Jetbody

Beyond affinity

Empowering Life Science with Precision

Extracellular Vesicles Solutions

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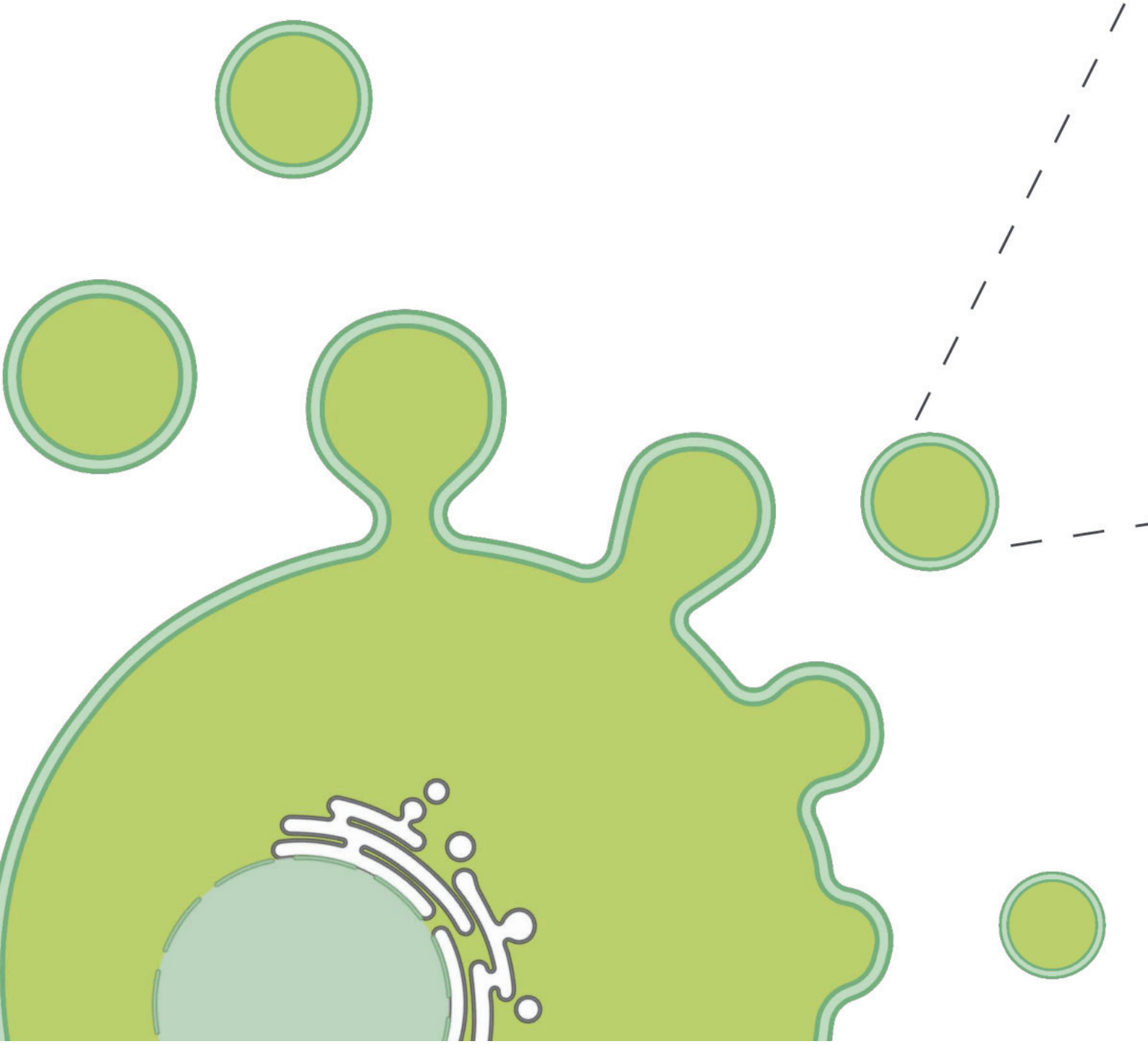
CliniSciences

Extracellular vesicles (EVs) are naturally secreted by all cell types.



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About

Jotbody

Empowering Life Science with Precision

Established in 2020, Jotbody (HK) Limited is a state-of-the-art biotechnology company in Hong Kong Science and Technology Park specializing in extracellular vesicles (EVs) and nanobody research based.

Since 2014, we have been deeply involved in EV research, collaborating with industry and academic partners. Furthermore, we were honored with a place on Forbes ASIA 100 to watch in 2023.

Within the realm of EVs, we offer comprehensive services tailored to meet the evolving needs of researchers worldwide.


Custom
Solution

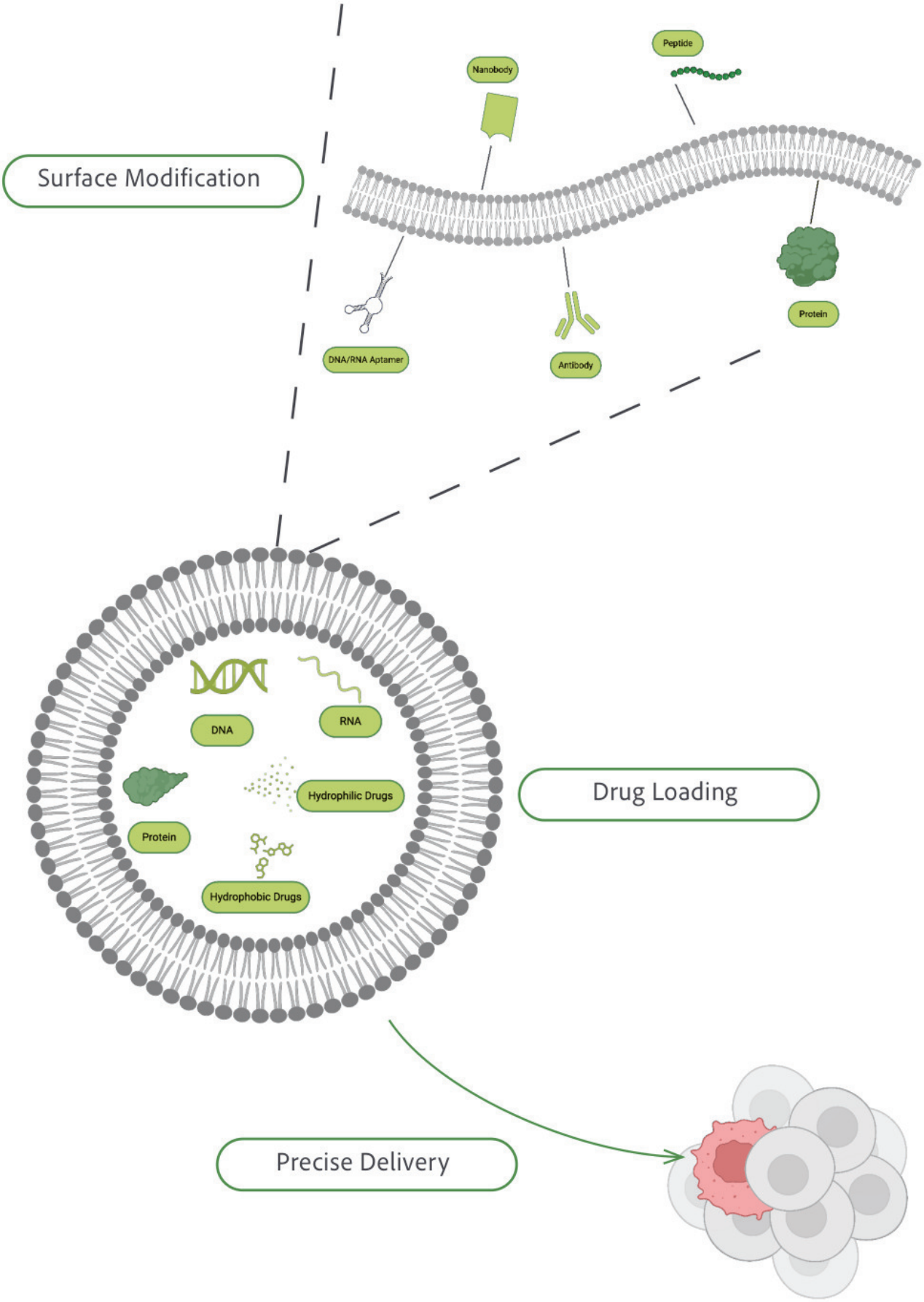
Functionalization

EVs possess remarkable qualities, including high cellular uptake, low immunogenicity, excellent biocompatibility, and the ability to easily cross the blood-brain barrier, making them a promising generation of drug delivery platforms.

Nevertheless, the inherent lack of specificity in EVs presents a notable challenge. While EVs are acclaimed for their ability to transport biological cargo to target cells, our specialization lies in customizing EVs to enhance their therapeutic impact.

