FROM THE LAB TO THE MARKET TO MAXIMIZE IMPACT

María de la Fuente

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Health Research Institute of Santiago de Compostela / SERGAS

DIVERSA Technologies SL, Co-founder & CEO/CSO

FROM THE LAB...

SERVIZO GALEGO de SAÚDE | Xerencia de Xestión Integrada de Santiago de Compostela Santiago de Compostela

idis Health Research Institute of Santiago de Compostela

NA ON Nano-Oncology and Translational Therapeutics Unit

...WITH THE PATIENT IN MIND...

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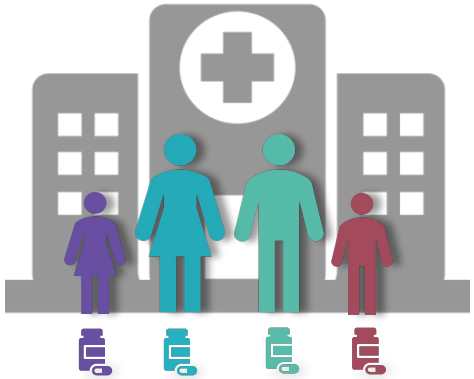


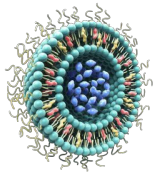
BIOINSPIRED TECHNOLOGY

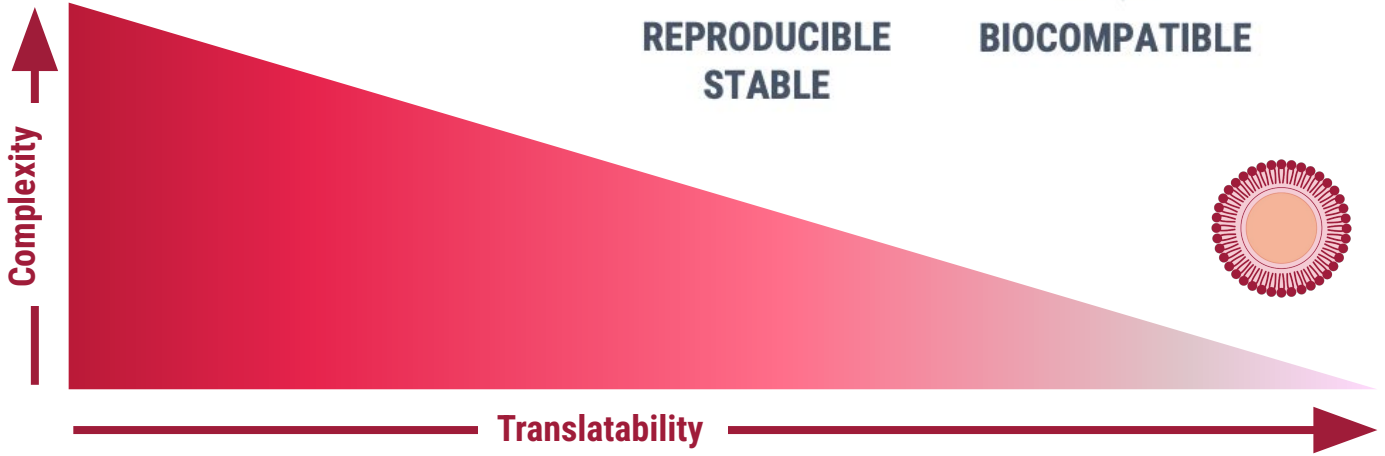
FAST
SIMPLE

SAFE-BY-DESIGN

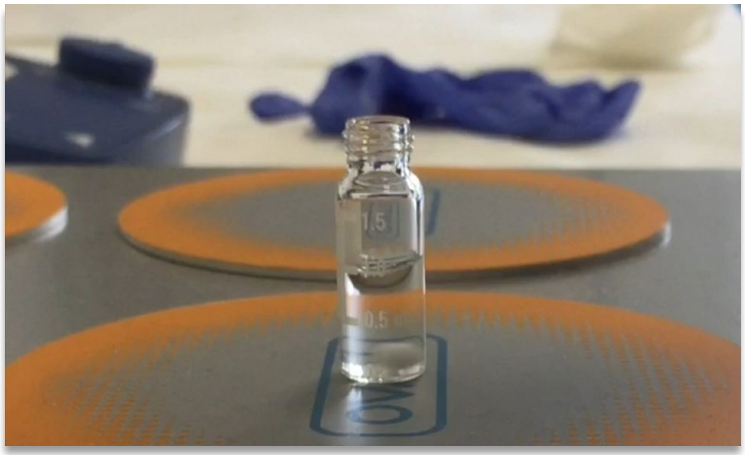
REPRODUCIBLE
STABLE

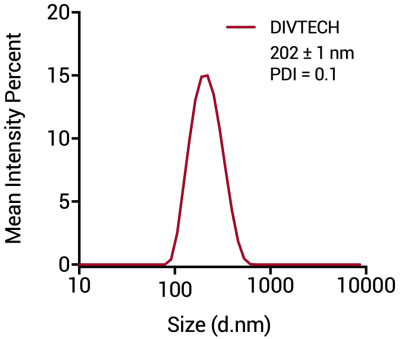
BIOCOMPATIBLE

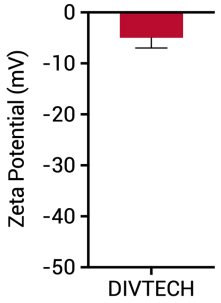


