

# On-chip Technology for EVs isolation and miRNA analysis

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Pillar Health – Spoke 2/WP3.1

SAMOTHRACE 2<sup>nd</sup> Year:  
Experimental Prototypes Demo Showcase

SAMOTHRACE PROJECT ECS00000022

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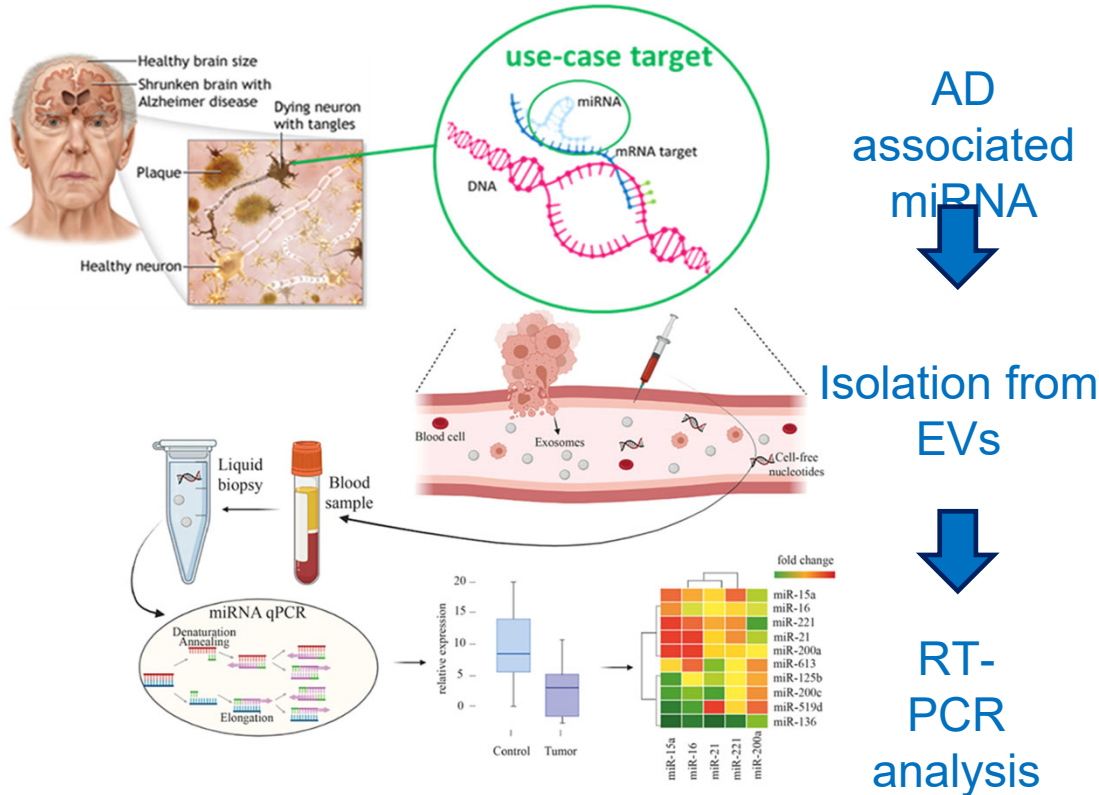
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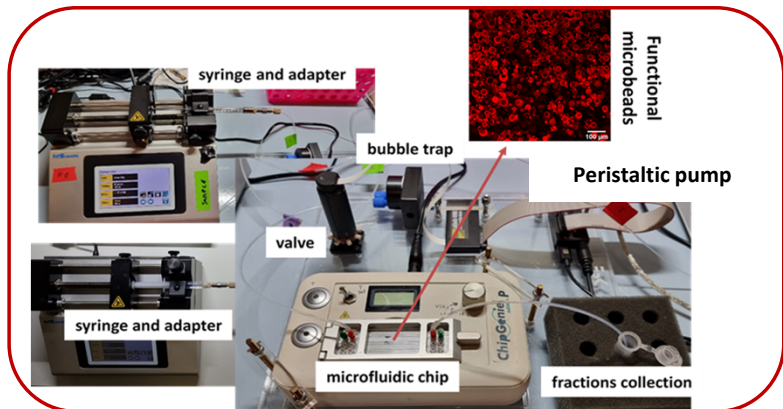
**Clinical Needs:** New Technologies for rapid molecular analysis. Reference Design: Alzheimer's disease (AD) early diagnosis and screening

