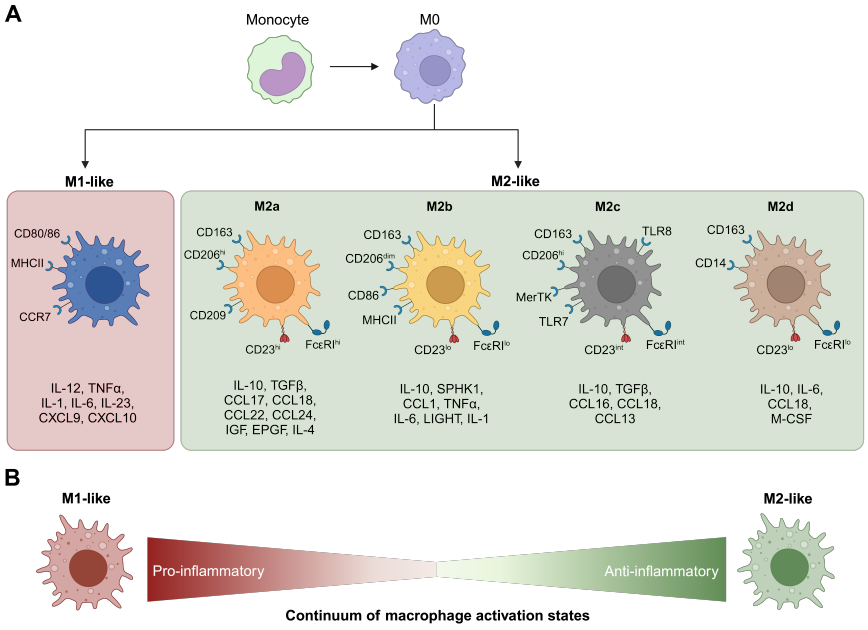

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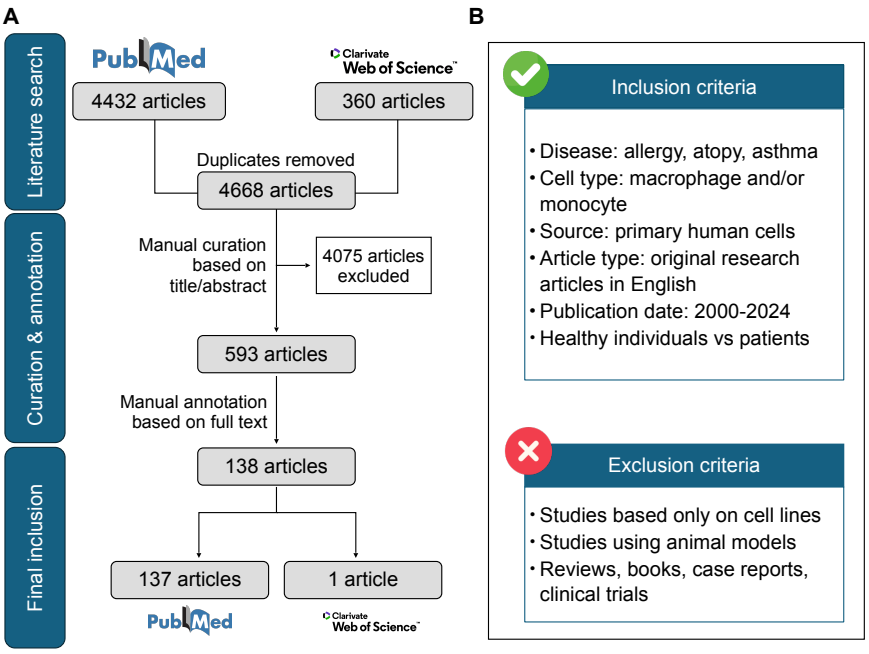

