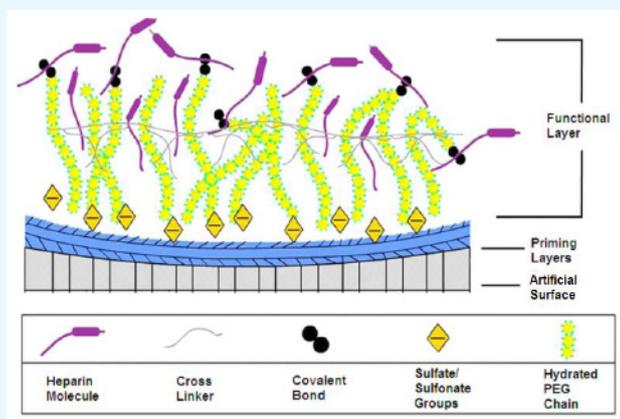


## Astute® Advanced Heparin Coating

The **Astute® Advanced Heparin Coating** has obtained clinical recognition for its successful use on blood contacting medical devices. The non-thrombogenic/anti-thrombogenic **Astute®** system directly negates the adverse biological responses that are initiated when blood contacts a foreign surface, such as platelet/protein adhesion, platelet activation and thrombus formation (blood clot).

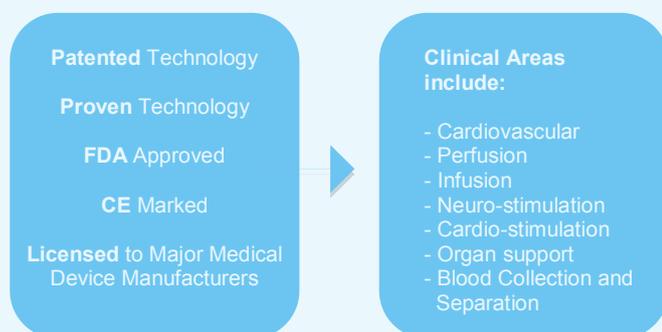
**Advanced** haemocompatibility is provided by triple endothelial-like action through:

1. **Heparin** – non-leaching, extremely high heparin activity, provides similar benefits to heparan sulfate found in the natural endothelium
2. **Sulfate & Sulfonate Groups** – strong negative charge repels blood cells and proteins
3. **Poly(ethylene glycol)** – highly hydrophilic PEG chains minimise the interaction with blood elements, reducing platelet/protein adhesion



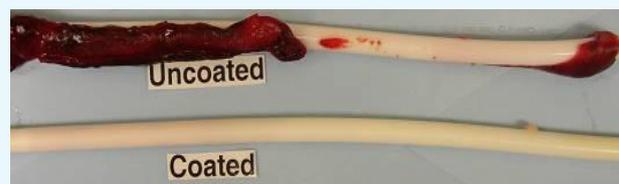
Schematic representation of **Astute®**.

The **Astute® Advanced Heparin Coating** has been developed specifically to **enhance** the haemocompatibility of blood-contacting medical devices.



### In-vivo Evaluation

Coated vs. uncoated haemodialysis catheters - Implantation for 30 days in an ovine model:



98.4% reduction in thrombus mass (gravimetric analysis).

### The Coating Process

- Simple water-based coating (no harsh solvents)
- At room temperature
- Flexible dip-coating batch process
- Process time less than 30 minutes
- Ethylene oxide (EtO) sterilisation
- Mechanically stable ('wet glove test')
- All substrates can be coated
- Chemically stable

### Astute® Biochemical Properties

Property	Result	Test/Platform
Heparin Activity	250-300 mU/cm <sup>2</sup>	FXa Inhibition
Antithrombin Uptake	93 ± 2.8 pmoles/cm <sup>2</sup>	ATIII Activity
Platelet Adhesion	95% reduction	Radiolabeling (In <sup>111</sup> )
Platelet Activation	92% reduction	In-vitro blood loop
Thrombus Formation	>98% reduction	Gravimetric

### Astute® Benefits

- Suits a wide range of medical devices
- Superior haemocompatibility
- Non-thrombogenic/anti-thrombogenic
- Not just a heparin coating
- Prevents non-specific protein deposition
- Promotes laminar flow (hydrophilic)

*BioInteractions has established license agreements with major medical device manufacturers for the **Astute®** coating technology. These include Medtronic Cardiac Surgery (Trillium® Biopassive Surface) & Covidien (now a part of Medtronic) - The Palindrome™ H- Heparin and Palindrome™ HSI-Heparin Hemodialysis Catheter Range. We are committed to the advancement of healthcare through innovation and welcome interest in the **Astute® Advanced Heparin Coating**.*

**BioInteractions Ltd.**  
Science and Technology Centre  
Earley Gate, Whiteknights Road  
Reading, Berkshire, RG6 6BZ  
United Kingdom

**T** +44 (0)118 935 7000  
**F** +44 (0)118 935 7917  
**E** general@biointeractions.com

[www.biointeractions.com](http://www.biointeractions.com)

