



DELTTM Vitamin C

Ultra-Bioavailable Dual Encapsulated
Liposomal Vitamin C

Clinically engineered delivery for superior absorption,
stability, and efficacy.



Why Vitamin C Needs Advanced Delivery?

Conventional Vitamin C suffers from low absorption and rapid degradation.

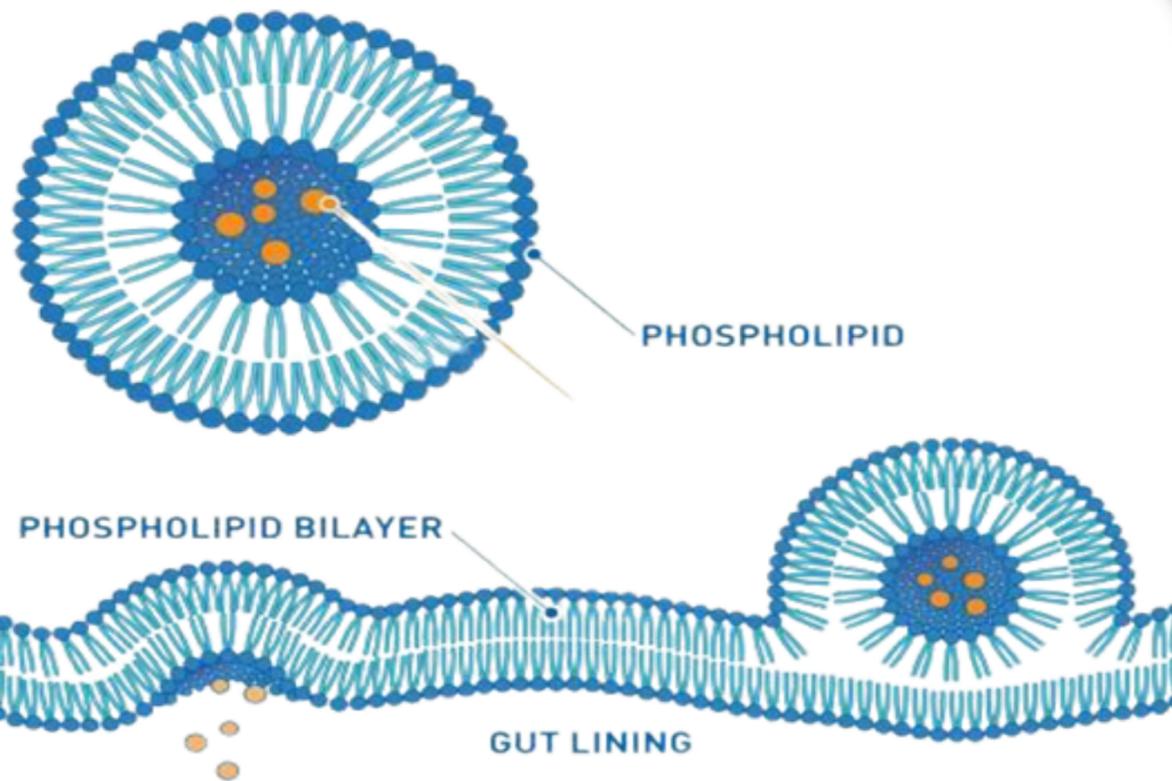
Pain points

- Low oral bioavailability
- Gastric degradation
- High dosage wastage
- GI irritation at high dose
- Liquid liposomes unstable, short shelf life
- Poor consumer compliance