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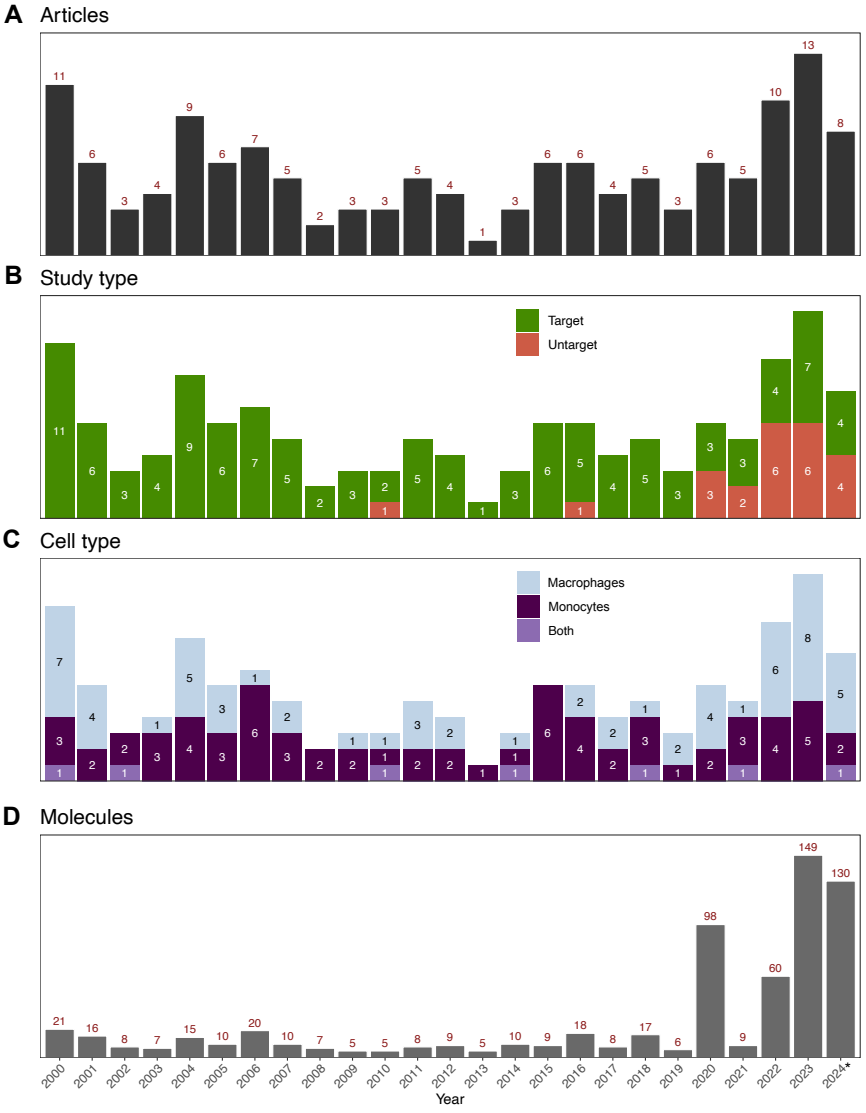

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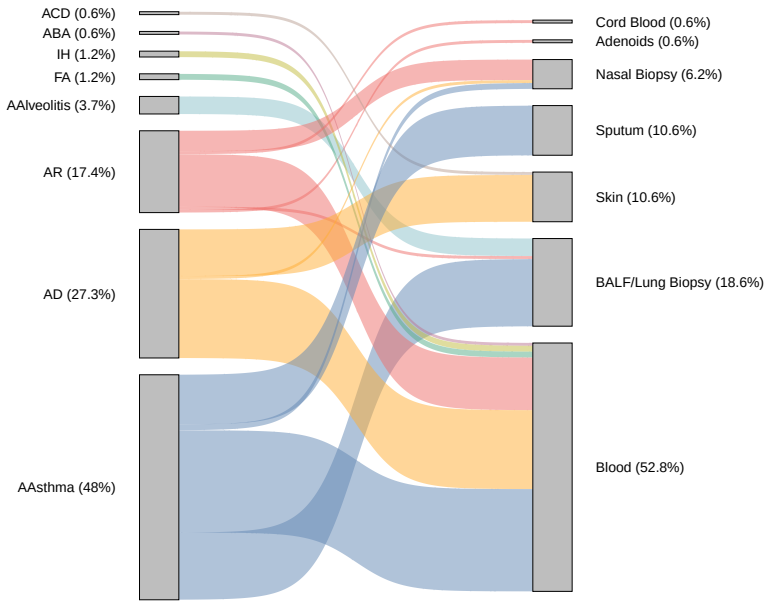

