SUBSTANCE WITH
UNLIMITED POTENTIAL

EYES

BRAIN

SKIN

HEART

LUNGS

INTESTINES

KIDNEYS

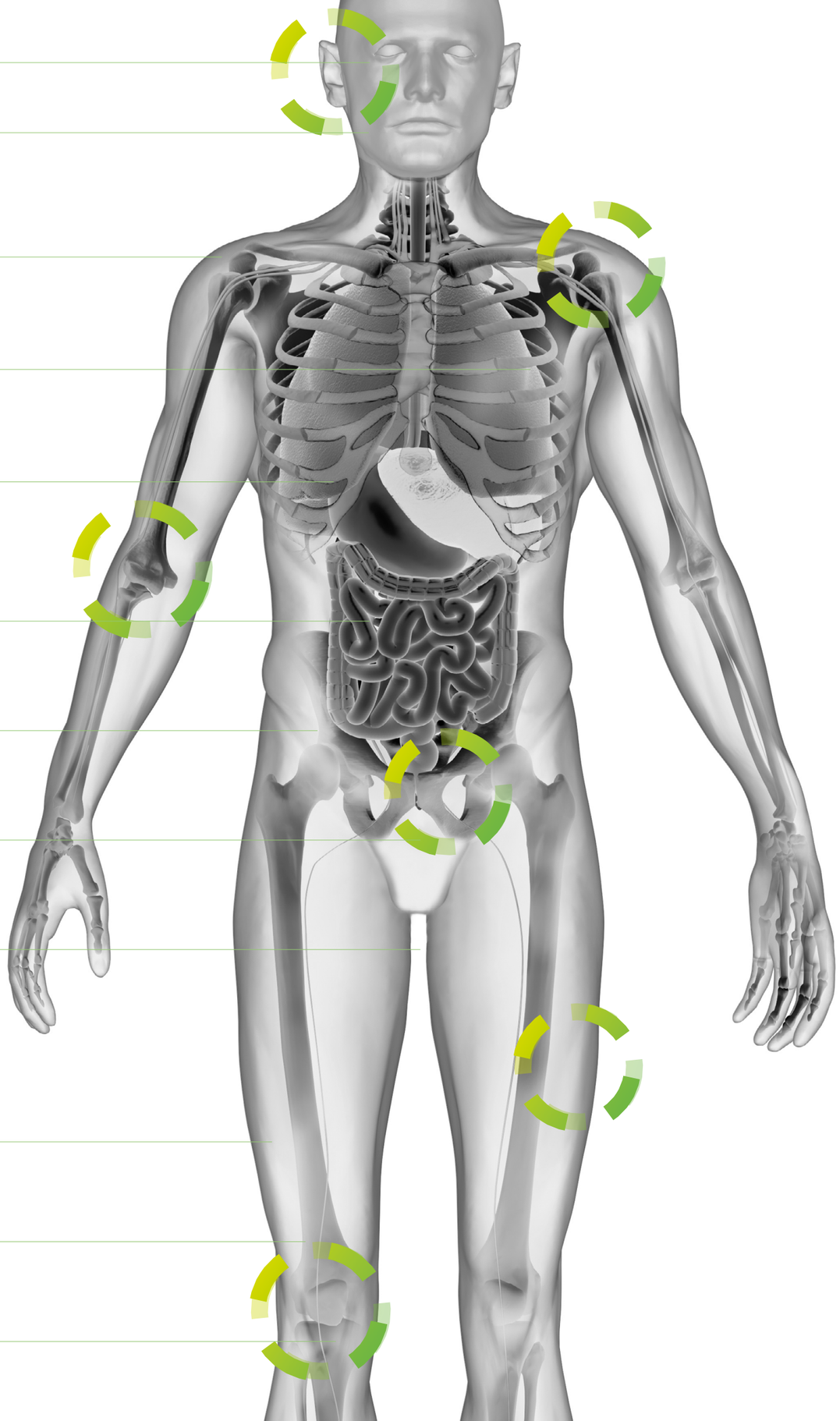
FETAL
MEMBRANES

GENITO -
URINAL SYSTEM

MUSCLES

CARTILAGE

SYNOVIAL
FLUID



CONTIPRO

SODIUM HYALURONATE

Download
the full brochure

CONTIPRO

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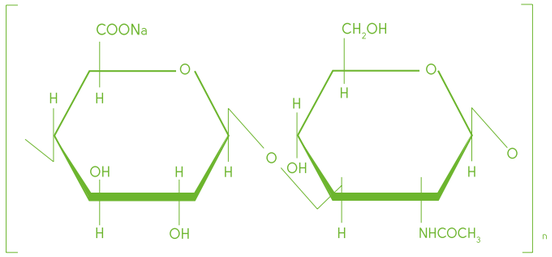
WHAT IS
SODIUM HYALURONATE



Hyaluronic acid (HA) is a viscoelastic biopolymer with multiple functions and unlimited application potential.

HA naturally occurs in form of Sodium hyaluronate (SH) salt. Depending on its molecular weight, SH provides a variety of biological effects, which are widely used in medicine, pharmaceuticals and cosmetics.

Our mission is to research and deeply understand all aspects of hyaluronic acid.

BIOLOGICAL
PROPERTIES

- Essential structural component of extracellular matrix
- Extremely hydrophilic - prevents cellular adhesion
- Provides lubrication of cartilage
- Prevents oxidative damage of tissues
- Regulates cell division, proliferation and cell death
- Modulates inflammation
- Promotes healing