Most Vitamin C products compete on price — not performance



Liposomal Technology



Conventional liposomes

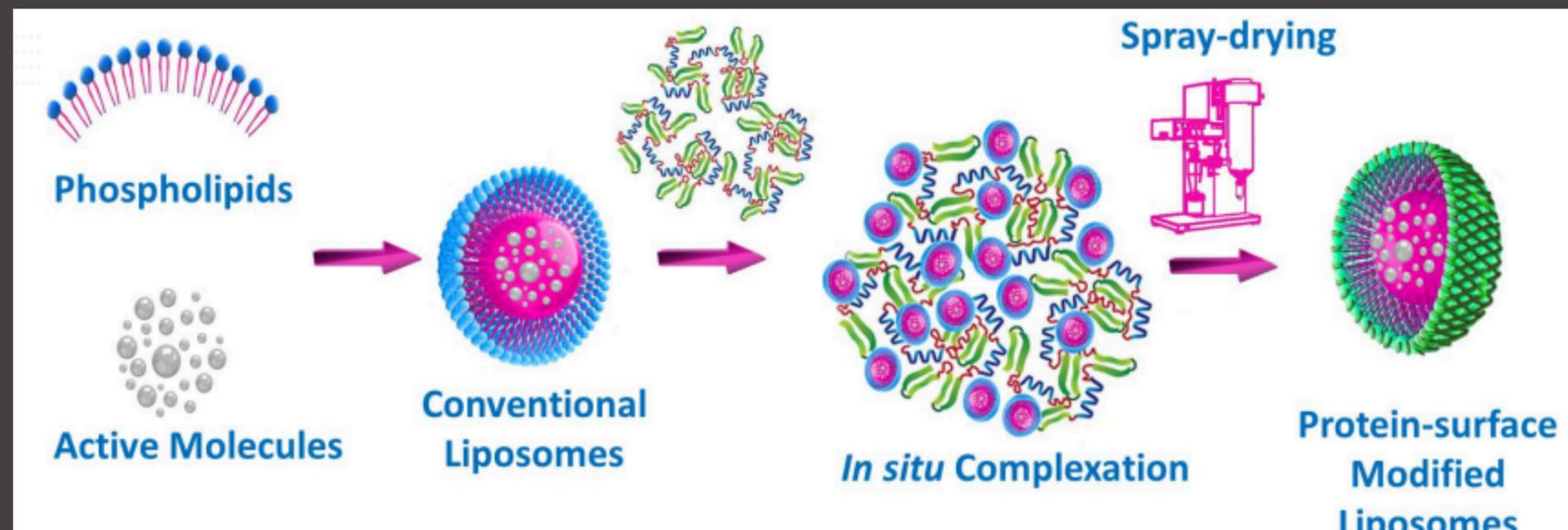
- Physically unstable in liquid formats
- Prone to oxidation, hydrolysis, and leakage
- Aggregation compromises dose consistency
- Limited shelf life and scalability

Liposomal technology

- Nano-carrier improves absorption and delivery
- Enhances solubility, stability, and bioavailability
- Enables controlled GI release and sustained exposure
- Mimics physiological transport mechanisms

