PrintyMed

Medical-grade Biomimetic Spider Silk

Jekaterina Romanova, CEO

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About us

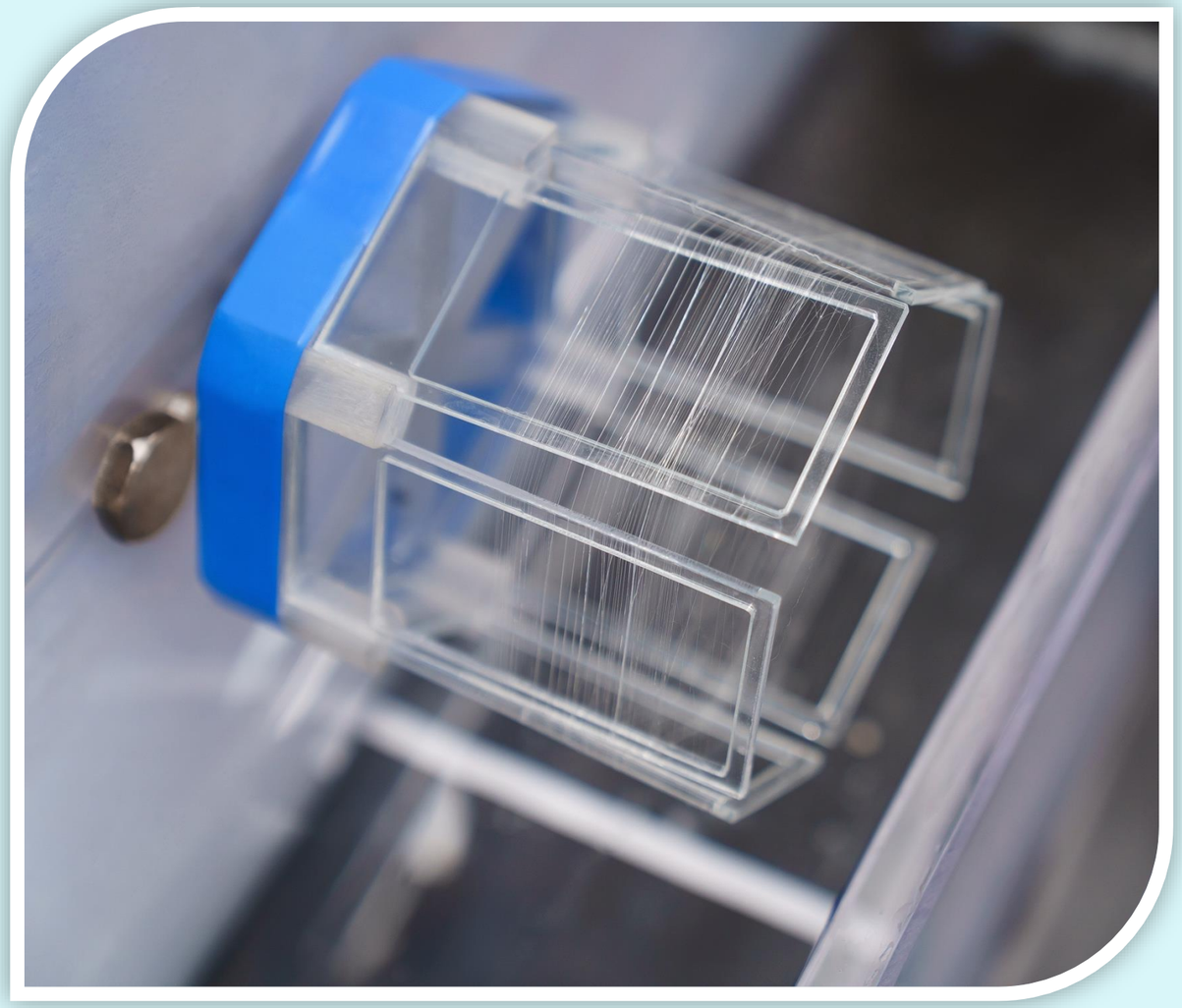
PrintyMed

PrintyMed - a biotech company born in Europe and moving our headquarters to Saudi Arabia to align with Vision 2030’s biotech strategy.

Our Vision: To set the global standard in regenerative biomaterials.

Our Mission: To transform healing with sustainable, nature-identical spider silk.

About us



PrintyMed produces nature-identical, medical-grade spider silk proteins via proprietary bacterial bioreactors.

Our biomimetic technology creates revolutionary biomaterials for medical applications with superior biocompatibility and tunable properties.

European TOP 5 early-stage startup

Awards & programs

PrintyMed

WOMEN TechEU

Entrepreneurship World Cup

Latvian Startup Awards 2024

eit JUMPSTARTER

eit Health

DEEP TECH CEE SUMMIT

COMMERCIALIZATION REACTOR™

Health Founders

Baltic Impact Accelerator

IDEJU KAUSS

STARTUP DAY

DEEP TECH ATELIER

techchill

ESCALTECH

WE MAKE FUTURE!