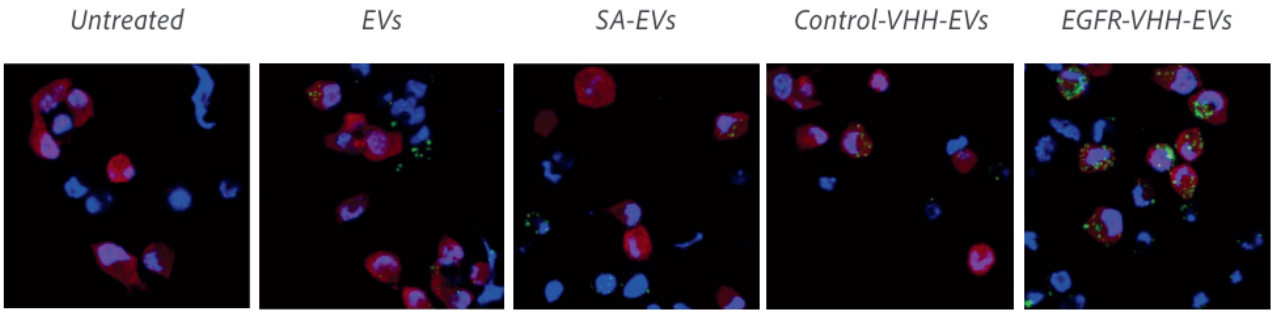
Jotbody is at the forefront of innovation, offering a dynamic service that transforms EVs to elevate their targeting capabilities. By expertly fine-tuning the surface properties of these vesicles, we dramatically enhance their ability to reach and be absorbed by specific cells or tissues. Our advanced drug loading service further empowers this process by enabling the efficient encapsulation of therapeutic agents within the EVs, ensuring precise and effective delivery of treatments.

Functionalization	Agents
Loading	Biopharmaceuticals
	ASOs, RNA, DNA
	Plasmid
	Peptide
Surface modification	Protein
	Antibody fragment
	Antibody
	Nanobody
	Peptide

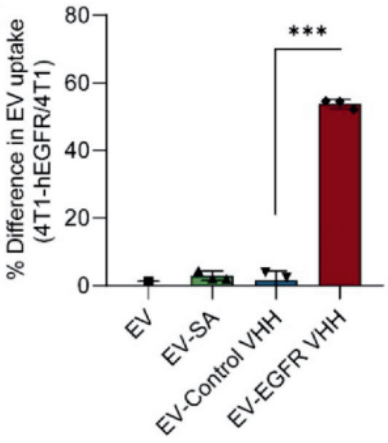

Surface Modification
Peptide
Nanobody
Protein
DNA/RNA Aptamer
Antibody
DNA
RNA
Hydrophilic Drugs
Protein
Hydrophobic Drugs
Drug Loading
Precise Delivery

Representative data
Surface modification of EVs enhanced specificity for uptake

Anti EGFR Nanobody-conjugated EVs (EGFR-VHH-EVs) exhibit increased uptake in target cells during co-culture experiments with mouse 4T1 cells that co-express tdTomato and human EGFR, and parental 4T1 cells.



EVs, labeled with CFSE (green), show enhanced intracellular accumulation in tdTomato-hEGFR double-positive 4T1 cells (red), while no accumulation is observed in tdTomato-hEGFR double-negative parental 4T1 cells (blue).



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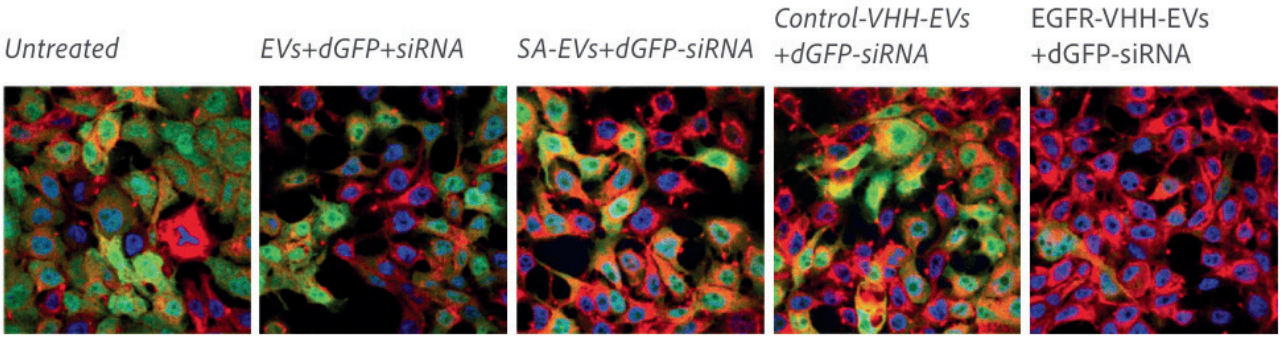
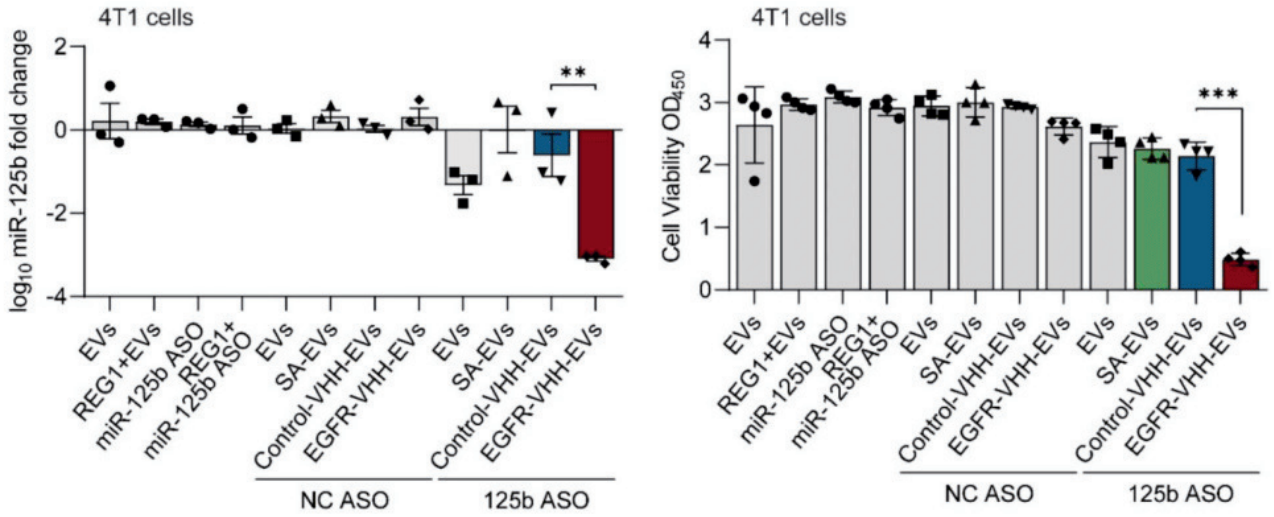
Representative data

Surface modification of EVs enhances targeted therapeutic delivery to specific cells

EGFR-targeted RBCEVs (EGFR-VHH-EVs) loaded with GFP siRNA achieved precise knockdown of destabilized GFP in CA1a-dGFP cells.

