BiocosMed®-BP

INCI: BIDENS PILOSA EXTRACT

Shanghai Coachchem Technology Co.,Ltd.

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COACHCHEM

CONTENTS

01

PART 01

Background

James E. Rothman

Photo: H. Goren. © HHMI

Randy W. Schekman

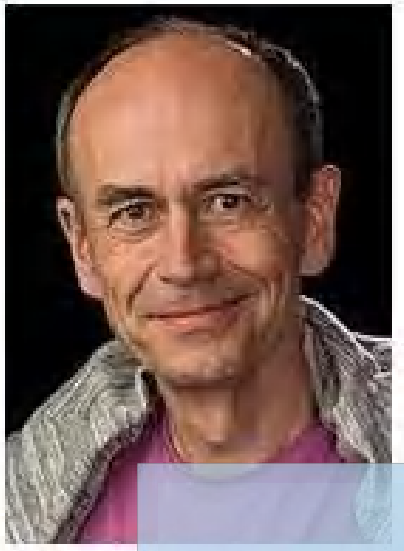
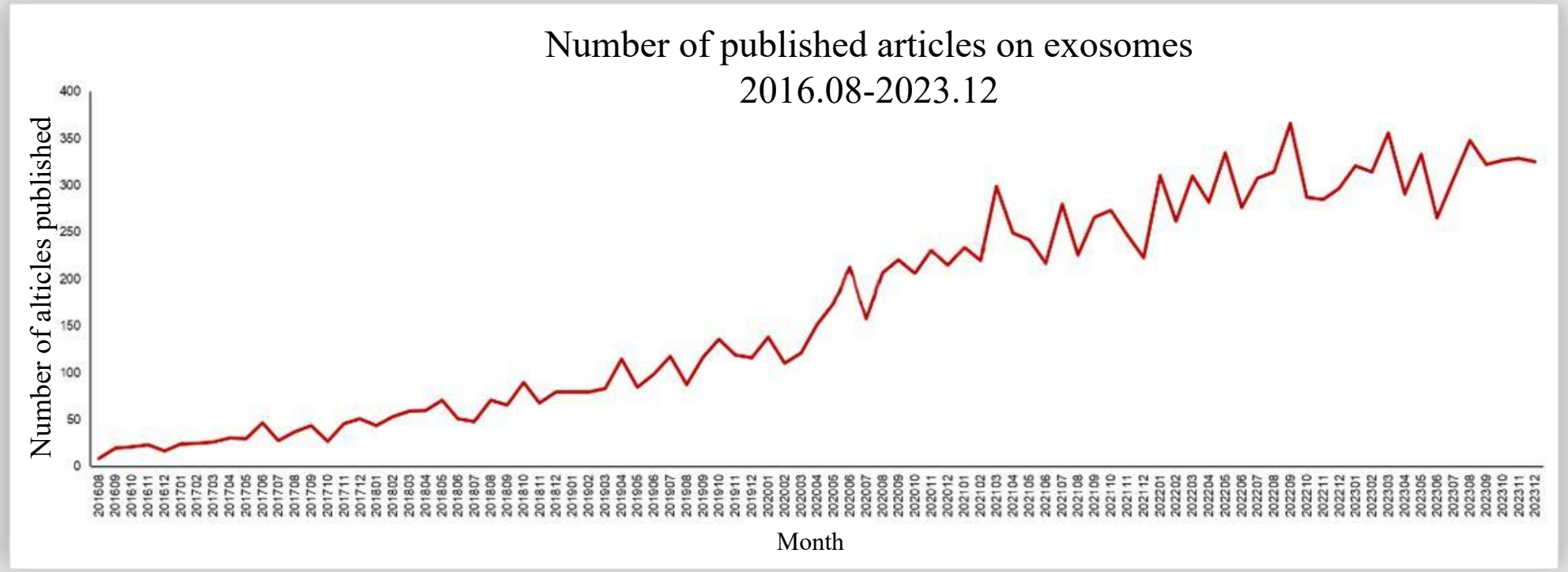


Photo: © S. Fisch

Thomas C. Südhof

The Nobel Prize in Physiology or Medicine 2013


Number of published articles on exosomes
2016.08-2023.12
Number of alticles published
0
50
100
150
200
250
300
350
400
Month

What are exosomes?