UniLab

Investment and Development Agency of Latvia

Our Value Proposition

PrintyMed

- **Safer for Patients:** PrintyMed's spider silk is highly biocompatible, minimizing immune reactions and implant failures. That means fewer complications, fewer revision surgeries, and relief from a $1.5B annual burden in the U.S. alone.

- **Stronger by Nature:** It is up to **30× tougher than steel and 7× more elastic than Kevlar**. This unique combination enables sutures, meshes, and grafts that today's biomaterials simply cannot deliver.

- **Designed to Heal:** Our silk can be tuned to degrade over weeks or months, and shaped into fibers, films, or hydrogels. That flexibility makes it relevant across wound care, implants, and drug delivery.

- **Built for Scale:** With our proprietary bacterial fermentation, we achieve **300% higher yields than competitors.** This means reliable industrial supply and gross margins exceeding 95% at scale.

- **Proven to Work:** Early studies show safer, more effective devices — the foundation for rapid adoption by hospitals, OEMs, and global healthcare systems.

PrintyMed turns nature's strongest fiber into medicine's most trusted material.

Customer Pain Behind the Promise

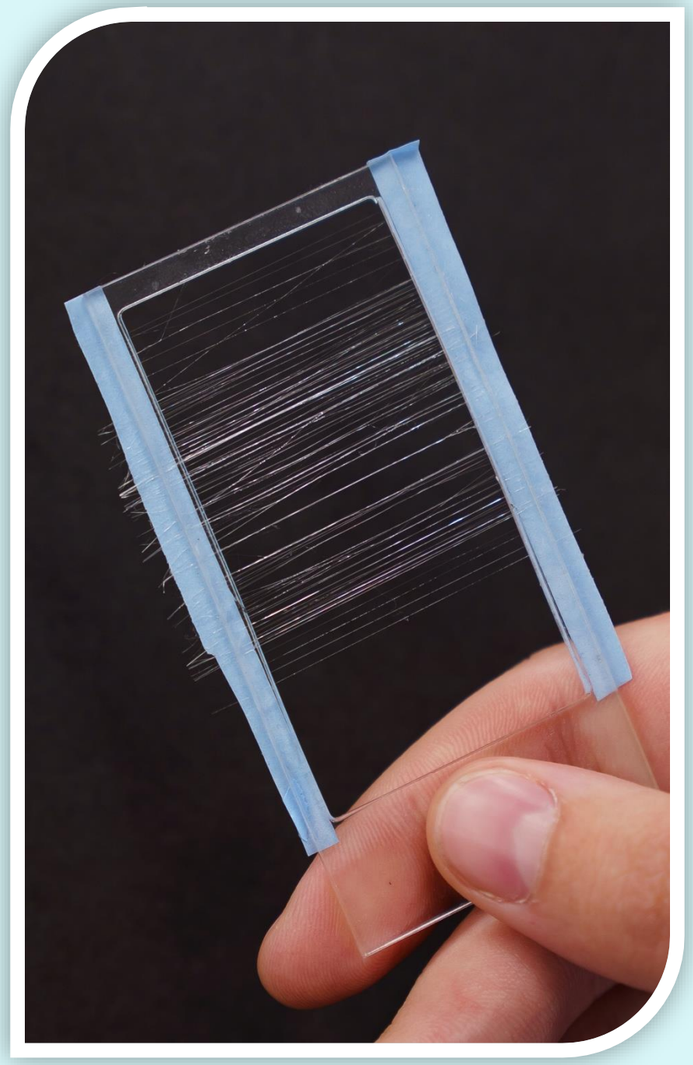
PrintyMed

Every year, millions of patients endure suffering not because of their illnesses, but due to the very materials intended to heal them:

- **A staggering 1 in 3 implants fail** due to immune rejection, leading to expensive revision surgeries that cost over $1.5 billion each year in the U.S. alone.
- **An alarming 9 in 10 abdominal surgeries** result in adhesions, which can cause chronic pain, infertility, and the need for repeated operations.
- **Chronic wounds impact 2% of the global population**, incurring costs between $25 billion and $50 billion worldwide. **In Saudi Arabia**, the rising prevalence of diabetes worsens this critical issue.
- The **organ shortage crisis leaves over 115,000 patients** desperately waiting for transplants, with many never receiving the lifesaving organs they need.
- Furthermore, **drug delivery systems often fail**, with half of patients abandoning their treatments, resulting in a staggering waste of more than $50 billion annually.

These statistics highlight the urgent need for innovative solutions to address these challenges in healthcare.

