



SPARThA
MEDICAL

The active interfaces

Multifunctional Biopolymer-based formulations for
Nosocomial Infection Prevention and Product
Performance Improvement

Safe and sustainable Biopolymer Interfaces



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General introduction

Overview of Spartha Medical's history and activities

Spartha Medical was **created in 2019**, following the discovery of the self-assembling and antibacterial properties of different polyions in the French National Institute for Health and Medical Research (Inserm). We were **laureate of the EIC Accelerator program** in 2021.

We are a **European company** located in France specialising in the **conception, production, and commercialisation of innovative multifunctional solutions** with **life-improving features (infection prevention, pro-regenerative properties)**.

We have three main axis of development:

protect | ION

Our range of products for the medical sector

spartha | SHIELD & spartha | SHIELD+

Our testing services & co-development offers

ION/aspis

Our range of non-medical products

Innovations based on scientific know-how and *in silico* modelling

Biopolymer catalogue (Polyions)

Different characteristics, properties and interactions discovered after 20+ years of research

Artificial Intelligence

In-house AI modelling for new solutions tailored to the expected outcome

Innovative active interfaces

Assembly of two or more components for a personalised solution to meet our customers' needs as closely as possible, while respecting regulatory and sustainable practices

Our global traction

Financial support at Regional, National and European level

€360K

Gross revenues in 2023



€800K

Projected Gross revenues in 2024



European Innovation Council



EIC supports Spartha for its SPARTHACUS project

€2.5M

Laureate of the European Innovation Council (EIC) Accelerator program



€250K

Laureate of the French Public Bank of Investment i-Lab 2019

Other key metrics

17 paying clients from 5 countries (6 multinationals)

1 signed licence agreement

1 sponsored pre-clinical trial with a multinational

1 public-supported clinical trial in facial reconstruction in dogs and humans

protect | ION

Medtech Clients (Antimicrobial Treatment of Products)



Non-Medtech Clients (Contamination Control)



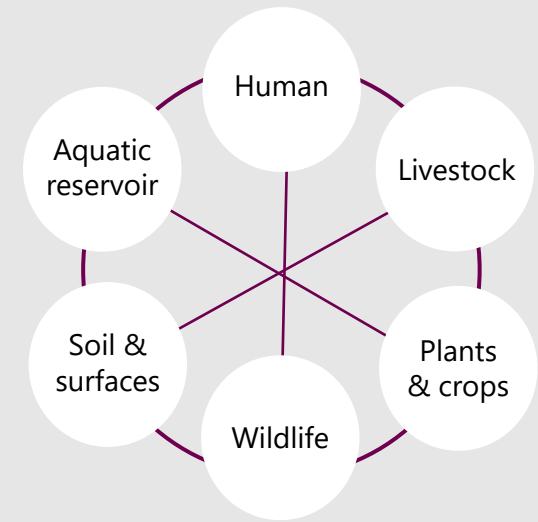
The global burden of infections across all sectors

A One-Health approach for an intertwined problem

An infection is the development of pathogenic germs (**bacteria, viruses, fungi or parasites**) in a living organism.

The environment (**animals, plants, water, inert surfaces**) plays a crucial role in transmitting those microorganisms, and human activities also impact this environment.

To tackle the infection problem, a holistic approach is necessary, with **new solutions and products that are safe to both human and the environment.**



This interconnection also promotes **the development of antimicrobial resistance (AMR) globally**, mainly through **the misuse and overuse of antimicrobials** to treat, prevent or control infections in humans, animals and plants. The World Health Organisation (WHO) defined AMR as a major concern for the future.

10M projected deaths by 2050

€920B additional healthcare costs by 2050

Sectors specificities

Healthcare-associated infections (HAIs)

sources: WHO, CDC

7-10% global prevalence

millions of deaths and **tens of billions of euros** to healthcare systems each year

Sources of contamination: catheter-associated urinary tracts, surgical sites, ventilator-associated pneumonia and central line-associated bloodstream

Foodborne infections

sources: WHO, World Bank

420,000 deaths annually

€50B annually to the food industry in the U.S.

