

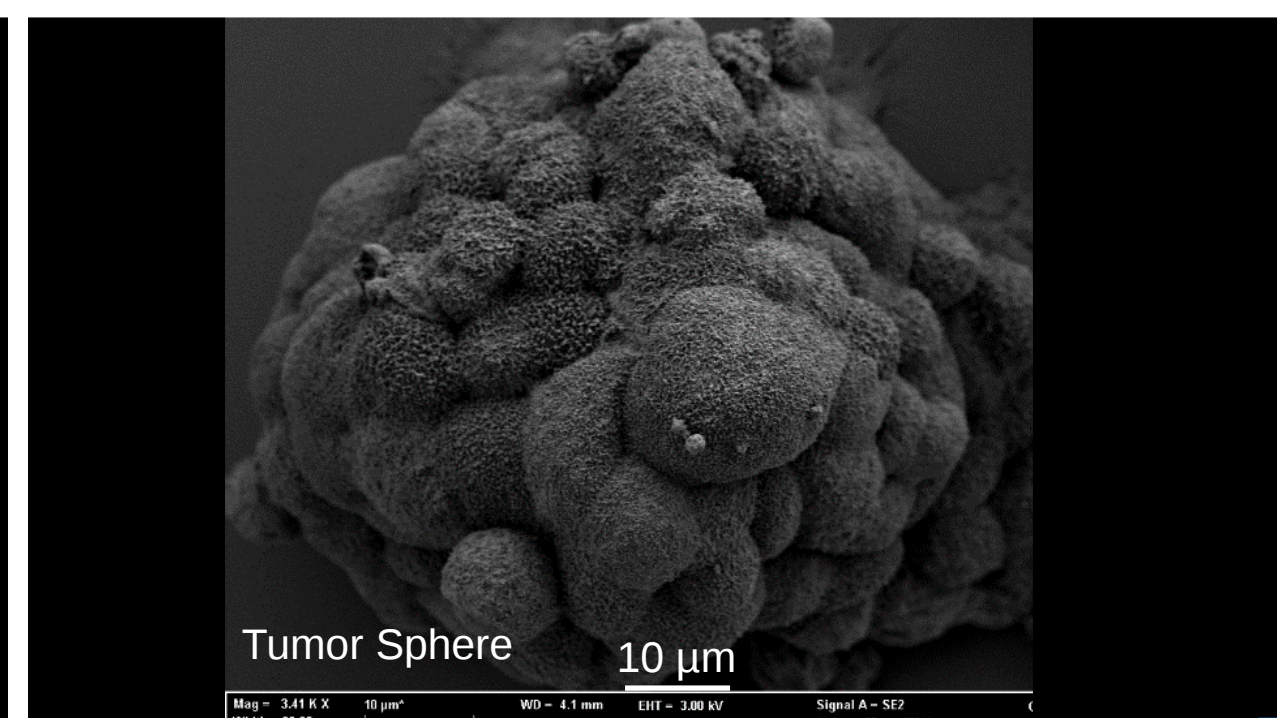
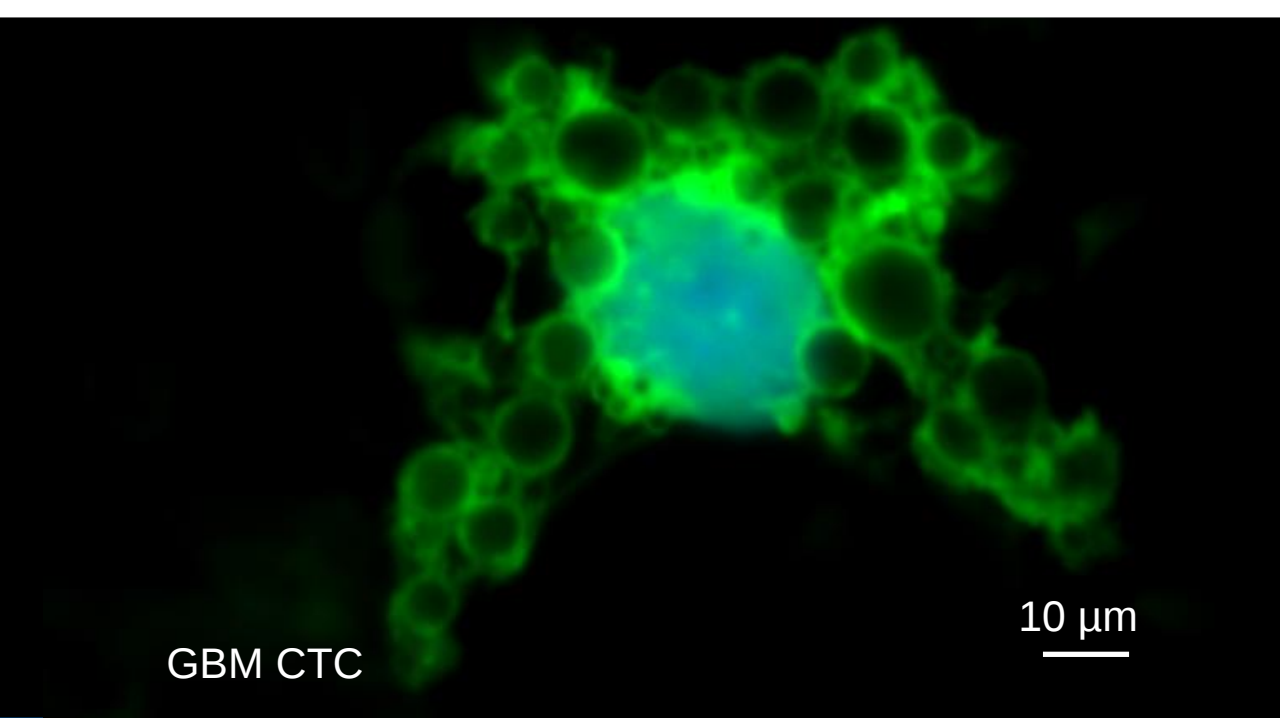
