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**Graphene for Biomedical Implants** THOMAS MOORE, Department of Bioengineering, Clemson University, Clemson, SC 29634, RAMAKRISHNA PODILA, Department of Physics, Clemson University, Clemson, SC 29634, FRANK ALEXIS, Department of Bioengineering, Clemson University, Clemson, SC 29634, APPARAO RAO, Department of Physics, Clemson University, Clemson, SC 29634, CLEMSON BIOENGINEERING TEAM, CLEMSON PHYSICS TEAM — In this study, we used graphene, a one-atom thick sheet of carbon atoms, to modify the surfaces of existing implant materials to enhance both bio- and hemo-compatibility. This novel effort meets all functional criteria for a biomedical implant coating as it is chemically inert, atomically smooth and highly durable, with the potential for greatly enhancing the effectiveness of such implants. Specifically, graphene coatings on nitinol, a widely used implant and stent material, showed that graphene coated nitinol (Gr-NiTi) supports excellent smooth muscle and endothelial cell growth leading to better cell proliferation. We further determined that the serum albumin adsorption on Gr-NiTi is greater than that of fibrinogen, an important and well understood criterion for promoting a lower thrombosis rate. These hemo-and biocompatible properties and associated charge transfer mechanisms, along with high strength, chemical inertness and durability give graphene an edge over most antithrombogenic coatings for biomedical implants and devices.

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