



The system that will be developed in the scope of Nexus will fully integrate small Extracellular Vesicles (EV) isolation from complex biological samples, their controlled enrichment and release, and simultaneous multiparametric analysis.

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About Nexus

The eu-funded NEXUS project will bring together a multidisciplinary group of partners to develop an easily customizable, integrated and automated platform to enable Extracellular Vesicles (EVs) separation, purification and multivariate characterization from complex biofluids. Circulating EVs are vehicles of multiple categories of molecules (proteins, nucleic acids, glycans, lipids, metabolites) and represent an ideal source of diagnostic, prognostic and efficacy biomarkers for new generation of Liquid Biopsy assays, as well as supporting drug and custom care products development pipelines.

Partners



Integrating EVs separation, purification and multivariate characterization from complex biofluids



The Nexus Project was funded by the EU Commission in the framework of the Horizon Europe – EIC Transition Open programme. Grant agreement 101058200.





Integration of **purification** and **analysis** in a single platform

1 ISOLATION AND PURIFICATION PHASE

The system performs the magnetic isolation of pure disease-related EVs from other EVs and plasma particles.

Thanks to specific tags, disease-specific EVs are labeled allowing for magnetic beads mediated separation.

Non related EVs, excess plasma and waste are expelled.

2 ANALYSIS PHASE

Detection of EVs' protein profiles

Separated EVs are released from beads and recaptured on the surface of Nexus' microchip and then analyzed...

OUTPUT

...leading to a **multiparameter analysis of vesicle size, number and type**

ADVANTAGES:



Unprecedented specificity and sensitivity in the analysis of EVs protein markers



Minimal sample processing with in-line sample purification and analysis



Fully automated: more robust process, less hands-on and turnaround time



Clinically validated for prostate cancer stratification and prognosis

Faster and more accurate liquid biopsy diagnosis



FOR THE PATIENT:

- less invasive procedures
- earlier and more accurate diagnosis
- real-time monitoring
- high precision and effective therapies

FEATURES



Integration

Hardware, consumables and reagents are integrated in all-in-one system, leading to seamless and smooth multi-parameter EV analysis

Automation

The platform is fully automated: this will guarantee to reduction of hands-on, turnaround time and margin for operator error, leading to optimized lab workouts

Flexibility

The platform's flexible architecture, chemistry and operation sequence will enable user – customized and robust protocols, chips and assays, and ultimately smooth translation to clinics

High quality affinity reagents

Nexus features proprietary chemistry for configurable and multivalent DNA-Antibody tagging, to enable mass separation and capture on chip

Quality separation of EVs

Better yield, specificity and integrity of EVs with respect to conventional affinity tools and seamless release of intact EVs for downstream analytical steps

Ultra-high sensitive analysis

Better specificity, sensitivity, throughput and resolution for single EV analysis, driving clinical and diagnostic application of EV protein biomarkers