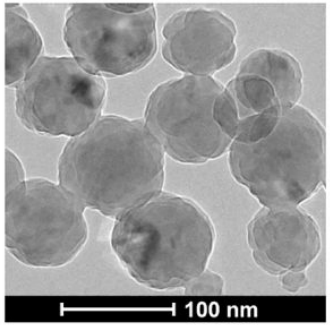


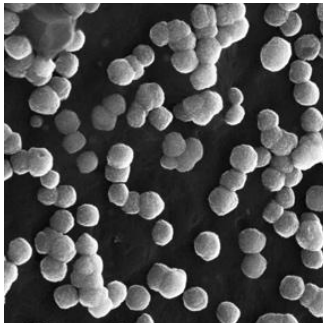
CHARACTERIZATION



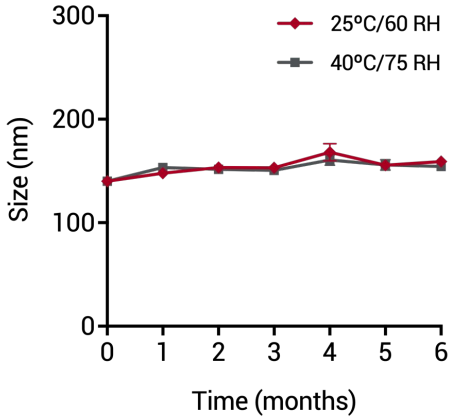


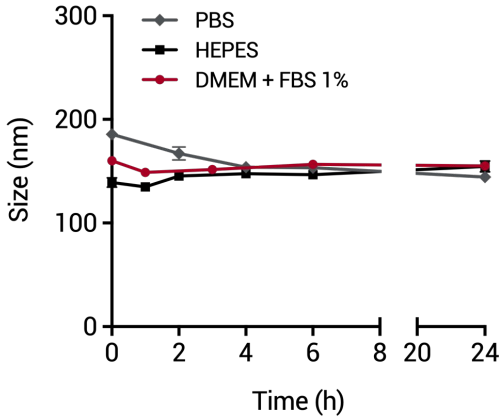






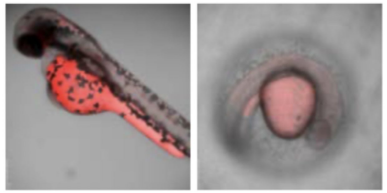
STABILITY

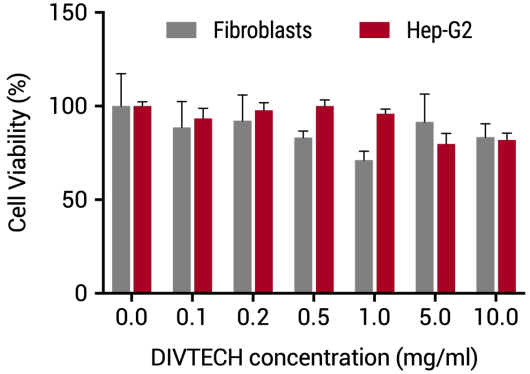


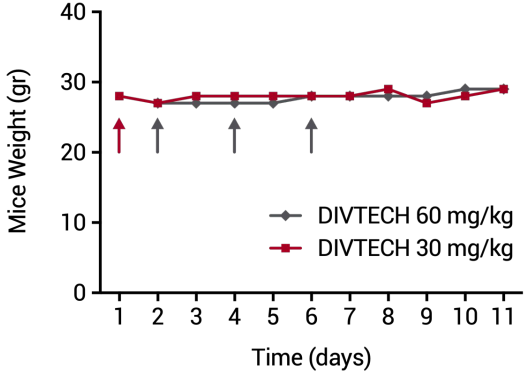


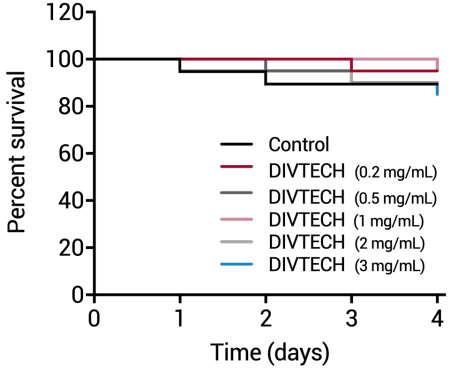
Biological fluids	DIVTECH
Human plasma	24 h*
Simulated tear fluid	24 h*
Simulated synovial fluid	24 h*
Simulated gastric fluid	6 h
Simulated intestinal fluid (SIF)	4 h
Fed state SIF	4 h
Fasted state SIF	24 h*

BIOCOMPATIBILITY

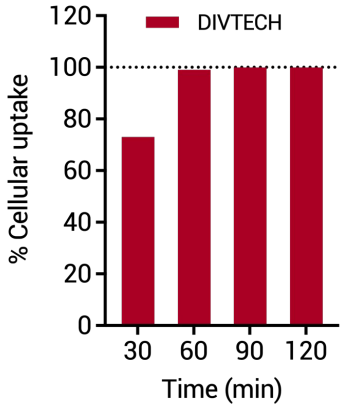


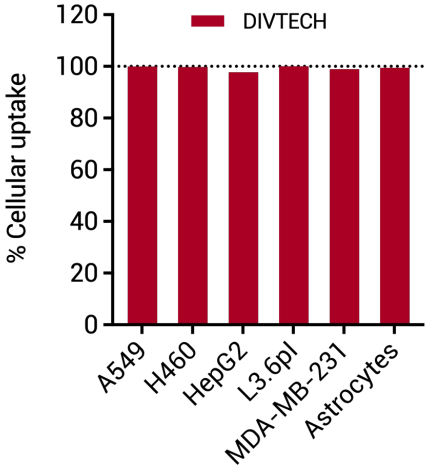


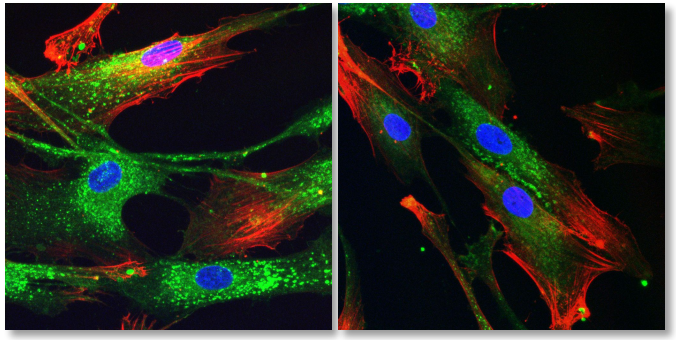




VERSATILITY

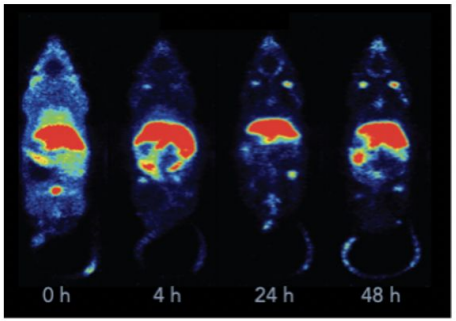




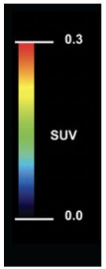


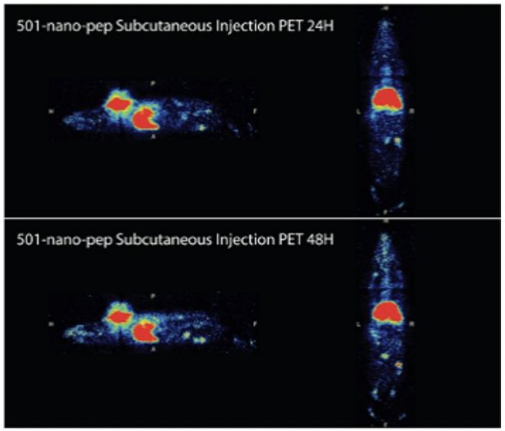
DIVTECH
(Green)

