



# Plaque: The Hidden Culprit of Oral and Cardiovascular Health

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## INTRODUCTION

Plaque, a term that is widely used across various disciplines, is especially significant in the realms of biology, medicine, and dentistry. In the context of human health, plaque refers to the buildup of substances that can have profound implications, particularly when it accumulates in the arteries or on the teeth. Plaques are associated with a wide range of conditions, from cardiovascular diseases to dental cavities, and their presence can lead to severe health complications if left unchecked. This article explores what plaque is, its formation, and its role in human health and disease, with a focus on atherosclerotic plaque in the cardiovascular system and dental plaque in oral health. Plaque refers to any abnormal accumulation or deposit of material, typically consisting of fats, proteins, dead cells, and other substances, in an organ or body part [1,2]. The most common associations with plaque formation are in the arteries (atherosclerosis) and the teeth (dental plaque). Although these types of plaques differ in composition and origin, they pose a risk to health when their accumulation reaches a critical level. Atherosclerotic plaque, often simply referred to as plaque, is a buildup of fatty deposits, cholesterol, and other substances within the walls of arteries. These plaques are part of a process called atherosclerosis, which is a form of arteriosclerosis (hardening of the arteries).

## DESCRIPTION

Atherosclerosis is a leading cause of cardiovascular diseases, including heart attack, stroke, and peripheral artery disease. Atherosclerotic plaque forms when there is damage to the inner lining of an artery, called the endothelium. This damage can be caused by high blood pressure, smoking, high cholesterol, or other risk factors. Once the endothelium is damaged, Low Density Lipoprotein (LDL) cholesterol and other lipids in the blood begin to accumulate at the site of injury. These substances are oxidized, and immune cells, particularly macrophages, are attracted to the area in an attempt to clear the damage. As more LDL cholesterol and immune cells continue to accumulate, the plaque grows. Over time, the

plaque can calcify and harden, making the artery less flexible and narrowing the passage for blood flow. This narrowing is referred to as stenosis and can impede the flow of oxygen rich blood to vital organs such as the heart and brain, leading to ischemia and potentially life-threatening conditions. The central core of the plaque is composed primarily of cholesterol, triglycerides, and other fats. These substances accumulate over time as a result of damage to the arterial walls. As the plaque develops, smooth muscle cells from the arterial wall migrate to the site of injury and produce collagen and other extracellular matrix proteins [3,4].

## CONCLUSION

This tissue helps into stabilize the plaque but also contributes to its growth. Macrophages and T-cells, the part of the immune system, which play a key role in plaque formation. Macrophages engulf oxidized LDL and can become the foam cells, which is contribute to the fatty core of the plaque. In some cases, calcium may be deposited in the plaque, causing it to harden. This calcification can make the artery less flexible and increase the risk of rupture. The accumulation of the plaque in the arteries is a gradual process that may take decades to develop, often without any symptoms.

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## CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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