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What do diabetes and malaria have in common?

A scientific and personal journey from bioceramics to our world's grand challenges

One of the most common complications of diabetes is heart disease; in diabetic patients this is due to the formation of calcium phosphate minerals in the walls of their arteries. The minerals harden their blood vessels; this burdens the cardiovascular system and significantly increases the risk of stroke and cardiovascular mortality. The same phenomenon happens in patients with chronic kidney diseases and seniors, and, although starting at different locations inside the blood vessels, in atherosclerotic patients.

My lab studies how biominerals are formed in our body, ranging from physiological mineralization of bones and teeth to pathological mineralization of blood vessels and heart valves. We were able to show that mineral deposition in the wall of the arteries has many points in common with that of bone, despite being initiated in a very different environment and on elastin, rather than collagen.

But my lab also studies malaria. Specifically, we focus on the mechanism by which Plasmodium, the parasite causing malaria, survives in the body of the organisms that it infects.

In this talk you will hear how biomineral formation and Plasmodium survival are related. At the end, we will discuss how scientists and engineers can contribute to one of today's grand challenges: improving health in communities from all over the world.