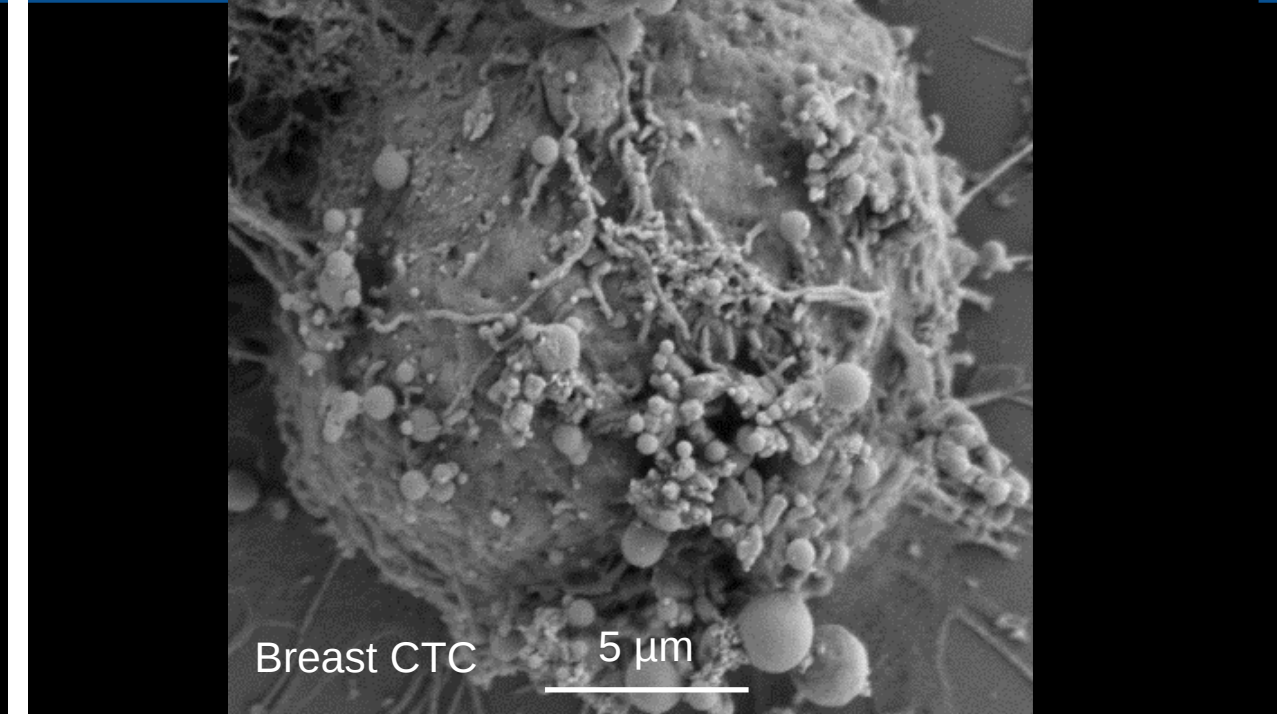
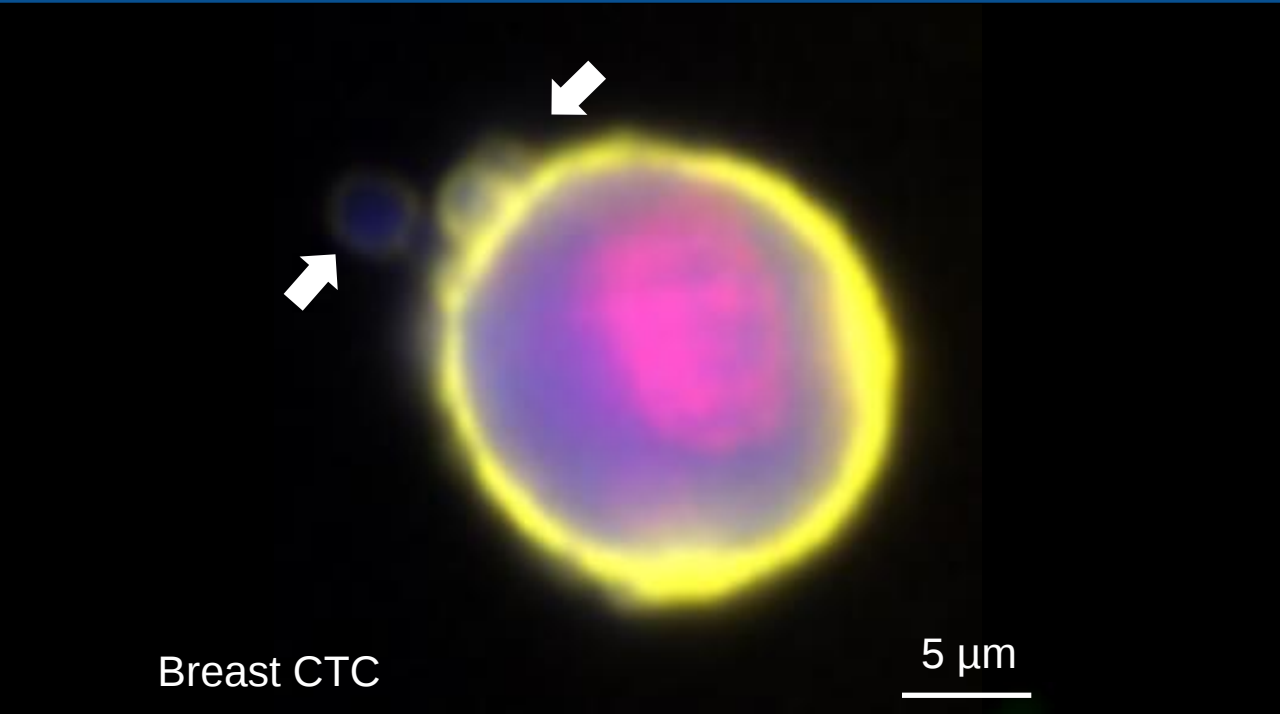