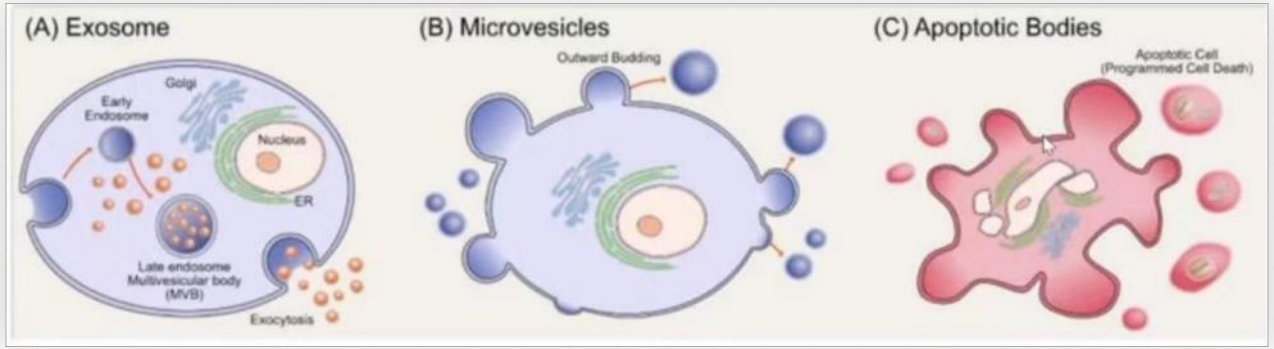
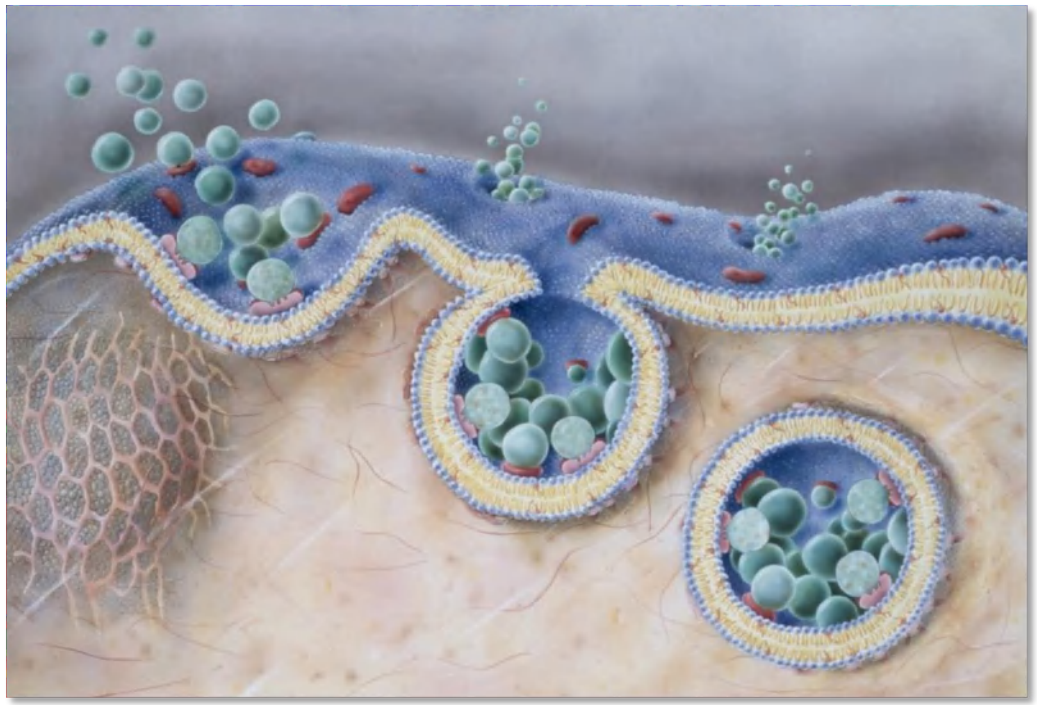
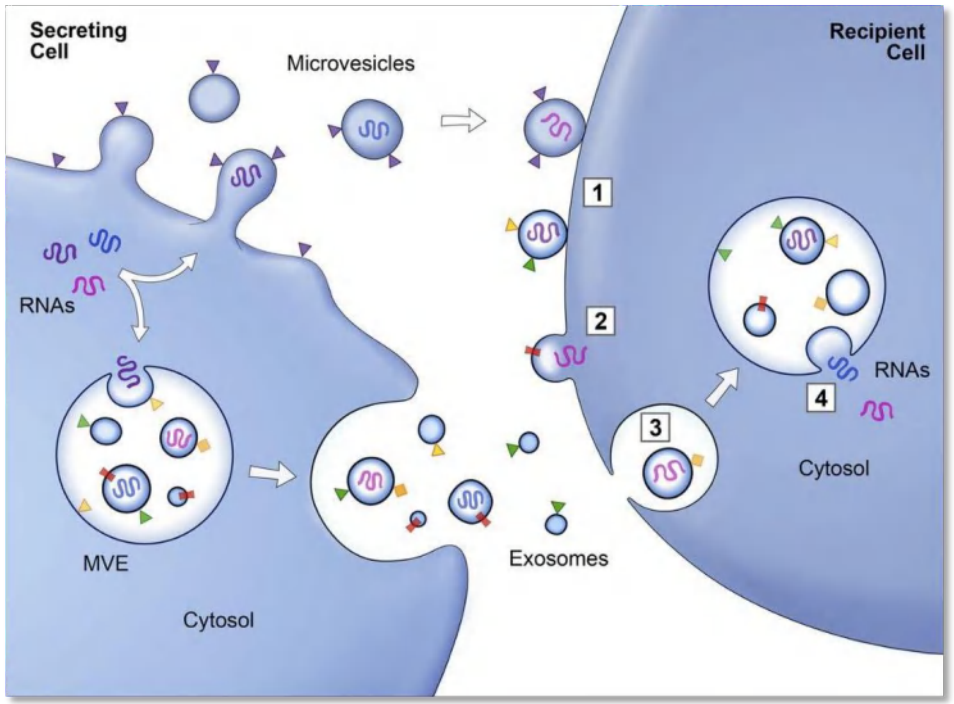


