Uncovering the genetic link between acute myocardial infarction and ulcerative colitis comorbidity

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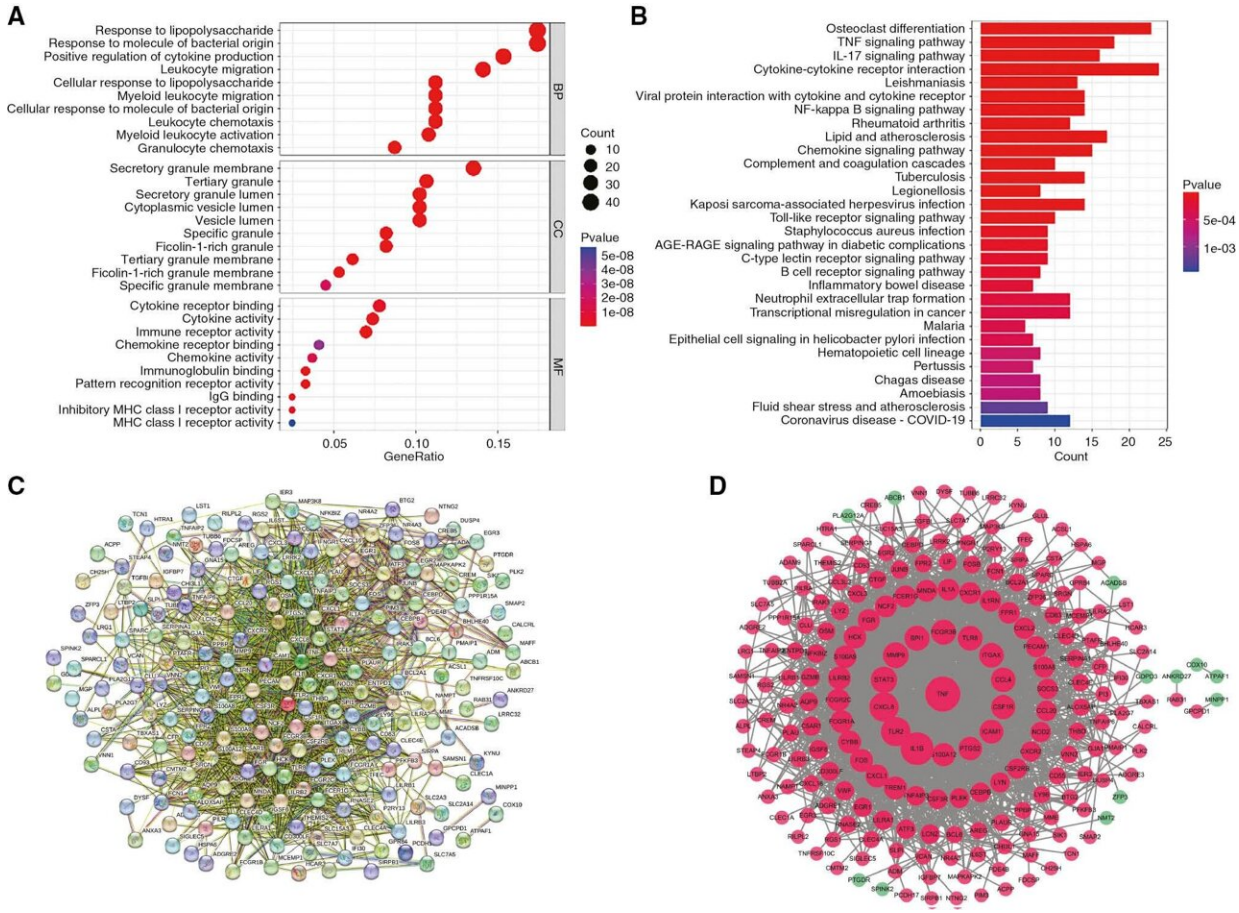

Functional Enrichment and PPI Network Analyses of Co-DEGs. (A) GO. (B) KEGG. (C) STRING. (D) Cytoscape. Red indicates upregulated genes, and green indicates downregulated genes. Credit: *Cardiovascular Innovations and Applications* (2023). DOI: 10.15212/CVIA.2023.0034

Cardiovascular diseases, particularly acute myocardial infarction, are the leading cause of disability and death. Atherosclerosis, the pathological basis of AMI, can be accelerated by chronic inflammation. Ulcerative colitis (UC), a chronic inflammatory disease associated with immunity, contributes to the risk of AMI development. However, controversy continues to surround the relationship between these two diseases. The present study, published in the journal *Cardiovascular Innovations and Applications*, unravels the pathogenesis of AMI and UC, to provide a new perspective on the clinical management of patients with these comorbidities.

Microarray datasets GSE66360 and GSE87473 were downloaded from the Gene Expression Omnibus database. Common differentially expressed genes (co-DEGs) between AMI and UC were identified, and the following analyses were performed: enrichment analysis, protein-protein interaction network construction, hub gene identification and co-expression analysis.

A total of 267 co-DEGs (233 upregulated and 34 downregulated) were screened for further analysis. GO enrichment analysis suggested important roles of chemokines and cytokines in AMI and UC. In addition, the lipopolysaccharide-mediated signaling pathway was found to be closely associated with both diseases. KEGG enrichment analysis revealed that lipid and atherosclerosis, NF-κB, TNF and IL-17 signaling pathways are the core mechanisms involved in the progression of both diseases. Finally, 11 hub genes were identified with cytoHubba: TNF, IL1B, TLR2, CXCL8, STAT3, MMP9, ITGAX, CCL4, CSF1R, ICAM1 and CXCL1.

This study reveals a co-pathogenesis mechanism of AMI and UC regulated by specific hub genes, thus providing ideas for further

mechanistic studies, and new perspectives on the clinical management of patients with these comorbidities.

More information: Chen Chang et al, Uncovering the Genetic Link between Acute Myocardial Infarction and Ulcerative Colitis Co-Morbidity through a Systems Biology Approach, *Cardiovascular Innovations and Applications* (2023). DOI: 10.15212/CVIA.2023.0034

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