Cardiovascular stents have been utilized as a prosthetic repair for damaged endothelial tissue within artery walls. Bypassing invasive open heart surgery for an implant threaded up through a femoral artery and sutured into the damaged or ruptured vessel, has been the most recent standard of care. It is a less invasive approach to sustaining circulation and not adding major insults to the body with chest wall and sternum breakage and ligation of venous material from the femoral venous system.

However, complications have arisen soon after the permanent implants were positioned and these complications included, platelet aggregation, revascularization and occlusion, increased propensity for pulmonary emboli, endocarditis and, often, immunological rejection of the mesh implant. These side effects were particularly disturbing and demanding in the pediatric cardiac population where revascularization and occlusion were occurring at rates commensurate with rapid growth rates, necessitating resection of the vessel and a second implant. Additionally, life-time anti-platelet therapy had to be initiated in the patient.

It was concluded that a biodegradable mesh stent, which facilitated revascularization and then was assimilated by the body, would eliminate many of the long term side effects of permanent stents. What was needed was a metal that would degrade in the biological system at a measurable and regulated rate, a degradable metal that would not create a toxic overload and a metal that would not adversely affect the already existing metaloorganic molecules and enzymes existing in the physiological environment. It also needed to be metal that would not negatively interact with the external environment. Additionally, it needed to be a material that can be easily fashioned into a thin mesh, capable of minimal interaction with the endothelial tissue of the artery walls and a substance that in itself is not antigenic.

This paper will look at the characteristics of iron as a candidate for the manufacture of a mesh cardiovascular stent for promoting revascularization over a short period of time with a measurable rate of decay and absorption within the physiological system, that promotes permanent revascularization.