



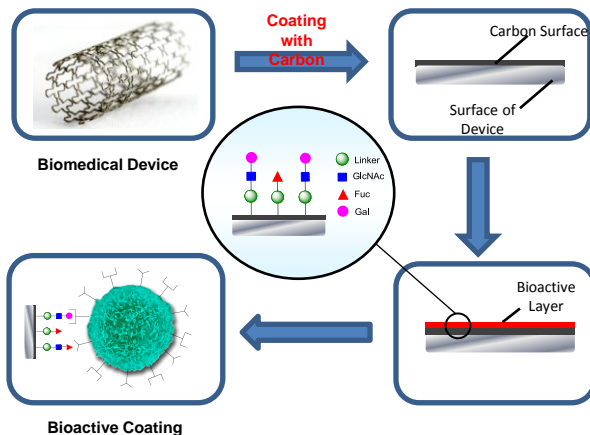
Novel Functional Glycocoatings for Implants and Biodevices

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Basic overview

This technology will provide a **new, low cost, general, mild grafting methodology** for **attaching complex carbohydrates to carbon coatings** on biomedical devices.

Carbohydrates are biomolecules that play key roles in various biological processes such as host immune response and cellular adhesion. The proposed technology will enable **functionalisation of carbon coated devices with carbohydrates** that display biological activity, e.g. for decreasing occurrence of restenosis (narrowing of the blood vessels).



Example application : Functionalisation of carbon surface of a biomedical device with synthetic carbohydrates

Advantages

- **Enhance lifetime and performance** of medical devices/implants through integration of carbon coatings that display biological activity via carbohydrate-based interactions
- **Low cost** attachment of complex carbohydrates to carbon coatings
- **Rapid, single-step** method that can be applied via dip or spray coating- can be scaled for **high throughput manufacturing**
- Functionalisation occurs through covalent bond formation between substrate and carbohydrates- leads to robust layers with non-hydrolyzable linkers
- Mixed carbohydrate layers can be prepared using this same methodology
- Method can be applied to any carbohydrate or any carbon coating of interest

Applications

- Biocompatible coatings for biomedical devices
- Regulation of cell adhesion, protein adsorption and immune response in biomaterials allowing control over a variety of processes, such as inflammation, resistance to infection and biofilm formation
- Bioactive, non-toxic, anti-fouling coatings
- Antirestenotic coatings for catheters and stents
- Antimicrobial and antifungal coatings for food packaging, textiles and agricultural applications
- Patterning of bioactive entities
- Carbohydrate-directed drug and nanoparticle delivery
- Biochips for rapid diagnostics (e.g. early-stage disease markers)
- Immobilization of enzymes and cells for catalysis and bioreactor applications

Technology and Patent Status

This technology is under development to create a new series of precursor compounds and a method for the covalent immobilization of carbohydrates on carbon coatings.

A priority patent application has been filed at the European Patent Office.

The opportunity

There are **currently no available technologies for the modification of carbon coatings using carbohydrates in a single step process**. This proposed technology offers an opportunity to fill this gap in the marketplace.

This method can be easily integrated into existing commercial products marketed by companies that fabricate either carbon coated devices or carbohydrate coatings.

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