Figure. A: Exosomes B: Microvesicles C: Apoptotic bodies

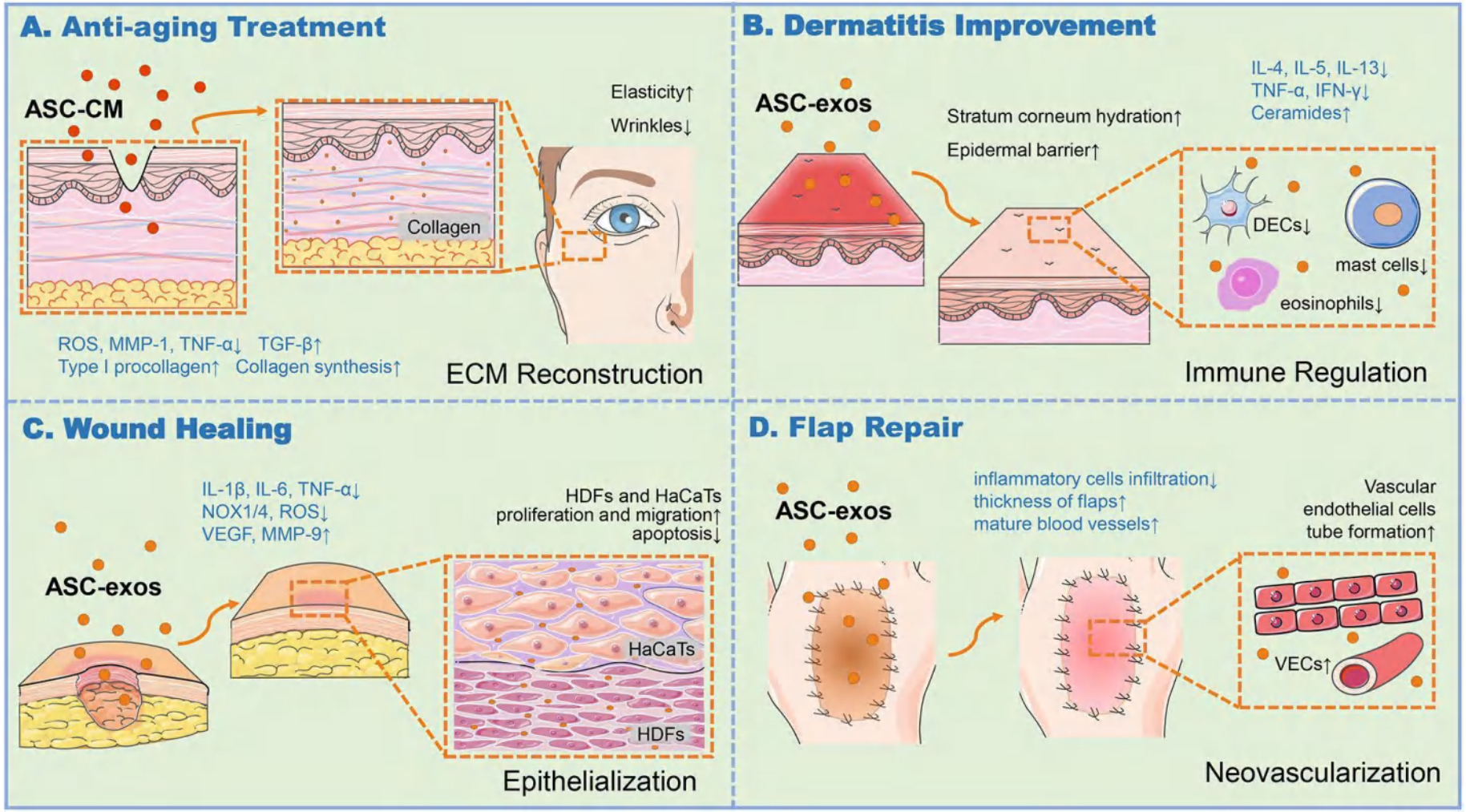
	Exosomes	Microvesicles	Apoptotic bodies
Size	40-160nm	100-1000nm	500-4000nm
Source	Originates from endocytosis, formed by fusion of early endosomal (ILVs) and late endosomal (MVB) with the plasma membrane.	Direct budding from the plasma membrane.	Formation through cell apoptosis.
Composition	mRNA, miRNA, non-coding RNA, proteins (cytoplasmic, cell membrane), and MHC molecules.	mRNA, miRNA, non-coding RNA, proteins (cytoplasmic, cell membrane, receptors).	DNA, nuclear components, organelles.
Function	Intracellular communication and intercellular material exchange.	Intracellular communication, intercellular material exchange.	Regulated pathological and physiological processes.
Application	Intercellular communication can be used to study the mechanisms of disease pathogenesis. The contents of exosomes vary at different stages, making them potential biomarkers. Exosomes, with their excellent biocompatibility and protective lipid bilayer vesicle structure, can serve as drug delivery carriers.		

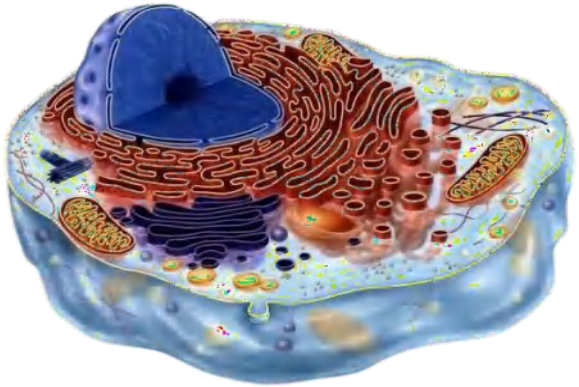
Formation of exosomes - intracellular lysosomal particles invaginate to form vesicles





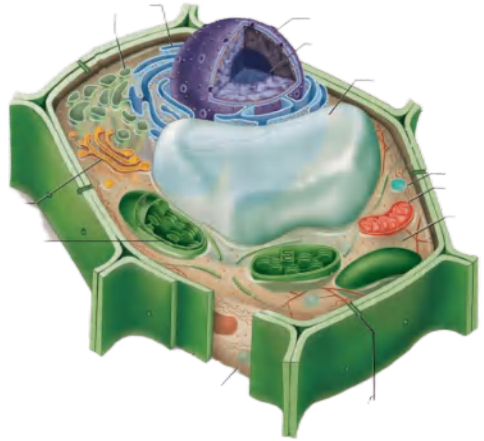
Human MSC exosomes in skin





Human-derived and animal-derived exosomes

Exosomes can be produced by almost all types of animal cells. For example, 1 mL of human blood contains approximately 1×10^12 exosomes. Exosomes are present in almost all tissues, intercellular spaces, and body fluids, carrying a large amount of proteins, mRNA, miRNA, and other molecules involved in intracellular signal transduction. They play a crucial role in intercellular regulation and may serve as early diagnostic markers for various diseases.



Plant cells can also produce exosomes

Research has shown that plant cells are also capable of producing exosomes. Exosomes produced by plant cells can participate in the regulation of information within the plants themselves, and they can also have cross-boundary regulatory effects. Additionally, plant-derived exosomes are abundant, which lays the foundation for their large-scale use.

- Expensive
- Difficult to store
- Troublesome to use
- Regulatory risks

Research history of plant exosomes

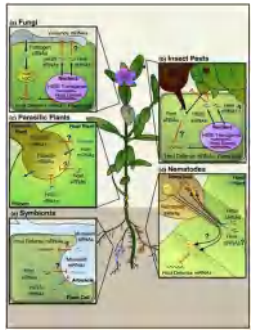
1960

First observation of plant extracellular vesicles

1967

Carrot extracellular vesicles

2018



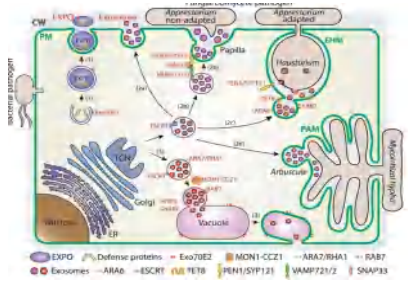
Cross-boundary transmission of plant extracellular vesicles

2018

Bidens Pilosa：

Plant retinol

Since 2019



The popularity of plant extracellular vesicles is on the rise.