Our Breakthrough



At PrintyMed, we tap into nature's most remarkable fiber-spider silk. Instead of harvesting it from spiders, we innovatively produce it using engineered bacteria in scalable bioreactors. The result?

- A material that is not only stronger than steel but also possesses the elasticity of human skin.
- Our spider silk is biocompatible, biodegradable, and fully customizable, available in a variety of forms such as sutures, meshes, films, and hydrogels.

We don't merely repair tissue; we create cutting-edge materials that empower the body to heal itself.

Technology Advantages

How We Make It Work for Medicine

PrintyMed

- **Biomimetic Spinning:** Our water-based process mimics how spiders naturally spin silk. This creates fibers with superior biocompatibility and eliminates toxic solvents.

- **Tunable Properties Without Redesign:** Through cross-linking and PEGylation, we can adjust strength, elasticity, and degradation speed without changing the protein sequence, tailoring materials for specific medical applications.

- **Increased Expression Yields:** Our proprietary bacterial system achieves 300% higher output than competitors. Optimized gene expression, protein folding, and purification ensure consistent quality at industrial scale.

- **Bioconjugated Coating:** We enhance silk functionality with coatings that enable drug delivery, superhydrophobic surfaces, and application-specific modifications.

Together, these breakthroughs turn spider silk from a biological curiosity into a platform technology for the next generation of medical devices.

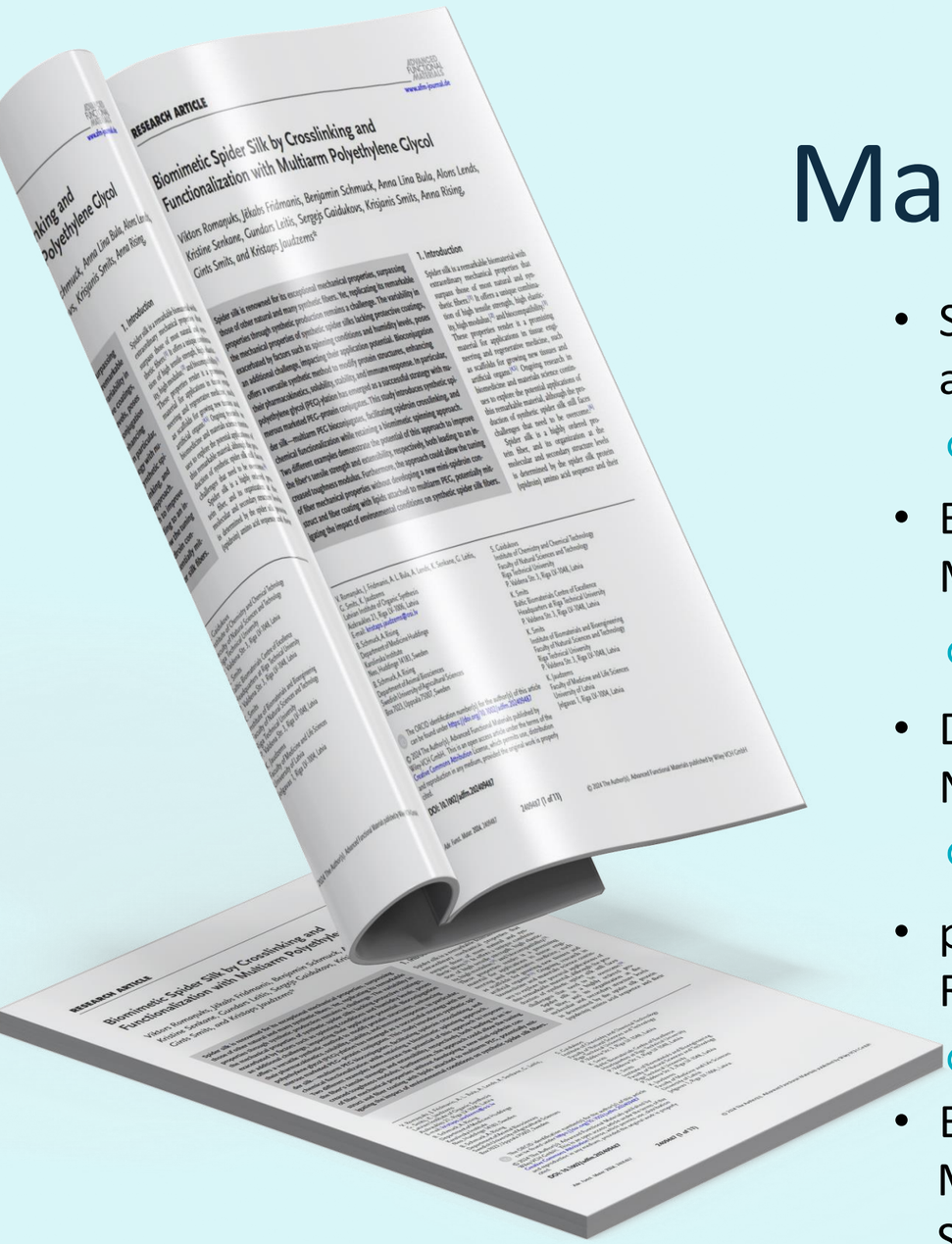
Intellectual Property

Obtaining artificial spider silk by using biomimetic production way, using as a solvent only water