VERSATILITY

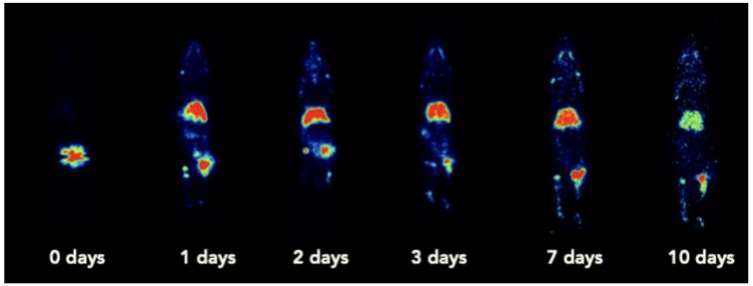


INTRAVENOUS INJECTION



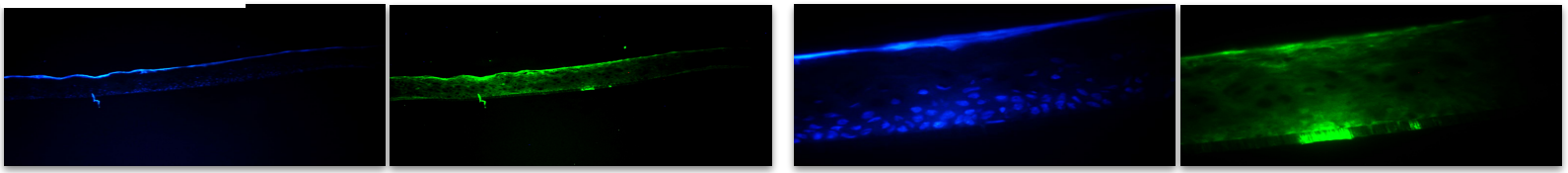


SUBCUTANEOUS INJECTION



INTRA-ARTICULAR INJECTION

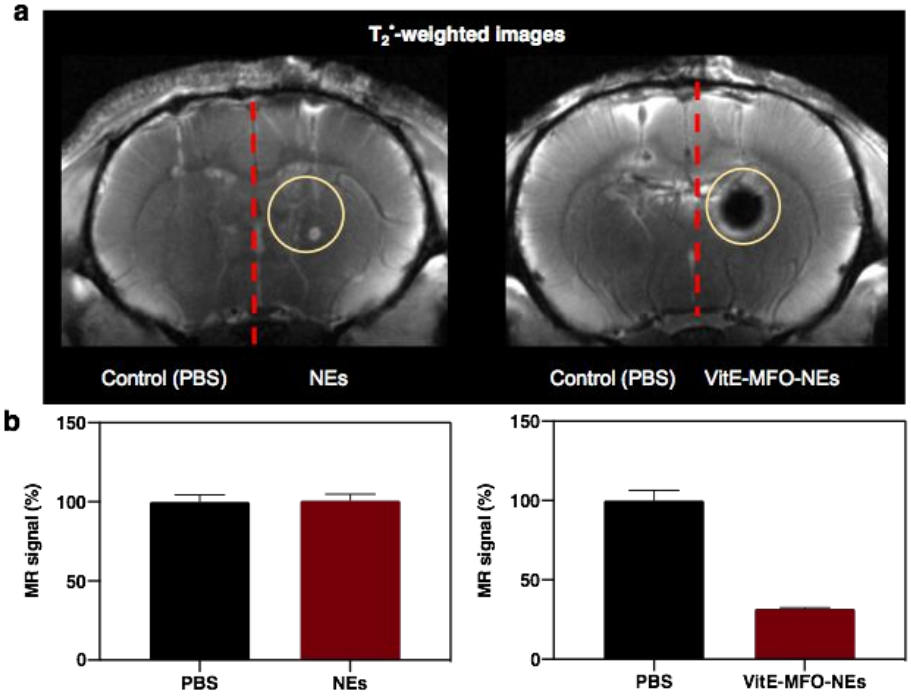
TOPICAL

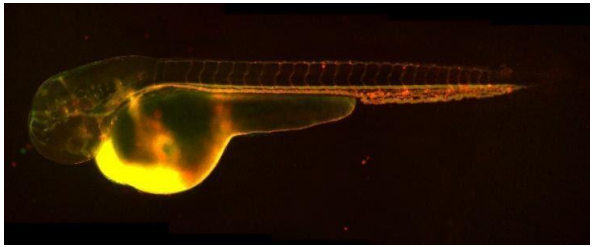


10X

40X

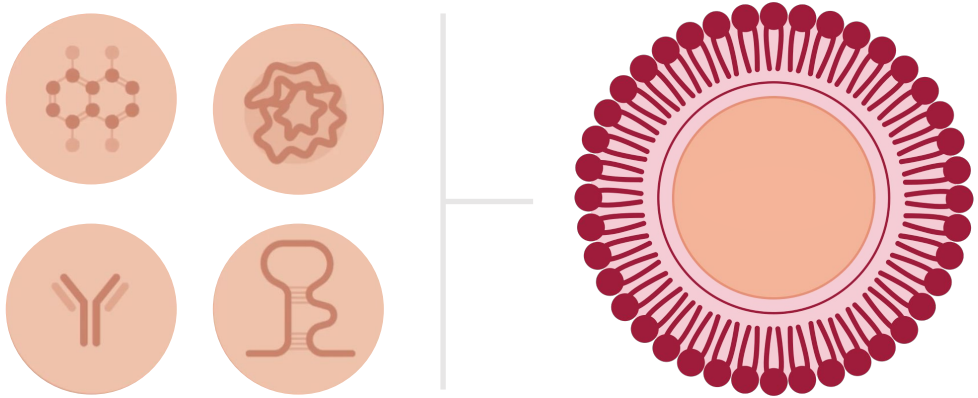
VERSATILITY



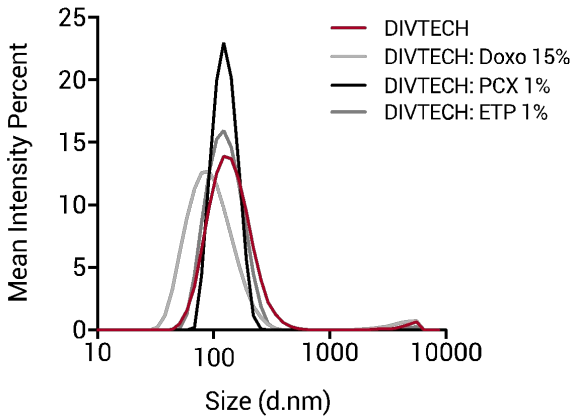


VERSATILITY

Molecules	Association efficiency
Small molecules	85-99%
Peptides	70-99%
Proteins	70-99%
DNA/RNA	85-99%



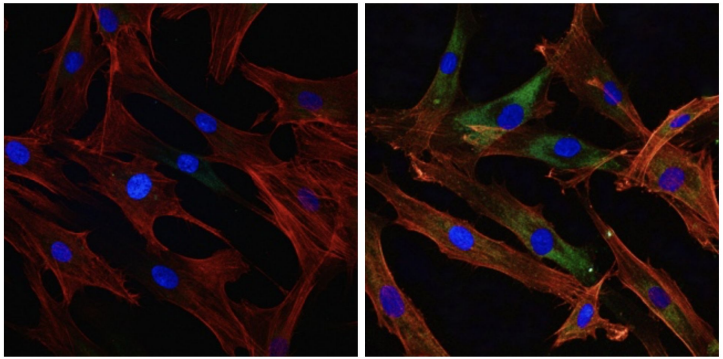
SMALL DRUGS



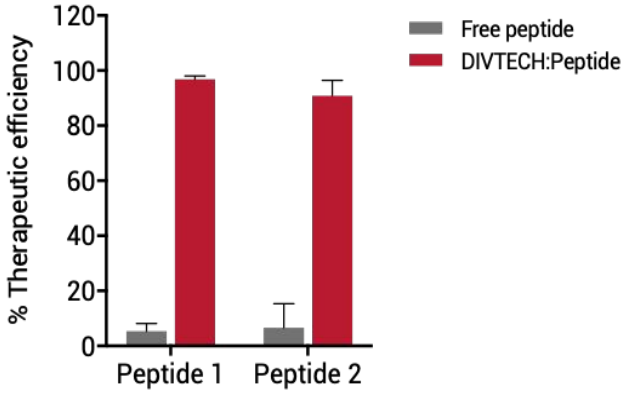
Drug	MW (g/mol)	Log P_{ow}	Mass (mg)	% Loading (w/w)	Molar (mM)	% EE
Galunisertib	369.42	2.4	0.75	15%	2.03	>80%
Doramapimod	527.66	5.7	0.75	15%	1.42	>99%
Disulfiram	296.54	3.9	0.75	15%	2.53	>90%
Paclitaxel	853.91	2.5	0.05	1%	0.06	>80%
Etoposide	588.56	0.6	0.05	1%	0.09	>80%
Doxorubicin	543.52	1.3	1	20%	1.84	>90%
Oleuropein	540.51	-0.4	0.75	15%	1.39	>99%
Rose Bengal	973.67	8.5	1	20%	1.03	>95%