Microfluidics for the Isolation and Tracking of Tumor Extracellular Vesicles

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NCI EDRN Breast and Gynecological Cancers Collaborative Group
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Extracellular Vesicles (EVs)

All cells release them to varying degrees

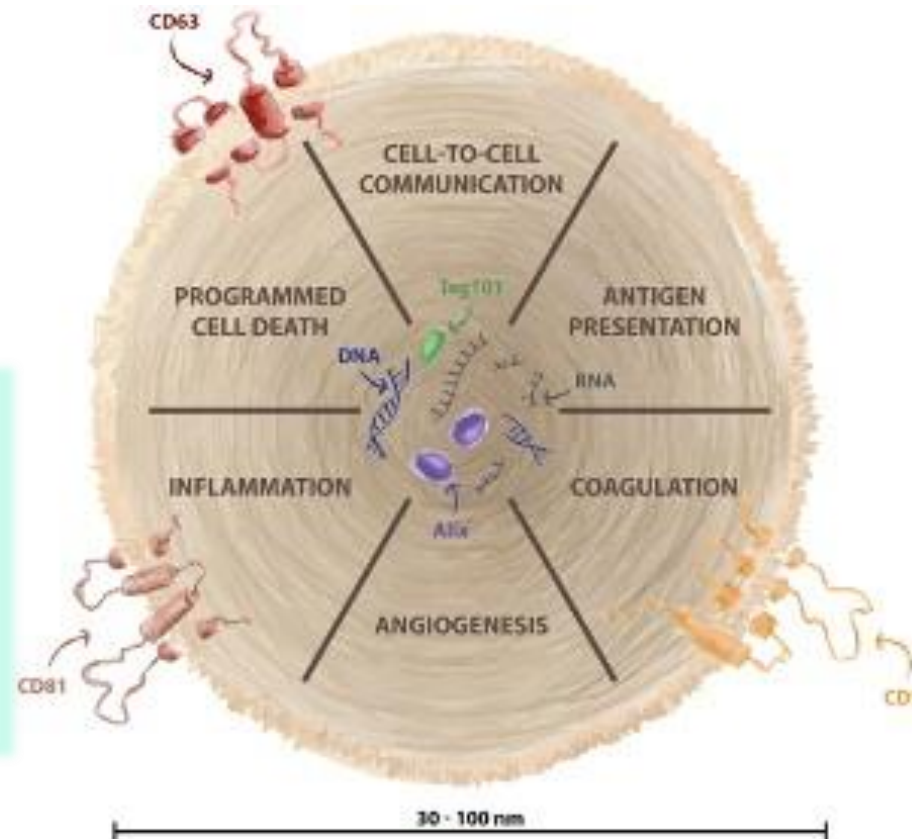
EVs found in plasma, urine, saliva, breast milk, CSF, blood

Nomenclature widely varies

Many emerging roles

- Tumor specific RNA (2008)

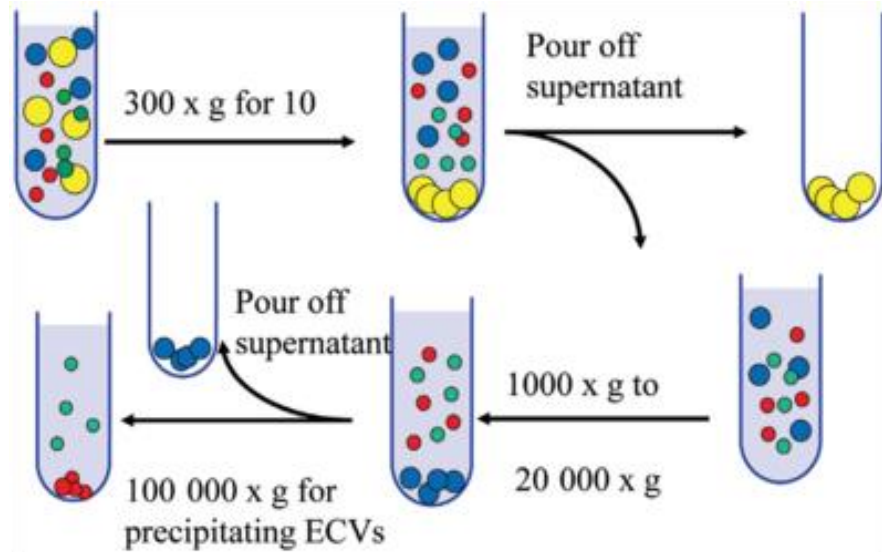
Contain: RNA (miRNA, mRNA, tRNA, yRNA, lncRNA, circRNA), DNA (dsDNA, gDNA), proteins, cytokines, lipids.