Plant exosomes have no policy risks

Unique features of plant exosomes

Safe, low risk

- Edible plant cell source
- Non-toxic and non-immunogenicity
- Stable in solution of stomach, intestine, etc. /orally acceptable

Environmentally friendly and high value

- Natural and sustainable plant sources
- Cross-boundary regulation
- Wide application prospects

Easy to prepare and high yield

- Diverse plant species with rich functions
- Higher content of plant exosomes
- Simple extraction methods

Plant exosome mediate cell communication mechanisms

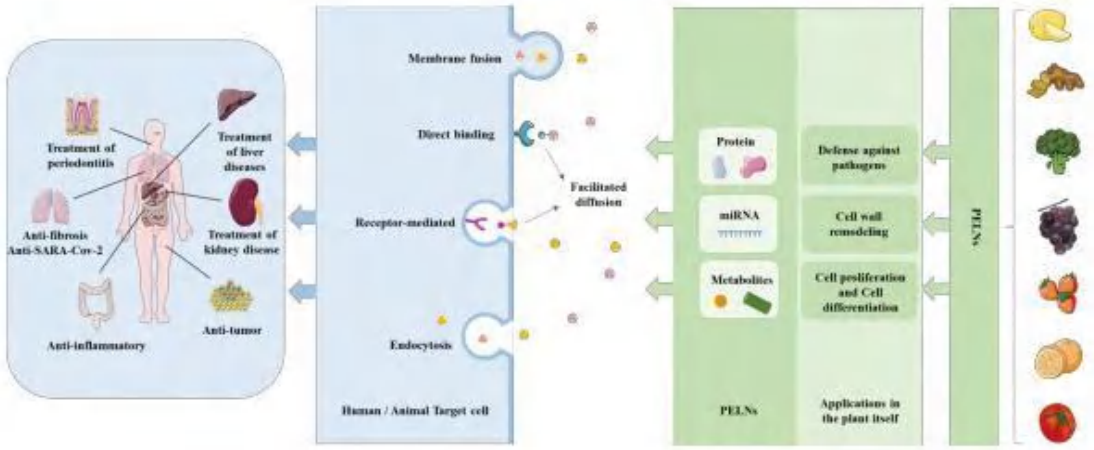
Plant exosomes (PLENs) are crucial for plant metabolism, physiological function maintenance, and immune defense. Additionally, PLENs are able to transboundary transfer to mammalian cells, where they regulate cellular metabolism and gene expression, influencing various physiological and pathological processes in animals.

- **PLENs mainly mediate cell communication through three mechanisms:**

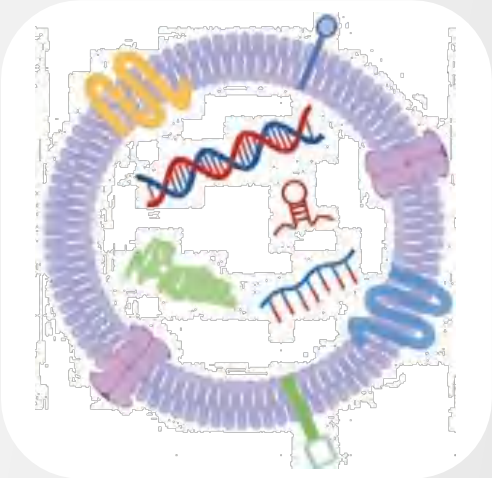
① Exosomes interact with target cells in a paracrine manner, binding to the target cell surface via receptor-ligand interactions, after which they are endocytosed into the target cell or directly released into the cytoplasm to activate the target cell.

② Exosomes directly enter target cells via endocytosis.

③ Exosomes may fuse directly with the target cell membrane, transferring their nucleic acids and proteins into the target cell non-selectively, thereby inducing a response in the target cell.



Plant exosomes have unlimited application potential



Intrinsic functions

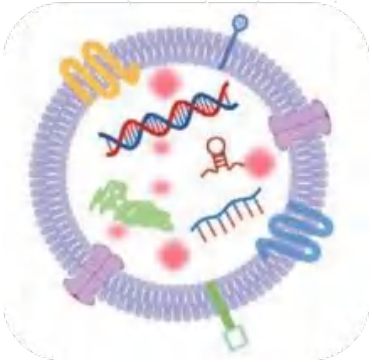
01 | Resistance to inflammation

- Induces the expression of the antioxidant gene HO-1 and inhibits pro-inflammatory cytokines.
- Activates dendritic cell AMP-activated protein kinase (AMPK), and reduces the release of IFN-γ and TNF-α.
- NLRP3 inflammasome activation and IL-1β release.

02 | Cell proliferation, etc.

- Promotes the proliferation of intestinal epithelial cells and accelerates wound healing of the epithelial layer.
- It shows inhibitory effects to the expression of tyrosinase-related protein, with a stronger whitening effect compared to the tyrosinase inhibitor arbutin.
- The TLR4/MyD88-dependent mechanism shifts macrophages from M2-like to M1-like polarization, inhibiting melanoma growth.