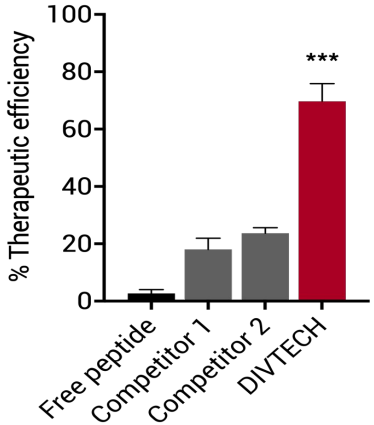
PEPTIDES

Peptide length	pI	Peptide charge	% Hydrophobic Aa
3-mer	5.9	-1	0 %
12-mer	9.5	+4	25 %
13-mer	9.8	+5	23 %
16-mer	9.5	+7	50 %
19-mer	8.6	+2	21 %
28-mer	11.9	+6	39 %



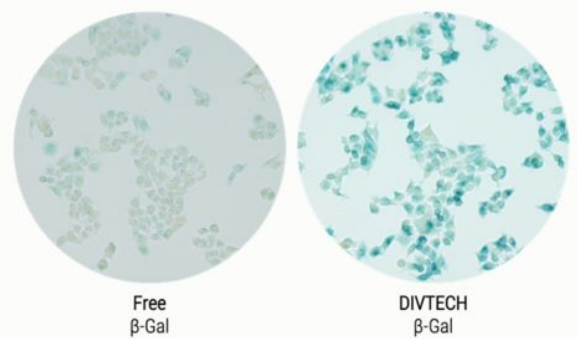
FREE PEPTIDE **DIVTECH**: PEPTIDE

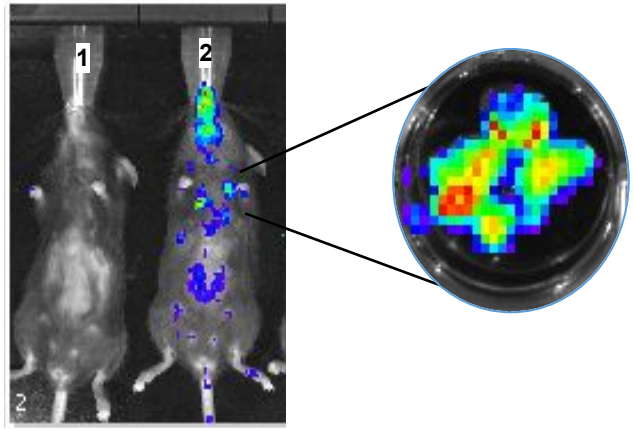




PROTEINS

Protein	MW (kDa)	pI	DIV031 (BR)	DIV042 (Anionic)
Anakinra	17.3	5.5	√	√
Green Fluorescent Protein	28.7	~6.0	√	
Luciferase (LucR8)	37.0	8.3	√	
Ovalbumin	44.5	4.6	√	√
Integrin α6β4	188.8	5.5	√	√
R-Phycoerythrin	250.0	5.6	√	√
β-Galactosidase	540.0	4.6	√	√

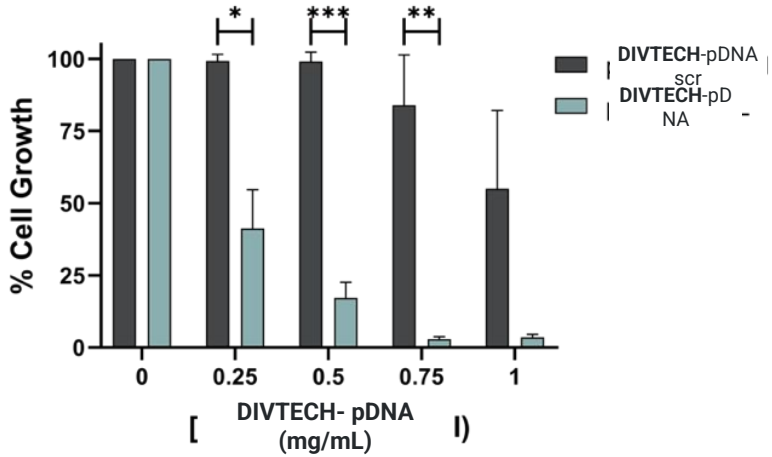




GENE THERAPY

Oligonucleotide	Length size	Association Efficiency (%AE)
siRNA	19–21 bp	> 95 %
miRNA	19–23 bp	> 95 %
Aptamer	75–76 bp	> 95 %
mRNA	1–2 Kb	> 95 %
pDNA	8–9.5 Kb	> 95 %
cDNA	4.5–12 Kb	> 95 %

GENE THERAPY (pDNA)



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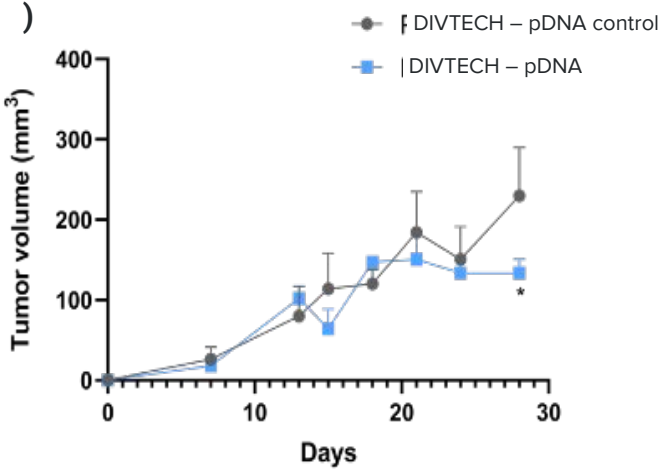

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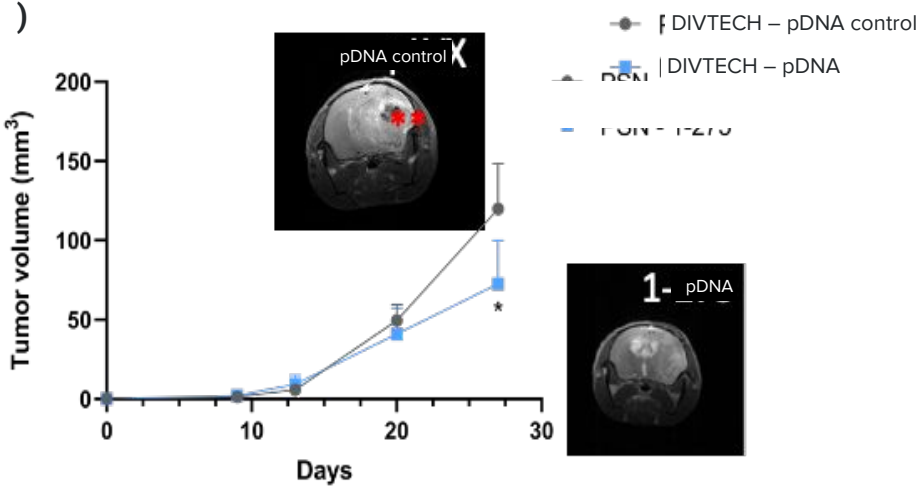
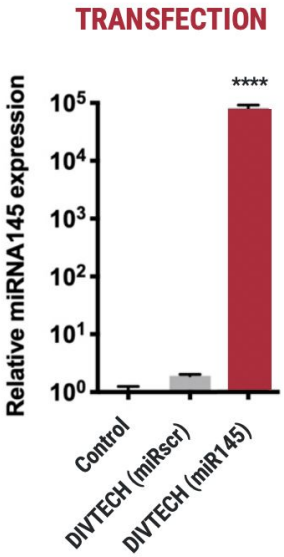
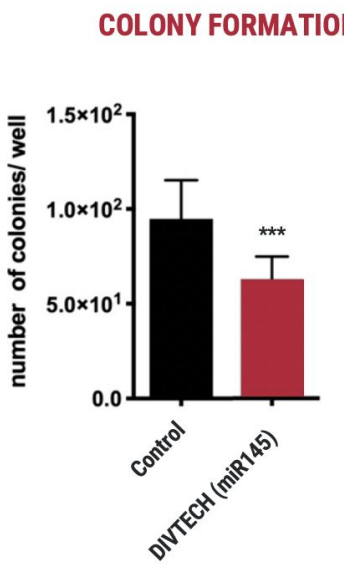
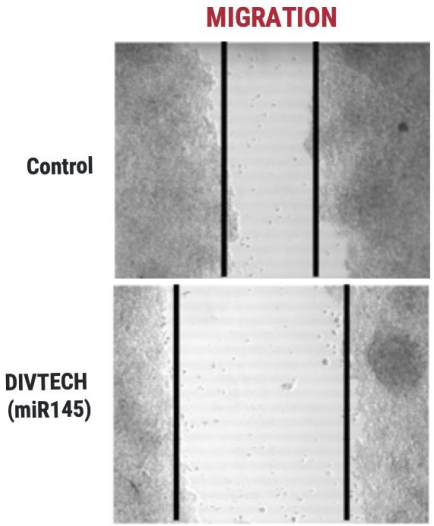