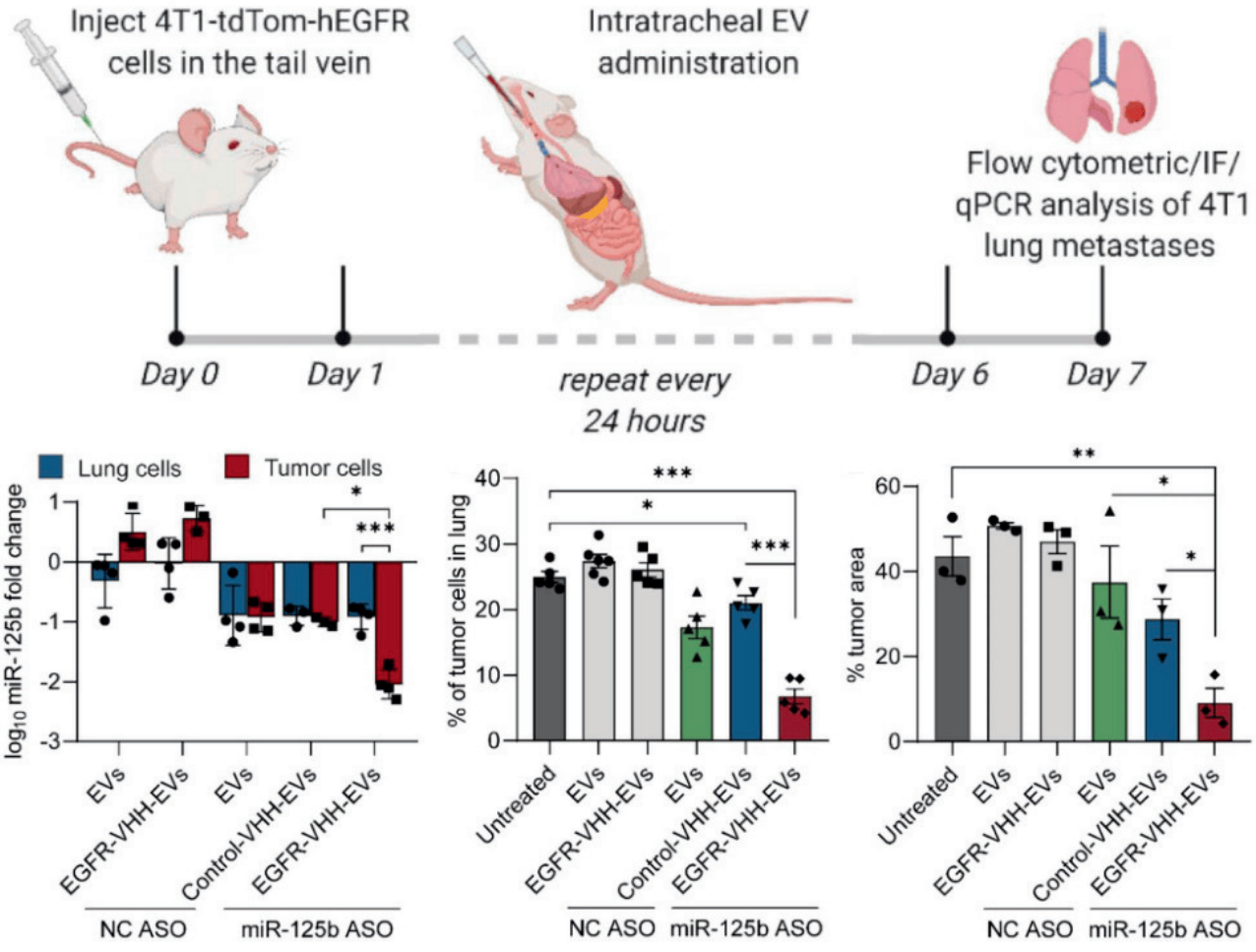


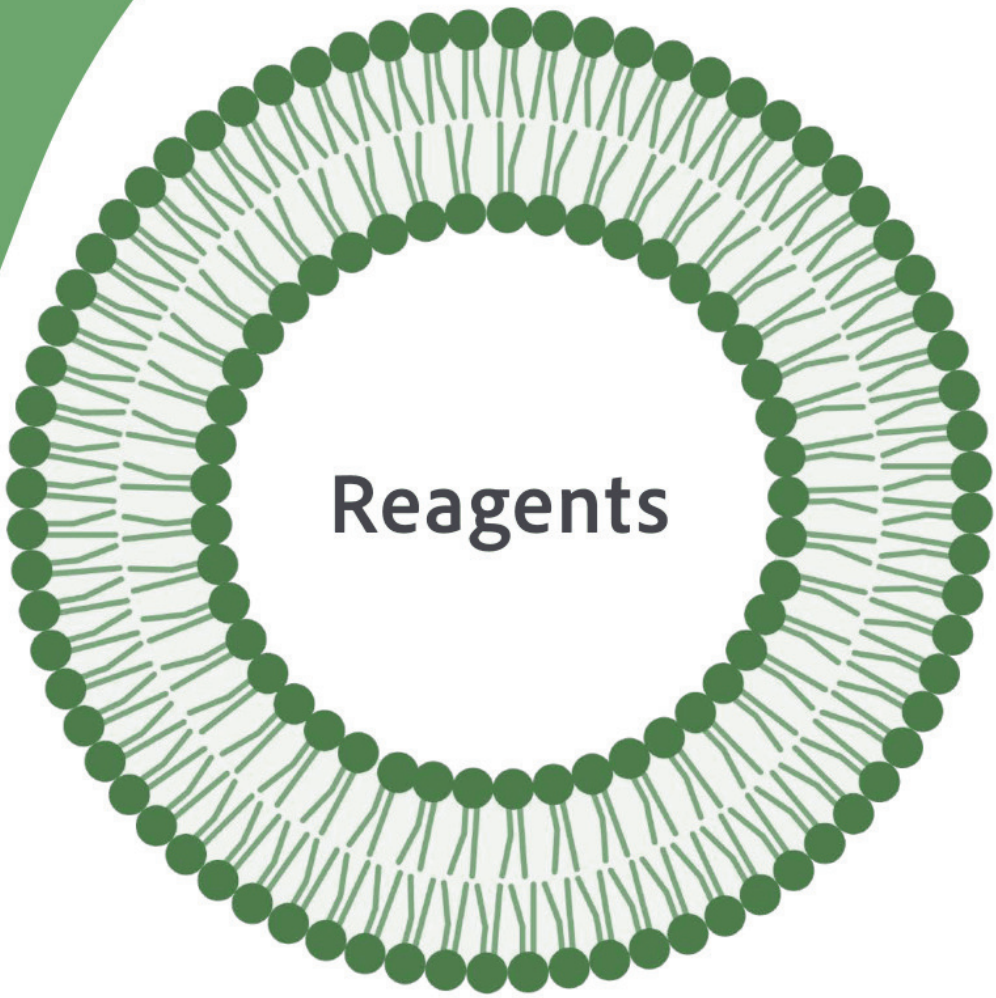
RBCEVs loaded with antisense oligonucleotides (ASOs) against miR-125b, a tumorigenic microRNA, demonstrated a ~10-fold greater reduction with EGFR-targeted RBCEVs compared to non-targeted ones (bottom left image). Furthermore, EGFR-targeted RBCEVs loaded with miR-125b ASOs significantly reduced 4T1 cell viability to ~20% compared to the untreated control (bottom right).



Representative data
Functionalized EVs enhance therapeutic efficacy in a metastatic breast cancer

EGFR-targeted miR-125b ASO loaded EVs efficiently suppress tumor progression. Establishment of an hEGFR-positive lung metastatic breast cancer model by injecting 4T1-tdTomato-hEGFR cells systemically into NSG-SGM3 mice for intratracheal EV treatment (top). RT-qPCR analysis showed that EGFR-targeted miR-125b ASO-loaded EVs resulted in significantly higher knockdown only in tumor cells, but not in lung cells (bottom left). Flow cytometric analysis of lung cells from each treatment revealed that EGFR-VHH-EVs loaded with miR-125b ASO demonstrated the best tumor suppressive effects (bottom right).




Reagents

EV Standards

All our EV standards are produced in facilities that comply with Good Manufacturing Practice (GMP) standards, ensuring high-quality and reliable products. The Ev are isolated, purified and characterized accordingly to the guideline of internatioal society of Extracelluar Vesicles.

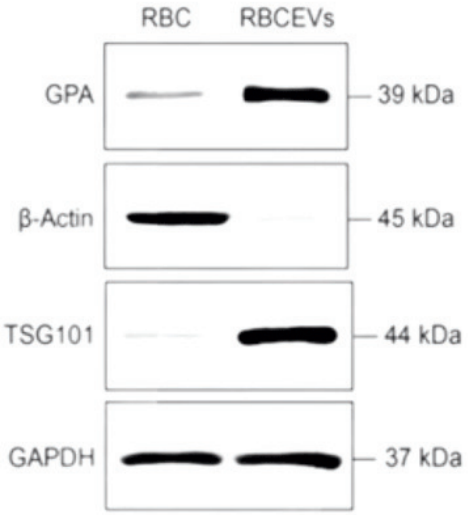
Source	Cat No.	Product Name
Biofluids	JOT-HRBCEV-A1	Human red blood cells group "0", healthy donor
	JOT-FLUO-HRBCEV-AF488	FLUO488-labelled Human Red Blood Cell-derived EVs
	JOT-PEP-EV	Human plasma, healthy donor
	JOT-SER-EV	Human serum, healthy donor
	JOT-PLT-EV	Human platelet, healthy donor
	JOT0UR-EV	Human urine, healty donor
	JOT-MILK-EV-03-01	Milk bovine (cow)
Stem cells	JOT-HUMSC-EV-01-01F	Human umbilical
	JOT-HUMSC-EV-01-02	Human umbilical
	JOT-HUMSC-EV-01-03	Human umbilical
	JOT-ATMSC-EV	Human adipose tissue
	JOT-HDMSC-EVS-03-01	Human Decidual Mesenchymal Stem Cells EV
	JOT-HAMSC-EVS-04-01	Human Amnion Mesenchymal Stem Cells EV
	JOT-SFSC-EVS-05-01	Skin Fibroblast Stem Cells EV
	JOT-HAMSC-EVS-06-01	Human Adipose Mesenchymal Stem Cells EV
	JOT-HSSC-EVS-07-01	Human Skin Stem Cells EV
	JOT-HDPSC-EVS-08-01	Human Dental Pulp Stem Cells EV
	JOT-BMMSC-EV-08-02	Bone marrow mesenchymal stem cells EV (lyophilized)
	JOT-HCBMSC-EVS-09-01	Human Cord Blood Mesenchymal Stem Cells EV

