INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

ChiroFlux: A Novel Platform for Rapid, Marker-Agnostic Extracellular Vesicle Capture for Clinical and Research Applications

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Accelerate Blue Foundry - 2025/Life Sciences

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Accelerate Blue Foundry - 2025 (Life Sciences)

OVERVIEW

A rapid, easy-to-use tool that isolates all types of extracellular vesicles (EVs)—small particles naturally released from cells that carry crucial molecular information—using small sample volumes in under 30 minutes. This is dramatically faster and more efficient than standard ultracentrifugation, opening new, cost-effective opportunities for diagnostics, research, and clinical monitoring.

DESCRIPTION

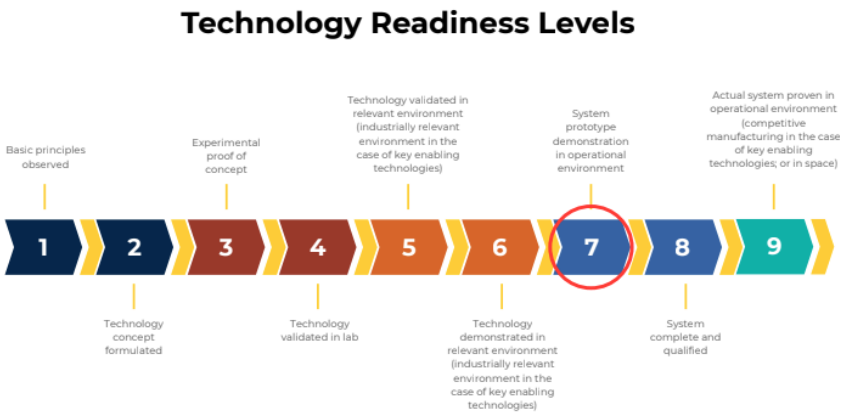
Extracellular vesicles (EVs) are microscopic packages released by almost all cell types; they contain proteins, RNA, and other molecules that reflect the state of their parent cells, making them highly valuable for non-invasive disease and health monitoring. This technology uses specially engineered chiral gold nanoparticles inside a simple collection device (such as a tube or chip) to attract and capture EVs from complex biological fluids in less than half an hour. It works with very small sample volumes and—unlike traditional EV isolation methods—does not depend on identifying specific molecules or tags on EV surfaces. This marker-agnostic approach means it captures the full diversity of EVs, leading to richer information for downstream

analysis, all while saving users time, money, and effort.

VALUE PROPOSITION

- **Unmatched Speed and Efficiency**: Processes samples in under 30 minutes versus 8+ hours for conventional methods, greatly accelerating research and diagnostic timelines.
- **Comprehensive, Marker-Agnostic Capture**: Isolates all EV types for more robust and unbiased biomarker discovery and disease monitoring.
- **Clinical Scalability**: Requires only tiny amounts of biological fluid, supporting uses ranging from patient diagnostics to preclinical research.

TECHNOLOGY READINESS LEVEL



MARKET OPPORTUNITY

Healthcare, biotechnology, and pharmaceutical sectors urgently need fast, reliable, and comprehensive EV isolation solutions to advance next-generation diagnostics, especially in cancer, sepsis, and personalized medicine. Existing methods are too slow and require too much sample, limiting growth in both research and clinical translation. This platform could drive adoption of EV-based liquid biopsies, drug development, and real-time disease monitoring across a wide range of settings.

Strong market growth is supported by expanding investment in liquid biopsy and non-invasive diagnostic tools for sepsis and neurodegenerative diseases, with EVs recognized as a central component in biomarker discovery.