REGULATING TISSUES
ON MOLECULAR LEVEL

SUPPORTING HEALTHY AND
REGENERATING TISSUES

oligosaccharides
4 - 10 mer

low molecular weight
7 - 250 kDa

high molecular weight
250 - 2 300 kDa

BENEFITS
OF HYALURONAN

Biocompatibility
& biodegradability

Does not induce
an immune response

Non-toxic fragments
of the degraded chains

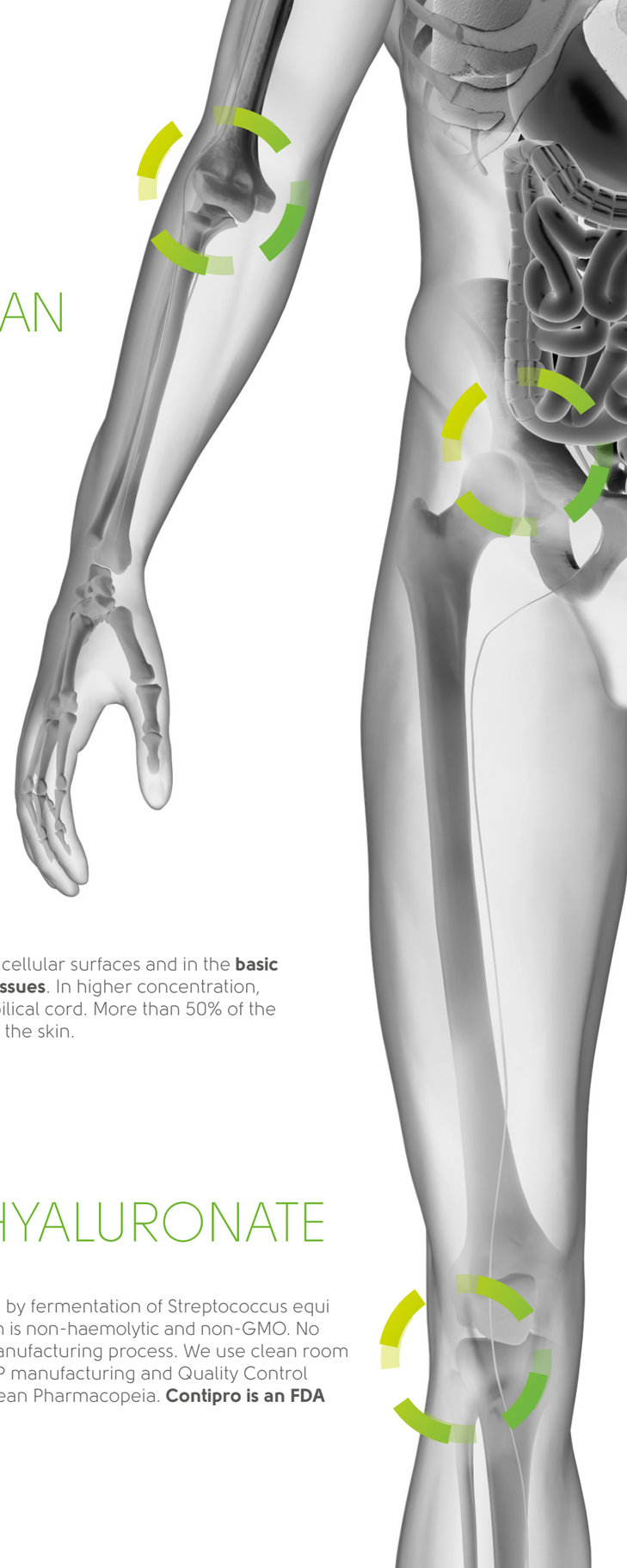
Favourable mechanical
properties

HYALURONAN
IN OUR BODY

Sodium hyaluronate occurs naturally in cellular surfaces and in the **basic extracellular matrix of the connective tissues**. In higher concentration, SH is located in joints, eyes and the umbilical cord. More than 50% of the body's Sodium hyaluronate is located in the skin.

PRODUCTION
OF SODIUM HYALURONATE

Contipro produces Sodium Hyaluronate by fermentation of Streptococcus equi subsp zooepidemicus bacteria. This strain is non-haemolytic and non-GMO. No animal materials are used during the manufacturing process. We use clean room production with strict adherence to GMP manufacturing and Quality Control testing to the latest edition of the European Pharmacopeia. **Contipro is an FDA audited facility**.



	TARGET	APPLICATION	RECOMMENDATION	MECHANISM
ANTI—ADHESIVE DEVICES	Abdominal Pelvic Thoracic Spinal surgery Surgery of paranasal sinus	Films, gels, textiles Postsurgery adhesions	**Molecular weight:** chemically modified sodium hyaluronate	Prevents adhesions of mucouse membrane.
JOINT VISCOSUPPLEMENTATION	Knee Hip Ankle joint	IAT injections Pre-filled syringes (2 – 6 ml) Osteoarthritis/ post--surgical treatment	**Molecular weight:** 0.7 – 6 MDa native or chemically modified sodium hyaluronate **Concentration:** 1 – 3%	Inhibition of the cartilage degradation. Stimulation of endogenous hyaluronic acid production. Restoration of the normal rheologiacal conditions.
