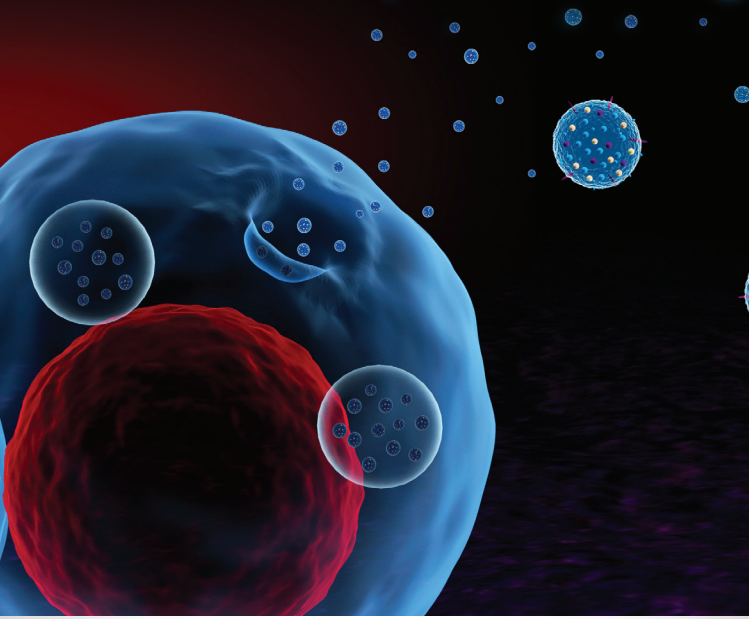
MARVEL

EVOLVING REVERSIBLE IMMUNOCAPTURE BY MEMBRANE SENSING PEPTIDES: TOWARDS SCALABLE EXTRACELLULAR VESICLES ISOLATION

GOAL IS TO DEVELOP A NEW AFFINITY-BASED PLATFORM FOR SCALABLE ISOLATION OF EXTRACELLULAR VESICLES AND PURSUE THEIR IMPLEMENTATION IN BOTH REGENERATIVE MEDICINE AND IN MANY DIAGNOSTICS WORKFLOWS.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n°951768, project MARVEL.

PROJECT DESCRIPTION

Extracellular vesicles (EVs) are cell-derived membranous structures found in all biological fluids that act as signalling vehicles in both physiological or pathological mechanisms. Accordingly, a flourishing interest in EV research is constantly advancing towards their exploitation in precision healthcare, with a particular focus on **Regenerative Medicine** and **Liquid biopsy**. EV market size and prospect potentially already worth billions, yet it is still confined to a very tiny niche by the current readiness level of EV technologies. Revolutionary, versatile, and cost-effective methodologies to enable scalable EV isolation in high purity from bio-samples, from laboratory analysis (µL to mL) to the manufacturing (>1L) scale, are still necessarily demanded to open new perspectives in EV-based therapeutics and diagnostics.

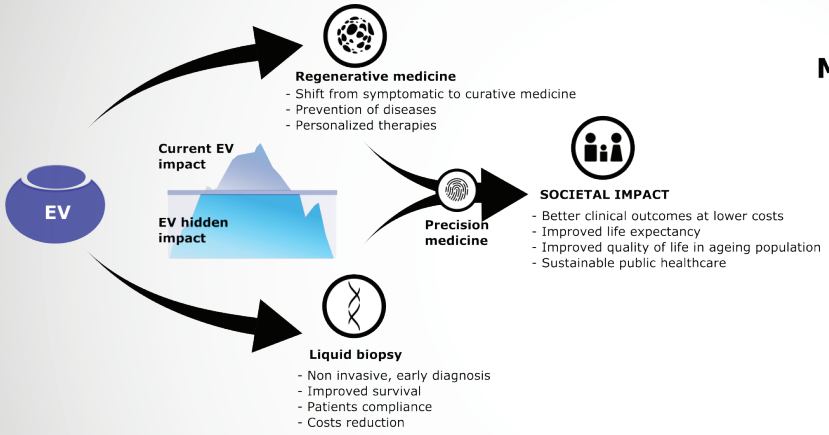
MARVEL's mission is to combine and implement reversible capturing and peptide science, towards the first and best performing ever affinity-based technology for scalable small EV (<200nm) isolation. The modularity in scaling-up of the novel protocols and kits will be demonstrated on medium/large sample volumes in relevant environments for therapeutic and diagnostics use of EVs.

IMPACT

MARVEL platform will produce direct and heavy impacts on the field of EV by empowering the sustainability of their use in both regenerative medicine (EV-based cell-free therapies) and diagnostics (EV-based liquid biopsy). Such empowerment is expected to increment readiness level of EV technologies and endow them with clinical grade maturity.

OBJECTIVES

1. Development of hybrid probes for high-yield, EV capture and intact recovery
2. Technology integration in diverse EV isolation systems across different scales
3. Testing in relevant environments
4. Definition and implementation of the exploitation strategy and entrepreneurial activity



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Cardiac repair

Impacts

- Reduction of damaged tissue in infarcted heart (in vivo model)
- Improved blood-ejection fraction (cardiac function) in post-infarction in vivo model
- Faster recovery

Bladder cancer diagnosis

Impacts

- Reduction in annual cytoscopies in EU
- Savings from non-invasive examinations
- Improved patients compliance
- Improved life expectancy

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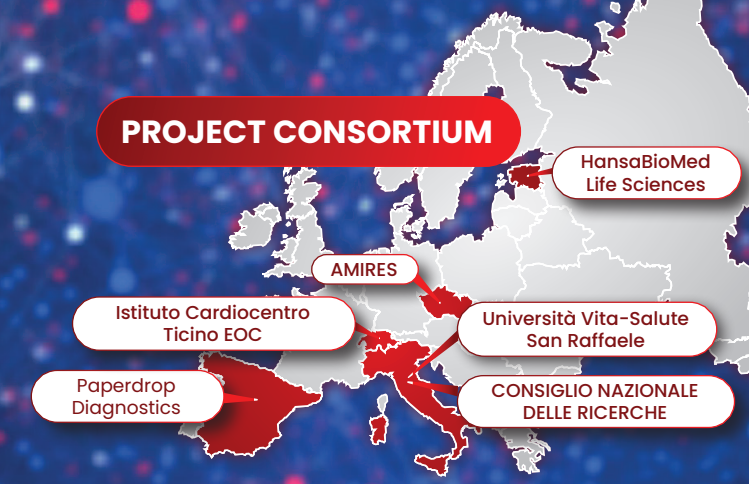

ITALY | SWITZERLAND | ITALY

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PROJECT KEY FACTS

Program funding scheme H2020 Research and Innovation Action

Coordinated by CONSIGLIO NAZIONALE DELLE RICERCHE

Start date	Finish date	Duration in months	Funding
1/11/2020	28/02/2023	28	1.881M€

Call H2020-FETPROACT-2019-2020

Topic EIC PATHFINDER PILOT Transition to Innovation Activities

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