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Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA



UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

Mano-HCC

HEAL | ITALIA

BANDO A CASCATA: SPOKE N. 6 HEALTHY TOOLBOX, TEMATICA 4

Three-dimensional matrices and engineered nanoparticles for locoregional treatment of hepatocellular carcinoma (Mano-HCC)

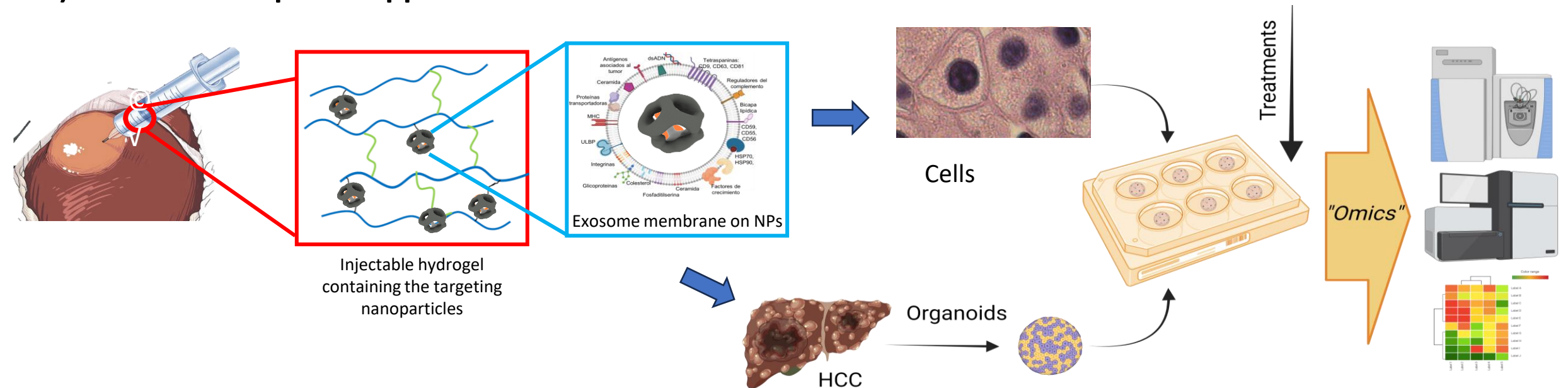
Consortium composition

| Partner n. | Nome del partner e acronimo | Expertise |
|--------------|--|---|
| 1 (Capofila) | Università degli Studi di Milano (UMIL) Luisa De Cola , Luigi Menduti, Filippo Reno' | Hydrogels, nanoparticles, exosomes |
| 2 | Università degli Studi di Messina (UNIME) Sabrina Conoci, Emanuele L. Sciuto, Antonio Leonardi | Characterization nanomaterials, targeting, devices, technology transfer |
| 3 | Università degli Studi di Bari "Aldo Moro" (UNIBA) Michele Vacca, Roberta Ragni, Gianluca Farinola, Orazio Nicolotti, Nunzio Denora | Organoids, HCC, organic synthesis, formulation, drug design, chemoinformatics |



ManoHCC has the ambition to provide a local therapy where the carriers, the matrix and also the therapeutic agents have been designed to achieve innovative and groundbreaking steps in the following directions:

- 1) **Selective Targeting**
- 2) **Locoregional delivery and controlled release**
- 3) **Possibility to co-administer combinational treatment**
- 4) **A novel therapeutic approach**



It can provide several (nano)materials and tools to the other members of the Heal project.



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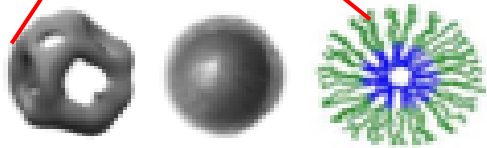
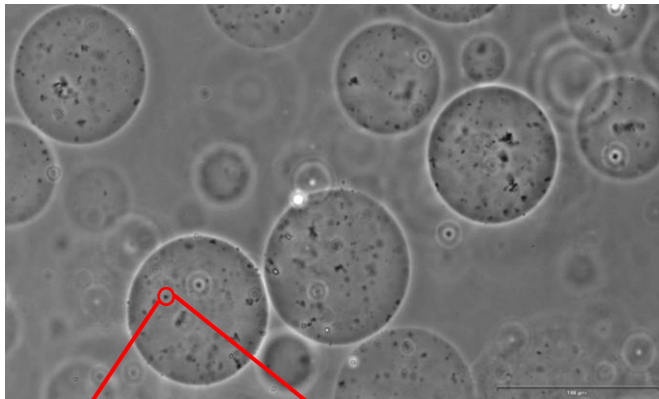
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Mano-HCC

WP1 – Development of hydrogels, nanoparticles and nanotherapeutics (UMIL, UNIME, UNIBa).

