ExoVerita™ Pro
Exosomal Enrichment Platform

Biological Dynamics

Provides high purity and yield with less hands-on time.

Material captured by the ExoVerita Pro platform has been proven to have higher purity and yield than other exosomal isolation methods.[1] For example, isolated materials minimize free protein contamination — including serum albumin and immunoglobulins.[1] The platform also automates many of the steps that require manual operation with conventional ultracentrifugation processes.

Patented Alternating Current Electrokinetics (ACE) technology is more efficient than ultracentrifugation

The ExoVerita Pro platform, powered by ACE technology, is a tunable band-pass filter that attracts particles of interest to specific locations on a microelectrode array through the creation of an electric field. Particles outside a desired size range are expelled from the array, resulting in a purer product than is typically produced with ultracentrifugation.

- The platform allows unbiased selection because all vesicles carrying targets of interest are represented as long as they fall within the targeted size range.
- Free floating proteins and apoptotic DNA are too small to be impacted by the ACE field and are trafficked to waste.[2]
- Cells and other particles greater than 1 uM in diameter are repelled by the ACE field and trafficked to waste.[3]
- Proteins both inside and on the surface of vesicles are preserved during the ACE capture.[4]
- Research has shown that using proteins bound via the ExoVerita Pro platform rather than free proteins produced better performance in early cancer detection models.[1]

Workflow requires significantly fewer steps

The workflow for the ExoVerita Pro platform requires only a few simple steps to prepare the sample. The actual process of isolating and capturing the targets of interest is entirely automated. In contrast, the process of preparing the sample and isolating the targets of interest in conventional ultracentrifugation methods requires significantly more hands-on time.

ExoVerita Pro Workflow

Hands-on Time
~30 MINUTES

MANUAL

- Place whole blood sample in refrigerated centrifuge and spin at 1500 RCF for 10 minutes.
- Transfer plasma layer to a new centrifuge tube and spin at 1500 RCF for 10 minutes.
- Transfer upper plasma layer to a new tube.
- Transfer plasma sample and reagents to ExoVerita Pro cartridge.
- Insert cartridge into bay.

AUTOMATED

- Start automated isolation process (< 4 hours).

MANUAL

- Open bay door, pull eluate from cartridge, store in separate tube (or cryovial for longer storage).

Conventional Ultracentrifugation Workflow

Hands-on Time
3+ HOURS

MANUAL

- Centrifuge whole blood sample at 500g for 10 minutes to remove cell contamination.
- Centrifuge at 3000g for 20 minutes to remove large cell debris and apoptotic bodies.
- Centrifuge at 12000g for 20 minutes to remove large microvesicles.

MANUAL

- Ultracentrifuge at 100,000g for 70 minutes.
- Resuspend pellet in 1xPBS.

MANUAL

- Ultracentrifuge at 100,000g for 70 minutes.
- Resuspend pellet in 1xPBS.

Provides efficient access to biomarkers

- Enables differentiated multiomics applications.
- Allows co-detection of multiple classes of biomarkers in the same sample.
- Enriches for biomarkers such as:
  - Exosomes
  - Exoproteins
  - Cell-free DNA (cfDNA)
  - Extracellular vesicle RNA (EV-RNA)
  - Neuronal extracellular vesicles (nEVs)
  - Other extracellular vesicles (EVs)

About the ExoVerita™ Pro system

Turnaround Time

- ~3.5 hours from start to isolation.
- Hands on time ~5 min.

Output

- Particle concentration on isolated material ~$5x10^{10}$ to $5x10^{11}$ particles/mL.
- Median particle size: 100nm.
- Particle size range: 50–200nm.
- Plasma protein contamination levels: < 0.5%, purer than can be expected with ultracentrifugation.

Required consumables

- ExoVerita Pro Conditioning Solution (BFR1-CS-00001).
- ExoVerita Pro Pretreatment Solution (BFR1-PS-00002).
- ExoVerita Pro Wash Buffer (BFR1-WS-00003).

Throughput

- Each 3.5-hour run on a single instrument can support up to 4 cartridges.
- One operator can manage up to 10 instruments in parallel.

Specifications

- Electrical: 100-240VAC, 50-60Hz, maximum current 6.3A.
- Operating System: Windows® 10 Professional.
- External I/O:
  - Ethernet Port (RJ45 CAT-6.
  - Minimum USB 2.0 port.
  - Minimum HDMI 1.4.
- Height: 335 mm.
- Width: 592 mm.
- Depth: 360 mm.
- Touchscreen display.

The ExoVerita Pro platform can improve the quality of your capture and the efficiency of your workflow

For more information, call 858-558-8295 or email info@biologicaldynamics.com.

For Research Use Only. Not for use in diagnostic procedures.

1. Hinestrosa JP, Kurzrock R, Lewis JM, et al. Early-stage multi-cancer detection using an extracellular vesicle protein-based blood test. *Commun Med (Lond).* 2022;2:29. doi:10.1038/s43856-022-00088-6
2. Hinestrosa JP, Searson DJ, Lewis JM, et al. Simultaneous isolation of circulating nucleic acids and EV-associated protein biomarkers from unprocessed plasma using an AC electrokinetics-based platform. *Front Bioeng Biotechnol.* 2020;8:581157. doi:10.3389/fbioe.2020.581157
3. Data on file, Biological Dynamics.
4. Lewis JM, Vyas AD, Qiu Y, Messer KS, White R, Heller MJ. Integrated analysis of exosomal protein biomarkers on alternating current electrokinetic chips enables rapid detection of pancreatic cancer in patient blood. *ACS Nano.* Apr 24 2018;12(4):3311-3320. doi:10.1021/acsnano.7b08199.

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