OPHTHALMIC SURGERY	Eyes	Injections Pre-filled syringes 0.5 – 1 ml Cataracts	**Molecular weight:** ≥ 0.8 MDa **Concentration:** cohesive variant (1.0 - 1.5%) dispersive variant (3 - 5%)	Protection of tissue against damage caused by surgical equipment. Cohesion of lens fragments for its better removal after lens breakage.
WOUND HEALING	Burns Ulcers Cuts Decubitus Scars	Bandages Gels Patches	**Molecular weight:** ≥ 0.8 MDa **Concentration:** 0.2 - 2.5%	Modulates the inflammation. Attracts water with growth factors. Support of re-epithelialization. Scars reduction.
MEZOTHERAPY	Epidermis Dermis Subcutaneous fat	Roller with micro-needles (1 ml)	**Molecular weight:** ≥ 0.5 MDa **Concentration:** 0.8 - 3%	Soft tissue augmentation. Eliminates skin depression.
DERMAL FILLERS FOR AESTHETIC CORRECTION	Dermis	Injections	**Molecular weight:** ≥ 1 MDa, modified sodium hyaluronate (cross-linked) **Concentration:** 0.5 - 2.5%	Soft tissue augmentation. Eliminates skin depression.
DRUG DELIVERY SYSTEM	Local or systemic effect depends on the application	Topical, intravenous	**Molecular weight:** modified sodium hyaluronate (hydrofobized)	Sustained drug release. Prevents early drug activity.
OPHTHALMOLOGY eye drops (with API), medium for lens	Eyes	Drops, solution One-dose variant without preservatives Multi-dose variant with preservatives Syndrom of dry eye Inflammation of eye	**Molecular weight:** ≥ 0.25 MDa **Concentration:** 0.08 – 0.3%	Moisturizing of the eye. Helps preventing the systemic effect as a medium for API. Optimal medium for ophthalmic lens.
RHINOLOGY	Nose	Nasal Spray	**Molecular weight:** ≥ 0.8 MDa **Concentration:** 0.04 – 1.5%	Protects and moisturises and soothes the mucous membrane of the nose.

