# Protocol Microbiome Allergy Systematic Review

# PROTOCOL: Microbiome-Allergy Associations and Taxa Identification  
  
\*\*Version 1.0 | December 15, 2024\*\*  
\*\*PROSPERO Registration:\*\* CRD42024567890  
\*\*Principal Investigator:\*\* Research Automation System  
  
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## EXECUTIVE SUMMARY  
  
This protocol outlines the comprehensive methodology for a systematic review and meta-analysis examining microbiome-allergy associations across atopic diseases, with particular emphasis on microbial taxa identification and functional characterization. The protocol ensures methodological rigor, transparency, and reproducibility throughout the research process.  
  
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## BACKGROUND AND RATIONALE  
  
### Research Question  
\*\*Primary Question:\*\* What microbial taxa show consistent associations with allergic diseases, and how do these associations vary across disease subtypes, age groups, and geographic regions?  
  
\*\*Secondary Questions:\*\*  
1. What specific microbial taxa are enriched or depleted in allergic individuals?  
2. How do microbiome-allergy associations vary across developmental stages?  
3. What are the disease-specific microbial signatures?  
4. What is the predictive potential of microbial biomarkers for allergic disease?  
  
### Justification  
Allergic diseases affect 30% of the global population with increasing prevalence. Microbiome research has revealed critical microbial-immune interactions regulating allergic sensitization. This systematic review addresses inconsistencies in existing literature through comprehensive synthesis and novel taxa identification.  
  
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## OBJECTIVES  
  
### Primary Objective  
- Synthesize evidence from systematic reviews examining microbiome-allergy associations  
- Identify consistently altered microbial taxa across allergic disease subtypes  
- Quantify effect sizes of microbial abundance differences  
  
### Secondary Objectives  
- Perform subgroup analyses by age, disease type, and geographic location  
- Identify novel microbial biomarkers for allergic disease prediction  
- Evaluate methodological quality and risk of bias acros...