GENE THERAPY (miRNA)

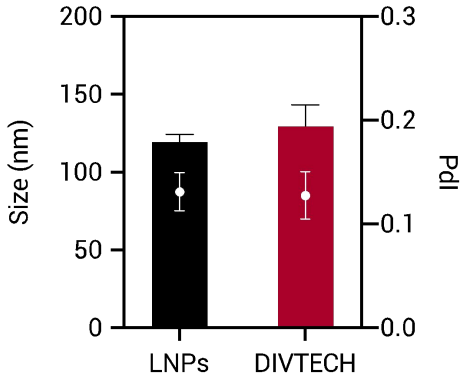


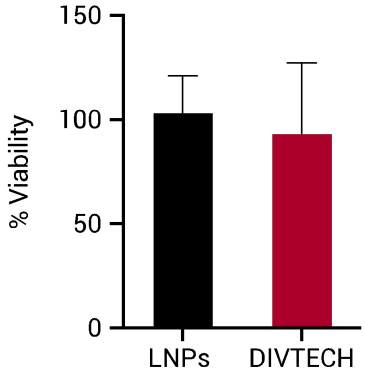


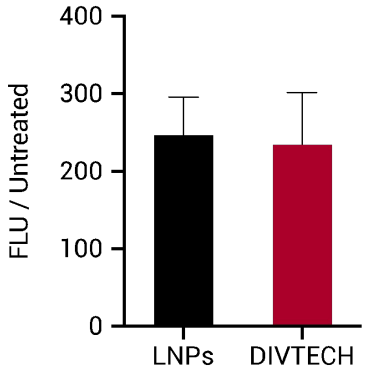


GENE THERAPY (mRNA)