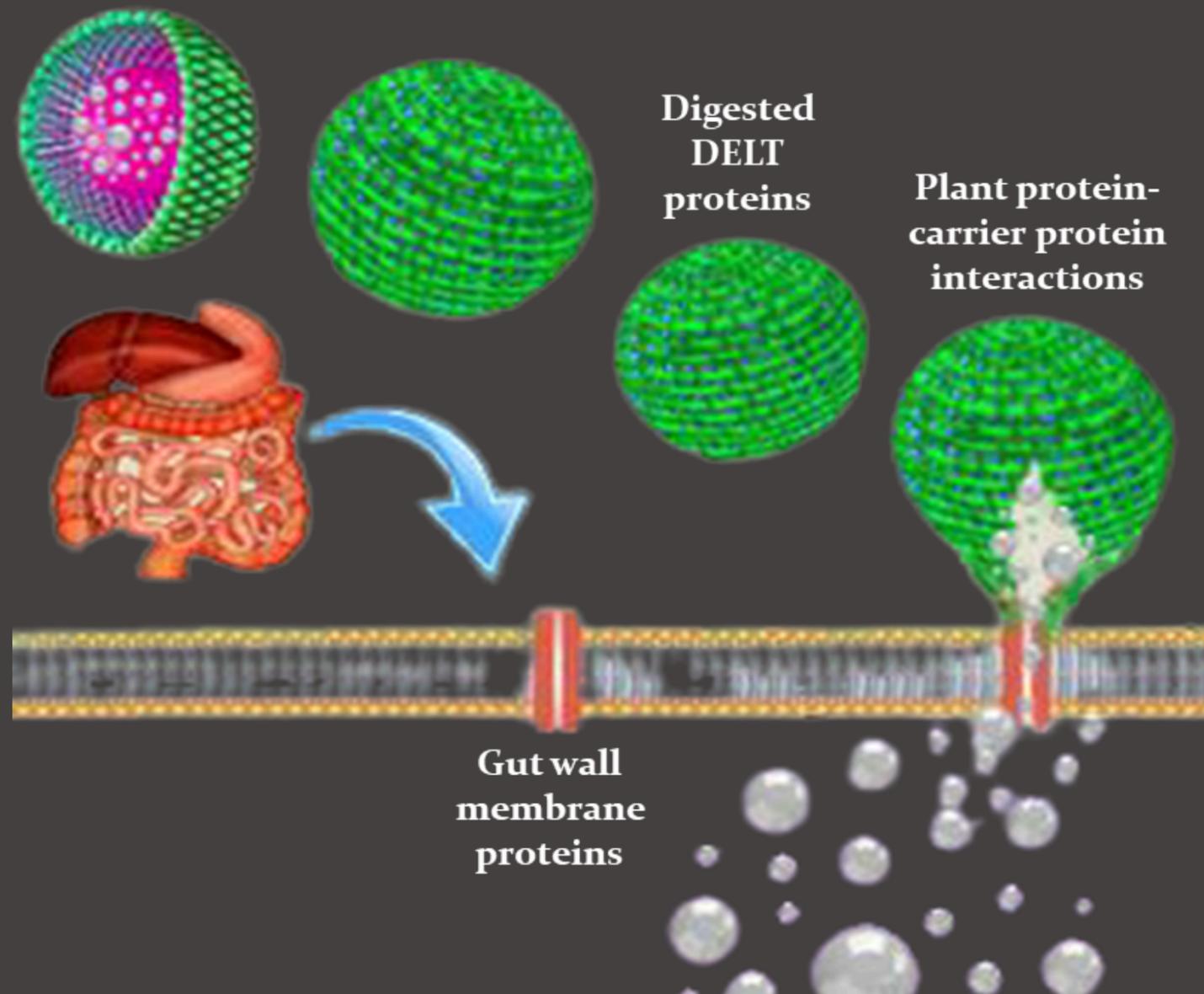
Plant Protein as a Functional Material for Dual Encapsulation of Liposomes

- Protects liposomes from gastric acid degradation and enzymatic stress.
- Enhances surface stability through in situ protein–lecithin ionic complexation.
- Prevents active molecule leakage from the liposomal core.
- Provides additional loading capacity and encapsulation efficiency.
- Improves membrane wettability and permeability for optimized absorption.



