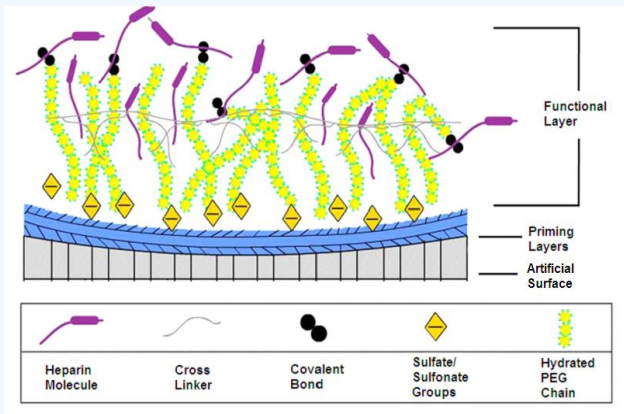


BioInteractions

Advancing Healthcare
Through Innovation™

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.

Patented Technology

Proven Technology

FDA Approved

CE Marked

Licensed to Major Medical
Device Manufacturers

Clinical Areas
include:

- Cardiovascular
- Perfusion
- Infusion
- Neuro-stimulation
- Cardio-stimulation
- Organ support
- Blood Collection and Separation

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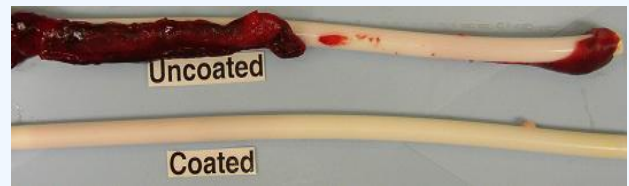
www.biointeractions.com

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).

In-vivo Evaluation

Coated vs. un-coated 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 ²	FXa Inhibition
Antithrombin Uptake	93 ± 2.8 pmoles/cm ²	ATIII Activity
Platelet Adhesion	95% reduction	Radiolabeling (In ¹¹¹)
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 (The Tai Palindrome™ Emerald™ and Sapphire™ Hemodialysis Catheter Range).

We are committed to the advancement of healthcare through innovation and welcome interest in the Astute® Advanced Heparin Coating



ISO 9001:2008
FS 531243