Plant exosomes have unlimited application potential



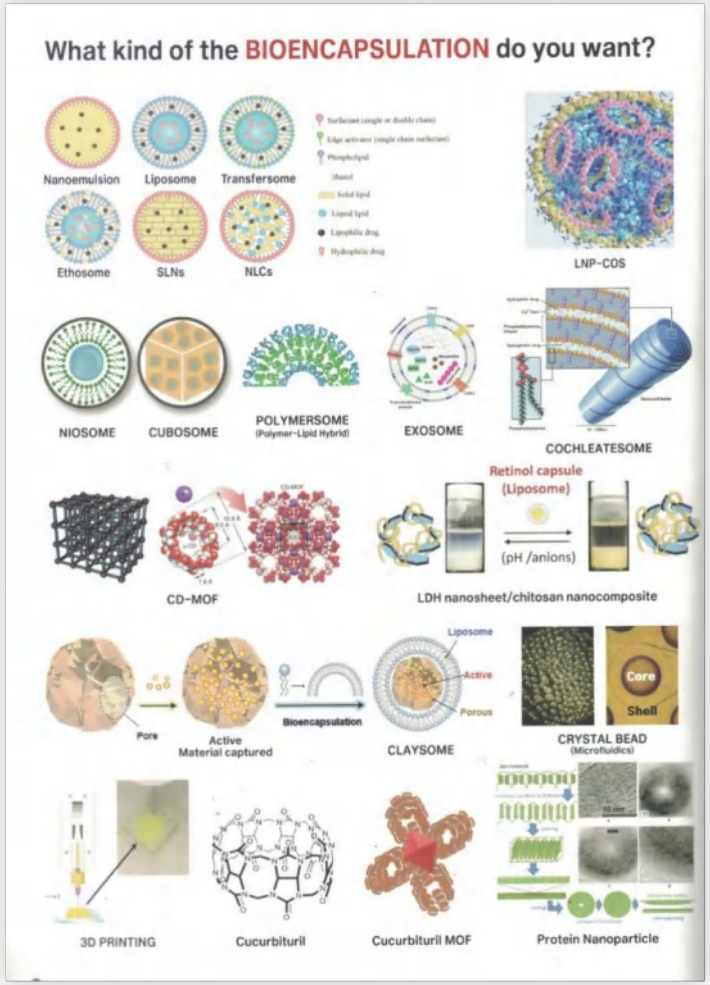
Natural carrier

Ingredient encapsulation

Strong penetration

High stability

Natural targeting



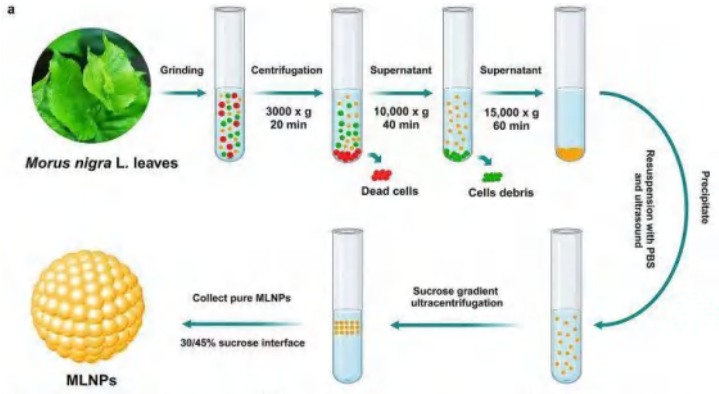
02

PART 02

BiocosMed®-BP

BiocosMed®-BP Bidens Pilosa Exosomes

BiocosMed®-BP Preparation process



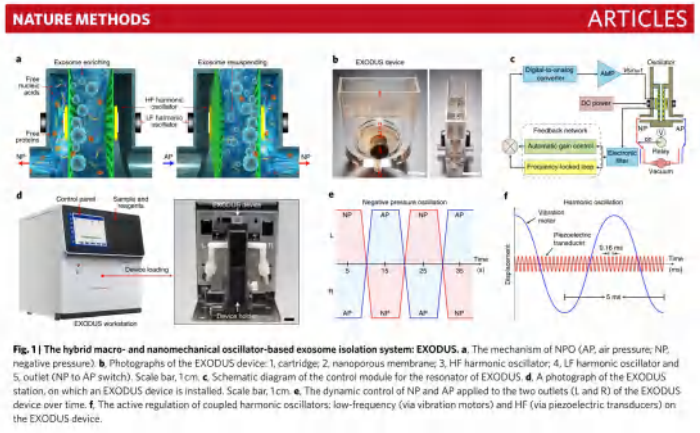
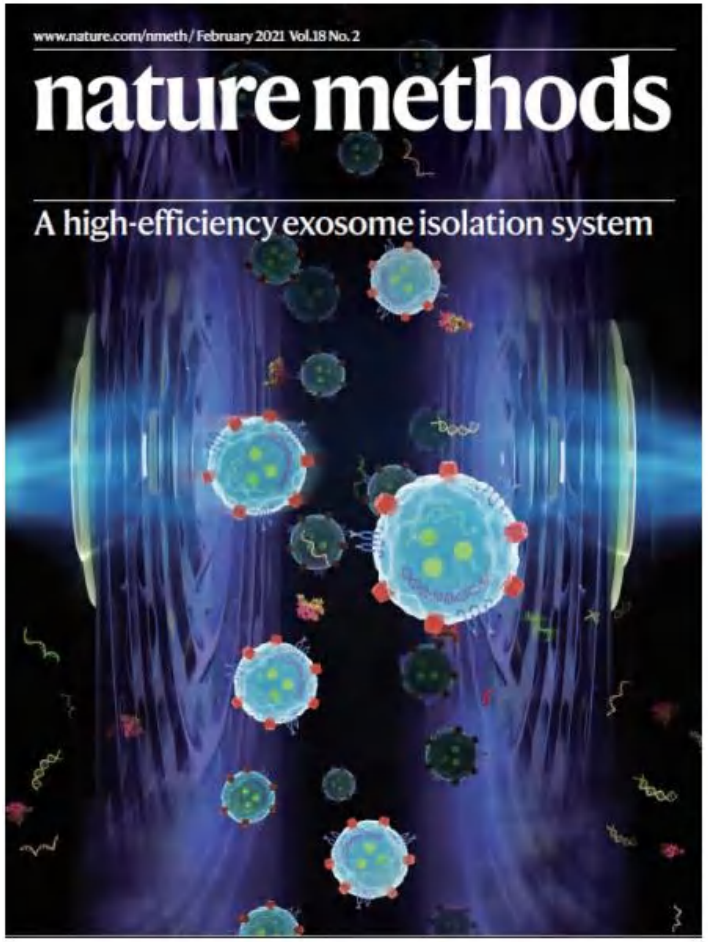
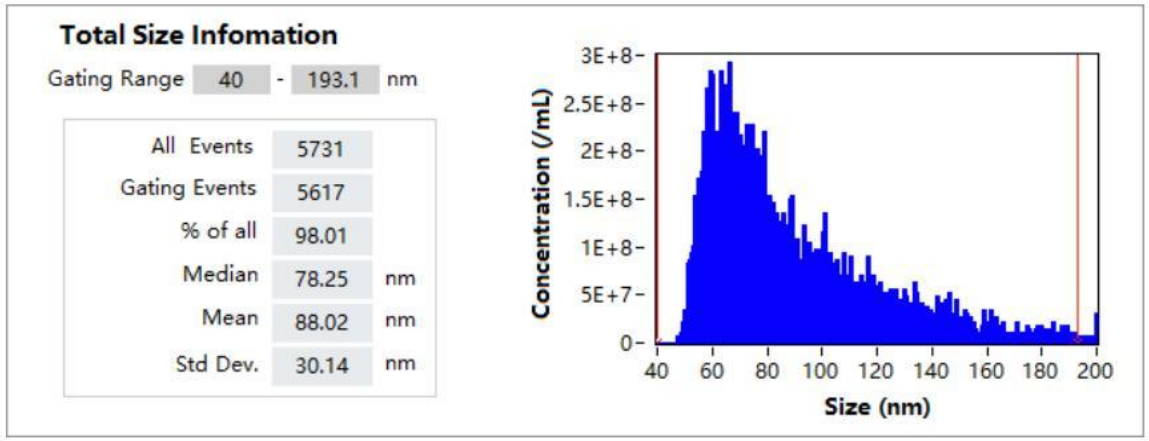