Specific modification technology that allows us to modify our spider silk specifically for the needed cell type

EU, US, JP, CH, AU, KOR

Most significant achievement in Latvian science 2024



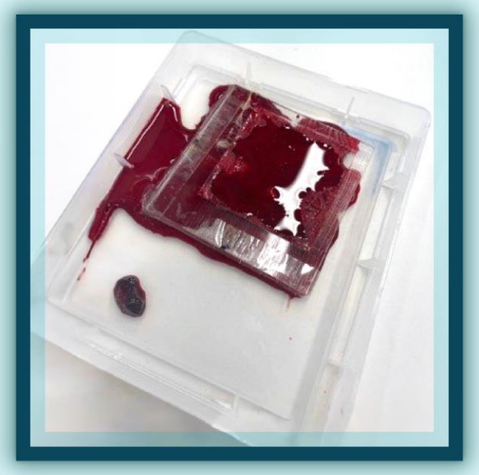
Main publications

- Spidroin N-terminal domain forms amyloid-like fibril-based hydrogels and provides a protein immobilization platform
  Link to publication
- Biomimetic Spider Silk by Crosslinking and Functionalization with Multiarm Polyethylene Glycol
  Link to publication
- Degree of Biomimicry of Artificial Spider Silk Spinning Assessed by NMR Spectroscopy
  Link to publication
- pH-Dependent Dimerization of Spider Silk N-Terminal Domain Requires Relocation of a Wedged Tryptophan Side Chain
  Link to publication
- Back Cover: Diversified Structural Basis of a Conserved Molecular Mechanism for pH-Dependent Dimerization in Spider Silk N-Terminal Domains (ChemBioChem 12/2015)
  Link to publication

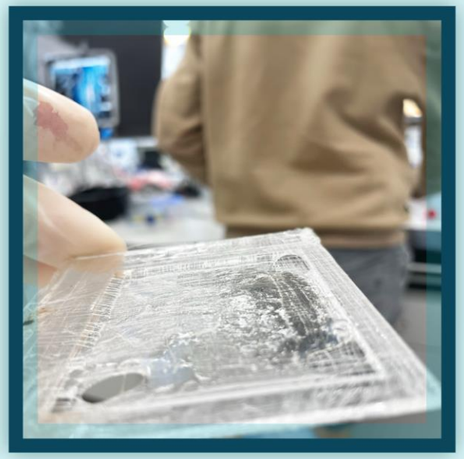
Current Status

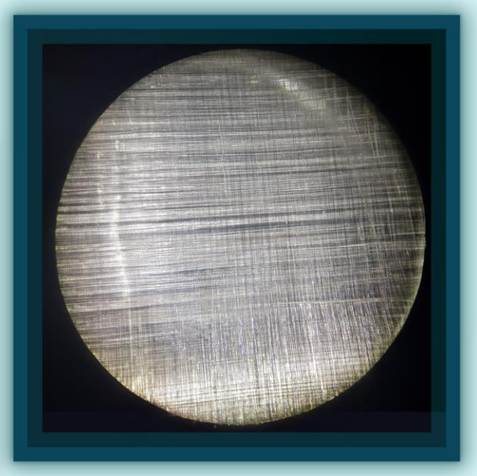
PrintyMed

TRL 3 - Artificial spider silk heart valve

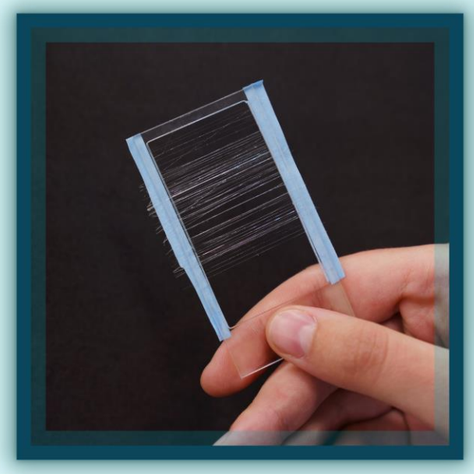


TRL 4 - Artificial spider silk membrane for OoC technology





TRL 5 - Artificial spider silk production



Why Now – Global & Saudi Arabia

PrintyMed

Regenerative medicine is a growing market worldwide, valued at over $40 billion. Hospitals are increasingly seeking safer and more sustainable materials.