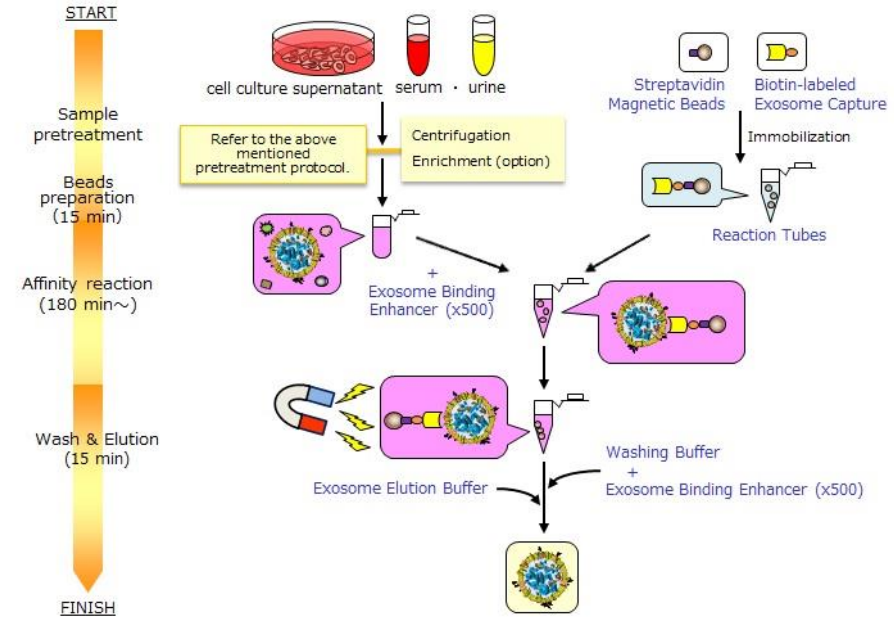
Benito-Martin et al., 2015 Front. Immunol.