Fig. 1 | The hybrid macro- and nanomechanical oscillator-based exosome isolation system: EXODUS. a, The mechanism of NPO (AP, air pressure; NP, negative pressure). **b**, Photographs of the EXODUS device: 1, cartridge; 2, nanoporous membrane; 3, HF harmonic oscillator; 4, LF harmonic oscillator and 5, outlet (NP to AP switch). Scale bar, 1 cm. **c**, Schematic diagram of the control module for the resonator of EXODUS. **d**, A photograph of the EXODUS station, on which an EXODUS device is installed. Scale bar, 1 cm. **e**, The dynamic control of NP and AP applied to the two outlets (L and R) of the EXODUS device over time. **f**, The active regulation of coupled harmonic oscillators: low-frequency (via vibration motors) and HF (via piezoelectric transducers) on the EXODUS device.

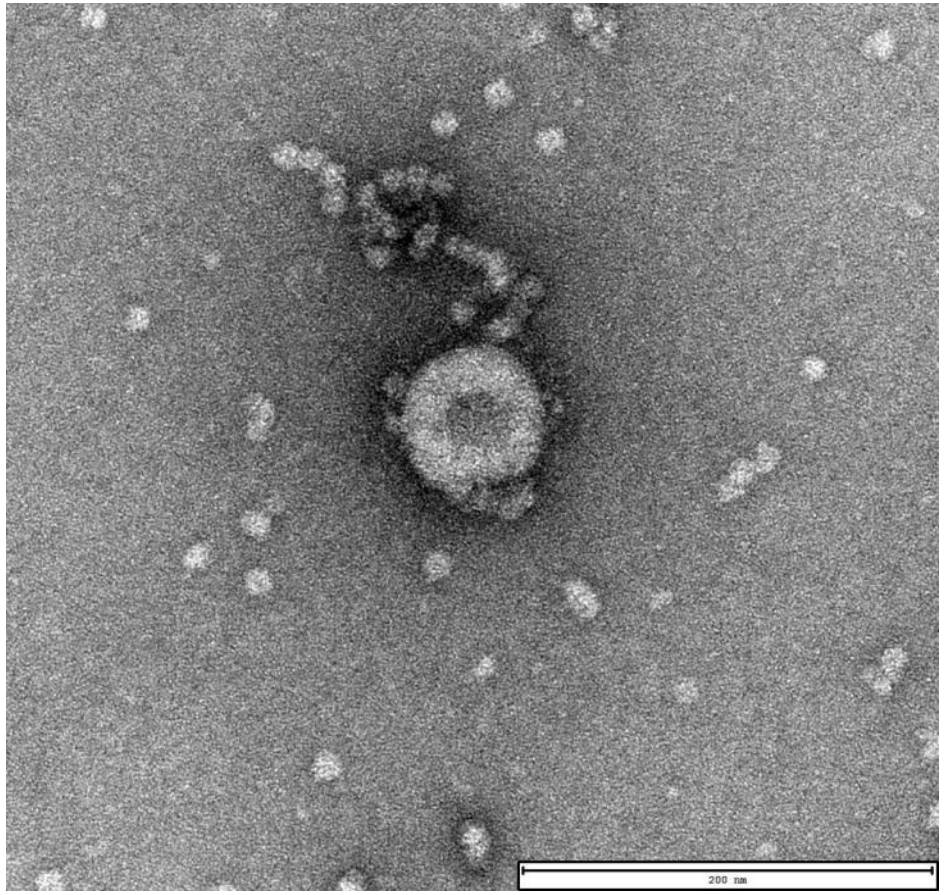


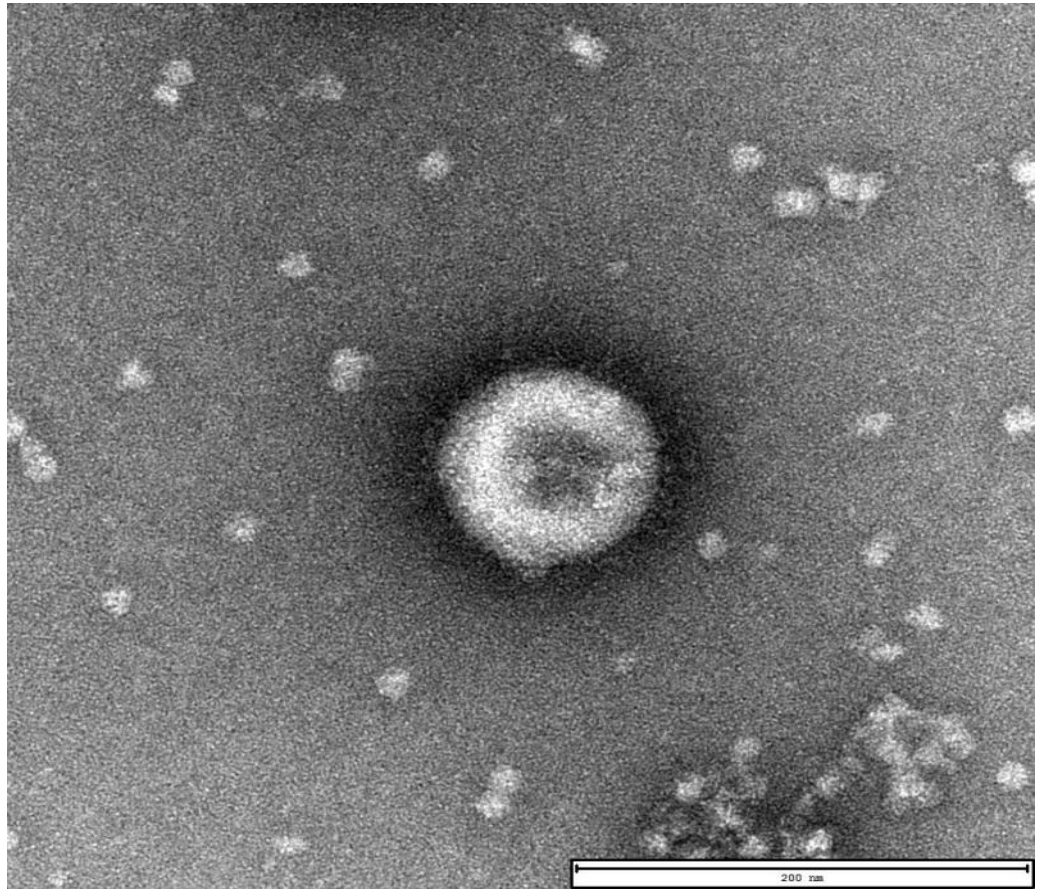
BiocosMed®-BP Comparison before and after freeze-drying (without any stabilizer)

Samples	Test items	Detection value
Stock solution	Particle concentration	650 billion Particles/ml
	Average particle size	85.27 nm
Freeze-dried stock solution	Particle concentration	380 billion Particles/ml
	Average particle size	88.02 nm

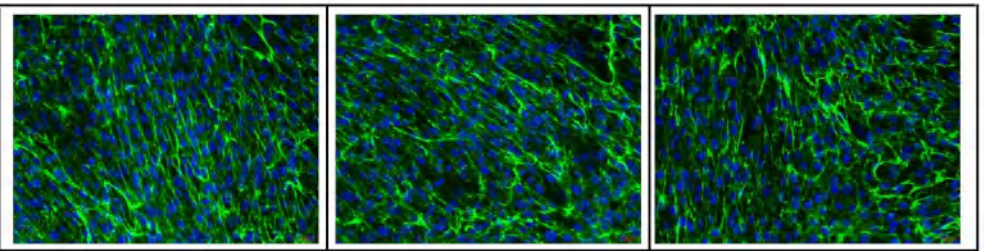
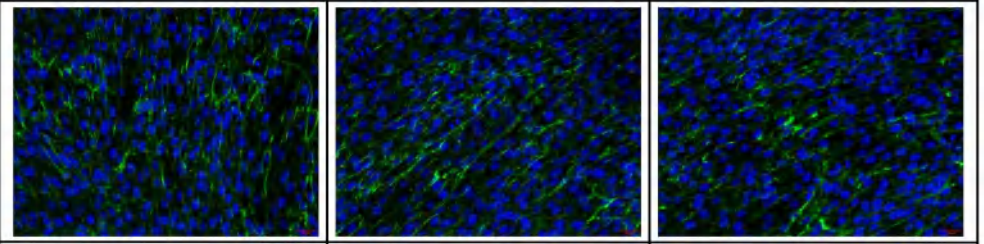
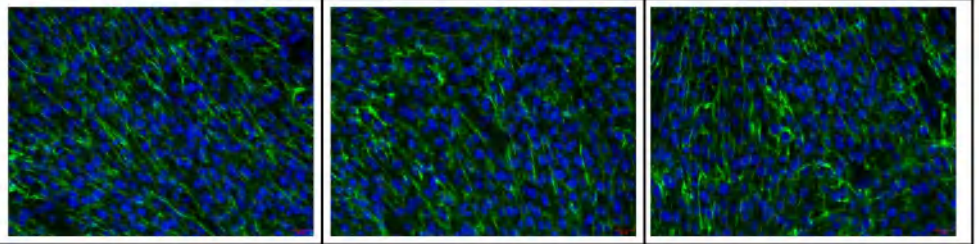
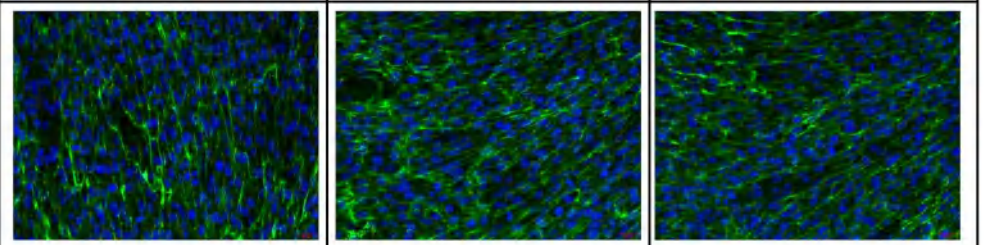


