High Yield Plasma Polymerization of Nanoparticles

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Opportunity

Multifunctional polymeric nanoparticles have advanced the field of nanotechnology, particularly biomedicine, by introducing a promising platform for targeted delivery, diagnostics, and therapeutics. Their surfaces can be conjugated with ligands such as proteins, peptides, pDNAs, fluorescent markers and drugs for versatile applications ranging from site-specific targeting, to bioactive delivery, cancer therapy, bioimaging and topical immunisation. Conventional preparation processes require time-consuming chemical synthesis and multi-step protocols with complicated techniques common to wet-chemistry approaches. Consequently, dry, physical methods of material synthesis at the nanoscale have become extensively sought to produce polymeric nanoparticles with tailored physical and chemical properties.

Technology

This technology is a simple, highly-scalable method for producing polymeric nanoparticles (PPN) that increases the PPN yield inside the well plates with a condensed and more uniform deposition pattern while preserving the PPN multifunctional surface characteristics that advances the field of biotechnology in a plethora of practical applications.

Inventors

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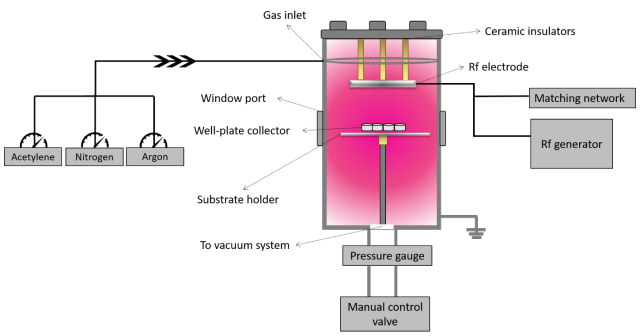
Intellectual Property Status

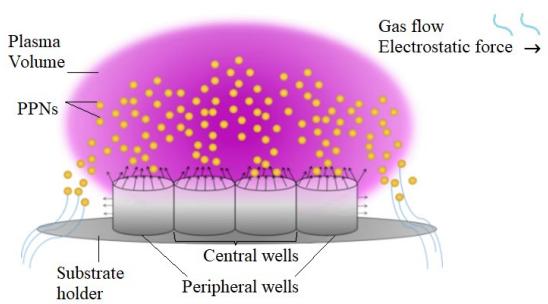
This technology is the subject of International PCT patent application PCT/AU2022/051135.

Commercial Opportunity

This technology represents a reproducible process that can be easily implemented by industry and automated.

The PPN produced by this process are able to covalently conjugate various functional ligands that provide a versatile platform to address applications in water purification, drug delivery, diagnostics, sensors, vaccines, biofunctionalised hydrogels and scaffolds. The platform is low-cost due to rapid, high-yield production in a dry scalable process with low-cost reagents. The reagent-free conjugation of ligands to these nanoparticles and their demonstrated non-toxicity removes hurdles to regulatory approval.





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