**Alzheimer's disease (AD) screening** by exosomal miRNA biomarkers analysis

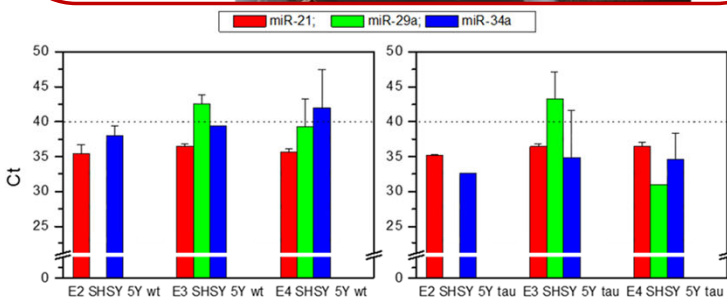
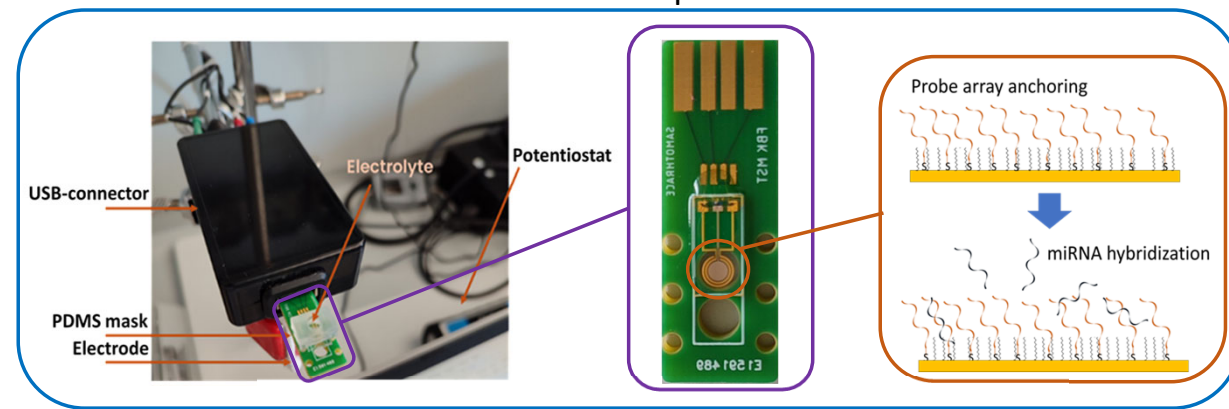
Long and complex procedures for purification and RT-PCR analysis of miRNA extracted from extracellular vesicles (EVs), unsuitable for PoC and decentralized diagnostics

# On-chip Technology for EVs isolation and miRNA analysis

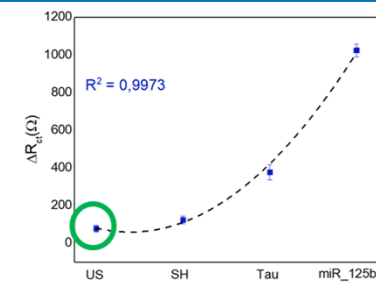
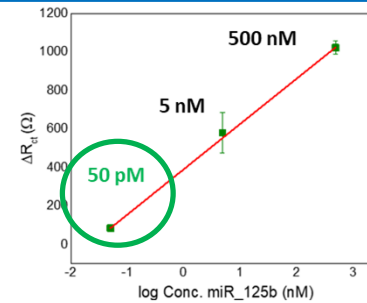
## Microfluidic system for the direct EVs isolation



## Amperometric biochip for the miRNA biomarkers PCR-free detection and quantification



RT-PCR of EVs miRNAs in eluted fraction from cell supernatants



Selective and sensitive detection of cell extracted miR-125b



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## DEVELOPMENT PLAN UNDER SAMOTHRACE ECOSYSTEM

- **The starting point:** background on state-of-the-art of AD screening methods based on miRNA profiling and DNA-chip technologies for PoC diagnostics
- **The key progress:** first protos of a microfluidic modules for EVs isolation and an amperometric biochip for **PCR-free miRNA analysis**, with proved functional performances → TRL 4



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## NEXT STEP UNDER SAMOTHRACE ECOSYSTEM

**Combination/integration** of EVs microfluidic and miRNA PCR-free biochip modules and tests with exosomal extracted samples → towards TRL5



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# THANK YOU

## VISIT OUR DEMO AT BOOTH N.29



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