Sources of contamination: raw materials, processing, handling, storage and distribution

Consumer

Surface infections

sources: WHO, CDC

€87B annually because of seasonal flu alone

millions of euros for consumer goods producers

Sources of contamination: door handles, public transportation, bank machines, elevator buttons, consumer electronics (phones, keyboards), shopping carts, home settings, kitchen, toilets and personal care products

Technologies

Innovative active interfaces for surface optimisation

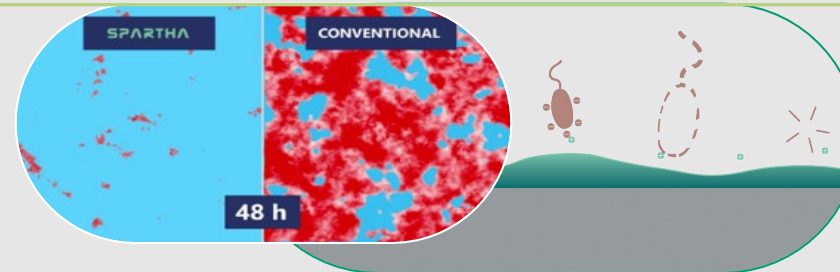
Spartha Medical specialises in **innovative thin interfaces**. Our technology uses supramolecular chemistry to create customised formulations, based on self-assembling multilayers of biopolymers. Those technologies can be formulated as **water-based solutions, coatings or hydrogels**.

The use of **biopolymers makes our technologies biocompatible and biodegradable**, following the European Union's **Safe-and-Sustainable-by-Design (SSbD)** framework for materials and chemicals.

Our interfaces, at the junction between a surface and its environment, **offer new life-improving features to the material** it is applied to.

Pathogen protection features

Our technology can be applied to **living tissue or inert materials**, regardless of the surfaces' geometry, and offers **a protection from bacteria** with a **contact-killing mechanism**, without the development of **bacterial resistance**.



It also offers **antiviral protection**, with the ability to **inactivate viruses** by preventing them from proliferating, and **antifungal protection**, with proven *in vitro* efficacy against *C.albicans*.

Cosmetics features

Our active interfaces can also be used on **skin or hair**.

Once applied to hair, they bring **shine, softness and discipline**, while also helping with **detangling** and **colour retention**.

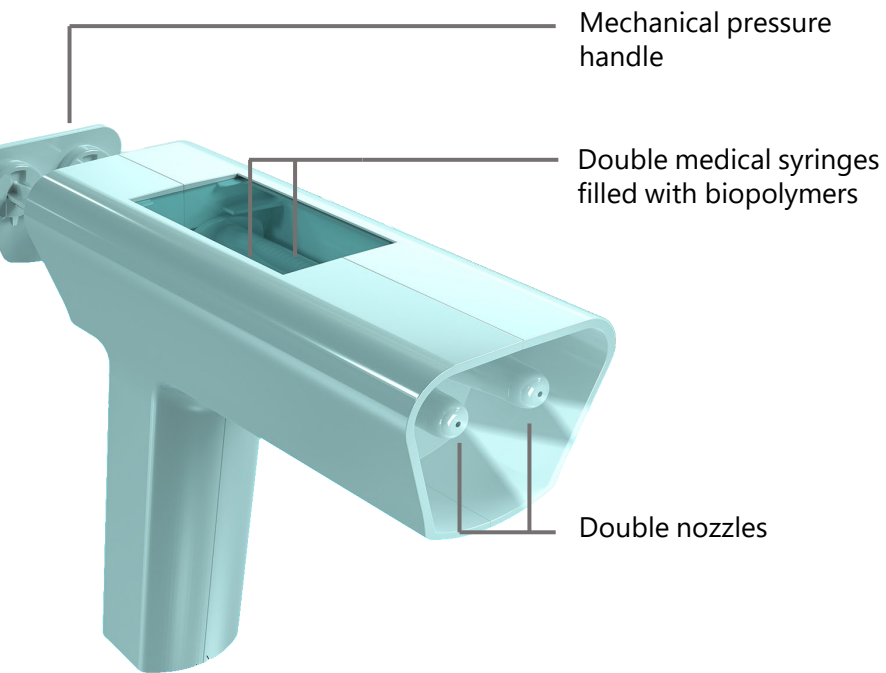
Pro regenerative features

We have formulations with immunomodulatory properties.