In Saudi Arabia, the timing for advancements in this field is particularly opportune:

- **The National Biotechnology Strategy (2024)** aims for a $26 billion biotechnology market by 2030.
- **The healthcare sector** is projected to reach a $38 billion market, with the private sector's share increasing to 65%.
- **Vision 2030** includes a goal of achieving 40% local production in biotechnology and pharmaceuticals.
- **Capital and support** for this initiative are backed by the Public Investment Fund (PIF), STV, SVC, Wa’ed, and various family offices.

Additionally, Saudi Arabia serves as the GCC hub, providing access to a market of over 100 million people.

Competitive Landscape

Companies	Technology	Process	Key Features	Limitations
AmSilk, Spiber, Bolt Threads	Organic Solvents Technology	Uses ethanol in production	Strong, elastic fibers	Limited production scale
Kraig Biocraft Laboratories	Silkworm Production	Uses animal sources	Traditional approach	Inconsistent parameters, not suitable for medical use
PrintyMed	Biomimetic Production	Water-based + bioconjugation	Tunable properties, medical-grade quality	None

Competitive Advantages

PrintyMed

- **Medical-First Focus:** Unlike competitors who chase trends in fashion, textiles, or cosmetics, we are committed to revolutionizing healthcare from the very beginning.

- **Unmatched Yields:** Our proprietary bacterial platform delivers an incredible 300% increase in silk production, setting a new standard in the industry.

- **Scalable Roadmap:** We are moving forward confidently, expanding from an initial 200-liter pilot phase to an impressive 20,000-liter industrial capacity.

- **Strong Intellectual Property:** With five patents filed, we protect our innovative production methods and medical applications, ensuring our competitive edge.

- **Saudi Advantage:** Our initiatives align perfectly with Vision 2030, enabling us to leverage government incentives and collaborate with world-class partners like KAUST and KACST, positioning us for unparalleled success.

Building in Saudi Arabia

PrintyMed

When we move to Saudi Arabia, we're not just opening a lab, we're planting the seeds of a new global industry.

- **In the first two years**, we will establish our lab at KACST, launch 200L pilot bioreactors, and hire local scientists and engineers to create the Kingdom's first homegrown spider silk prototypes, including sutures and wound dressings for patients.

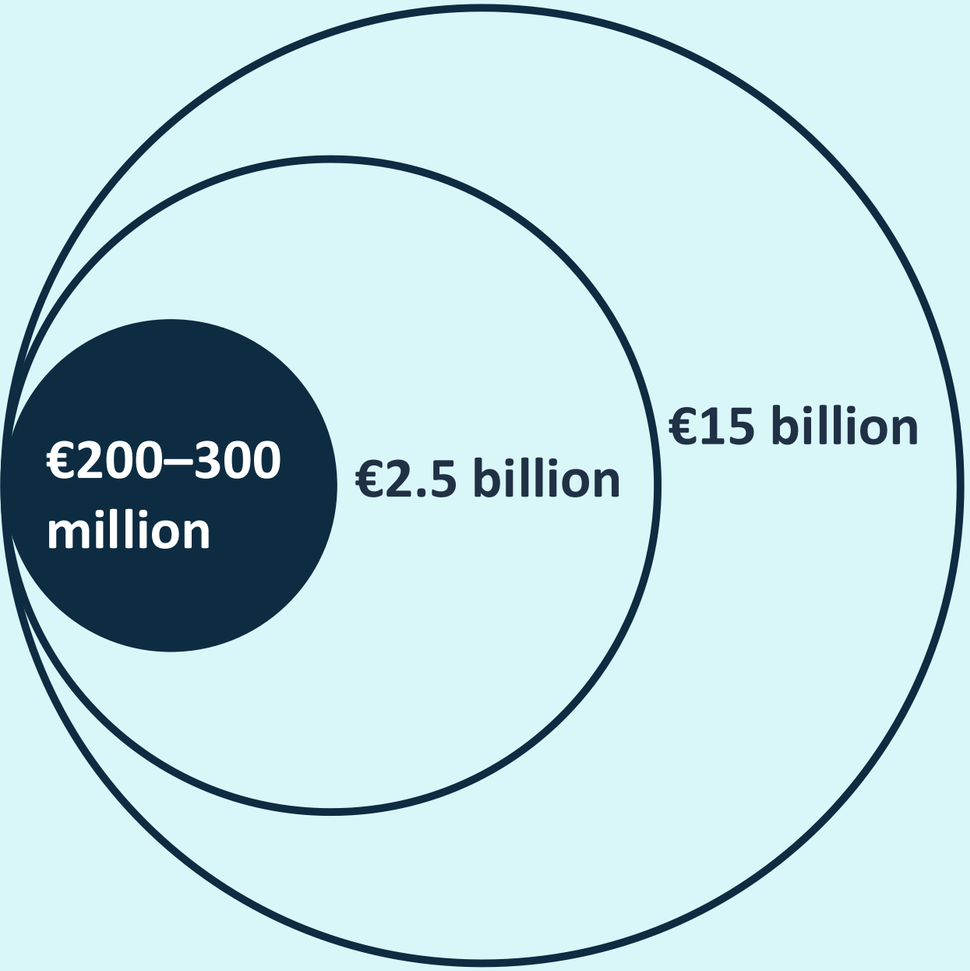
- **By years three and four**, our first 1,000L facility will be operational. We will validate our products in leading hospitals, like Dr. Sulaiman Al Habib and Saudi German, while preparing for export across the GCC.