Methods for EV Isolation

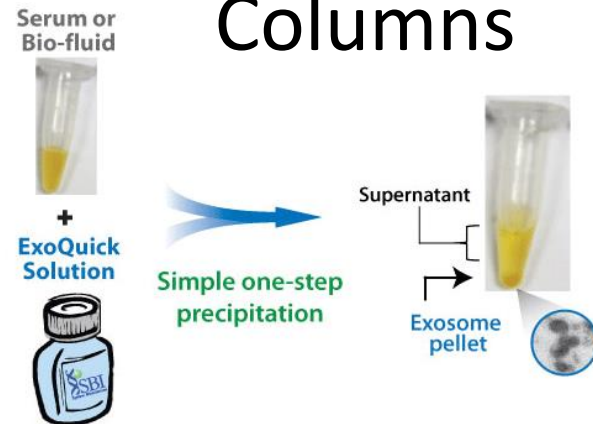
Ultracentrifugation



Magnetic Beads

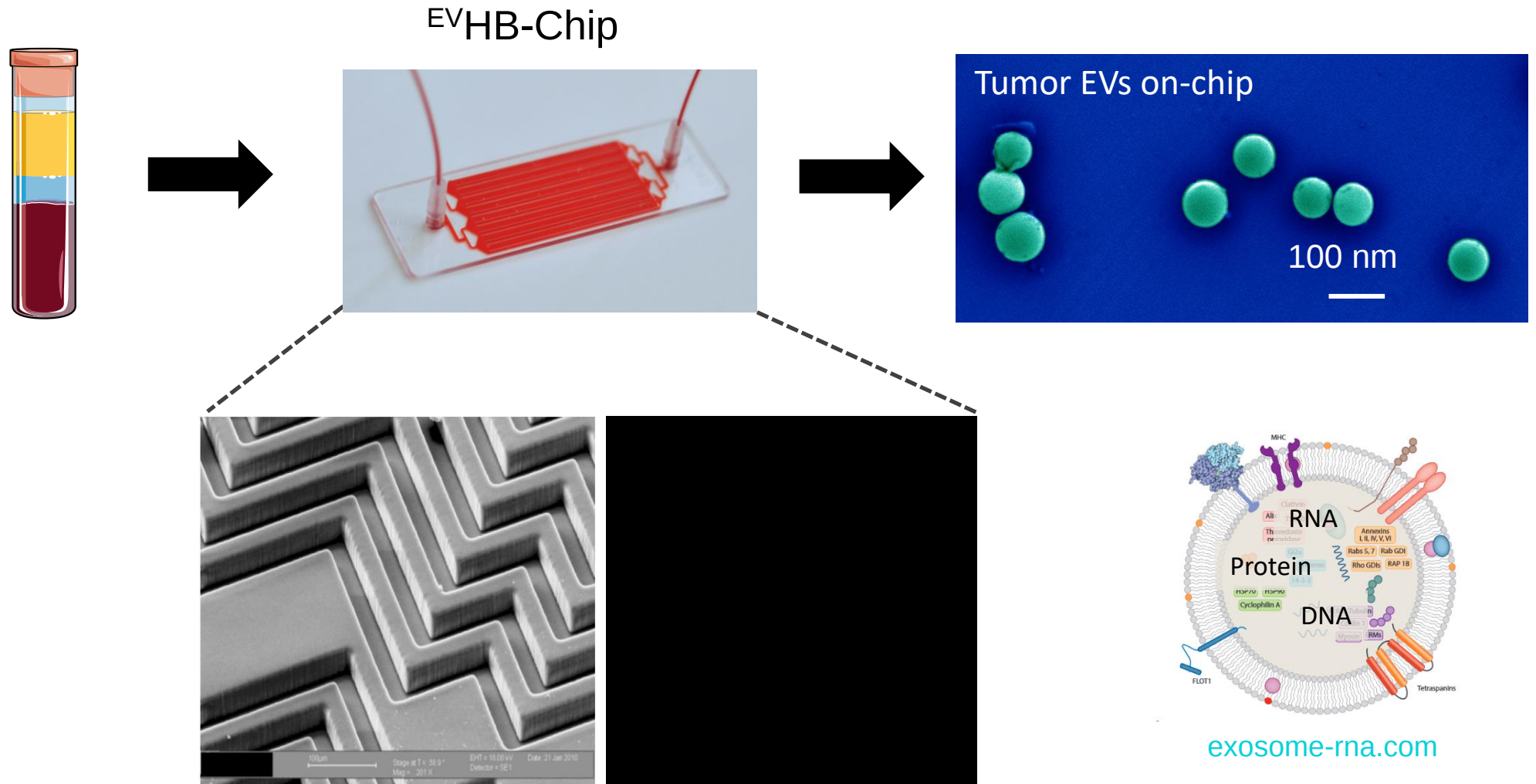


Columns

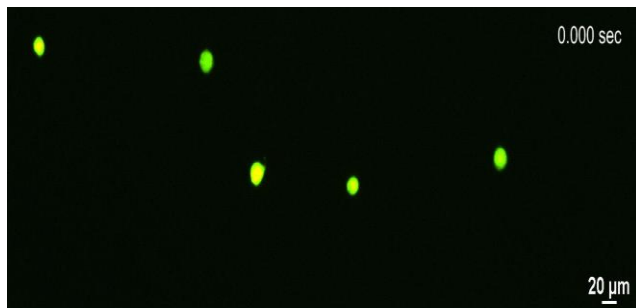
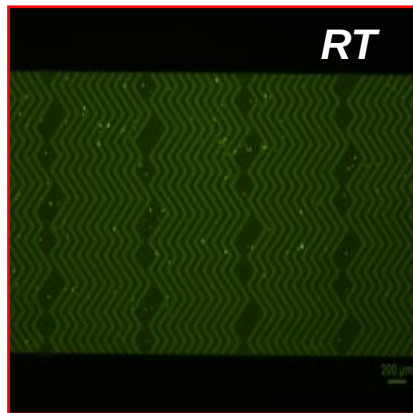
