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Translating LRP1 Biology into New Therapies for Inflammation and Immunology (I&I) Disorders

- Serpin Pharma has discovered SP16, the active portion of Alpha-1 Antitrypsin (A1AT) that activates LRP1, a master regulator of inflammation.
- The company is developing a pipeline of LRP1 agonists (such as A1AT) with applications across multiple inflammatory conditions and aging diseases.
- SP16 is 300x more potent than endogenous A1AT and can be developed into oral, topical, and injectable forms, providing excellent safety as it's derived from an endogenous protein.

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The SP16 Platform Technology

LRP1 Targeting

LRP1 is a signaling and endocytic receptor critical for maintaining cell health. Our bodies naturally activate LRP1 through A1AT binding to reduce inflammation, but developing A1AT mimetics has been challenging.

Market Validation

A1AT market potential was validated in 2024 when Sanofi acquired InhibRx A1AT asset for $2.2 billion, highlighting the significant commercial opportunity.

Versatile Formulations

SP16 platform can be developed into oral, topical, and injectable forms, offering multiple therapeutic approaches for different conditions.

Serpin is planning to launch three Phase 2 trials with SP16 and is raising up to $20 million in Series A financing to fund the development of oral formulation and multiple Phase 2 trials. To date, the company has secured $16 million in equity capital and $7 million in non-dilutive grants and licensing.

Mechanism of Action

1

LRP1 Activation

SP16 binds to LRP1, activating specific anti-inflammatory and reparative signaling to restore immune balance.

2

Endocytic Function

Clears inflammatory triggers (DAMPS/PAMPS) from the cell environment, providing upstream inflammasome regulation.

3

Cell Signaling

Reduces inflammatory (NFκB) pathways while initiating regenerative tissue repair pathways (Akt/ERK).

4

Immune Balance

Harmful inflammatory mediators are reduced while resolving mediators are increased to help restore cell health.

Unlike other anti-inflammatory approaches, SP16 works without immunosuppression, breaking the continuous cycle of immune activation while promoting tissue and cell repair through key survival pathways.

SP16 Drug Profile

High Potency

Activity shown in STEMI phase trial with ng/ml SP16 in plasma. 300 times stronger than A1AT, providing powerful anti-inflammatory effects at low doses.

Fast Response

SP16 is a short, linear peptide, readily available for LRP1 engagement. Unlike A1AT, which requires binding to a protease and conformational change to expose its binding site.

Prolonged Effects

Signaling triggered by SP16-LRP1 engagement initiates a cascade of reactions leading to prolonged pharmacodynamic effects. Pulsatile delivery is effective without requiring long plasma residency.

SP16 has a mitigated risk profile as a derivative of a natural plasma protein. It demonstrates excellent tolerability with a clean safety profile, with no adverse events in preclinical toxicology studies or clinical trials.

Pipeline and Clinical Development

PROGRAM	MODALITY	FORMAT	INDICATIONS	STAGE
SRP-100	Injectable	Peptides	AKI, AMI, CIPN	Phase 2
SRP-200	Topical/injectable	Peptides	Severe skin disease	Phase 2 ready
SRP-300	Oral	Cyclic analogs	RA, MS, lupus	Preclinical
SRP-400	Cosmetics	Natural protein	Skin care, cosmetics	Licensed

SP16 efficacy and safety have been established across multiple pre-clinical toxicology studies and clinical trials. The company has completed a Phase 1 trial in healthy volunteers and a Phase 2a trial in patients with Acute Myocardial Infarction (AMI), both demonstrating safety and preliminary efficacy.

Key Clinical Programs

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1 Acute Kidney Injury (AKI)

Approximately 30% of patients develop AKI following cardiopulmonary bypass surgery, with rates up to 50% in high-risk patients. Serpin is conducting a randomized, double-blind, placebo-controlled study of SP16 in subjects at risk for AKI following cardiac surgery.