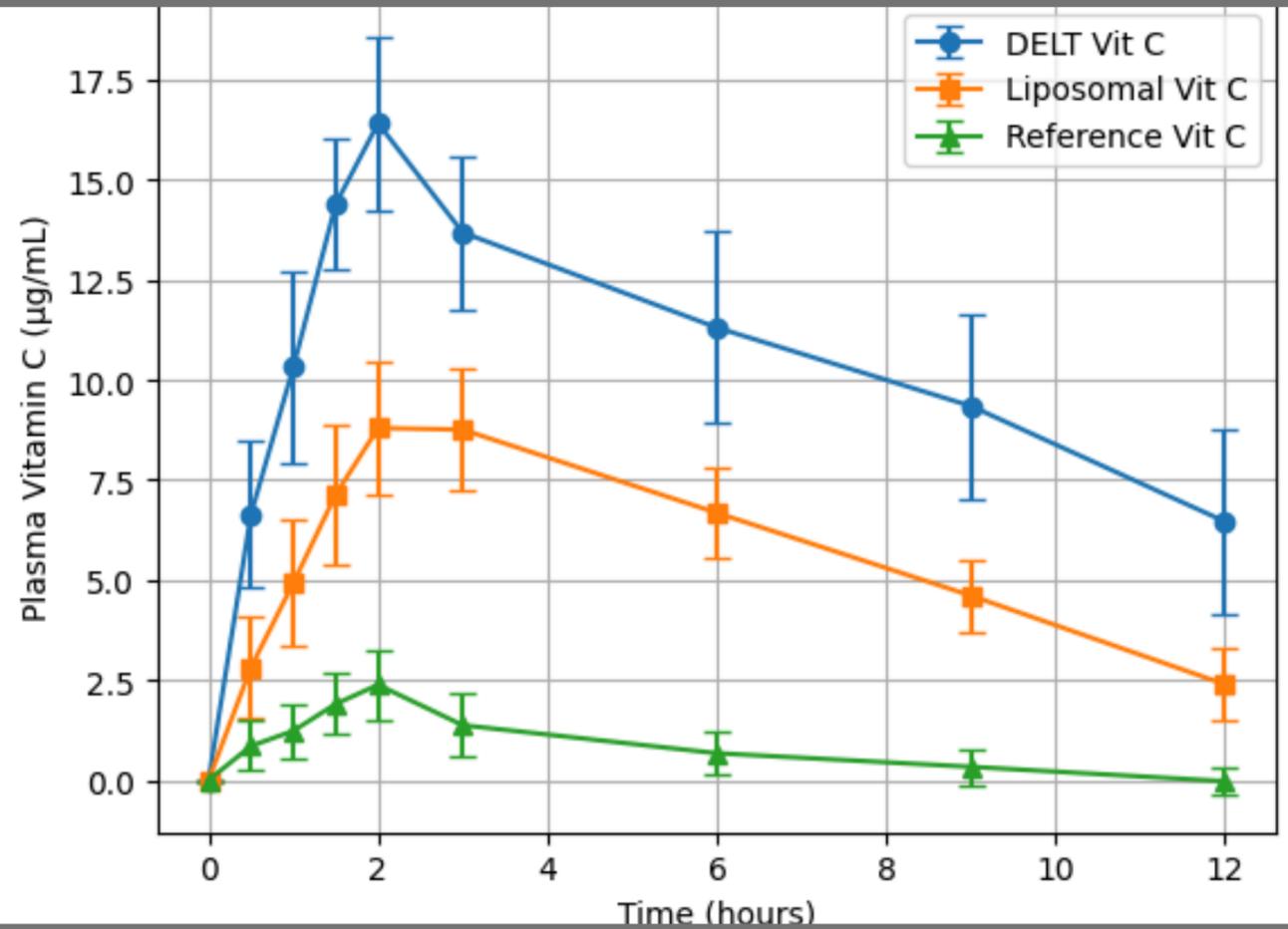


Mode of Action



- The liposomes cross over the gut barrier by two process: Passive transport and active transport (Endocytosis).
- Passive transport occurs from high concentration to low concentration (diffusion).
- Endocytosis: The active transport will enhance by the plant protein-carrier protein interactions

Pharmacokinetic Performance of DELT™ Vitamin C in Human Subjects