	TARGET	APPLICATION	RECOMMENDATION	MECHANISM
UROLOGY - CYSTITIS	Urinary bladder Interstitial cystitis Chronical (bacterial) cystitis	Gel via catheter	**Molecular weight:** ≥ 0.25 MDa **Concentration:** 0.8 – 2.4%	Glycosaminoglycan layer regeneration effect. Reduction the chronical inflammation.
INCONTINENCE	Urinal Fecal incontinence	Injectable gel to the neck of the bladder or submocosal layer of anal canal	**Molecular weight:** 1 MDa modified sodium hyaluronate **Concentration:** 1.5%	Volume-barrier. Strengthening the side of urethra/rectum.
CANDIDIASIS	Mycosis/Candidiasis Vaginal dryness	Vaginal ovules filled with gel	**Molecular weight:** 0.2 MDa **Concentration:** 0.1 – 0.25%	Vaginal mucose hydration.
ARTIFICIAL CARTILAGE GRAFTS	Knee joint	Gel, sponge	**Molecular weight:** modified sodium hyaluronate	Replacement of the cartilage.
ARTIFICIAL SKIN GRAFTS	Damaged and burned skin	Hydrogels, textiles, foils Possibility of *in situ* cross-linking	**Molecular weight:** modified sodium hyaluronate	Cell scaffolds – homogenous implantation of various types of cells into the scaffold structure. Induction of capillary growth. Positively impacts the natural re-epithelialization process.
BONE HEALING	Bone defects Bone injuries	Gel	**Molecular weight:** modified sodium hyaluronate (cross-linked) **Concentration:** 0.1 - 4%	Scaffold for cell cultivation.
ANAESTHESIA	Surgical site	Gel	**Molecular weight:** ≥ 0.2 MDa **Concentration:** 0.2%	In combination with anaesthetics eliminates the pain caused by injection during aesthetics surgeries. Anaesthetic effect prolongation.
SPERM SEPARATION MEDIUM FOR *IN VITRO* FERTILIZATION	Process *in vivo* fertilization	Transfer medium for embryos to uterus Immobilising medium for sperm	**Molecular weight:** ≥ 0.5 MDa **Concentration:** 0.1% transfer medium 1% immobilising medium	Optimal cell environment. Slowing down the movement of the sperm to allow the selection of the most mature viable spermatozoa.

SODIUM HYALURONATE

ULTRA PURE

TYPE I: molecular weight **250 – 2300 kDa**
TYPE II: molecular weight **7 – 250 kDa**

SPECIFICATION

Appearance	odourless white to almost white powder or granules
Identification - test A (Infrared spectrum)	complies with the Ph. Eur. reference spectrum
Identification - test B (Sodium)	pass
Appearance of solution - Appearance	clear
Appearance of solution - Absorbance	≤ 0.010
pH	5.0–8.5
Intrinsic viscosity	< 0.65 m^3/kg
Nucleic acids	≤ 0.03
Protein	≤ 0.035 %
Chlorides	< 0.3 %
Iron	< 4.0 ppm
Loss on drying	< 10.0 %
Microbial contamination	< 5 CFU/g
Bacterial endotoxins	< 0.005 IU/mg
Sodium hyaluronate	95.0–105.0 %
Ca^{2+}, Mg^{2+}	≤ 80.0 ppm
Molecular mass of disaccharide unit	401,3 Da. CAS number 9067–32–7

CAN BE SUPPLIED IN TAILOR-MADE INTRINSIC VISCOSITIES OR MOLECULAR WEIGHT RANGES

SOURCE

- Biofermentation of non-pathogenic Streptococcus equi zooepidemicus bacterial strain, non-haemolytic
- Non-GMO
- Non-animal sourced materials used during the manufacturing process

TOXICOLOGY

Sodium hyaluronate has been proven to be a non-toxic substance. Toxicological data available upon request.