Source	Cat No.	Product Name
Colon cancer cells	JOT-COLO-EV	COLO cell line
	JOT-HCT-EV	HCT116 cell line
	JOT-HT29-EV	HT29 cells
Prostate cancer cells	JOT-PC3-EV	PC3 cells
	JOT-LnCAP-EV	LnCaP cells
Lung cancer cells	JOT-549-EV	549 cells
	JOT-H1975-EV	H1975 cells
Glioblastoma /neuroblastoma cells	JOT-U87MG-EV	U87 MG cells
	JOT-SK-N-SH-EV	SK-N-SH-EV cells
Leukemia cells	JOT-K562-EV	K562 cells
Melanoma cells	JOT-B16F10 -EV	B16F10 cells
Breast cancer cells	JOT-SK-BR-3 -EV	SK-BR-3 cells
	JOT-MCF7-EV	MCF7 cells
Pancreas cancer	JOT-BxPC-3-EV	BxPC-3 cels
Kidney	JOT-293-EVS-01-01	HEK 293 cells
	JOT-HEK293-EV	HEK cells
Immuno cells	JOT-ACC-EVS-10-01	Allogenic CIK (DCIK) Cells EV
	JOT-NK-EV	Allogenic NK Cells EV
Plant	JOT-CAV-EwV-02-01	Curacao aloe vera
	JOT-DO-EV-04-01	Dendrobium officinale
	JOT-HC-EV-05-01	Houttuynia cordata
	JOT-COCONUT-EV-06-01	Coconut
	JOT-GINSENG-EV-07-01	Gingseng
	JOT--EV	Ginger root
	JOT-POT-100	Potato
	JOT-ONI-100	Onion
	JOT-GAR-100	Garlic
	JOT-SEA-100	Seaberries
	JOT-LET-EV	Lettuce

Featured
Human red blood cell-derived EVs
JOT-HRBCEV-A1

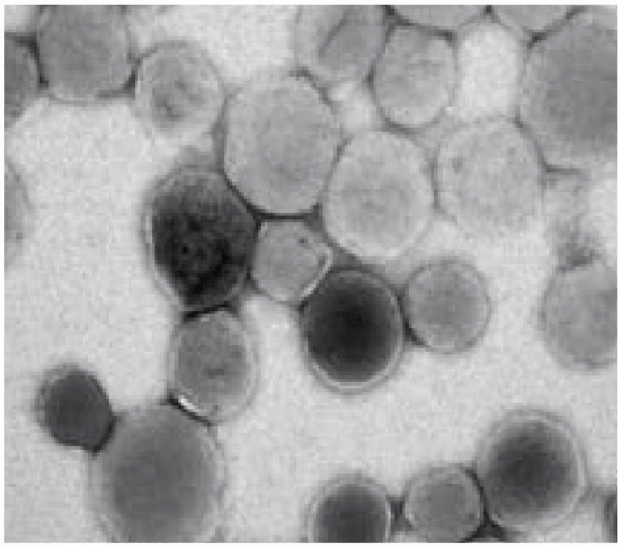
- Highly purified EVs derived from human red blood cells
- Uniform size range (50-250 nm)
- Stringent purification process ensuring purity
- Effective carrier for therapeutic cargo
- Reliable positive control for EV experiments
- High sensitivity and specificity in detection
- Lyophilized and suspension forms available

Western Blot Analysis



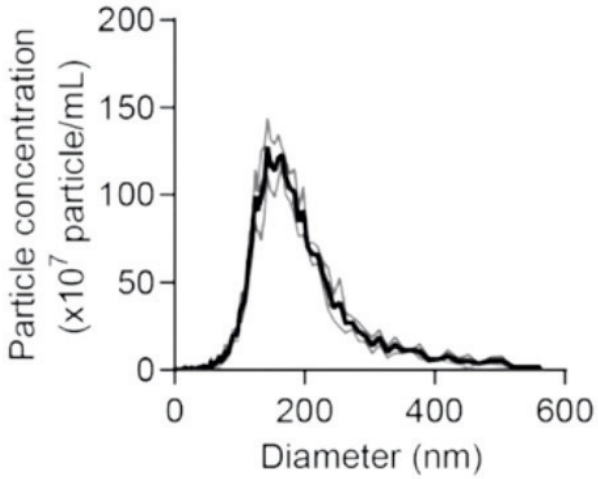
Western blot analysis demonstrated the enrichment of EV marker TSG101 and the human red blood cell EVspecific protein GPA (Glycophorin A) in HRBCEVs.

Transmission Electron Microscopy



Transmission electron microscopy revealed that purified EVs exhibit a typical cup-shaped morphology with an intact structure.

Size Distribution

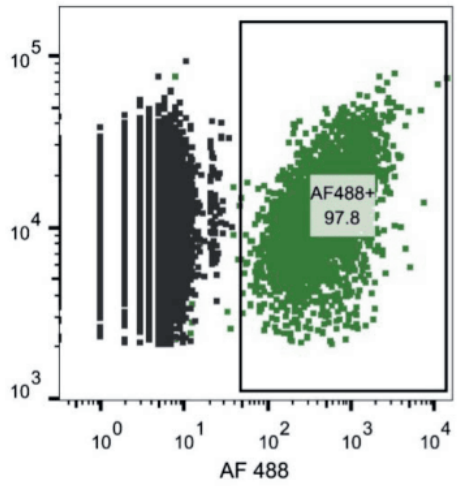


Analysis using nanoparticle tracking techniques unveiled a consistent size distribution of EVs isolated from human red blood cells.

Featured
FLUO488-labelled Human Red Blood Cell-derived EVs
JOT-FLUO-HRBCEV-AF488

- Rigorous Purification Workflow: Ensures absence of impurities like lipoproteins and serum proteins.
- Stable Fluorophore Labeling: Compatible with Alexa Fluor® channels (430, 488, 561, 594, 647). Labels are fixable, highly photostable, and detectable with high sensitivity.
- Applications: Suitable as standard material for instrument calibration, EV uptake tracking (in vitro/in vivo), flow cytometry, immunofluorescence imaging, IVIS, and fluorescence assays.
- Excitation/Emission Peaks: Excitation peak at 488 nm; emission peak at 496 nm.

Single EV flow cytometric analysis



The green population of JOT-FLUO488-HRBCEV exhibits a homogenous distribution, with over 95% of EVs showing strong positivity for the fluorophore, ensuring reliable and consistent calibration results.

Buffer & Serum

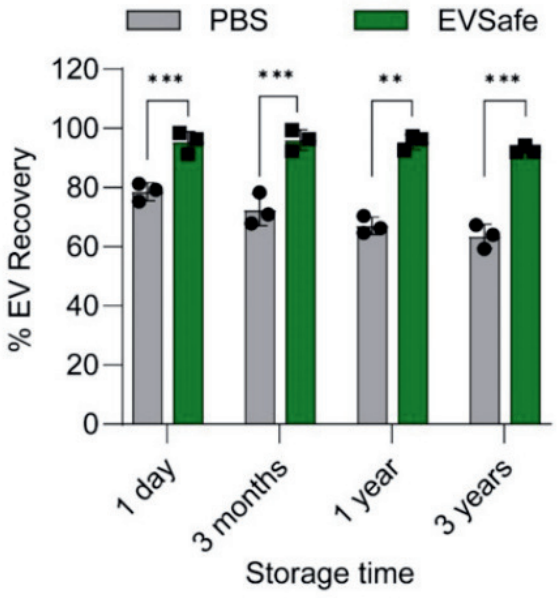
Cat No.	Product Name
JOT-EV-LYOB	EVSafe Lyophilization Buffer
JOT-EV-LYSB	EVSafe Lysis Buffer
JOT-EV02-07-01	EV Depleted Fetal Bovine Serum (Characterized)
JOT-EV02-08-01	EV Lysis Buffer
JOT-EV02-09-01	FBS depleted EV
JOT-EV-SB1	EVSafe storage buffer 10X
JOT-EV-LB1	EV Lyophilization buffer

Featured
EVSafe storage buffer 10X
JOT-EV-SB1

Preserve the integrity and biological activity of EVs during freezing.

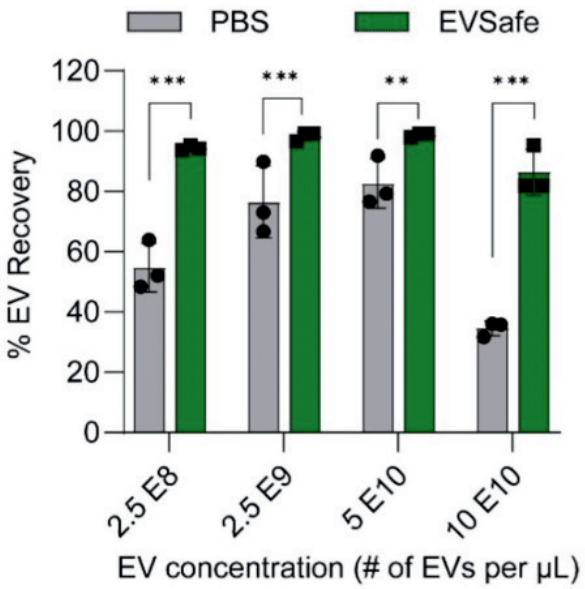
- 95% EV recovery after freezing
- Safe multiple freeze-thaw cycles
- Easy component removal with 1 centrifugation step
- Convenient 10× formulation for EV suspensions, media, or biofluids
- Immediate -80 °C freezing after buffer addition

EV recovery (Storage time)



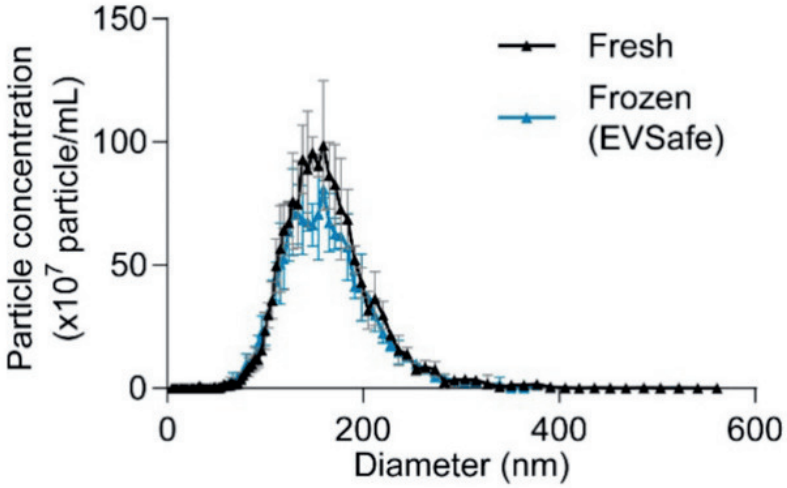
EVSafe consistently resulted in higher EV recovery across all the EV storage period.