Such interfaces can **improve healing** and pain perception of the wounds and can increase the **integration of the medical devices** with the surround tissues

protect | ION

Our product for medical use



Patented handheld spray applicator

Class IIb

Wound protection properties

First application: surgical wounds with high risk of infection

spartha | SHIELD

Our service offer

Spartha provides industrial and academic clients with **its expertise in biomaterials and microbiology** with a **catalogue of standard and tailor-made tests.**

Examples for any products/materials: contamination tests, cytotoxicity tests, biocompatibility with specific cells, antimicrobial tests, antibiofilm tests, customised tests

spartha | SHIELD+

Integration of our technology in client products



licensing contracts
in negotiation



signed
licensing contract



Co-development opportunity

Example: Integration of Spartha's antibacterial technology in a Hartmann's wound dressing product

ION/aspis

Our products for non-medical use

First application: Cosmetics – hair conditioner

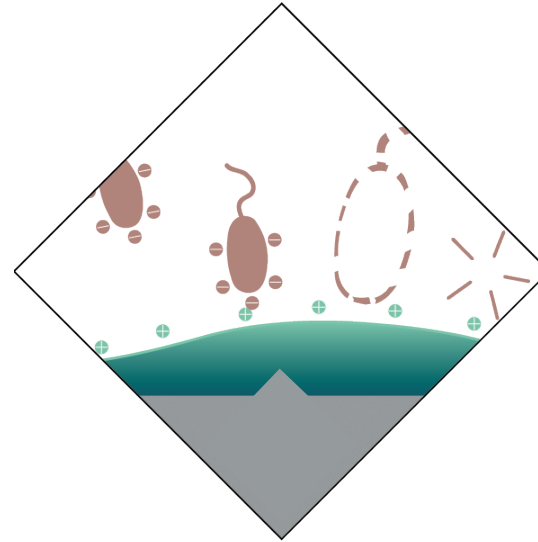
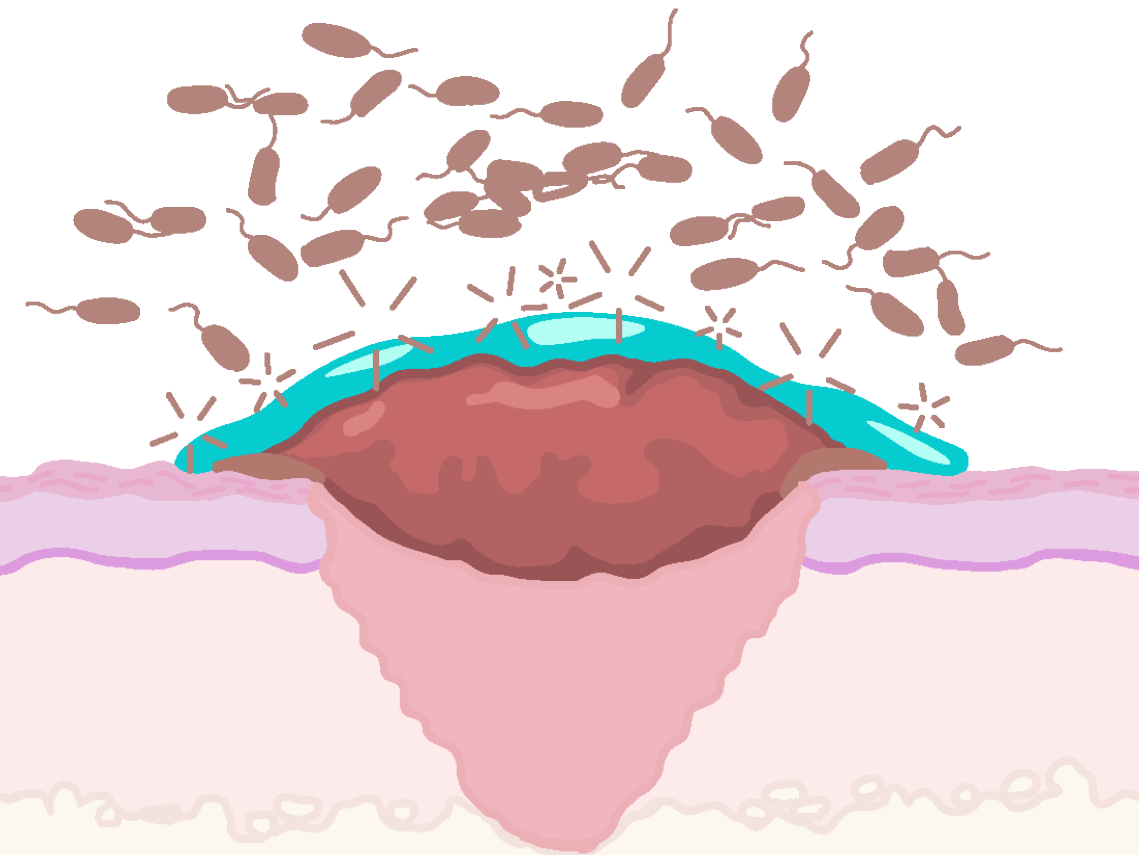
A biopolymer-interface for hair,
to reinforce **radiance and shine**