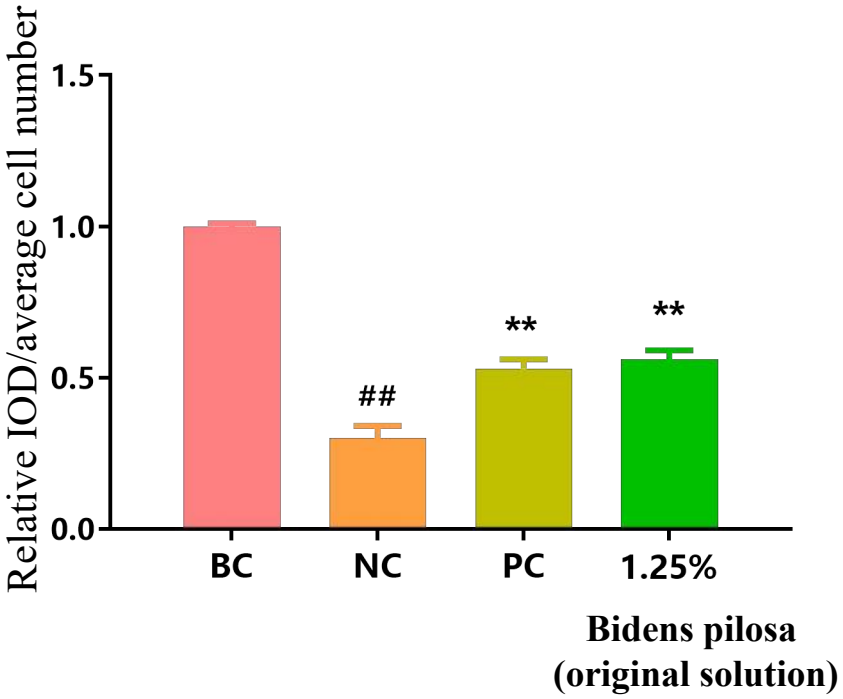
BiocosMed®-BP Electron microscope image





BiocosMed®-BP promotes the efficacy of Collagen I

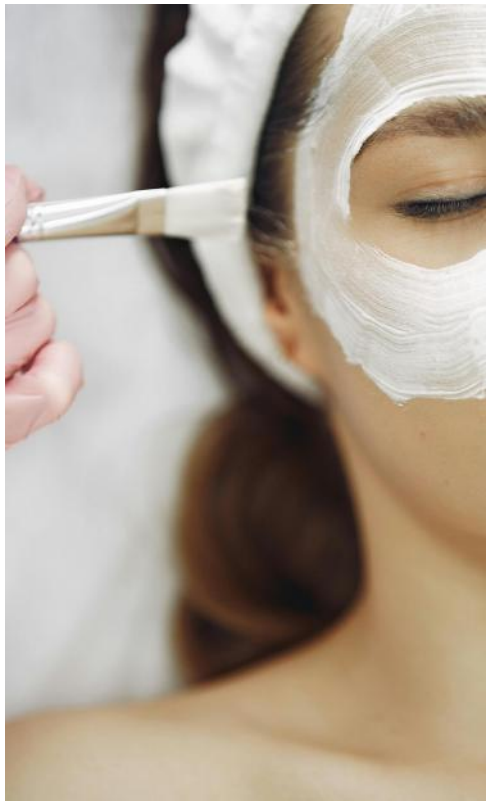
Blank control	
Negative control	
Positive control	
1.25% Bidens pilosa (original solution)	



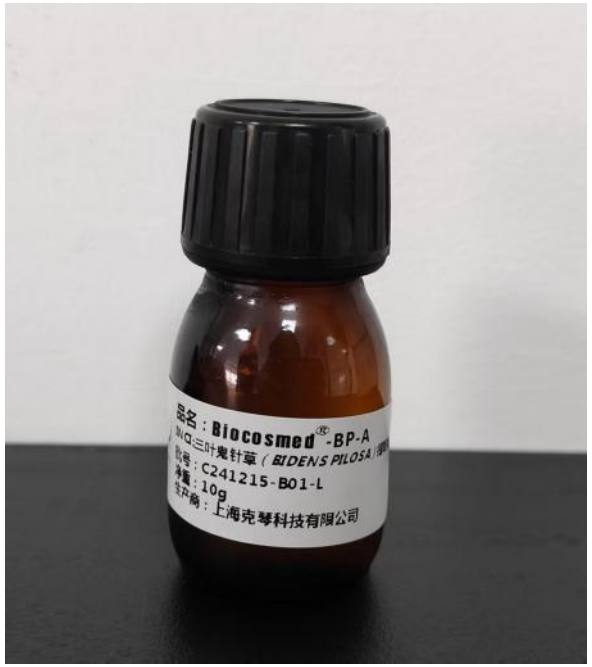
BiocosMed®–BP significantly promotes an increase in Collagen I content, with an enhancement rate of 86.67%.

BiocosMed®-BP Application

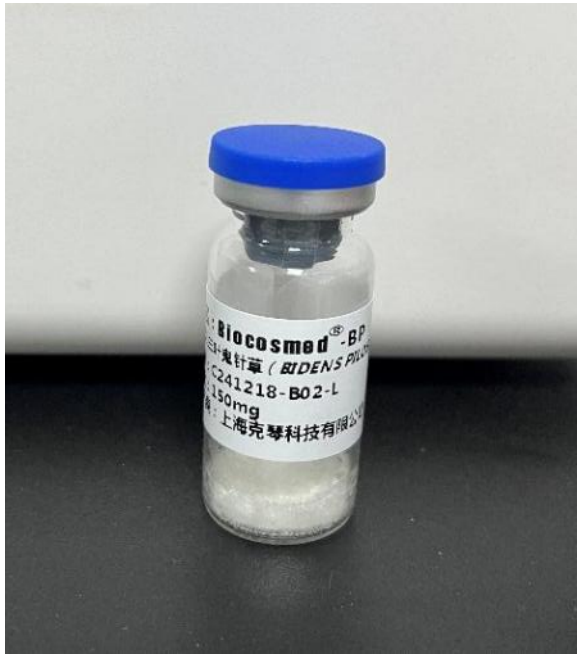
- Beauty salon
- Finished product
- Encapsulated small molecule active ingredients: retinol, NAD, etc.



BiocosMed®-BP BIDENS PILOSA EXTRACT



Solution version: Colorless to pale yellow liquid



Lyophilized version: white loose powder (stabilizer: trehalose)

Average particle size（nm）	**≥ 80**
Total number of particles（Particle/g）	≥ 1 billion

THANKS FOR WATCHING

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