EV recovery (EV concentration)



EVSafe consistently resulted in higher EV recovery across all the EV concentrations.

EV size distribution

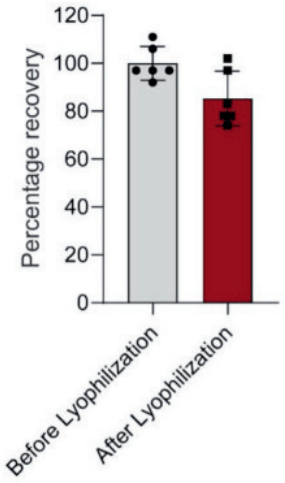


Recovered EVs show similar size distributions as fresh EVs and do not show any sign of aggregation.

Featured
EVSafe Lyophilization Buffer
JOT-EV-LYOB

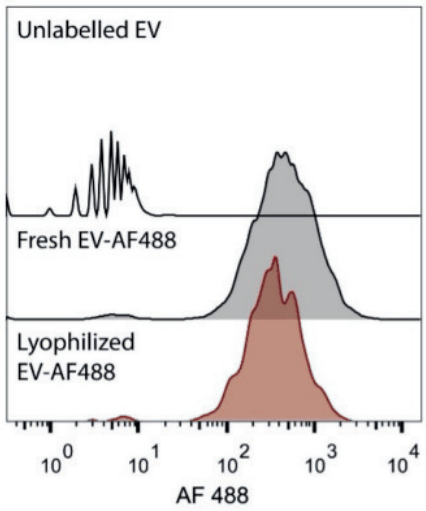
- Specialized lyophilization buffer designed for preserving EVs during spray drying.
- Formulated with optimized lyoprotectants to maintain EV integrity, biological activity, and recovery.
- Tailored specifically for large-scale EV handling.
- Ideal for long-term storage of EVs.
- Provides reliable and consistent results for critical applications.

EV recovery (Concentration)



Comparative analysis of EV recovery before and after lyophilization consistently demonstrated approximately 85% recovery with EVSafe Lyophilization Buffer.

Lyophilization of surface decorated EVs

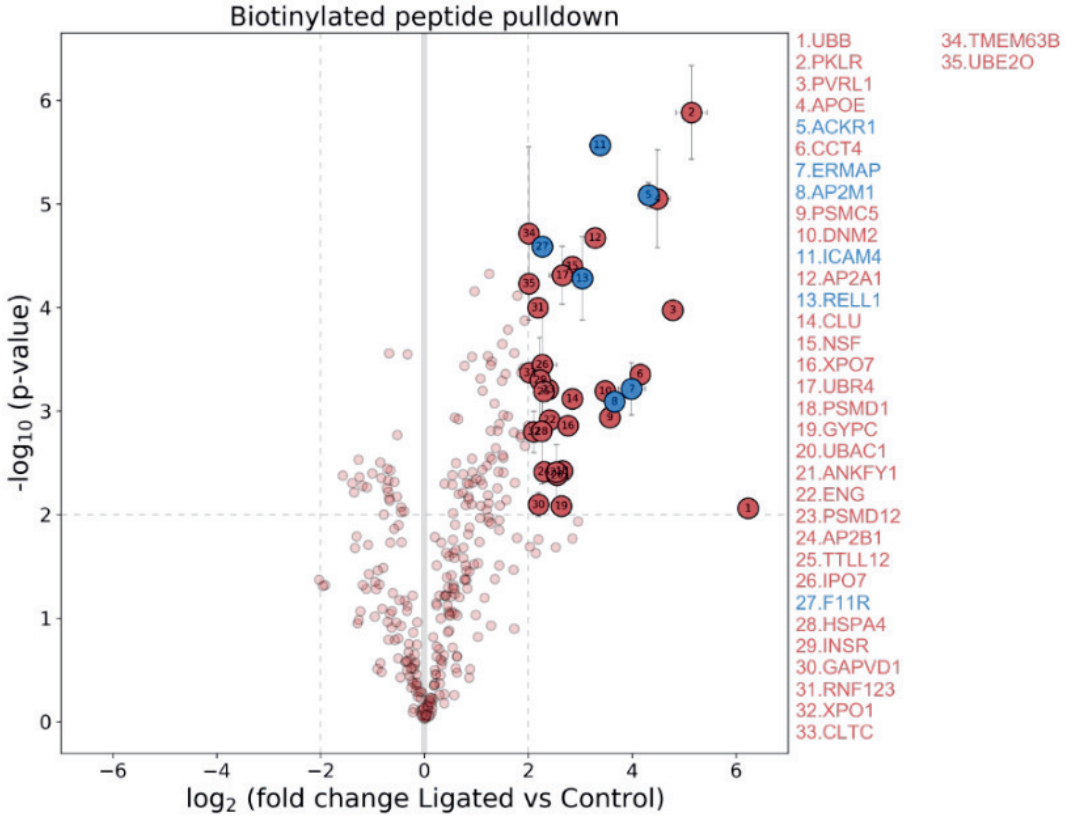


Surface Decorated EVs can withstand lyophilization in the presence of the EVSafe lyophilization buffer.

Featured
EVSafe Lysis Buffer
JOT-EV-LYSB

- Ready-to-use reagent for gentle and efficient lysis of EVs.
- Ensures effective solubilization of EV-associated and internal proteins, preserving protein structure and activity for downstream applications such as Western blotting, ELISA, and mass spectrometry.
- Detergent-based formulation minimizes protein degradation.
- Includes EDTA for metal ion chelation to enhance protein stability.
- Formulated as a 2× buffer for easy addition to pre-purified EV suspensions.

Sample preparation for Mass Spectrometry



EVs were lysed with JOT-EV-LYSB buffer to extract and solubilize membrane proteins for label-free quantitative mass spectrometry.

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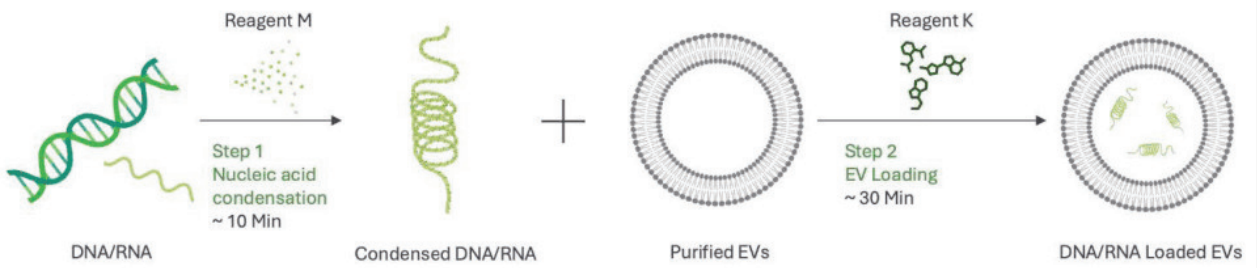
Functionalization Kits

Cat No.	Product Name
JOT-EV-SM1	EVcraft EV Surface Modification Kit
JOT-EV-T1	EVfect EV Transfection Kit
JOT-EV-FL488	EV Fluorescent Labelling Kit
JOT-EV02-06-01	EV Decorating Kit (For Sa-Biotin)

Featured
EVfect Transfection kit
JOT-EV-T1

- Efficient loading of nucleic acid payloads
- Validated in *vitro* and in *vivo* settings
- Compatible with EVs of different origins
- Liposomal reagent- and micelle formation-free
- Low toxicity tested
- Alternative gene delivery method for hard-to-transfect cells