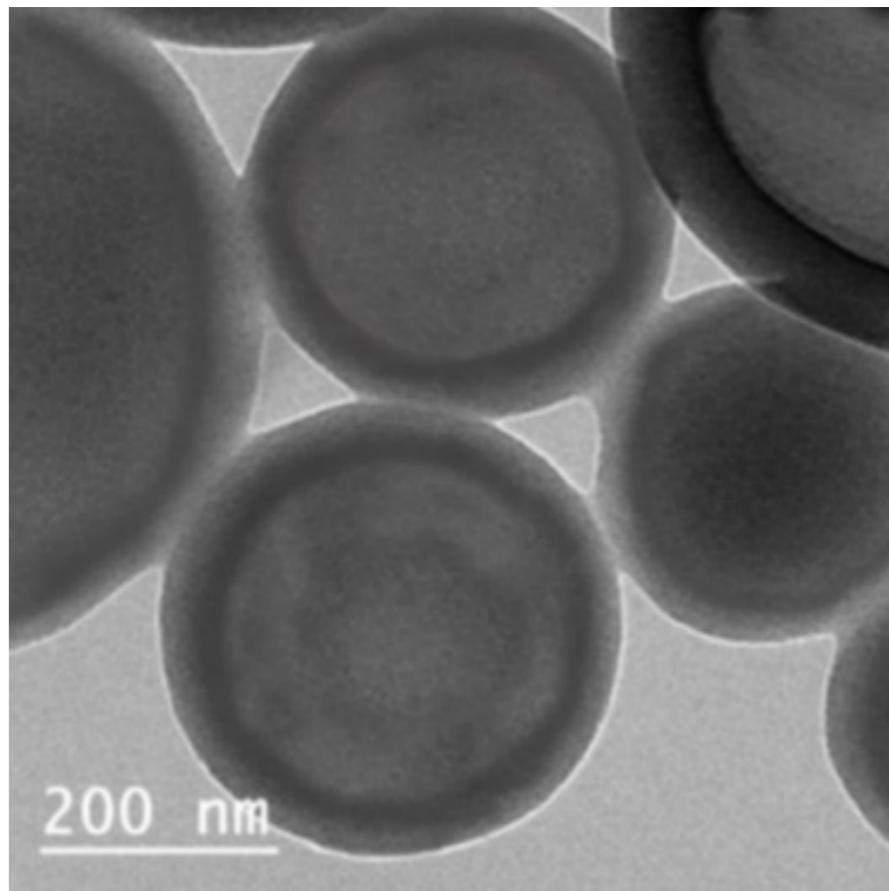
Parameter	DELTA Vitamin C	Liposomal Vitamin C	Reference Vitamin C
AUC _{last} (µg·h/mL)	126.32 ± 19.60	68.11 ± 8.46	11.43 ± 2.60
AUC _{inf} (µg·h/mL)	206.32 ± 62.75	84.99 ± 17.45	12.73 ± 3.77
C _{max} (µg/mL)	16.90 ± 1.90	9.92 ± 1.10	2.62 ± 0.76
T _{max} (hours)	2.00 ± 0.37	2.29 ± 0.54	1.96 ± 0.40
Half-life, t _{1/2} (hours)	8.52 ± 2.34	5.49 ± 1.13	3.70 ± 1.78