QUALITY

- In compliance with Ph. Eur. latest edition
- ISO EN 9001 : 2015
- ISO 13485:2016
- GMP facility according to ICH Q7
- In-house quality management system
- FDA audited facility

STABILITY & STORAGE

- The stability and quality of sodium hyaluronate powder is guaranteed for 36 months when stored in originally sealed packaging at the temperature 2–8 °C.
- Sodium hyaluronate is delivered in polyethylene bag and three-layer aluminium foil. Packaging size upon the customer´s request.

CERTIFICATES AND REGISTRATIONS

- GMP - State Institute for Drug Control, Prague, Czech Republic
- CEP (Certificate of Suitability to Ph.Eur.) – EDQM, Strasbourg, France
- US DMF
- ASMF
- KDMF

CONTIPRO, MEET THE PROFESSIONALS

Our material is used worldwide in many novel medical device applications and drug products

Contipro also produces a wide range of HA derivatives and research materials

Our Sodium Hyaluronate pharmaceutical grade material is one of the purest raw materials available on the market

Contipro will tailor make your desired molecular weight range or intrinsic viscosity

We introduce innovative products and materials to the market every year.

We are a world leaders in the research and development of HA based products

Contipro follows visions of associate professor Vladimír Velebný, leading HA enthusiast

WHO WE ARE

Contipro is a Czech based biotechnology company with a strong history stretching back to 1990. We produce the finest quality hyaluronic acid for the most prestigious brands in more than 70 countries worldwide.

WHAT WE DO

The great success of Contipro is built on active pharmaceutical raw materials, modern technical equipment and everyday innovations. Contipro benefits from in-house developed biotechnological production.

WE INNOVATE

More than 120 in-house research and development professionals actively focusing on customers' future needs. Every year, Contipro sets a new agenda in the progress of tissue engineering and regenerative medicine.

WE OFFER MORE

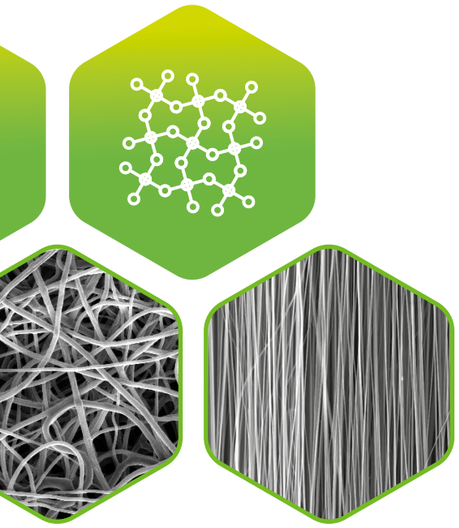
Contipro stands strongly on the strategic pillar of uncompromising quality of products and services. We also offer additional services in technical, analytical, and development support.

WE DO CARE

Because we are situated in the natural countryside of green central Europe, we have a double motivation to care for our environment. Our production is firmly based on natural biological processes.

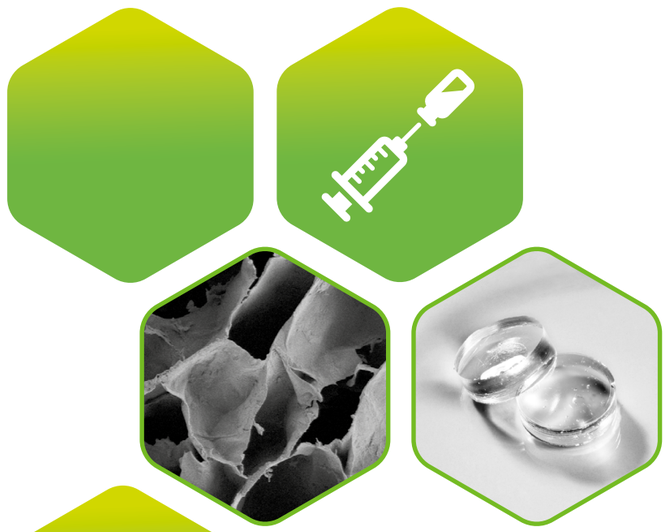
HYALURONAN FORMS

Examples of Innovative materials for medical and pharmaceutical applications developed by Contipro.



