Configurable Biopolymer Coatings for Medical Devices

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Biocoat Corporate Overview

- Born out of work at Columbia University in early 1980's
- Hydrophilic coatings based on Hyaluronic Acid
- Founded 1991
  - Ellington Beavers, PhD
  - ~20 employees today
  - New 8000 sq ft facility in 2005
- Applying and expanding on those technologies today...
Biocoat Corporate Overview

- Products approved and sold worldwide
  - Japan, EU, USA, Australia
- $300+ million in product sales that use coating
- New automated coating system for applications development
Hydak® Technology Platform

Time-tested Well-understood Chemistry

- Isocyanate linkages
- Acrylic-based polymer matrix
- Heat cured (~60°C)
- Able to attach functional compounds
Coating Possibilities

Hydak® Coatings...surfaces with...

- Hyaluronic acid-based bilaminar coating
- Glycosaminoglycans (GAG's)
- Other cellular matrix components
- Functional protein surfaces
- Anti-biofilm surfaces
- Bound API's
Biocoat's Model

- Customer presents a need
- Biocoat platform engaged
- Solution to problem developed
- Technology is licensed to clients
- Reagents are for sale
Hydak® Base Coat

- **B-23K**
  - Organic solvent-based
  - Most commonly used

- **DC-8**
  - Aqueous-based dispersion
  - Good for solvent sensitive substrates
  - Good for polycarbonates and metallic substrates
Hydak® Base Coat

- Acrylic-based
- Provides adhesion to substrate
  - Possibilities include: Pebax, Polyurethane, Nylon, PE, PEEK, PMMA, PVC, Stainless Steel
- Provides chemistry for covalent attachment of top coat
- Flexible to accommodate mechanical deformation of substrate
Suitable Substrates

- Polyesters
- Polyimides
- Polyethers
- Polyurethanes
- Poly (ethylene-co- vinyl acetates)
- HDPE/LDPE/PP with Plasma treatment
- Silicones with Plasma treatment
- Poly (methyl methacrylate)
- Nylon
- PEBAX
- Polycarbonates
- PVC w/ Plasma treatment
- PEEK
- Metals (SS, Pt, Ni, Ti)
Hydak® Top Coat

- Lubricious
- Biocompatible
- Non-thrombogenic
- Durable
- Customizable
Structure of Hyaluronan
Hydak® Coatings: Non-Crosslinked
Hydak® Coatings: Crosslinked
Hydak® Coating Process

1) Surface preparation
2) Apply Base Coat
3) Cure Base Coat (~ 35 to 80 C)
4) Apply Top coat
5) Cure Top Coat (~ 35 to 80 C)
6) Wash/Inspect/Dry
7) Package
8) Sterilize
Hydak®/AgION™ Coatings with Antimicrobial Protection

- Incorporate AgION™ silver-zeolite compounds in base coat
- Combine advantages of hyaluronan with silver release
Why Choose Hydak®?

- Versatile platform for bio-functional surfaces
- Lubricity and durability can be adjusted to application
- Non-thrombogenic coatings
- Heat-cured system: easy to coat lumens
- Low cost of manufacturing and setup
- Biocompatible
- Already used in the market
Why Choose Hydak®?

- Reproducible and reliable
- Biocoat's service and tech support
- Biocoat's adaptability
- Biocoat's technical knowledge
Hydak® Applications

Devices:
- Catheters
- Balloons
- Guidewires
- Stents
- Scaffolds
- IOL Cartridges

Markets:
- Peripheral Vascular
- Cardiological
- Neurovascular
- Urological/GI
- Ophthalmic
Thank You