Synthesis, characterization, in silico predictive studies, in vitro evaluation of the materials

Microgels containing breakable nanoparticles

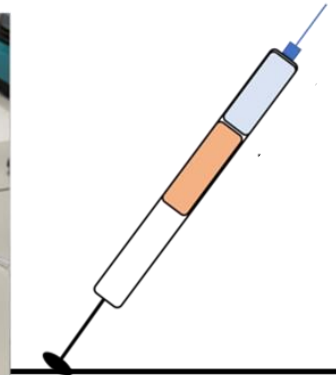
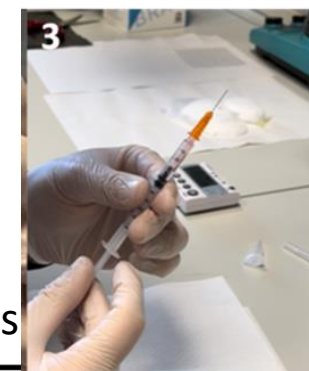


All particles of 20/30 nm

The coating of the nanoparticles will be achieved using the microfluidic technique available in UNIBa

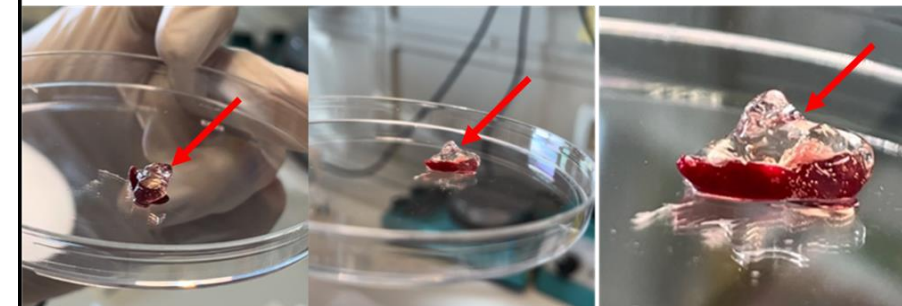
Injectable hydrogels

Gelation time 5 seconds



Hydrogel injection

Spleen



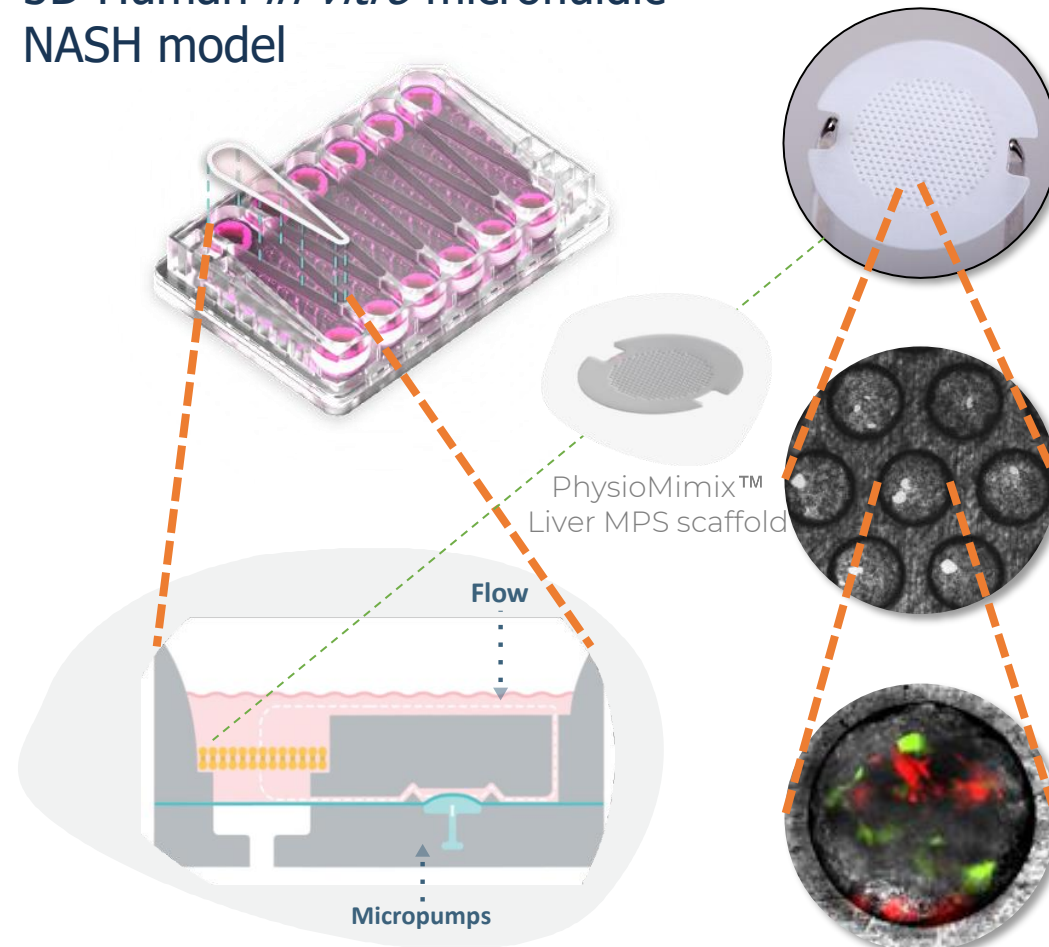
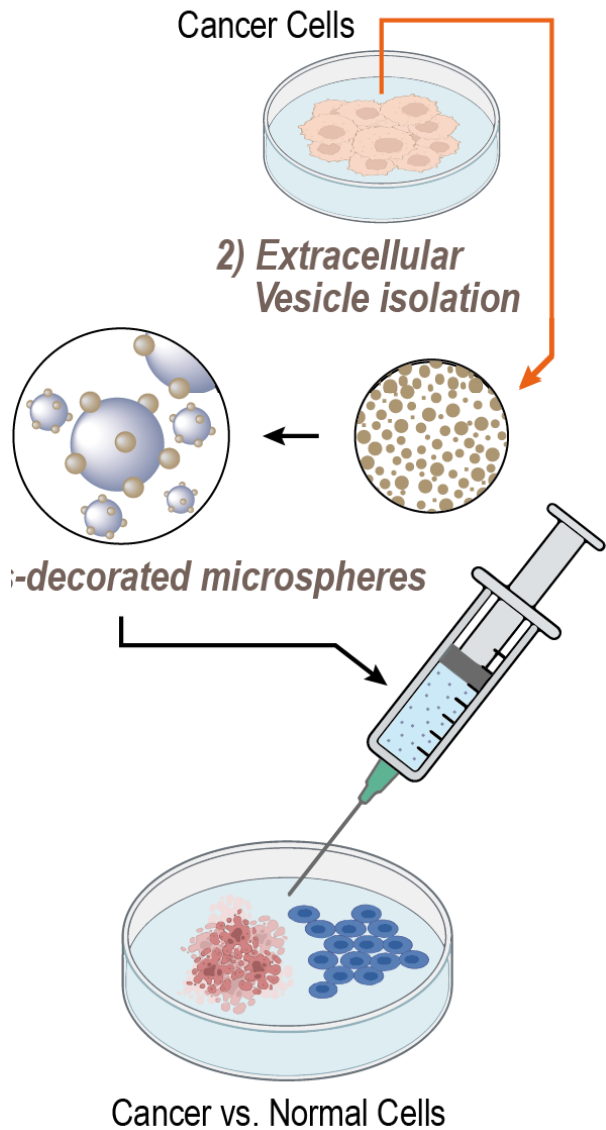
Liver