Testing protocol for EVfect Transfection Kit

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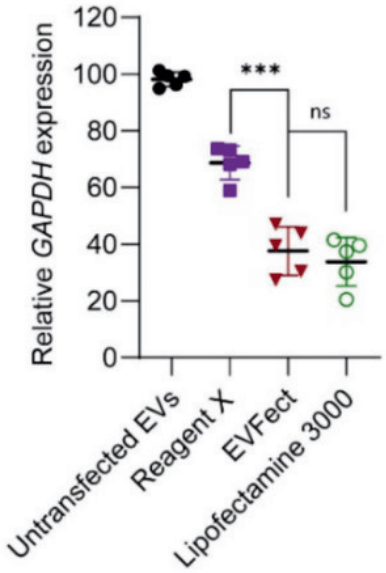
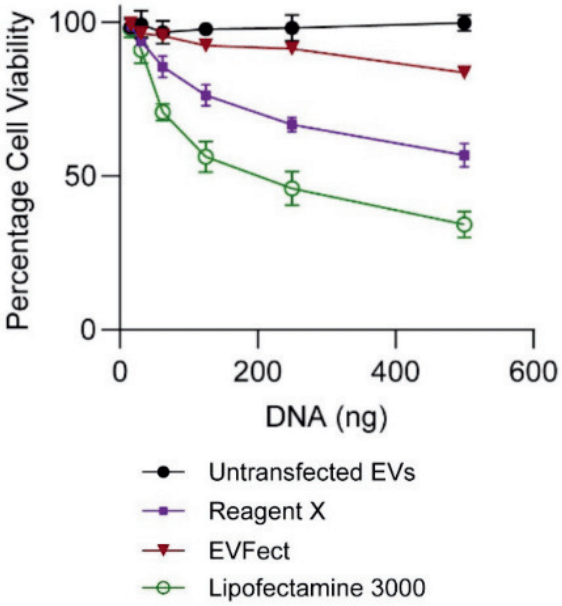
In *vitro* gene knockdown



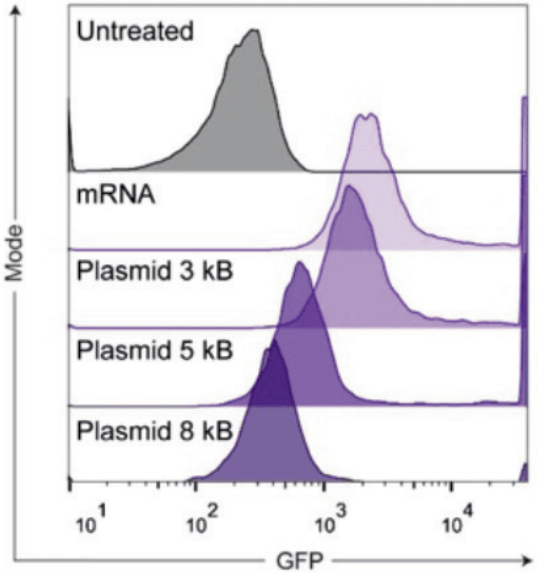
EVfect showed superior gene knockdown, comparable to Lipofectamine 3000.

Realative Toxity



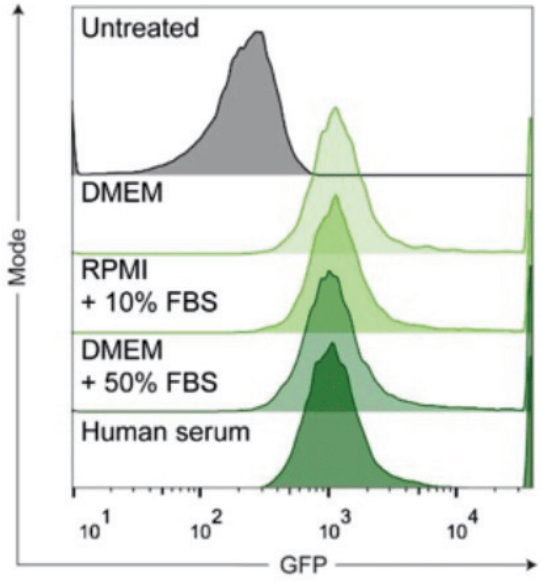
Both ASOs and plasmid DNA showed loading efficiencies between 80-95%.

Single EV analysis of loaded EVs



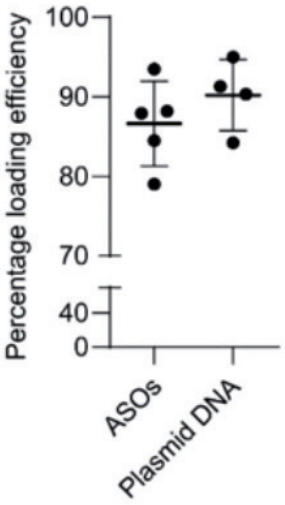
mRNA and 3 kB plasmids resulted in comparable levels of eGFP expression.

Transgene delivery efficiency



Media composition had no significant effect on the efficiency of transgene expression across all tested media.

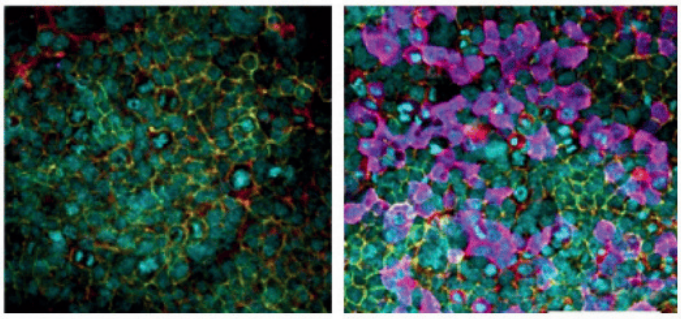
DNA/RNA Loading Efficiency



Relative toxicity of Evs loaded with over a range of DNA doses assessed in H358 cells.

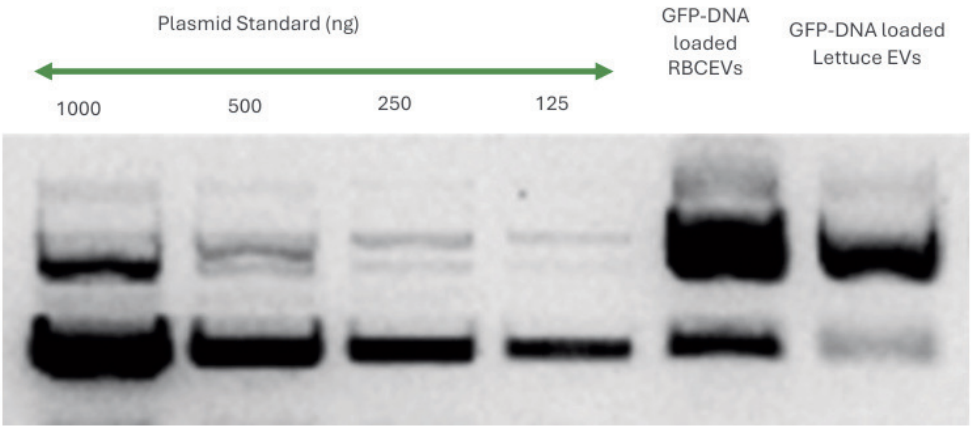
In *vitro* transgene delivery

Untransfected EVs *EVfect*



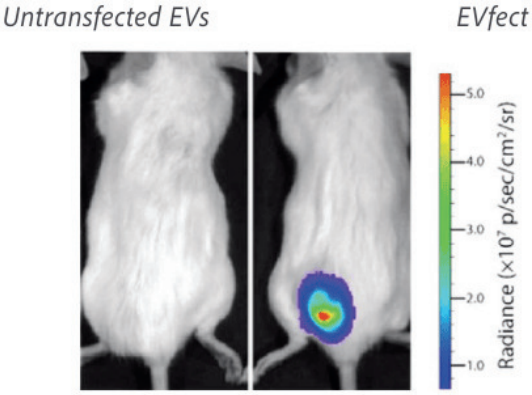
Cells treated vs EVs loaded with plasmids encoding nanoucifease (magenta) using EVfect displayed high levels of espression.

In *vitro* transgene delivery



Lettuce-derived EVs transfected with an eGFP plasmid successfully delivered the payload to H293 cells.

In *vivo* transgene delivery



Mice receiving nanoluciferase-loaded EVs via EVfect showed persistent and consistent luciferase expression from the tumor site throughout the monitoring period.

