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Plasma-Based Coatings in Biomaterial Engineering

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Plasma-based processes are increasingly finding applications in a variety of fields, including biomaterial engineering and medicine. This proliferation, in part, is due to the fact that the plasma state of matter not only allows surface modifications with monoatomic layer precision, but also offers the opportunity of synthesizing new materials and nanostructures that could influence the cell response, or could be used as treatment delivery vehicles. The quality of implants for the recipients of medical prosthetics determines the quality of their lives. These implants in addition to their bio- and haemocompatibility characteristics must also possess the required mechanical, electrical or tribological properties. Designing materials that could simultaneously fulfil all these characteristics constitutes a significant challenge to the biomaterial engineering community. The application of plasma-based thin film coatings or synthesized layers offers the possibility of surface engineering of medical implants and medical tools. In this presentation we will give a brief highlight of plasma-based technologies commonly in use, along with some examples of their applications for biomaterial surface engineering.

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