2 Chemotherapy-Induced Peripheral Neuropathy (CIPN)

58-78% of patients receiving chemotherapy develop CIPN, with up to 30% experiencing symptoms for at least 6 months after stopping treatment. There are no approved therapies. SP16 works through three mechanisms: reducing inflammatory mediators, promoting neuronal survival, and providing direct analgesic effects.

3 Acute Myocardial Infarction (AMI)

In a Phase 2a trial, SP16 was safe and well-tolerated, lowered inflammatory markers, preserved heart function at 1-year follow-up, and significantly reduced heart failure compared to placebo.

Commercial Potential and Partnerships

$233.6B

Global Anti-inflammatory Market

Predicted market size by 2032, driven by aging population and increasing prevalence of inflammatory diseases.

$2.2B

A1AT Asset Acquisition

Sanofi's acquisition of InhibRx validates the market potential for A1AT-related therapies.

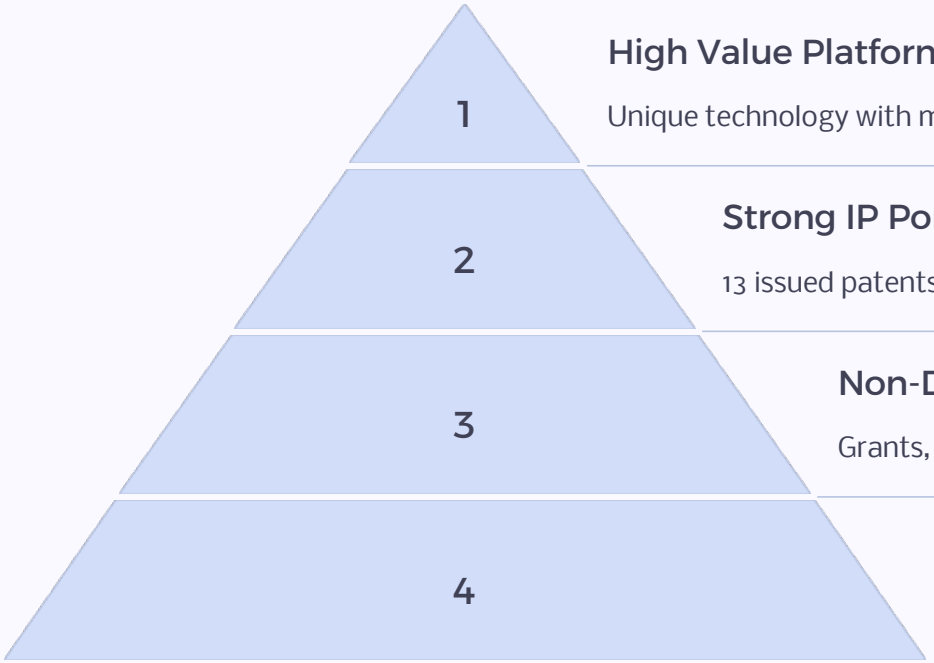
$10-12M

Estee Lauder Partnership

Estimated direct revenues through 2028 from licensing SRP-400 for cosmetics applications.

Serpin has established key partnerships providing external validation and access to non-dilutive capital. Estee Lauder has licensed SRP-400 (Natural SP16) for cosmetics and beauty applications, with potential to license additional peptides from Serpin's 40-peptide library. The company retains all rights to develop SP16 for medical indications.

Investment Opportunity



High Value Platform

Unique technology with mitigated risk

Strong IP Portfolio

13 issued patents across 5 families

Non-Dilutive Capital Access

Grants, licensing, and partnerships

Capital Efficiency

Lean operations maximizing investor return

Serpin is raising up to $20 million in Series A financing to fund the development of oral formulation and multiple Phase 2 trials over a 3-year period. The proceeds will support clinical trials in inflammatory skin disease ($0.8M), AKI ($5M), and CIPN ($5M), as well as development of second-generation SP16 analogs ($1.5M), pre-clinical toxicology studies ($0.5M), drug supply/CMC ($1.2M), intellectual property ($1.2M), and company operating expenses ($4.8M).

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