*Other possible applications in cosmetics: lipsticks,
skin creams, shampoos*



First product: **protect|ION**

The solution: liquid bandage



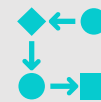
The power of polyions

Nanoscale multilayers of **polypeptides** and **polysaccharides**

Contact-killing mechanism

No bacterial resistance

Key advantages



Easy fabrication



Water-based



Effective against multi-resistant
Gram + and Gram - bacteria



Long time protection
Between bandage changes



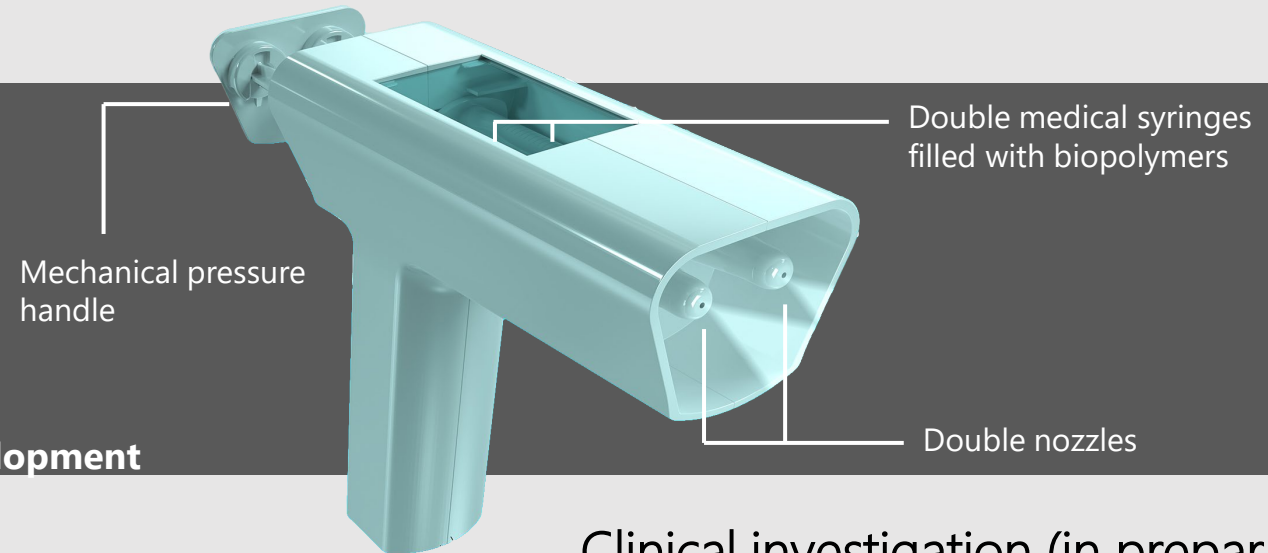
No cytotoxicity
Non-pharmacological action