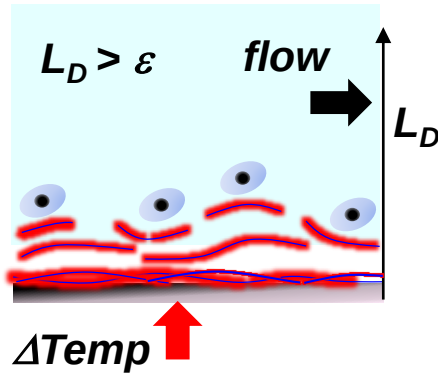


Time Intensive
Low Yield
Contamination

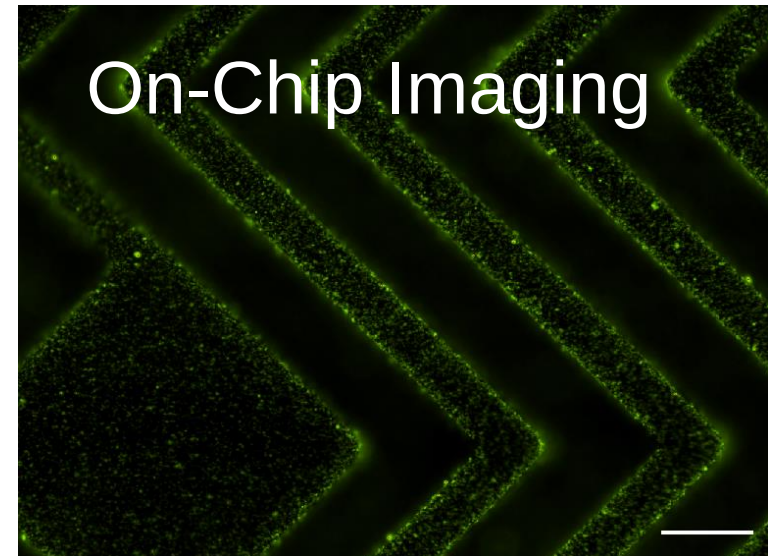
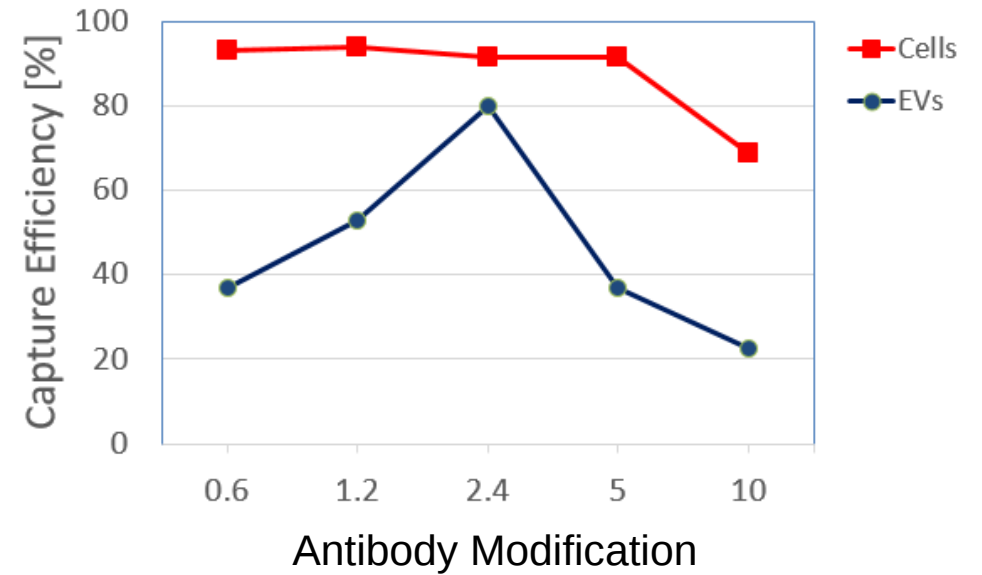
Microfluidic Extracellular Vesicle Capture