NANOFIBERS

Nanofibers can be produced from native hyaluronan, its derivatives or composite materials. Nanofibers are formed via electrospinning and by using our unique 4SPIN technology. This allows the formation of nanofibers of different structures, voluminous and flat layers and even tubes of different surface area weights or perfectly oriented and aligned nanofibers. Applications of nanofiber materials could include wounds dressings, drug delivery carriers and scaffolds for tissue engineering.

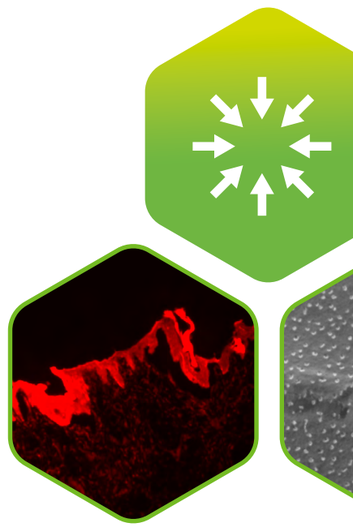


HYDROGELS

Hydrogels are based on hyaluronan derivatives suitable for cross-linking. Hyaluronan derivatives are able to form hydrogels by a non-cytotoxic reaction with the possibility of forming a gel directly inside the body or in the presence of cells. Crosslinking can be achieved by chemical, enzymatic, or photocatalytic reactions. Applications could include scaffolds, material for augmentation or for viscosupplementation

MICROFIBERS

Hyaluronan based fibers have a form of endless continual monofilaments, these can be prepared from various biodegradable derivatives of hyaluronan with differing rates of water solubility, resorption time in a body and other biological and physical properties. Mechanical properties of fibers allow manufacturing by textile technology, like knitting and weaving. Hyaluronan microfibers are resorbable, implantable and also a sterilisable biomaterial.

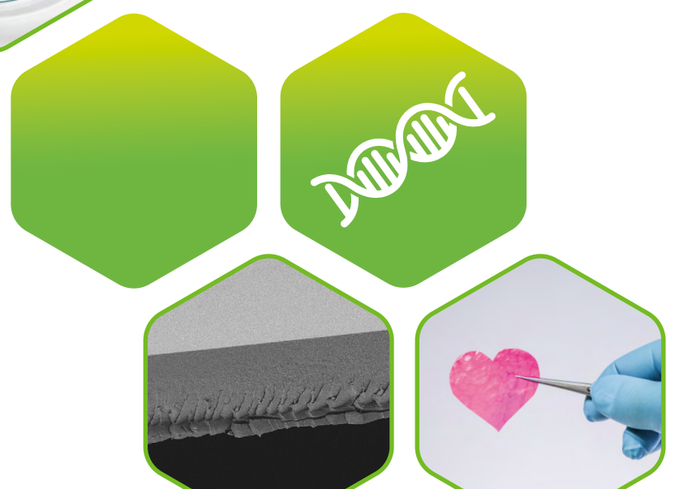


POLYMERIC MICELLES

Prepared from hydrophobized (acylated) derivatives of hyaluronan, micelles self-assemble in aqueous solutions into core-shell structures, which enable non-covalent encapsulation of poorly water soluble drugs. Mainly because of its biodegradability, biocompatibility and safety, hyaluronan offers a number of advantages over synthetic polymers in both nonparenteral and parenteral administration routes.

STAPLE FIBERS

Staple Fibers are short fibers with a typical length of 3—5mm produced from native hyaluronan, its derivatives and other biopolymers. They can be manufactured into nonwoven textiles and can be sterilised. Staple fibers are very flexible and can be used for wide range of implantable medical devices. Solubility in buffered saline can be modified from seconds to several weeks. Nonwoven textiles can be modified by number of active substances for a variety of uses e.g. antiseptics and haemostatic pads. Staple fibers can be loaded with growth factors or MRI contrast agents.



THIN FILMS

Free-standing films prepared from native hyaluronan or its various derivatives. Films insoluble in water can be made from hydrophobized (acylated) hyaluronan or from covalently cross-linkable hyaluronan derivatives. The thin films could even carry active substances, dyes, and fluorescent nanoparticles inside the film.