UNIVERSITY OF COPENHAGEN

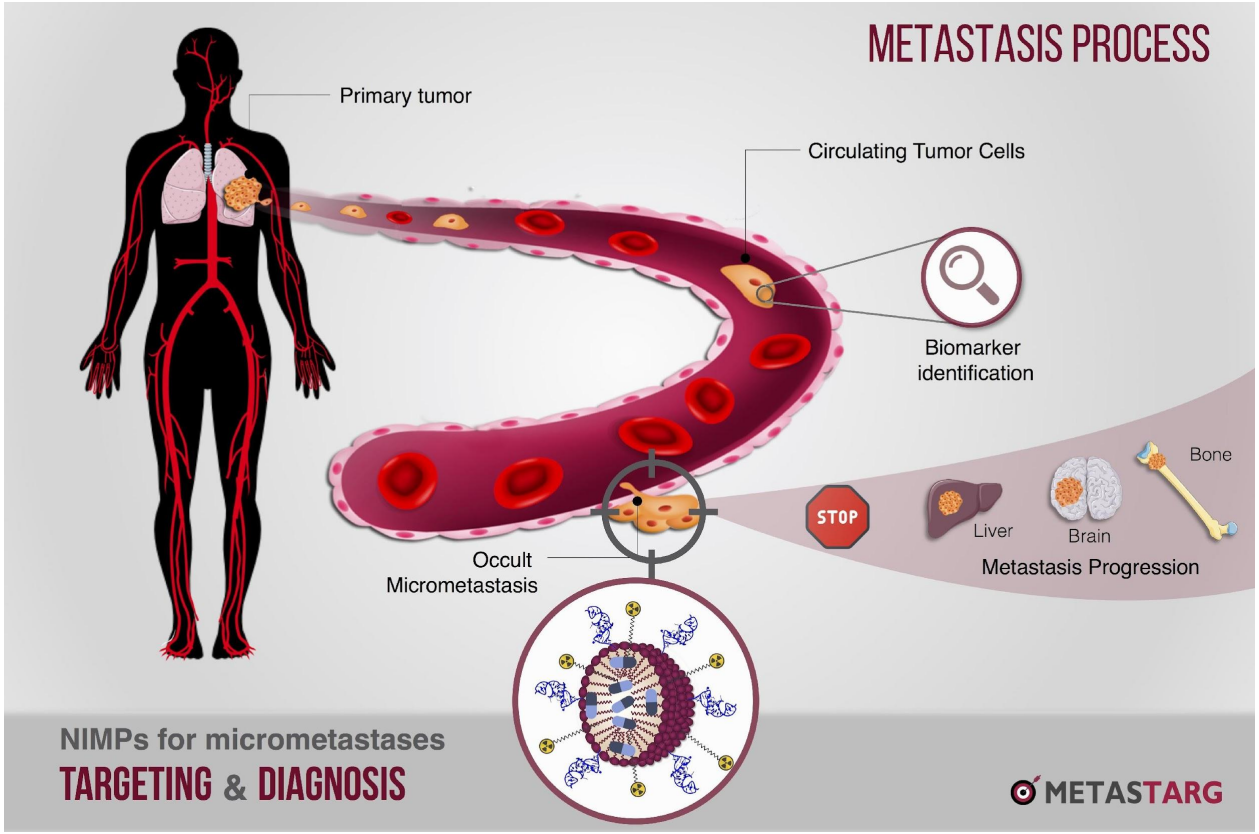






mRNA dose / well
1 ug/mL mRNA

METASTARG



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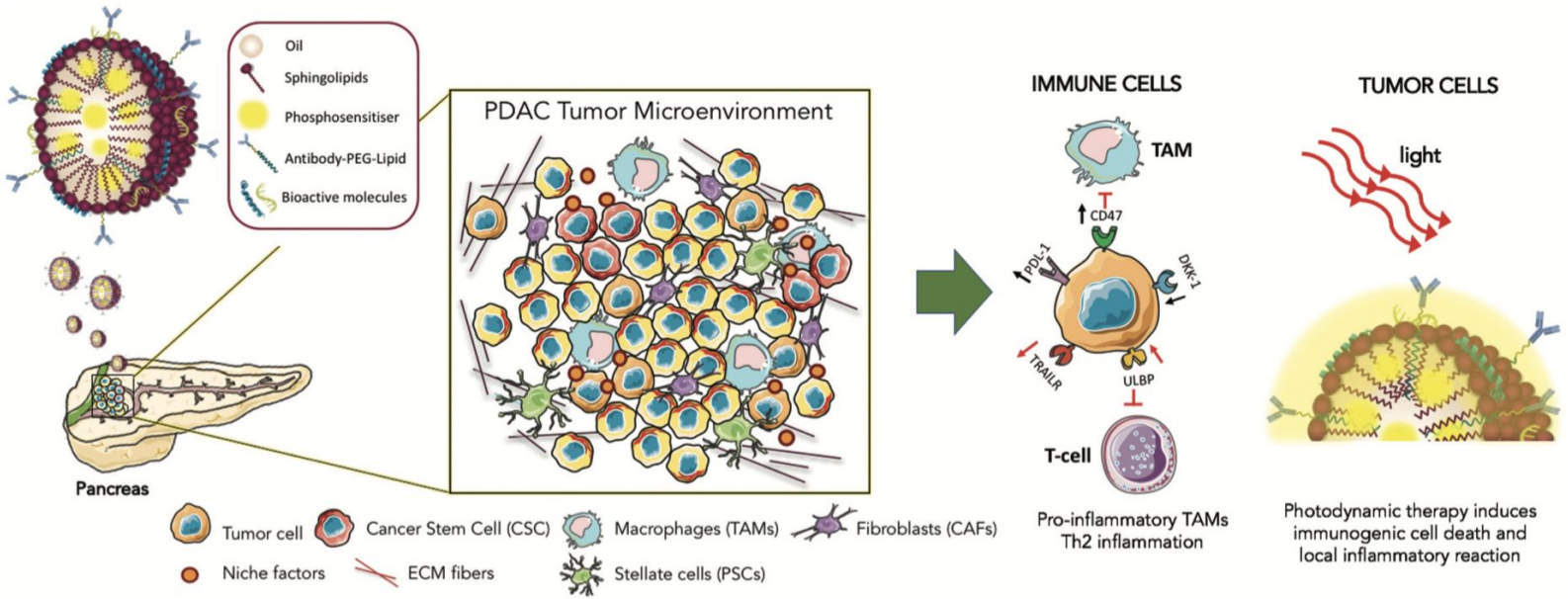
PANIPAC



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Una manera de hacer Europa
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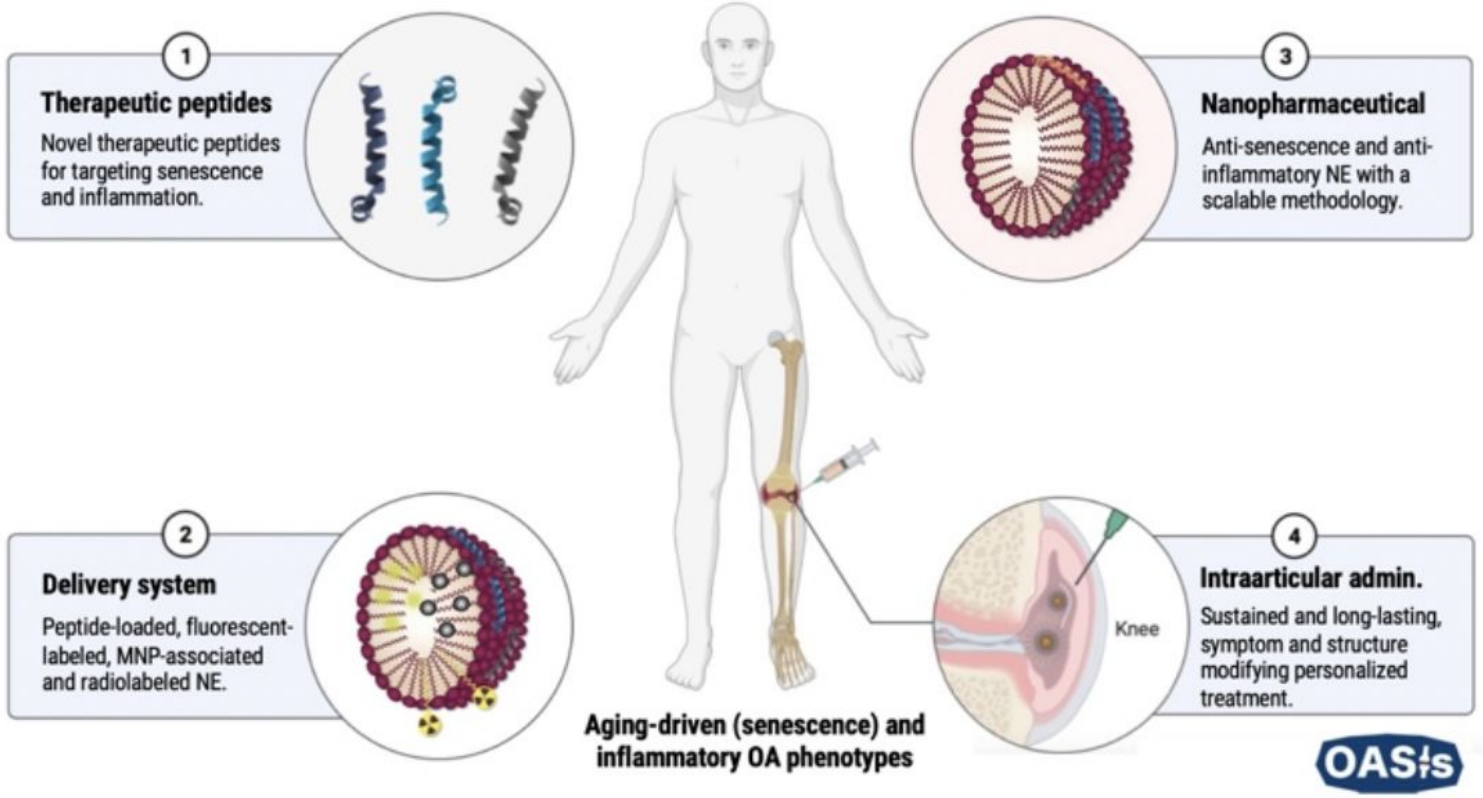
OASIs



