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Atherosclerosis is the second most common cause of mortality worldwide, it mostly occurs at arterial branch points leading to disruption of blood flow. Literature review clearly points out that atherosclerosis is an oxidative stress induced chronic inflammatory disease mainly provoked and aggravated by hypercholesterolemia. The main cause for atherosclerosis is elevated LDL cholesterol levels in blood, which gets oxidised in arterial intima that leads to macrophage recruitment and foam cell formation. Current therapeutic strategies involve supplementation of anti-inflammatory agents and cholesterol absorption/synthesis inhibitors. But due to the deleterious side effects of these existing drugs in the market, the search for other agents that have less/no side effects is still on the path of atherosclerosis research and in this regard, many nutraceuticals are tested for their beneficial properties. One among them is EGCG, an identified potential candidate in subliming atherosclerosis because of its inherent antioxidant, anti-inflammatory and anti-atherogenic properties. However, it cannot be exploited to the maximum because of its decreased bio-availability. On the other hand, the blooming field of nanotechnology opens promising avenues in drug delivery system that can maximize absorption. Therefore, the present study is designed in a multidisciplinary approach to synthesize EGCG nanoparticles using nanotechnology and to compare the efficacy of nano encapsulated EGCG against EGCG in mitigating atherosclerotic events, by studying prooxidant–antioxidant status, inflammatory cytokine expression, and apoptotic index in aorta of rats challenged with high cholesterol diet.