- **From year five onward**, Saudi Arabia will become the global hub for spider silk medicine, with 20,000L facilities supplying advanced biomaterials to Europe, the U.S., and beyond.

PrintyMed isn't just relocating; we're making the Kingdom the epicenter of spider silk medicine worldwide.

Market Opportunity

PrintyMed



Total Addressable Market (TAM): Over **€15 billion** in global medical biomaterials demonstrates a vast landscape for growth.

Serviceable Available Market (SAM): An impressive **€2.5 billion**, focusing on critical segments such as sutures, wound care, and dental membranes.

Serviceable Obtainable Market (SOM): Targeting an initial market of **€200–300 million** in the high-potential regions of the GCC and EU.

Compound Annual Growth Rate (CAGR): With a robust growth rate of **15–20%**, we are positioned to capitalize on expanding opportunities.

KSA Medical Devices Market: Projected to surge to **$3 billion** by 2030, signaling tremendous potential in this burgeoning sector.

Business Model – Material Sales

PrintyMed

Phase 1: R&D Partnerships and B2B (1-2 years)

Premium spider silk biomaterials (€700–900/g initially, €300–600/g at scale)

Gross margin: 60-75%

Focus: validation, performance data, early co-development

Phase 2: Medical Materials (3-4 years)

Mid-range price (€500-800/g), medium volume

Gross margin: 80-93%

Phase 3: Implant-Grade Materials (5+ years)

Lower price (€300-600/g), high volume

Production cost optimized

Gross margin: 90-98%

Finished Devices:
Sutures, grafts, scaffolds (€200–5,000 per procedure).

Licensing & Co-Development:
With global medtech OEMs.

Go-to-Market Strategy

PrintyMed

Initial Focus

Target academic researchers, medical device R&D teams, and specialty surgical product firms.

- Establish 3-5 key partnerships
- Focus on clear regulatory pathways
- Build scientific credibility

Market Expansion

Secure CE Mark/FDA clearances and expand to major device OEMs and dental companies.

- Develop a direct sales force
- Create distribution partnerships
- Enter Saudi Arabia/MENA region

Long-Term Growth

Expand to hospitals, pharmaceutical companies, and sports medicine markets

- Establish global presence
- Develop a full product portfolio
- Prepare for IPO/exit

Partners and customers

PrintyMed

Europe

- Chanel – cosmetics
- Nanordica – wound dressings
- Akita by Finnadvance – OoC solutions
- Cellbox Labs - OoC solutions
- Alternative Plants – cosmetics
- PsyLink – spider silk production scaling
- Latvian Institute of Organic Synthesis
- Latvian Biomedical Research and Study centre

Saudi Arabia

- KACST – spider silk production
- KAIMRC – wound dressing & tissue regeneration
- Alfaisal University – OoC solutions
- KFSHRC - bioprinting

Product Roadmap

PrintyMed

Phase 1 (Years 1-2)

Material for medical research and possible cosmetic industry

Phase 2 (Years 3-4)

Surgical mesh, dental membranes, advanced wound-care

Phase 3 (Years 5+)

Implantable devices, vascular grafts, drug-delivery systems, tissue engineering

Founding team

Jekaterina Romanova
CEO

10+ years in med-tech start-ups, economist, EU funding expert.

Dr. Sandra Treide
CMO

Medical expert, 2 successfully commercialized medical technologies.

Prof. Kristaps Jaudzems
CSO

Dean of the University, Artificial spider silk researcher for 10+ years, Author of the technology.

Prof. Gints Smits
CTO

Head of the Laboratory, Artificial spider silk researcher for 7+ years.

PhD Viktors Romanuks
COO

Scientist, Artificial spider silk researcher for 5+ years.