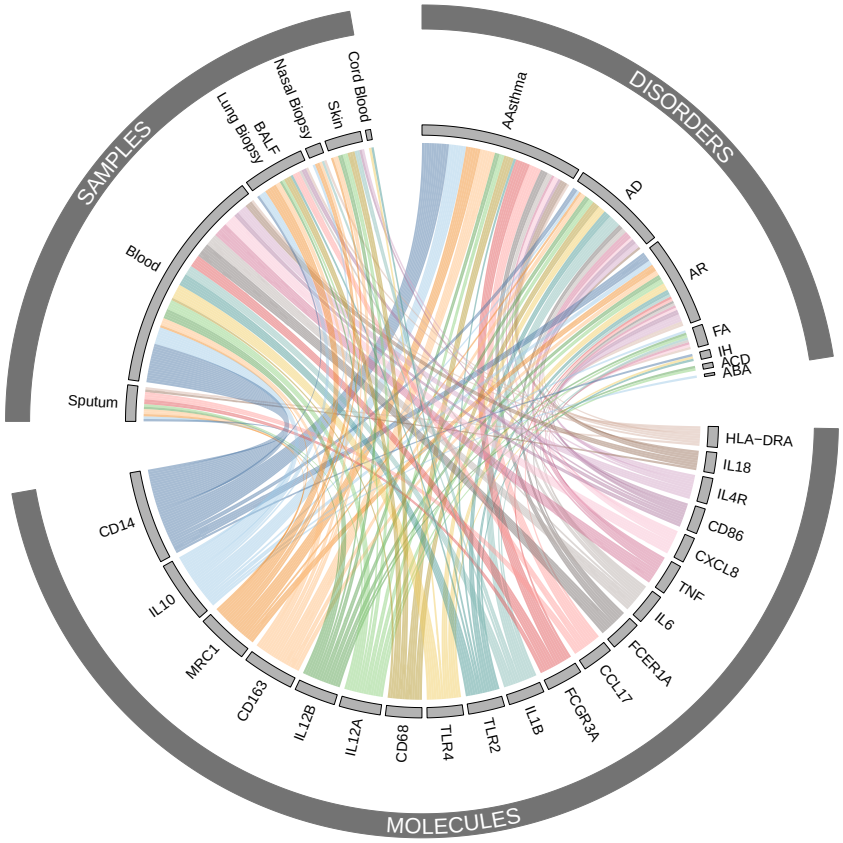

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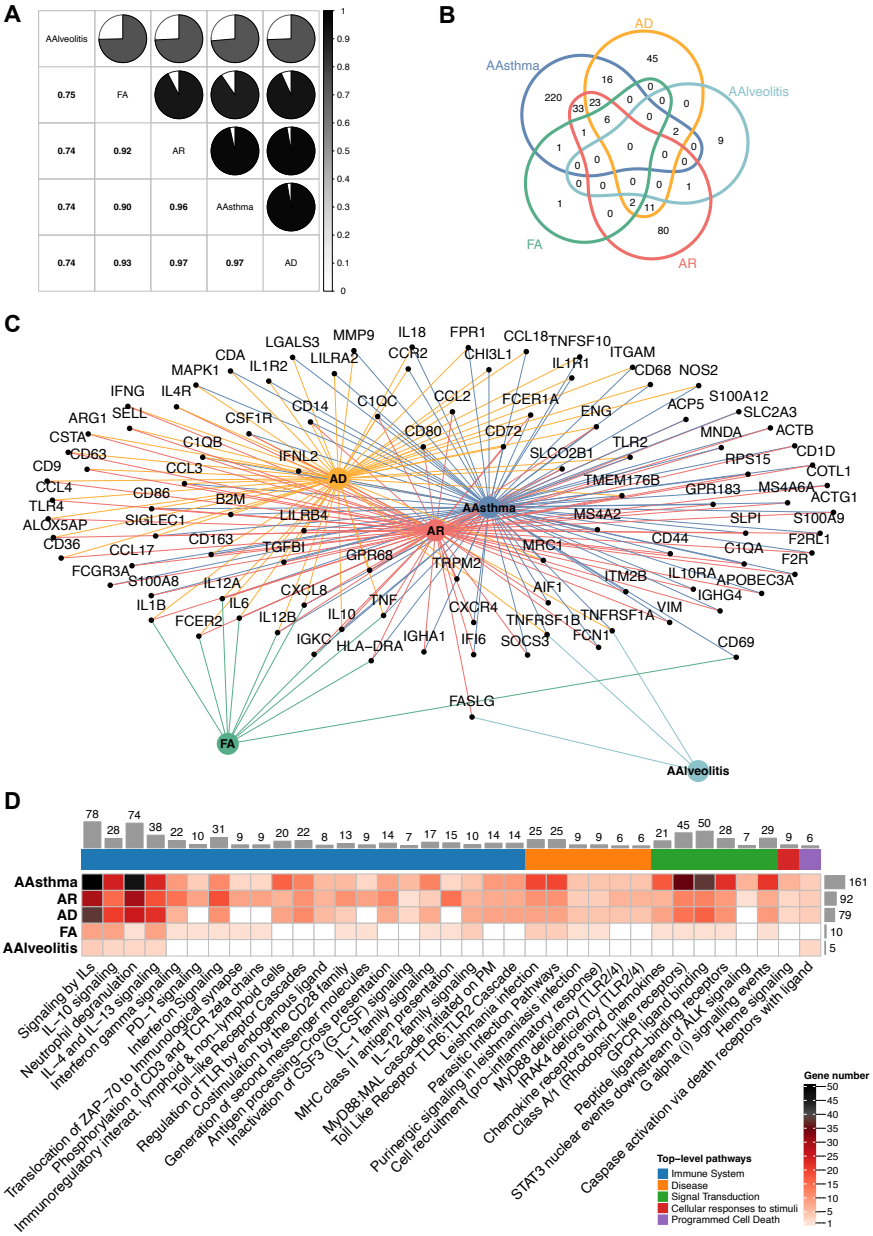

