

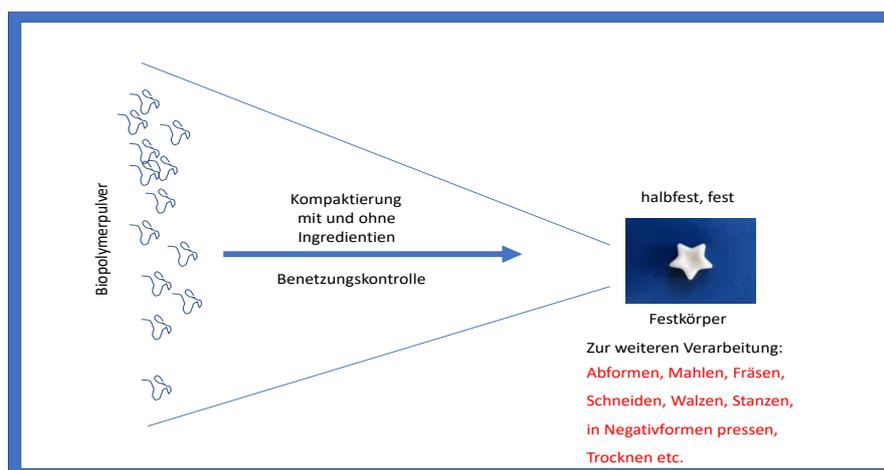
Hyaluronic Acid as starting material for innovative medical and cosmetic products

Hyaluronic acid (HA) is a natural component of the tissues of all higher organisms. It is the natural cement substance between the body cells, provides structure to the body tissues and stabilizes their communication. Because of these properties, HA as a body component is naturally extremely tissue-compatible and is neither allergenic nor immunogenic.

So far Hyaluronic acid could only be handled as an isolated substance in 2-3 percent solutions; furthermore, higher HA solutions become very viscous and are unsuitable for further use. Other physical forms such as gels, foils or kneadable, semi-solid masses or solids could not be achieved despite intensive research in universities and industry. Only these low concentrated 2-3 % solutions are applied since many years on a large scale subcutaneously as "dermal fillers" in cosmetics without any problems.

A few years ago, a Berlin based research team succeeded in converting Hyaluronic acid into all desired physical forms in a patented process. Based on this innovation, SolyPlus GmbH was founded in Berlin in autumn 2017. In 2020 the company was relocated to Schleswig-Holstein and provided with a further start-up capital of € 1.75 million.

This breakthrough invention of SolyPlus allows for the first time to produce environmentally friendly, biodegradable and biocompatible biopolymers (Hyaluronic acid but also other biopolymers such as albumin, chitin, gelatin etc.) as powder, gels or as technically very well processable materials, semi-solid or solid.



The invention is protected for HA as well as for other biopolymers by multiple patents or patent applications (one patent now granted in the USA and Europe and 5 PCT applications).

This innovative breakthrough opens up a wide range of technical possibilities to develop new and innovative medical and cosmetic products from pure, natural, non-chemically cross-linked hyaluronic acid:

1. **Microparticles** as temperature-stable drug delivery vehicles in medicine (in all sizes and quantities) e.g. for oral, nasal and inhalation applications or in cosmetics as skin care products,
2. **Dry or water-containing films and gels** of any thickness and geometry, in medicine as wound dressings, wound-covering gels and also as buccal application of active ingredients or in cosmetics as caring face masks,
3. **Microneedles** for trans- and intradermal applications (e.g. for painless vaccination) and for temperature stabilization of sensitive vaccines,
4. Controlled **dissolving implants** for orthopedics and trauma surgery such as plates, rods, screws etc. in any geometry.