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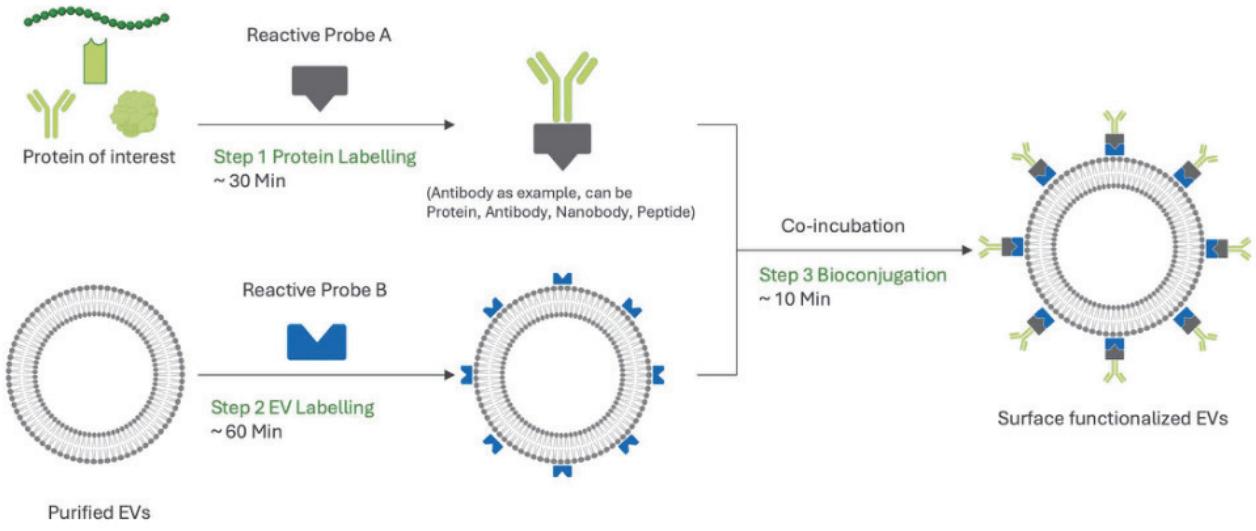
Featured
EVcraft Surface modification kit
JOT-EV-SM1

- Covalent conjugation of any molecules of choice
- High copy number display of molecules
- Absence of EV aggregation and maintenance of polydispersity index
- Applications include antigen-specific cellular targeting, cell activation, and specific target uptake
- User-friendly protocol



Testing protocol for EVcraft Surface Modification Kit

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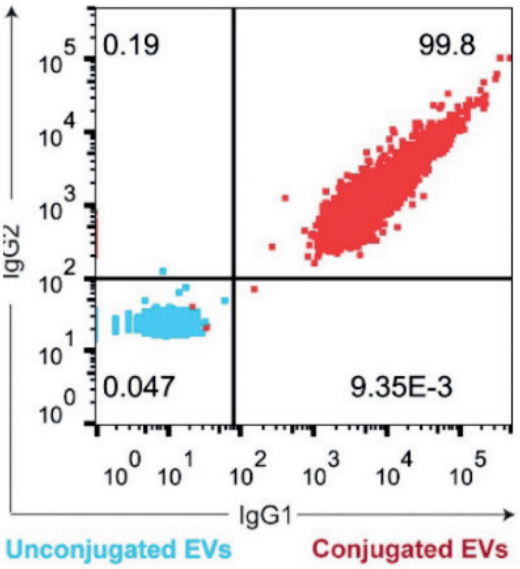
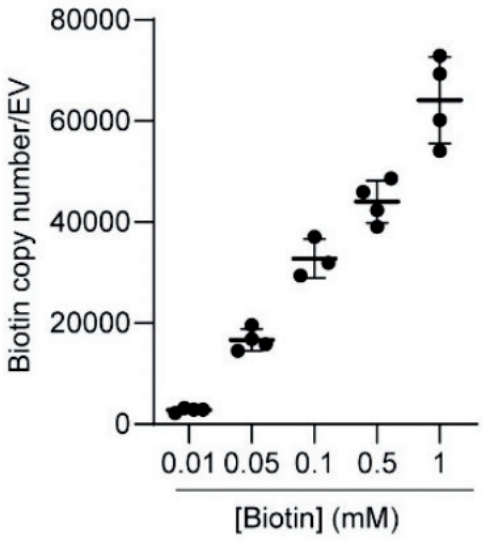
Single EV Flow Cytometry



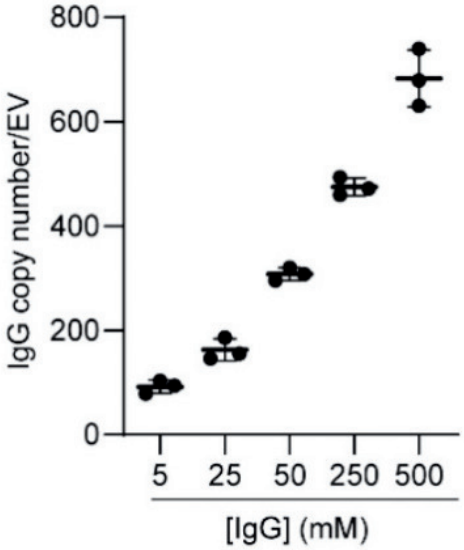
Average 99.8% of the EVs are successfully conjugated with both IgGs.

Copy Number of Probes



Copy number per EV can be adjusted based on probe concentration, ranging from a few hundred per EV, up to ~60,000 per EV.

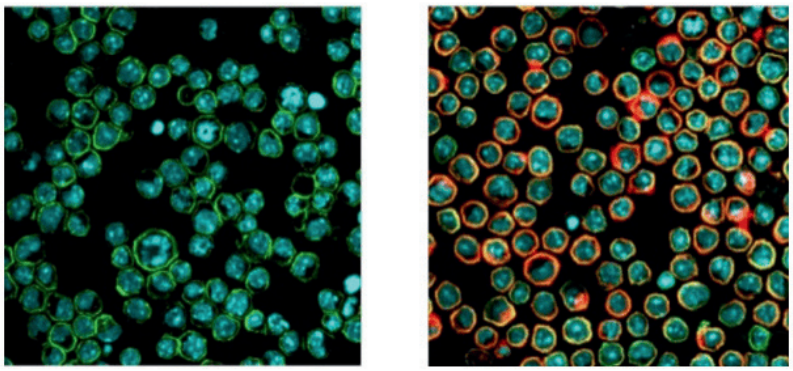
Copy Number of Proteins



Copy number per EV can be adjusted based on protein concentration range from a few hundred per EV, up to ~700 per EV.

In *vitro* antibody delivery

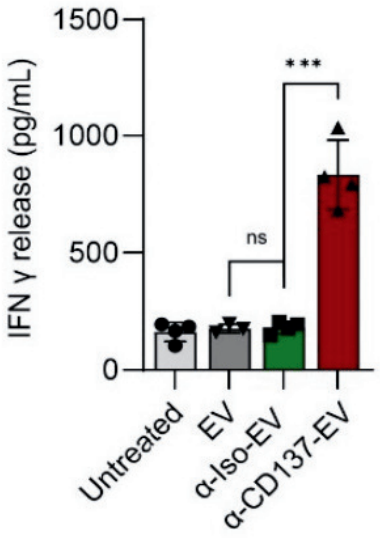
α-ISO EV *α-CD137 EV*



EVs were conjugated with an α-CD137 antibody or isotype control antibody using the EVcraft kit and incubated with activated T cells.

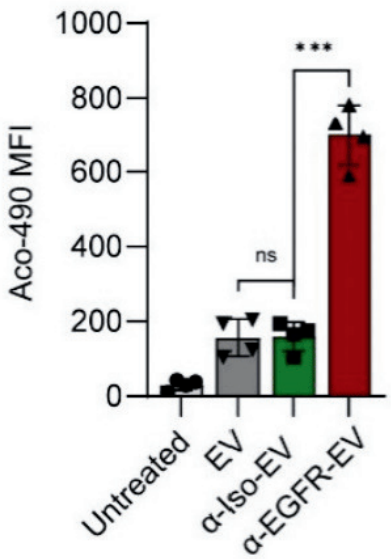
α-CD137-EVs specifically bound to T cells expressing CD137 receptor.

Stimulation of cognate receptors



EVs displaying agonistic ligands can stimulate cognate receptors.

Target cell accumulation

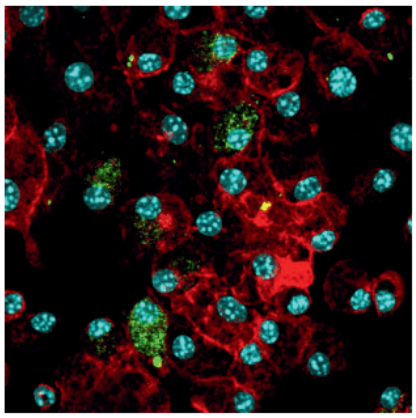


EVs decorated with targeting molecules increase specific accumulation in target cells.