Patented handheld spray-delivering device Class IIb

Wound protection properties

Self-forming active membranes

A current version for Dental applications is under development



in vitro efficacy

Staphylococcus aureus

- 3.25 log

Pseudomonas aeruginosa

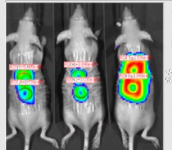
- 5.41 log

Escherichia coli

- 3.63 log

in vivo efficacy

Non-Sprayed

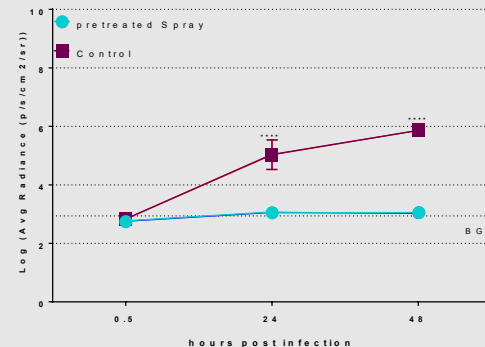


Infection

Sprayed



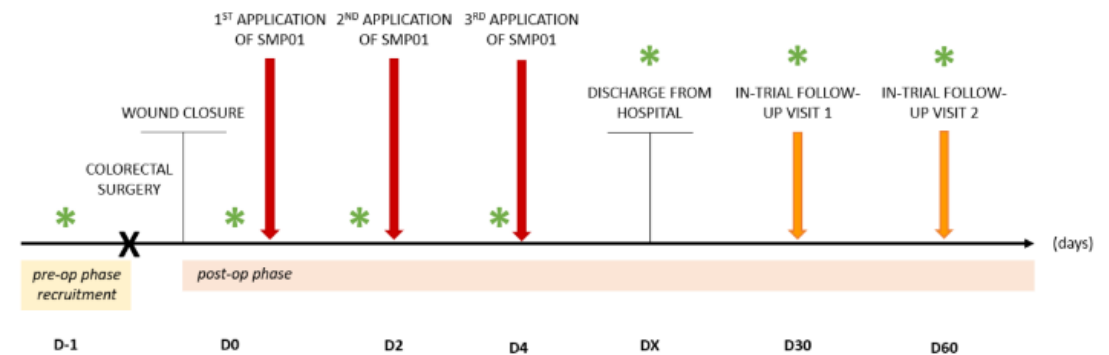
No infection



Spray application also prevents the **development of pain symptoms**

Clinical investigation (in preparation)

Randomized, controlled first-in-human study to evaluate the **efficacy and safety** of protect|ION following primary wound closure in **colorectal surgeries** for the **prevention of surgical site infections (SSIs)**.



Implicated markets

Size, CAGR, and opportunities

The versatility of our technology makes it applicable to various sectors, with opportunities for both co-development with industrial partners and our own products

Market	Size	CAGR
Contract Development and Manufacturing Organizations (CDMO)	€243.3B (2024)	6.4%
Medical devices	€468B (2023)	6.3%
Antimicrobial Medical Device Coatings	€2.1B (2023)	13.7%
Woundcare	€19.6B (2022)	5.9%
Advanced Woundcare	€9.9B (2023)	4.8%
Surgical Site Infection Prevention	€3.9B (2023)	6.8%
Surgical Woundcare	€6.1B (2023)	5.9%
Cosmetics	€344B (2023)	9.8%
Haircare	€82B (2022)	5.8%
Conditioner	€13.6B (2023)	6.2%

Competition

Medical devices & cosmetics Landscape – A niche technology

protect|ION

Prontosan® wound gel

B.Braun Melsungen AG (Germany)

Gel for biofilm prevention used for chronic skin wounds to cleanse and decontaminate the wound bed.