OASIs

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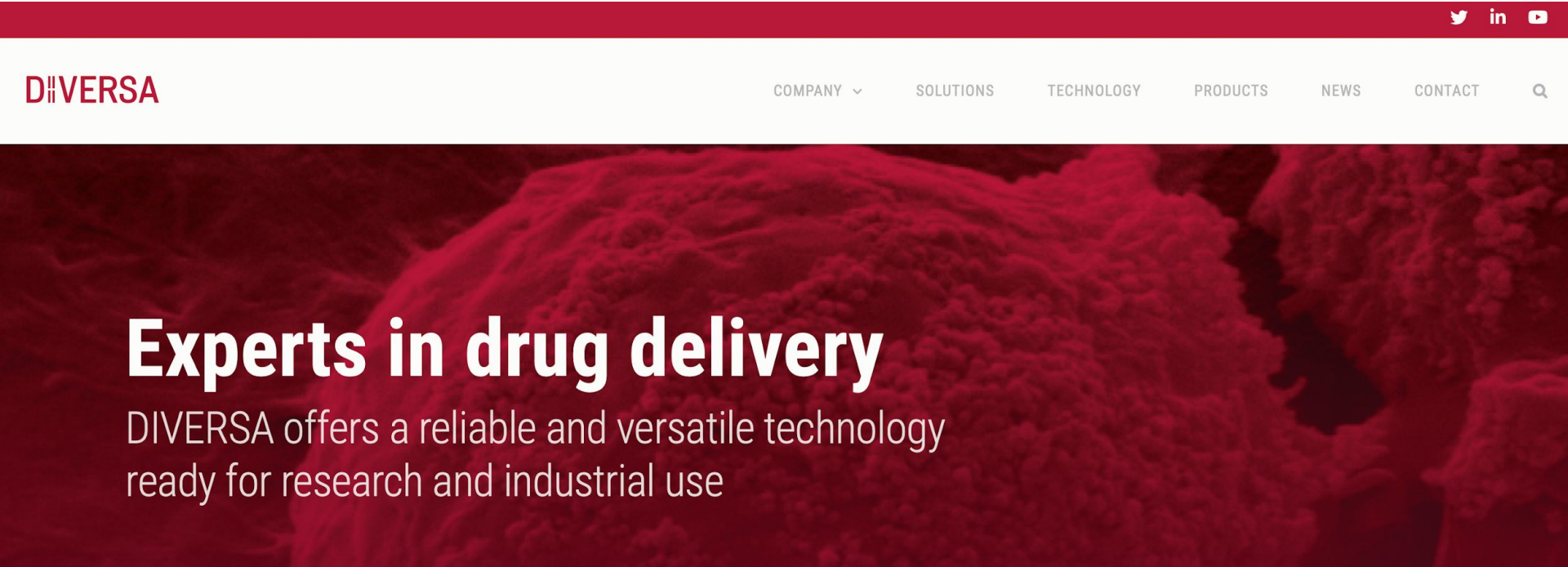
...TO THE MARKET



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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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WO 2019/138139 A1

(54) Title: NANOSYSTEMS AS SELECTIVE VEHICLES

(57) Abstract: In the present invention, the development of various oil-in-water (O / W) nanoemulsions containing an oil phase or oil core, preferably selected from vitamin E or oleic acid, stabilized by a sphingolipid of the sphingomyelin type, and optionally other lipids such as phospholipids, cholesterol, octadecylamine, DOTAP (N- [1- (2,3-Dioleoyloxy) propyl] -N, N, N-trimethylammonium methyl-sulfate), and PEGylated derivatives (derivatives with polyethylene glycol), for use as a nanotech vehicle, in particular for the management of cancer and metastatic disease, is herein described. Said nanoemulsions can be functionalized with ligands capable of interacting or binding to receptors expressed on the cell membrane of tumor cells, and in particular capable of interacting or binding to receptors expressed on the membrane of primary and/or disseminated or metastatic tumor cells. Also, antitumor drugs or therapeutic biomolecules can be encapsulated in said nanoemulsions and, finally, contrast agents can be incorporated for their use in the *in vivo* diagnosis in said nanoemulsions.

...TO THE MARKET

- Specific funds for tech transfer:

PROGRAMA ignicia

Caixa impulse
innovation for society

ISC Instituto de Salud Carlos III

- Specific support for tech transfer:

Panacea Stars

Spin UP

bioga

BIOINCUBATECH

Healthtech TAB
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2022

TEAM

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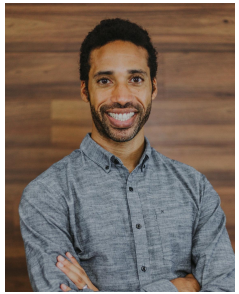

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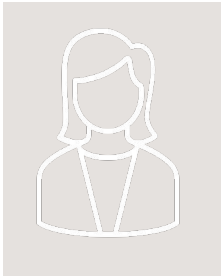

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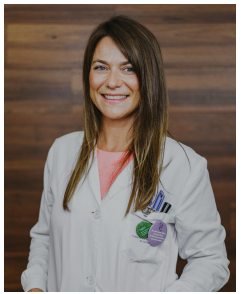
Research Scientist

Cristina Cotelo
Lab Technician



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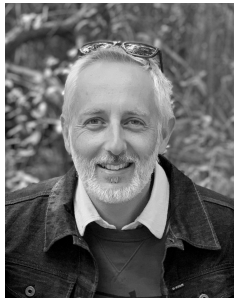
Lab Researcher

ADVISORY BOARD



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Scientific advisor

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Scientific advisor

Felicity Sartain
Scientific advisor

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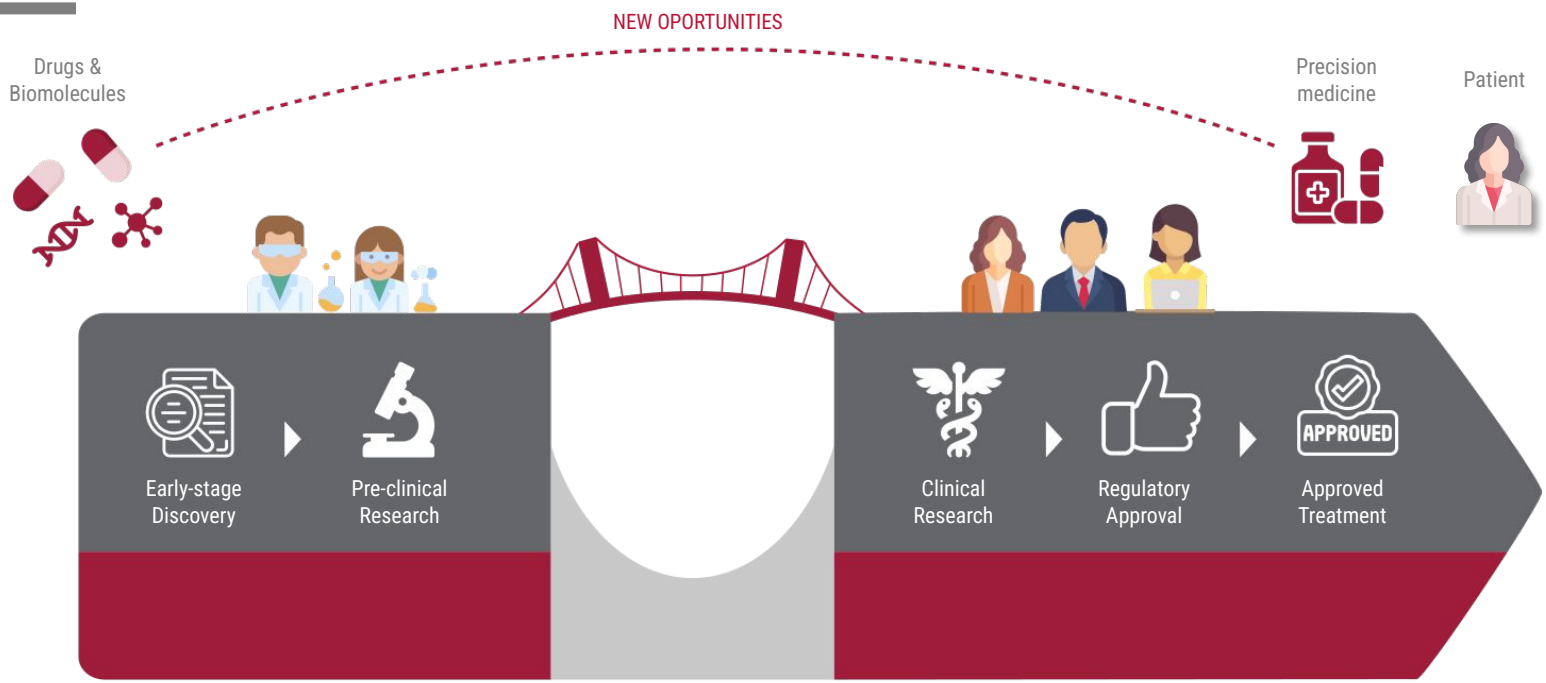
Scientific advisor