DELTA Vitamin C demonstrated ~11.05 fold higher bioavailability, than reference Vitamin C

Scientific Validation DELT™ Vitamin C

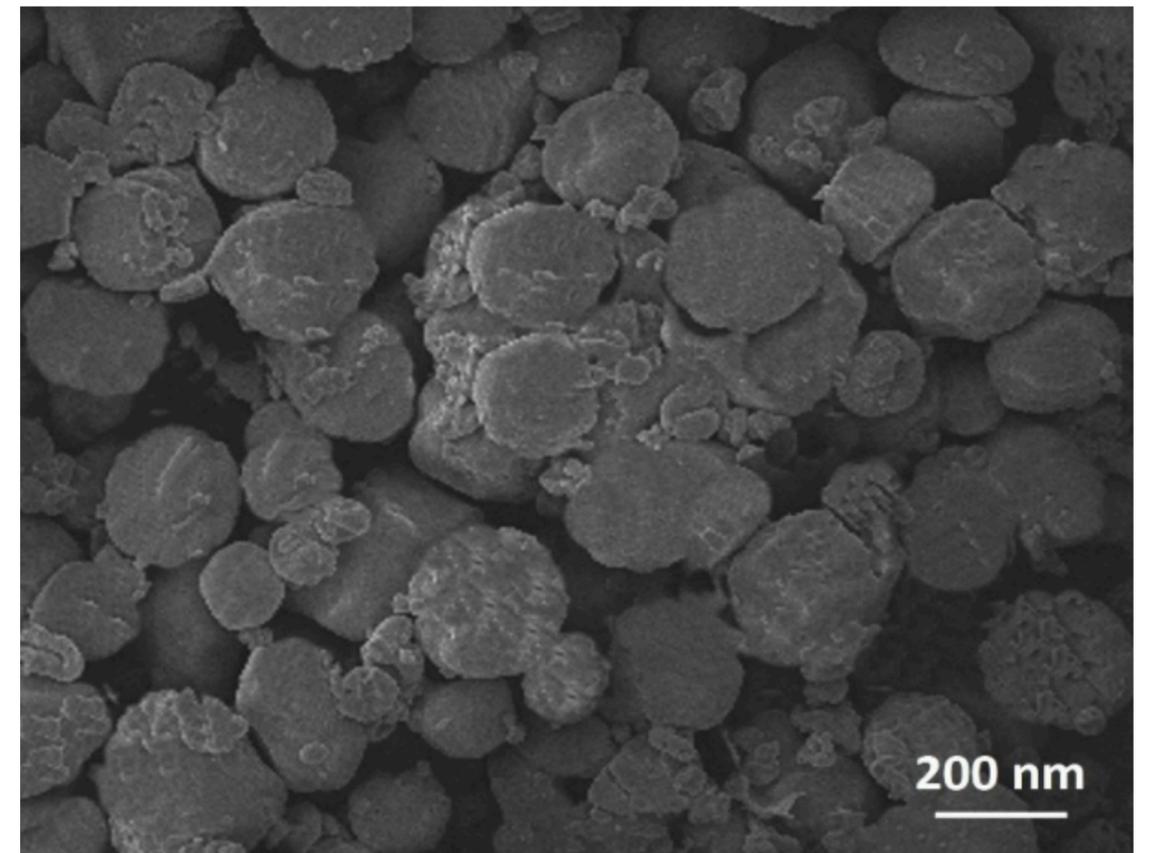
TEM

- Highly oriented, spherical liposomes (~200–300 nm)
- Clear inner core with outer plant-protein layer
- Intact structure confirms dual encapsulation and stability



SEM

- Smooth, spherical surfaces without cracks or aggregation
- Presence of rough outer coating from plant proteins
- Confirms independent, non-agglomerated particles

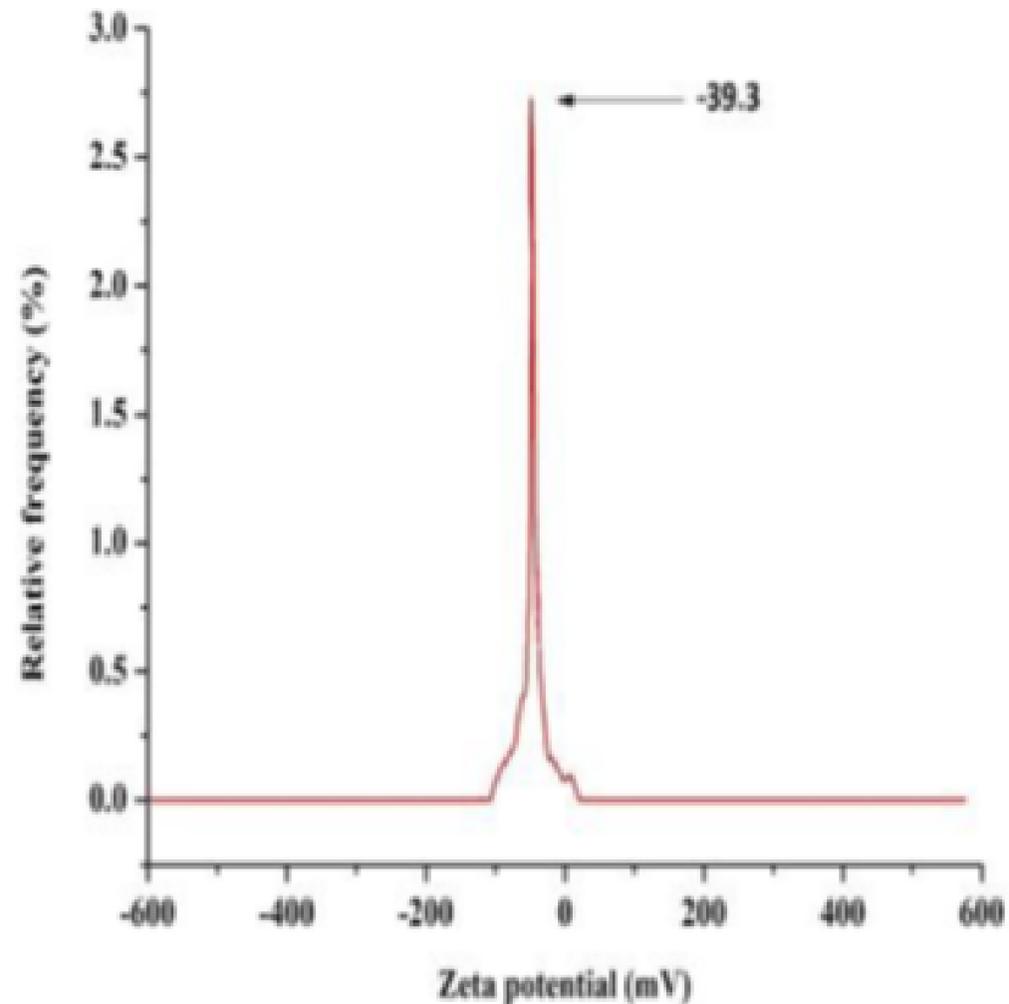


Scientific Validation DELT™ Vitamin C

Surface Charge & Encapsulation Efficiency

Zeta potential: -39.3 mV \rightarrow Excellent stability, prevents flocculation.