Featured
EV Fluorescent Labelling Kit
JOT-EV-FL488

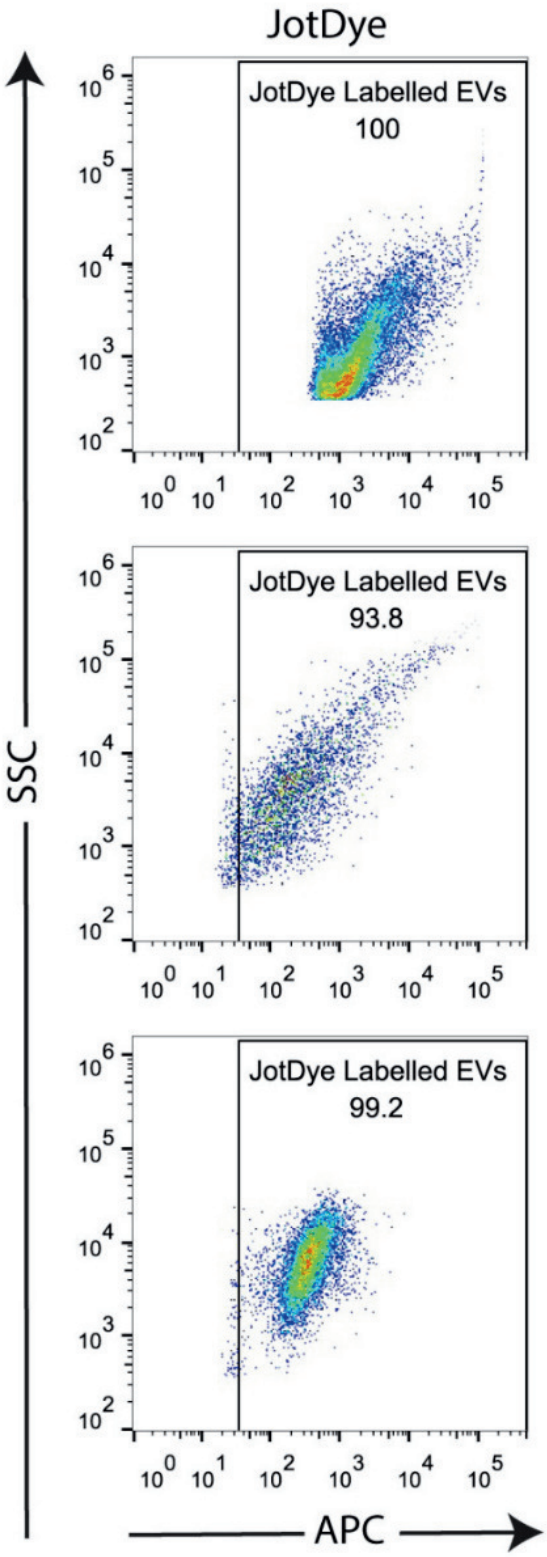
- Specifically designed for fluorescent labeling of a wide range of EVs and cell-derived particles from various sources.
- Labeled EVs retain fluorescence stably post-repurification, suitable for in vitro and in vivo tracking.
- Non-lipophilic dye ensures ease of EV repurification after labeling. The dye is non-fluorescent until it interacts with EVs or cells.
- Enables clear tracking of labeled EVs within cellular compartments in under 8 hours.
- Suitable for nano-flow cytometry, in vitro EV tracking, and confocal imaging.
- Option available for 405, 488, 561, 640 laser lines.

In vitro tracking of labelled EVs



EVs labelled with JOT-EV-FD488 were successfully tracked to the endosomal compartments of human monocyte-derived macrophages within 8 hours post-treatment using confocal microscopy. The cellular membranes were stained with CellMask (Red), while nuclei were labeled with Hoechst (Cyan), enabling clear visualization of the interaction.

EV labelling



JOT-EV-FL488 demonstrated consistently high labeling efficiency across various EV sources, including mesenchymal stem cell-derived EVs, lettuce-derived plant EVs, and human red blood cell-derived EVs.

Selected publication

1) Extracellular Vesicle Surface Display Enhances the Therapeutic Efficacy and Safety Profile of Cancer Immunotherapy, Molecular Therapy (2024) 32: 1-22

2) Red Blood Cell-Derived Extracellular Vesicles Display Endogenous Antiviral Effects and Enhance the Efficacy of Antiviral Oligonucleotide Therapy, ACS Nano 2023, 17, 21, 21639–21661

3) Surface-engineered extracellular vesicles for targeted delivery of therapeutic RNAs and peptides for cancer therapy", Theranostics (2022); 12(7):3288-3315

4) Covalent Conjugation of Extracellular Vesicles with Peptides and Nanobodies for Targeted Therapeutic Delivery", Journal of Extracellular Vesicles, 10.4 (2021): e12057

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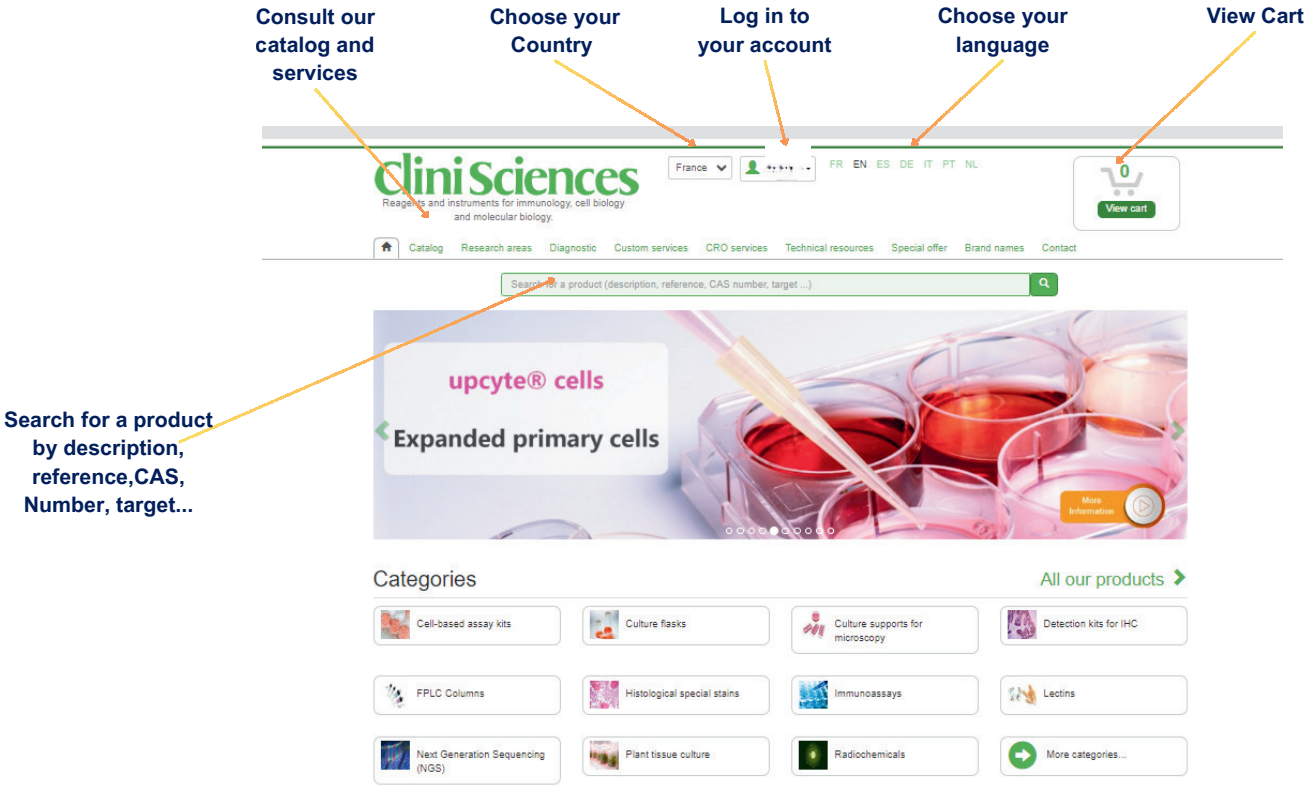

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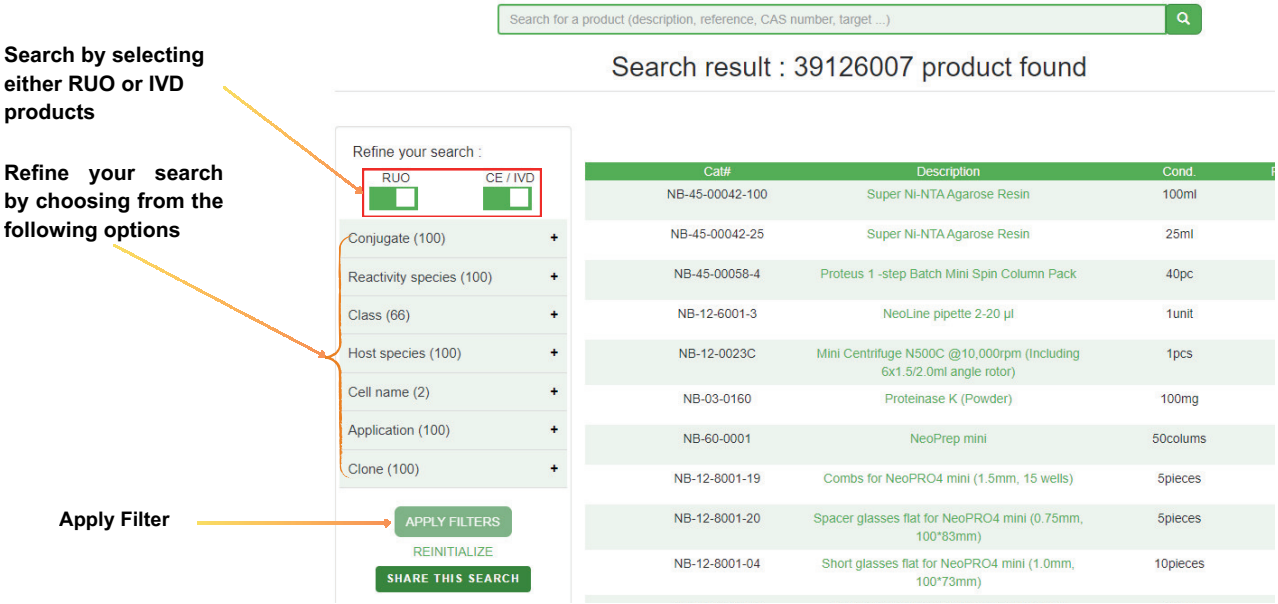

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