Microfluidic Biomaterial Coating

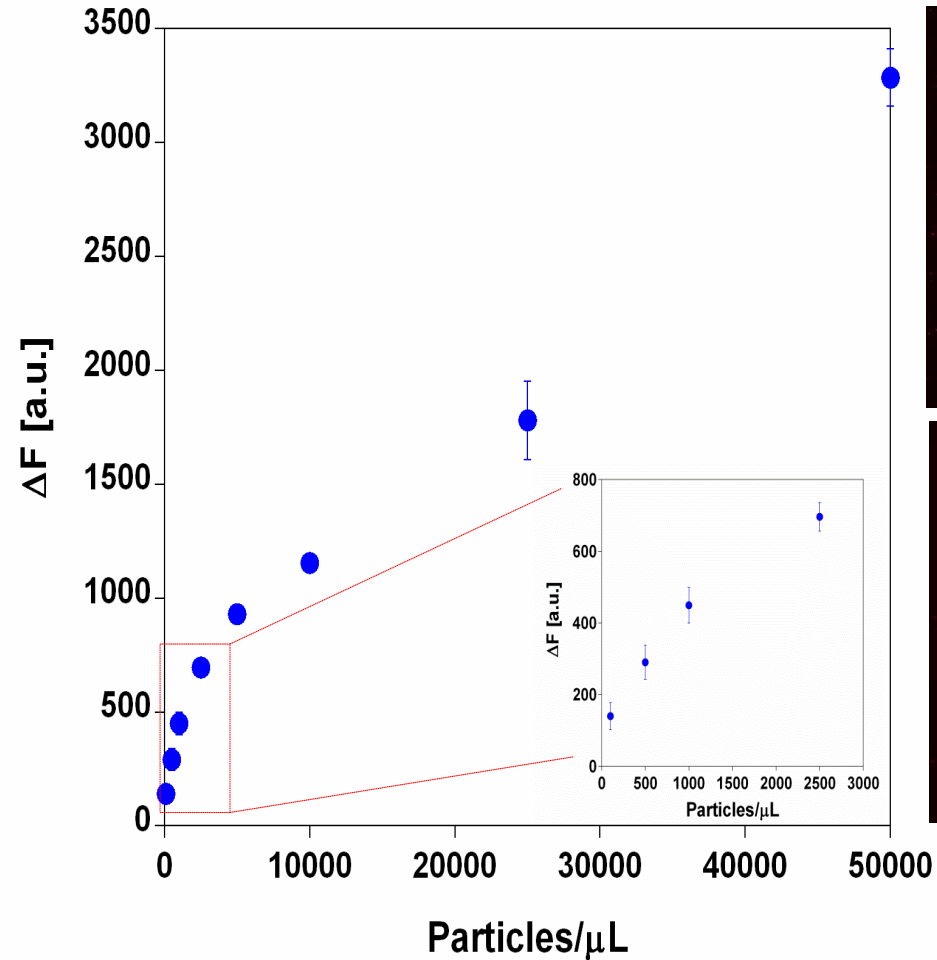
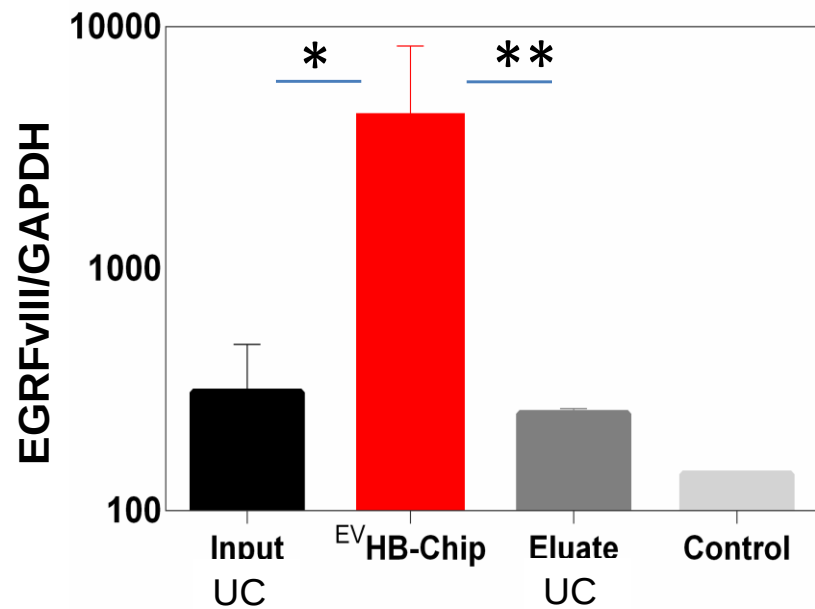
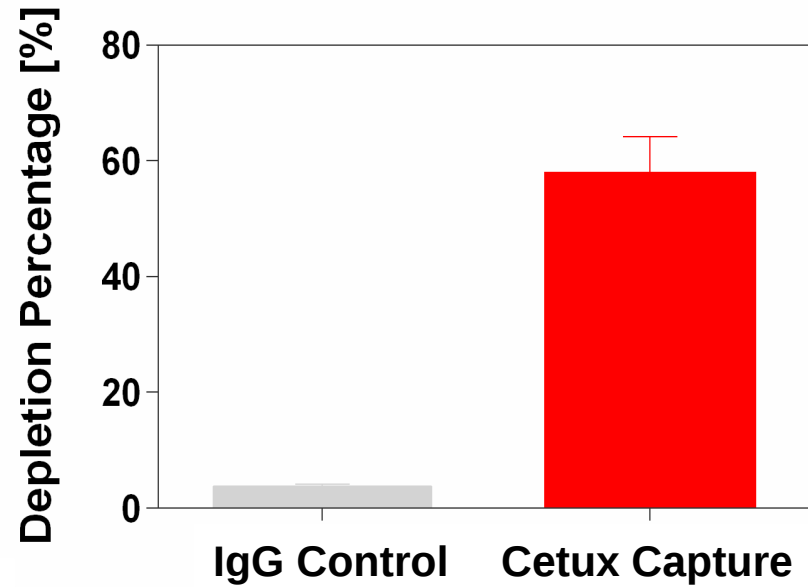