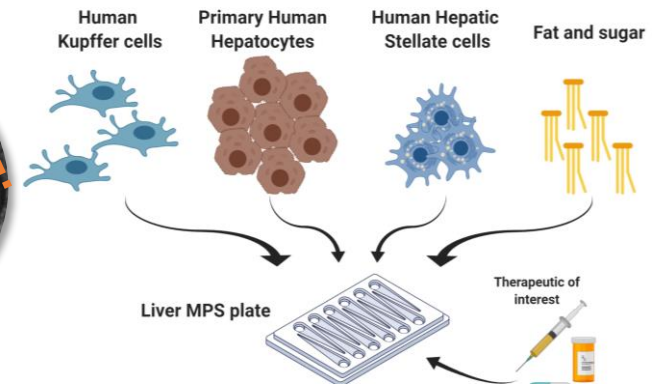


WP2 – Biological characterization in pre-clinical models (UNIBA, UNIME, UMIL)

- 3D Human *in vitro* microfluidic NASH model



Cells are cultured on a scaffold within the LC12 MPS plates



Hepatocytes are seeded with **Kupffer** and **stellate** cells at 10:1:1 ratio



WP3 – Project Exploitation (UNIME, UMIL, UNIBA)

Where are we at the moment?

We have already bought all the equipments. Most of the scientists appointments have been made or at least the positions opened. Some materials, hydrogels, nanoparticles, linkers, are in preparation and the HCC cells from tumor samples have been isolated to grow the organoids.

The nanoparticles, injectable hydrogels, microgel particles, tools and the targeting strategies will be available to all the partners of Heal.

Equipment acquired

UNIBa

| Descrizione | Prezzo unit. | Importo |
|--|--------------|-----------|
| ND-ONEC-W NANODROP ONEC SPECTROPHOTOMTR EA | € 11.500,00 | 11.500,00 |
| AMF3000 EVOS M3000 IMAGING SYSTEM M3000 DIGITAL | € 5.684,05 | 5.684,05 |
| AMEP4646 POWER CORD - EU, EVOS FL/ XL EACH | € 0,00 | 0,00 |
| AMEP5010 EVOS FL PH OBJ BUNDLE 4X/10X/20X LWD FLUORITE OBJS | € 3.061,50 | 3.061,50 |
| AMEP5011 EVOS M3000 ATTACH MECH STAGE M3000 MECHANICAL STAGE | € 977,67 | 977,67 |

UMIL

Microwave oven MonoWave 400 17.080 Euro
Rotavapor 3.090 Euro