Cavilon™ Advanced – Protecteur cutané

3M Company (USA + European subsidiaries)

Durable, very thin and transparent film to create a protective environment that repels irritants and promotes epidermalization

Askina® Barrier Film

B.Braun Hospicare (Ireland)

Sterile liquid dressing to protect peristomal skin, perilesional skin, or to be used for skin care during incontinence.

Octenilin® Wound Irrigation Solution

Schülke & Mayr GmbH (Germany)

Wound irrigation solution for cleansing and moistening of chronic skin wounds, wound dressings and wound pads.

Hyalo4

Fidia Farmaceutici S.p.A. (Italy)

Hyalo4 is a range of different hyaluronic acid-based products. They help manage each stage of the lesion healing effectively and act as 'healing starters'

spartha|SHIELD

spartha|SHIELD+

Biofilm control

Virhealth

Eurofins

NAMSA

Our advantage lies in our unique technology and ability to offer customized and environmentally-friendly solutions that meet the specific needs of our clients, setting us apart from standard offerings by competitors.

Cosmetics & Haircare Competitors

ION|aspis

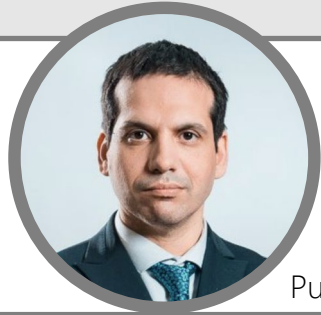
L'Oréal

Kerasoin

Avon

The nature of Spartha's technology as a more natural alternative that is free of toxins can help respond to the general market direction, and the layer-by-layer technology could make it possible to add materials that could help us become even more competitive.

Team & infrastructure



N.E. Vrana (PhD, HDR)
CEO

*Marie Curie Fellow, Post-doctoral training in Harvard-MIT
15 years of experience in medical device sector*

Publications: **150+**

Citations: **6,000+**

H-index: **40**



P. Lavalle (PhD, HDR)
CSO

*Director of INSERM U1121, with 45 members
20+ years of experience in R&D of coatings and medical devices*

Publications: **160+**

Citations: **9,000+**

H-index: **44**

Executive management



T. Mignot
CFO

*9 years as part time CFO for biotech and medtech start-ups
20+ years as financial management for industries and services*



C. Calligaro
Laboratories and Services Manager - MSc

*10 years of experience in Services sector
10+ years of experience in biomaterial laboratories*



P. Matsodoum Nguemte
Key stakeholders Manager - PhD, MBA

*Schlumberger FFTF fellow, Life & Health Sciences, Biotechnology
5 years of experience in Business Development*



B. Letellier
Operations Manager - PhD, MBA

*Health and life science, Neuroscience PhD
7 years of experience in DeepTech*



Scientific and Technical development

Biomedical Research Center (CRBS)

3 offices & 2 laboratories:

- Coating and chemistry laboratory
- Microbiology laboratory
- Access to cell culture laboratory

Valuation and Support functions

eXplora building

2 offices



Planning

2024

protect|ION

Technical folder preparation

Current situation (1st batch)

Projected selling cost **100€**
 89€ in 2027
 85€ in 2028

spartha|SHIELD

spartha|SHIELD+

Feasibility study contracts **10**
 Co-development contracts **1**
 Services revenues (€) **800,000**

 for 1 product;
 more opportunities will be negotiated

Classification by ANSM

(french national agency for the safety of medicines and health products)

Two current development axis

Cosmetic
 Hair conditioner to boost shine and radiance

Sexually Transmitted Infections (STIs) protection
 Antiviral and antibacterial solutions to prevent STIs in oro-genital practices, or intimate caresses.

Clinical investigation
 (protect|ION – in preparation)

Randomized, controlled first-in-human study to evaluate the **efficacy and safety** of protect|ION following primary wound closure in **colorectal surgeries** for the **prevention of surgical site infections (SSIs)**.

