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## **Atherosclerotic Plaque Formation and Cardiovascular Disease: Mechanisms and Preventive Strategies**

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### **ABSTRACT**

The most common cause of cardiovascular disease (CVD) worldwide is still atherosclerosis, a chronic, progressive inflammatory disease of the artery wall. Immune system activation, endothelial dysfunction, and lipid metabolism interact intricately during the pathogenesis. The NLRP3 inflammasome, smooth muscle cell (SMC) phenotypic flipping, and the shift from stable to susceptible plaques are all highlighted in recent studies. The molecular processes of plaque development, indicators of instability, and contemporary preventive measures, such as sophisticated lipid-lowering treatments and focused anti-inflammatory interventions, are all reviewed in this work.

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