InnoBuyer
FAST TRACK TO INNOVATION PROCUREMENT

CHALLENGER

Karolinska Institutet

SOLVER

iLoF

ALSO FUNDED BY THE EIC

European Innovation Council

INNOBUYER IMPACT STORIES:

OPEN CALL FOR SOLVERS

EV-NEXT

Next-generation extracellular vesicles detection platform for advanced therapies

Innobuyer collaborated with public institutions (challengers) to identify their unmet innovation needs and select suitable SMEs (solvers) to address them. The matched teams co-created pilot solutions over a 10-month period. Following successful pilots, challengers received support from Innobuyer and experts to design simplified ToR. Each project was backed by €80,000 in financial support—€21,500 for the challenger and €58,500 for the solver.

THE NEED

The program addressed the significant challenges in developing Extracellular Vesicle (EV) and Lipid Nanoparticle (LNP)-based therapeutics. These challenges included **the need for efficient and scalable production of EVs, ensuring their purity and consistency**, and precisely characterizing their contents and biophysical properties.

The Karolinska Institutet, a public institution at the forefront of medical research, was seeking a tailored solution to characterize therapeutic cargo in EVs and similar LNPs for advanced therapeutic biologics.

The affected groups were primarily researchers and professionals in medical research and advanced therapeutics development, specifically those involved in the development of innovative drug delivery technologies and precision medicine for diseases like Alzheimer's Disease and various cancers.

THE SOLUTION

The co-created solution involved leveraging iLoF's patented digital platform, which utilises advanced photonics and artificial intelligence methods, to provide precise characterisation of the cargo and other critical properties of EVs and LNPs in their native form. This platform was designed to generate accurate, multiparametric profiles of samples, encompassing data on nanoparticle size, concentration, and cargo composition.

The solution addressed the challenges by providing a **label-free and non-destructive method for evaluating nanoparticle delivery systems**, aiming to enable new therapies for previously untreatable diseases.

Product adaptations included the development of a new feature on the iLoF platform for distinguishing LNPs and EVs based on RNA/DNA/protein cargo.

High Sensitivity to Particle Number Concentration

The solution exhibited heightened sensitivity to changes in nanoparticle concentration, outperforming standard techniques.

Effective Cargo Profiling

The platform successfully profiled EVs and LNPs based on their internal content, achieving over 90% separability scores for distinguishing distinct molecular cargo.

Reduced Sample Volume

The required sample volume was reduced from an initial 150 µL to approximately 100 µL. A new capillary design is being tested to reduce this to 50 µL further.

Accuracy & Reliability

The iLoF platform demonstrated approximately 90% accuracy in profiling EVs and LNPs, particularly based on their cargo.

Significant Efficiency Gains

The iLoF solution provided over 30% time savings and a more than 50% increase in throughput compared to standard multi-step processes by consolidating key measurements into a single run. Analysis times per sample are now typically under 20 minutes.

"

THE EV-NEXT PROJECT HAS ALLOWED US TO OPTIMIZE THE PROCESS OF NANOPARTICLE CHARACTERIZATION, LEADING TO A NEW PLATFORM FEATURE THAT IDENTIFIES VARIOUS TYPES OF EVS AND LNPS BASED ON MOLECULAR CONTENT.

"

European Innovation Council

Funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Grant Agreement 101071212. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

civitta

ticbiomed