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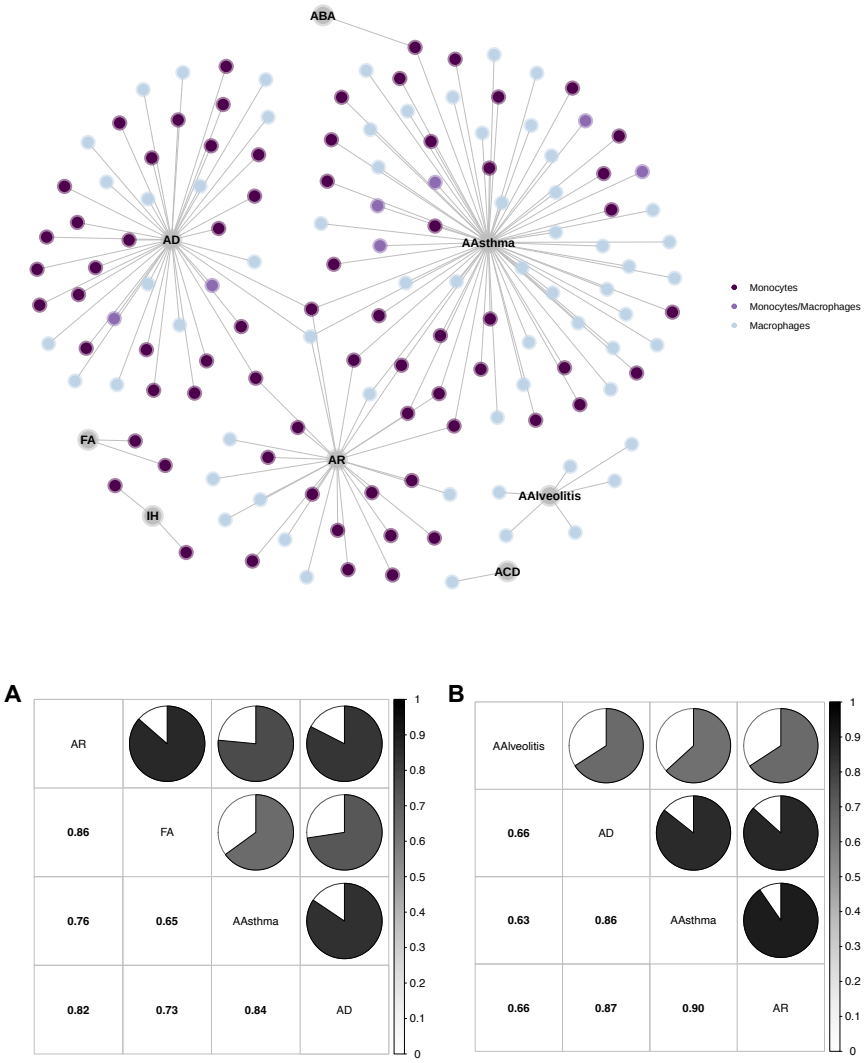

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