BUSINESS MODEL



BUSINESS MODEL

- ✔ Academic and research institutes
- ✔ CROs
- ✔ Pharmaceutical and / or biotechnology companies
- ✔ Own developments

KITS

“DO IT YOURSELF”

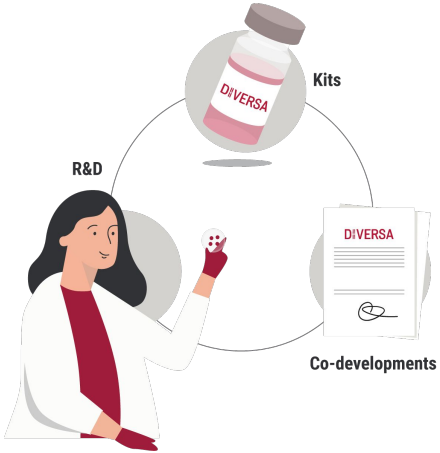
CO-DEVELOPMENT

“DO IT WITH US”

R&D

“WE ARE DOING IT”

BUSINESS MODEL



KITS *"DO IT YOURSELF"*

CO-DEVELOPMENT *"DO IT WITH US"*

R&D *"LOOK HOW WE DO IT"*

PRECLINICAL STAGE	CLINICAL STAGE	MARKET APPROVAL
In vitro and *in vivo* testing	Human testing	Review and approval

DIVTECH KITS

References

1. **DIVTECH** FluoGreen **Uptake** Kit
2. **DIVTECH** **Small Molecule** Kit
3. **DIVTECH** FluoGreen **Small Molecule** Kit
4. **DIVTECH** Broad Range **Peptide** Kit
5. **DIVTECH** FluoGreen Broad Range **Peptide** Kit
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9. **DIVTECH** FluoGreen Anionic **Peptide/Protein** Kit

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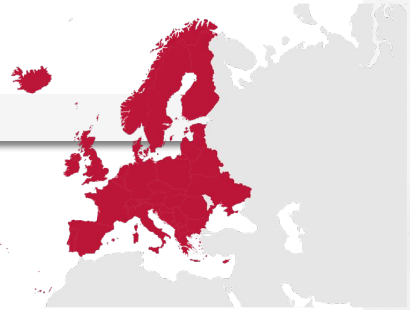
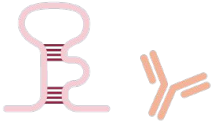


CO-DEVELOPMENT

Service Agreement

€



Material Transfer from Customer

License Agreement

€

DIVERSA

Testable Prototypes

DIVERSA formulation development

R&D

DISCOVERY	FEASIBILITY	PROOF OF CONCEPT	PRECLINICAL (IND)	PHASE I/II
ONCOLOGY PROGRAM (CAGR 13.4%)				
OSTEOARTHRITIS PROGRAM (CAGR 7.9%)				
METABOLIC DISEASES PROGRAM (CAGR 7.6%)				

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BOOTH 205

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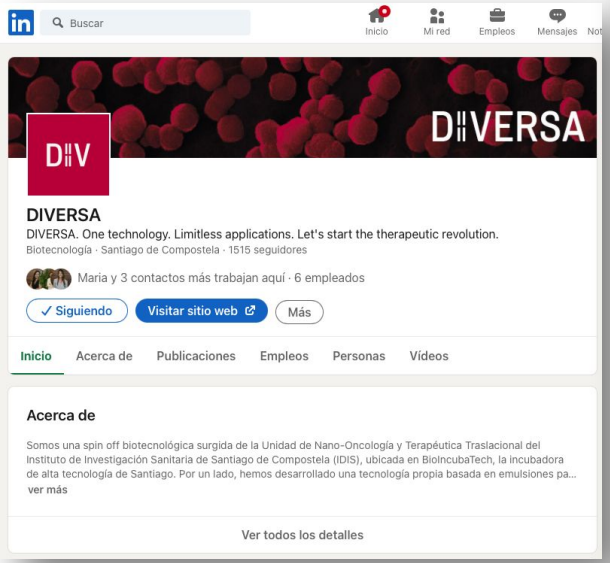
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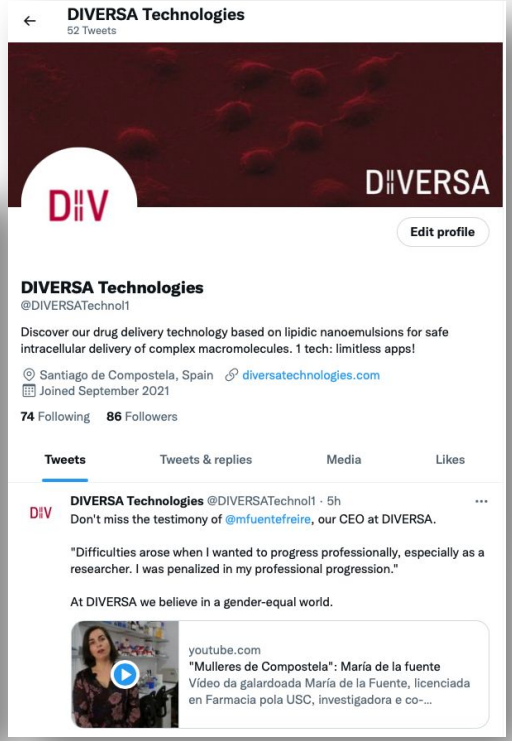
Somos una spin off biotecnológica surgida de la Unidad de Nano-Oncología y Terapéutica Traslacional del Instituto de Investigación Sanitaria de Santiago de Compostela (IDIS), ubicada en BioIncubaTech, la incubadora de alta tecnología de Santiago. Por un lado, hemos desarrollado una tecnología propia basada en emulsiones pa...
ver más
Ver todos los detalles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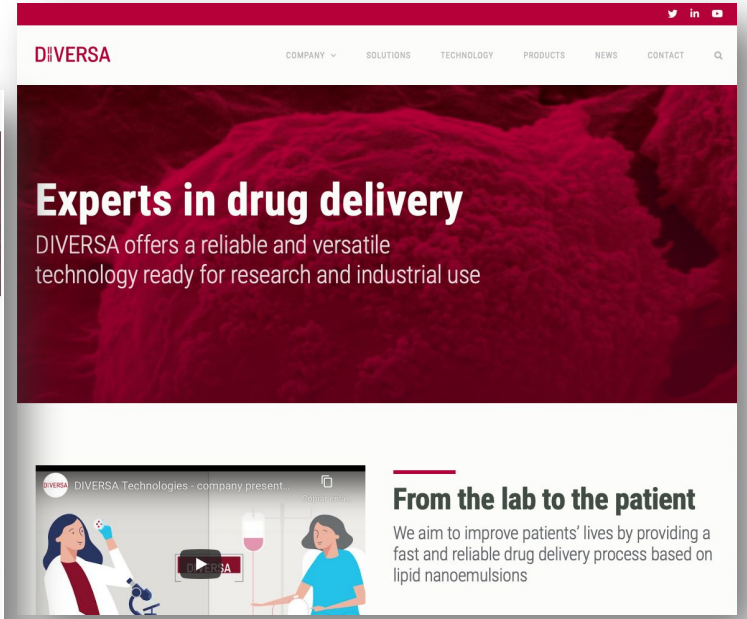
"Mulleres de Compostela": María de la fuente
Vídeo da galardoada María de la Fuente, licenciada en Farmacia pola USC, investigadora e co-...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