2025

Phase I Clinical trials

ISO 13485 certificate & CE mark
 1st commercialisation

Financial projections

Total sales 9,900
 Total sales revenue (€) **990,000**

Feasibility study contracts 12
 Co-development contracts **1**
 Total services revenues (€) **840,000**
 New licenses **1** 
 One-off payments (€) 2,000,000
 Total licence payments (€) **2,300,000**

Inclusion in ECHA
 Biocide Annex

1st commercialisation

2026

Phase II Clinical trials
 (expansion of use cases)

FDA approval

79,000
 7,900,000

15
1
1,200,000

1 
 2,000,000
4,200,000

First revenue

2027

Phase III Clinical trials
 (reimbursement)

Distribution

305,000
 27,150,000

15
1
1,500,000

1
6,100,000

Expansion to American
 and Asian markets
 (authorisations)

2028

Internationalisation

650,000
 55,250,000

15
1
1,800,000

2
18,000,000

Internationalisation

Financial need

Total need

€5.1 M
in equity

Current situation

€1.7M European Investment Bank through EIC program

€1.3M Private VC letter of interest

€0.5-0.8M Private investment platform 3rd investor engaged

€2M Non-dilutive already secured

Missing parts

€1.3-1.6 M
in equity

€2M non-dilutive – preparation of grants (Eurostars, I-NOV)

Use of Equity funds

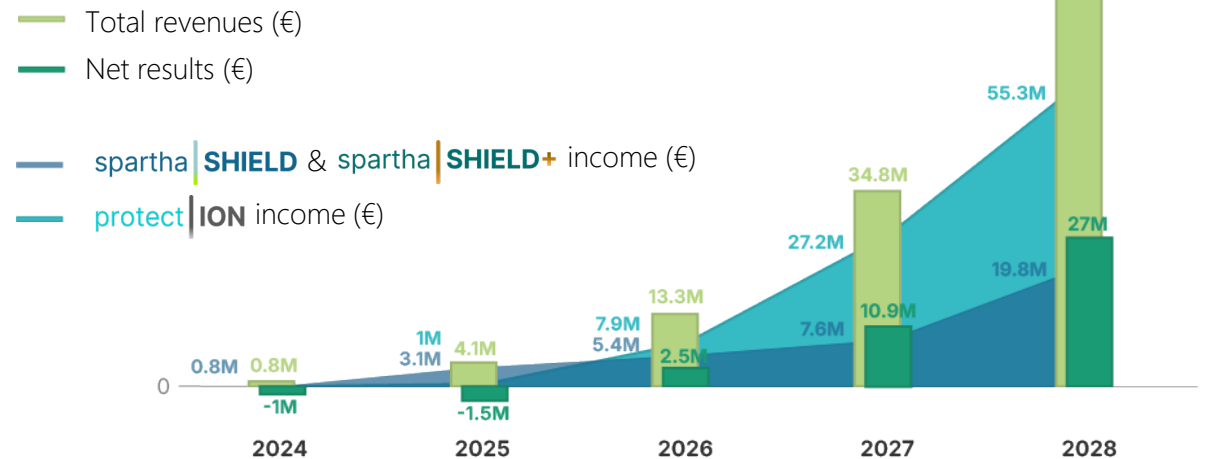
€2M Clinical trials

€1M CE mark & commercialisation

€1.1M Production

€1M Recruitment & infrastructure

Global finance & ROI



Expansion of the Current Activities and Future Outlook

Other sectors with infections' problems

Hospitals



Surgical use

Chronic wounds treatment

Nursing home & other long-term care facilities

Nurses, orderlies, medical auxiliaries



Veterinary



Consumer, home settings

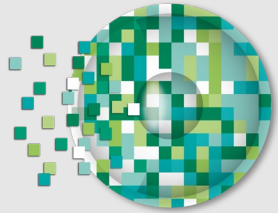


Sexually Transmitted Infections (STIs)

On-site emergencies, paramedics



Food packaging



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the active interfaces

Interested to know more about our technology and our medical product?

sparthamedical.eu

evrana@sparthamedical.eu
contact@sparthamedical.eu

Interested to know more about our services and co-development offer?

sparthashield.com

commercial@sparthamedical.eu