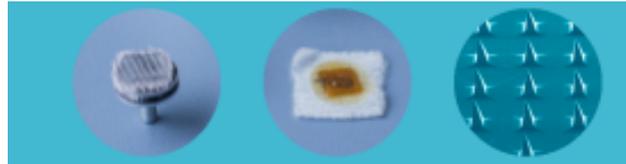
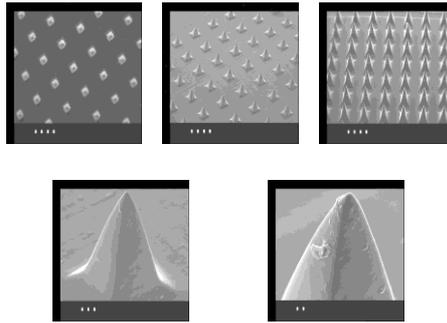
All these materials can be produced primarily without the use of chemical crosslinkers or can be additionally modified with FDA-approved crosslinkers to further extend the dissolution time. In addition, all product variants presented above can be loaded without (in pure form) or additionally with passive/active ingredients or pharmaceuticals.

All these products-forms are at present **not** available on the market as hyaluronic acid derivatives. They enable innovative product expansions in highly interesting, established and large-volume economic markets and can replace today's environmentally harmful materials in marketed products (e.g. non-degradable microplastics).

A selection of the product possibilities is shown in the following figure:

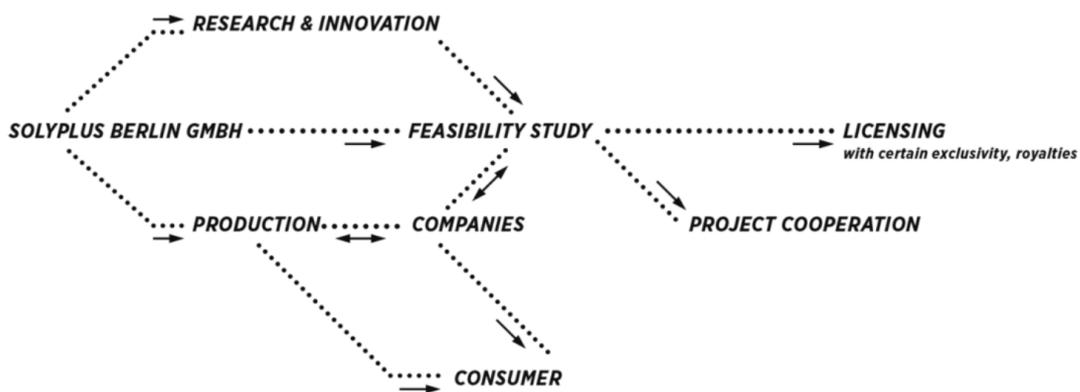


From an economic point of view, the extremely simple industrial production of these HA products, especially the HA microneedle arrays, represents a highlight of the SolyPlus developments. The HA-microneedles can be varied in length and geometric structure:



For the microparticles, a first scale expansion has now been carried out with an external provider. This company has contracted with SolyPlus to expand the production of microparticles as required.

The SolyPlus business model will initially focus on research and development co-operations and the targeted out-licensing of the marketing rights of the developed products and technologies to cosmetic and pharmaceutical companies in order to achieve a rapid cash flow. In addition, in the initial phase, internet sales of selected products (e.g. peeling products with HA microparticles instead of micro-plastics) to end-customers will provide necessary market- and customer- insights as well as revenues. The structure of the business model with regard to the targets in the market is as follows:



The current management of SolyPlus consists of:

- CEO : Joe Bender Ph.D. chemist, with many years of experience in general management and Business development,
- CSO : Andreas Voigt Ph.D., polymer physicist, *founder*, with more than 30 years of experience in research & development of biopolymers and galenic drug delivery systems,
- COO : Richard Anderson, pharmacist, *founder*, with experience in galenics and production of cosmetics and pharmaceuticals,
- CFO : Ralph Böttcher, business economist and tax consultant, with many years of experience as entrepreneur and controller,
- Lab Manager: Elena Maltseva; Ph.D., polymer chemist, *founder*, with multiple years of experience in laboratory management.

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