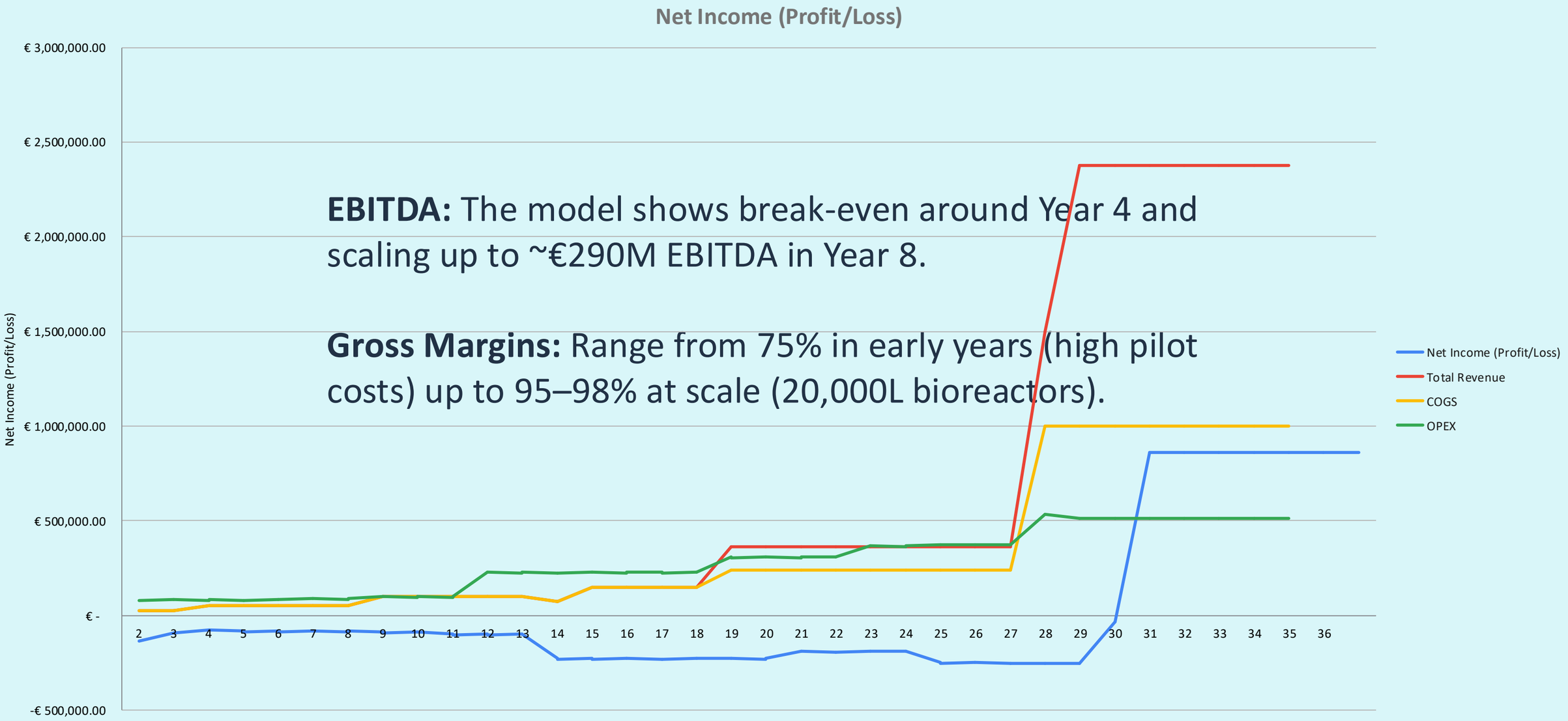
Financial Projections 1/2

PrintyMed

Revenues: The model projects growth from ~€0.5M in Year 1 to €580M in Year 8.

Financial Projections 2/2

PrintyMed



EBITDA: The model shows break-even around Year 4 and scaling up to ~€290M EBITDA in Year 8.

Gross Margins: Range from 75% in early years (high pilot costs) up to 95–98% at scale (20,000L bioreactors).

The Ask – Seed Round

PrintyMed

€1.2M Seed at ~€4.5M pre-money

Use of Funds:

- 40%: KSA lab setup + 200L pilot.
- 20%: Regulatory (SFDA, FDA/CE preclinical).
- 15%: Team expansion (Saudi scientists & engineers).
- 10%: Prototypes (sutures, wound care).
- 10%: Business development & partnerships in GCC.
- 5%: Contingency & IP.

Comparables

PrintyMed

While peers in fashion and textiles command hundreds of millions, PrintyMed is the only medical-first spider silk company — offering investors a rare early entry at just €4.5–6M pre-money with massive upside.

Company	Focus	Valuation	Stage	Notes
AMSilk	Industrial silk	$200–400M	Series C	Non-medical focus
Bolt Threads	Fashion/cosmetics	$500M+	Growth	Weak medical angle
Spiber	Apparel	$1B+	Growth	No medical
PrintyMed	Medical spider silk	€4.5–6M pre	Seed	First medical-only player

Our valuation is fair for entry, with first-mover medical upside.