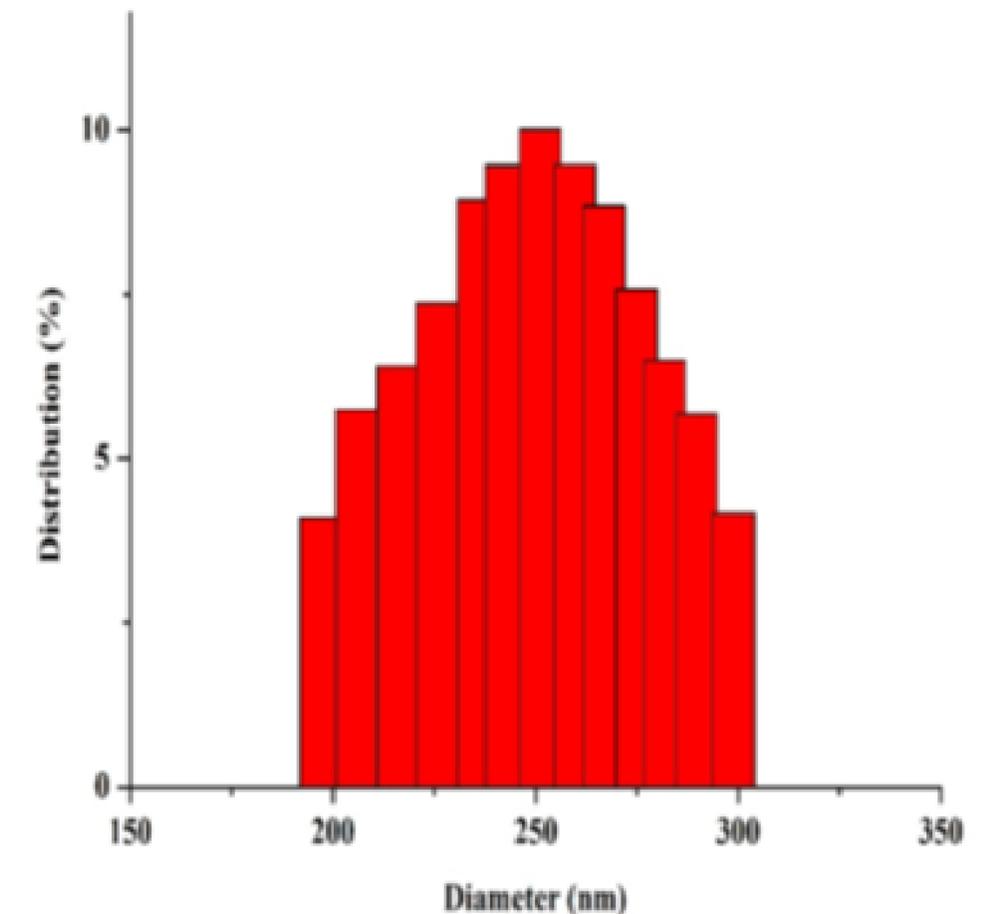
Encapsulation Efficiency (EE): 87.8% confirms effective loading of Vitamin C.



Dynamic Light Scattering

DLS range: 190–305 nm (peak ~ 251 nm) confirms uniform particle distribution.

Indicates strong electrostatic repulsion, compact structure, and enhanced water dispersibility.



Why DELT Vitamin C Wins?

Dimension	Standard Vitamin C	Liposomal	DELT Vitamin C
Absorption	Low	Moderate	High
Stability	Poor	Moderate	High
Dose Efficiency	Poor	Moderate	Excellent
Shelf Life	Medium	Short	Long
Scalability	High	Medium	High
Differentiation	Weak	Medium	Strong

- Clinically validated superior absorption
- Long-term stability in powder form
- Lower dose, higher therapeutic efficiency
- Manufacturing scalability and margin advantage
- Proprietary dual encapsulation differentiation

“DELT™ transforms Vitamin C from a commodity supplement into a clinically differentiated, scalable, premium delivery solution.”

Thank you



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