Med-Tech Innovation | CASE STUDY

Encapsulation Technology for Wound Care APIs

Transforming a failed formulation into a successful technology through an innovative encapsulation method, eliminating cytotoxic stabilizers while enhancing cell proliferation and extending shelf-life by 2x.

The Challenge:

Our client had developed a wound care API formulation that achieved excellent physical stability through conventional stabilizer technology. However, preclinical testing revealed a fatal flaw: the stabilizer was killing fibroblast cells, preventing tissue regeneration and rendering the product clinically ineffective, and could not support wound healing in real-world clinical conditions. This challenge created an urgent need for an innovative solution that could salvage years of R&D investment while meeting strict regulatory and manufacturing requirements.

The InSciTe Solution:

We developed a proprietary encapsulation technology and manufacturing process that eliminated the need for toxic stabilizers while simultaneously enhancing formulation stability and therapeutic performance.
This approach transformed the formulation architecture from a conventional emulsion system dependent on toxic surfactants into an advanced encapsulated delivery system with inherent stability. Beyond simply replacing the toxic component, our encapsulation technology demonstrated synergistic effects on cell proliferation.

Technical Approach

Encapsulation System Design

Our proprietary encapsulation technology utilizes a lipid matrix, eliminating cytotoxic chemical stabilizers. The matrix architecture ensures uniform API distribution, controlled release profiles, and protection against oxidative degradation throughout the product's shelf life.

Cell- friendly Chemistry

The encapsulation materials were carefully selected for biocompatibility. Our encapsulation system demonstrated positive synergistic effects on cell proliferation. This cell-friendly chemistry transforms the formulation from a cellular inhibitor into a growth enhancer.

Regulatory & Manufacturing Validation

From the initial phase, we integrated regulatory considerations to ensure the solution would meet regulatory requirements. The manufacturing process was designed for scalability and compatibility with existing infrastructure, ensuring seamless technology transfer.

Key Results

100%	2X	<0.1%	Zero
Cytotoxicity Elimination	Enhanced stability	Enhanced cell proliferation	Regulatory Surprises

Regulatory Advantage

Zero regulatory issues during the review process enabled a smooth transition from development to commercialization.

Manufacturing Ready

Immediate implementation with existing Manufacturing lines using standard materials and scalable processes.

Superior Performance

Enhanced formulation stability, paired with improvement in cell proliferation, delivers superior wound healing performance.

Commercial Impact

This innovative approach rescues years of R&D investment and opens the door to successful market entry. By transforming a failed formulation into a regulatory-compliant, clinically effective product, the technology enables the client to compete in the growing wound care market with a differentiated, high-performance solution.

Partner with InScite Consulting

How is your team addressing antimicrobial durability, leaching, or performance loss in medical device coatings? Contact us or visit www.insciteconsulting.com to explore how we can help you achieve your goals.