Investor Upside & Equity Growth – From Seed to Billion-Dollar Potential

PrintyMed

Competitor Benchmarking (Valuation Progression):

AMSilk – Focus on industrial silk

- Seed valuation ~€10M, Series C valuation €200–400M, Raised >€100M to date, Early investors likely looking at 5–8×.

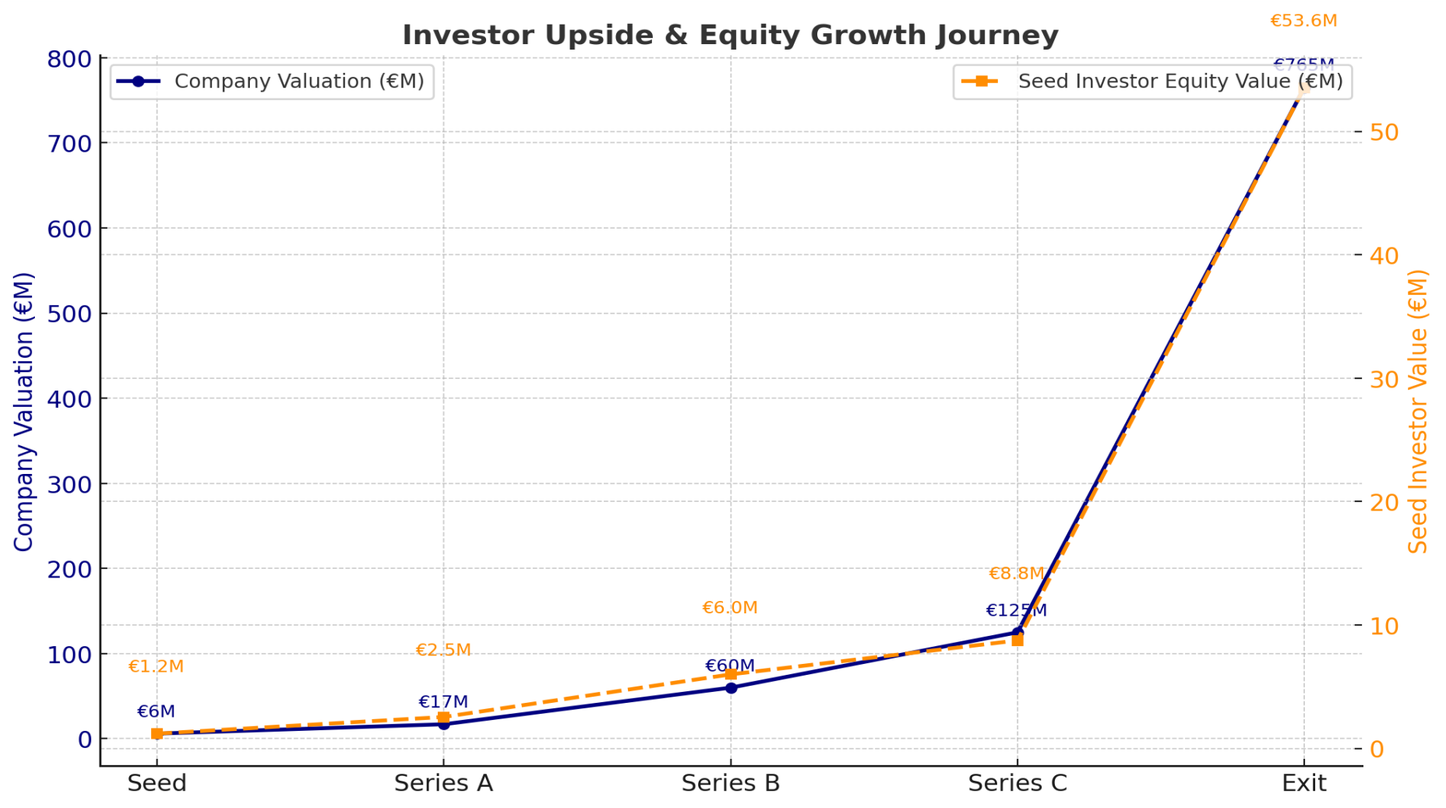
Bolt Threads – Fashion & cosmetics focus

- Raised >$300M, Valuation peaked >$500M, No medical device applications. Investors may only see 1–3× if no medical pivot.

Spiber – Apparel/textiles

- Valuation >$1B, Raised >$500M, Top-tier investors may hit 10–12×.

All raised bigger rounds in less regulated, lower-margin sectors.



PrintyMed plans to raise approximately €112 million over eight years to scale from pilot production in Saudi Arabia to global facilities with a capacity of 20,000 liters. The goal is to achieve an exit valuation between €765 million and €1.5 billion or more, potentially offering early investors returns of up to 18 times their investment.

Reserve your seat

www.printymed.com

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