Reátegui E., et al. Adv Materials (2015)

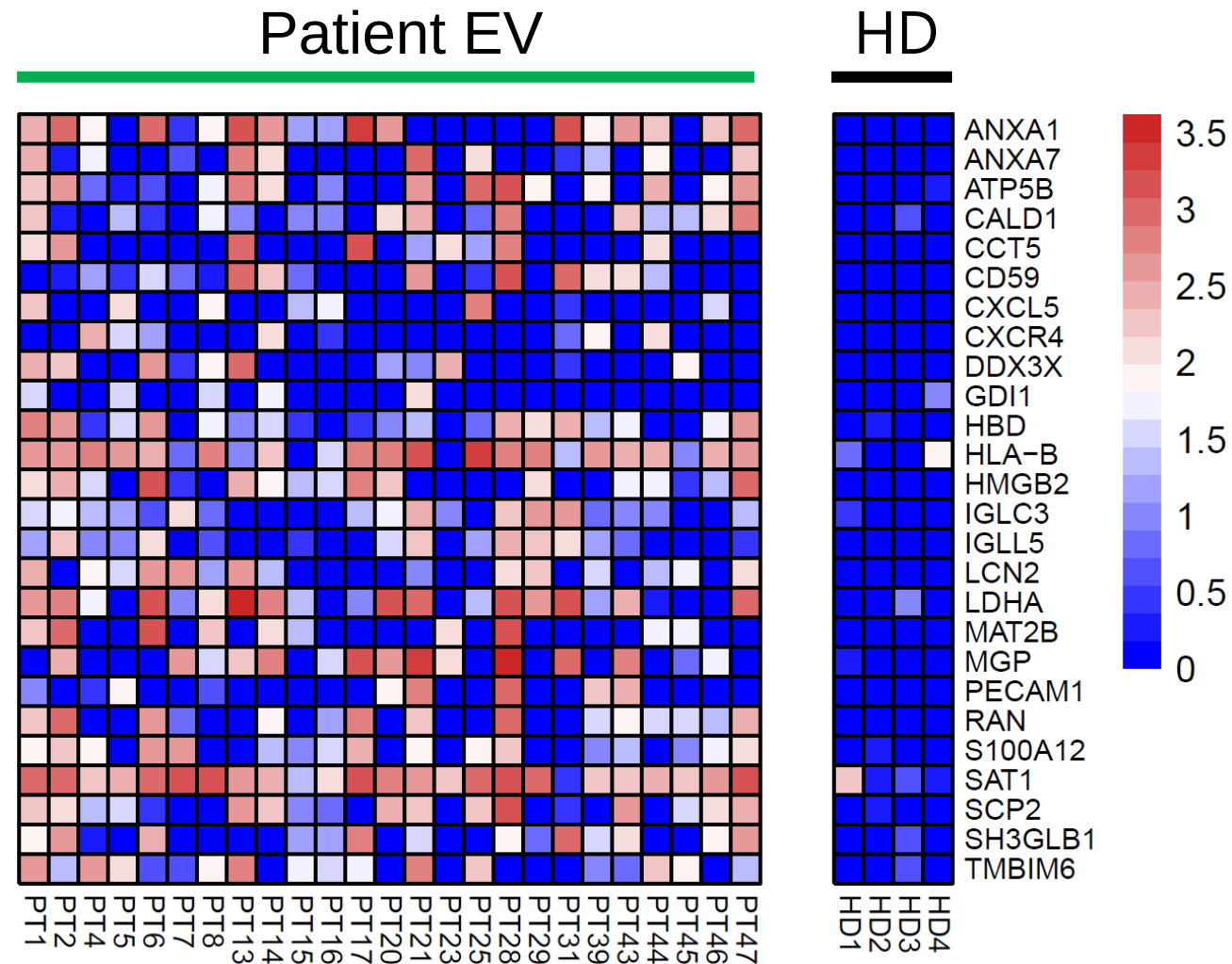


Capture Performance

LOD: 100 EVs in 100 uL

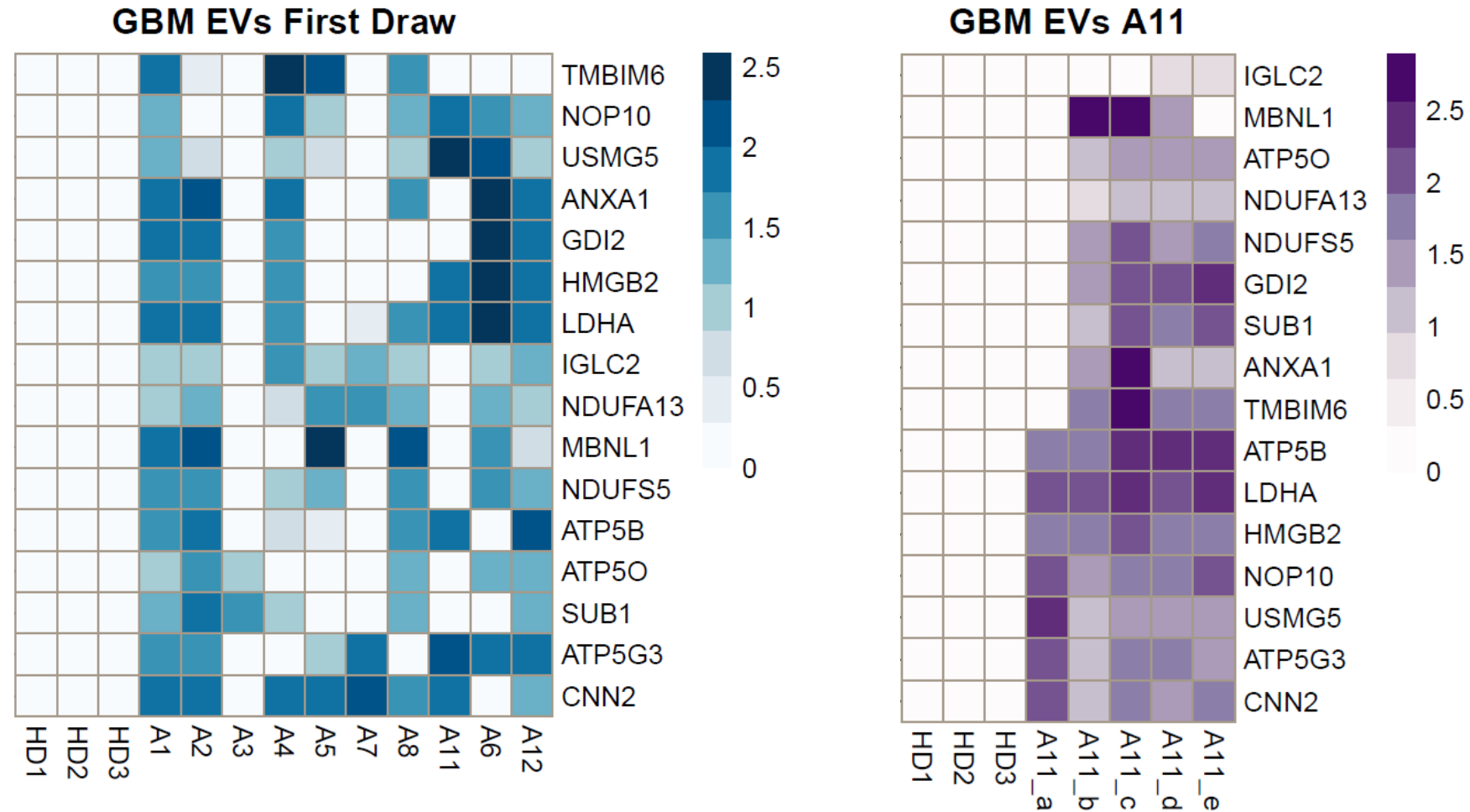


RNASeq from GBM EVs: Genes from Pre-treatment Patient Samples



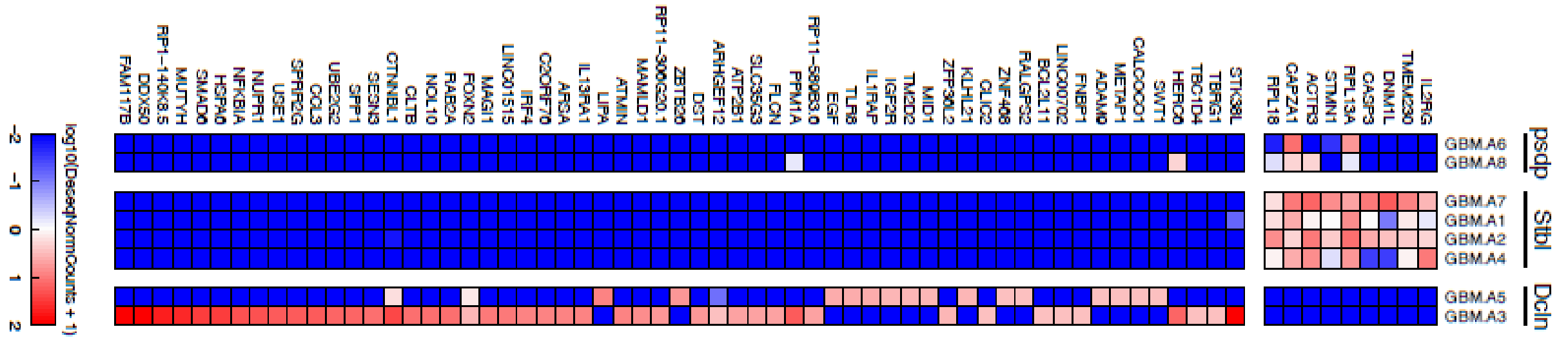
Unpublished

Patient EV Gene Signatures

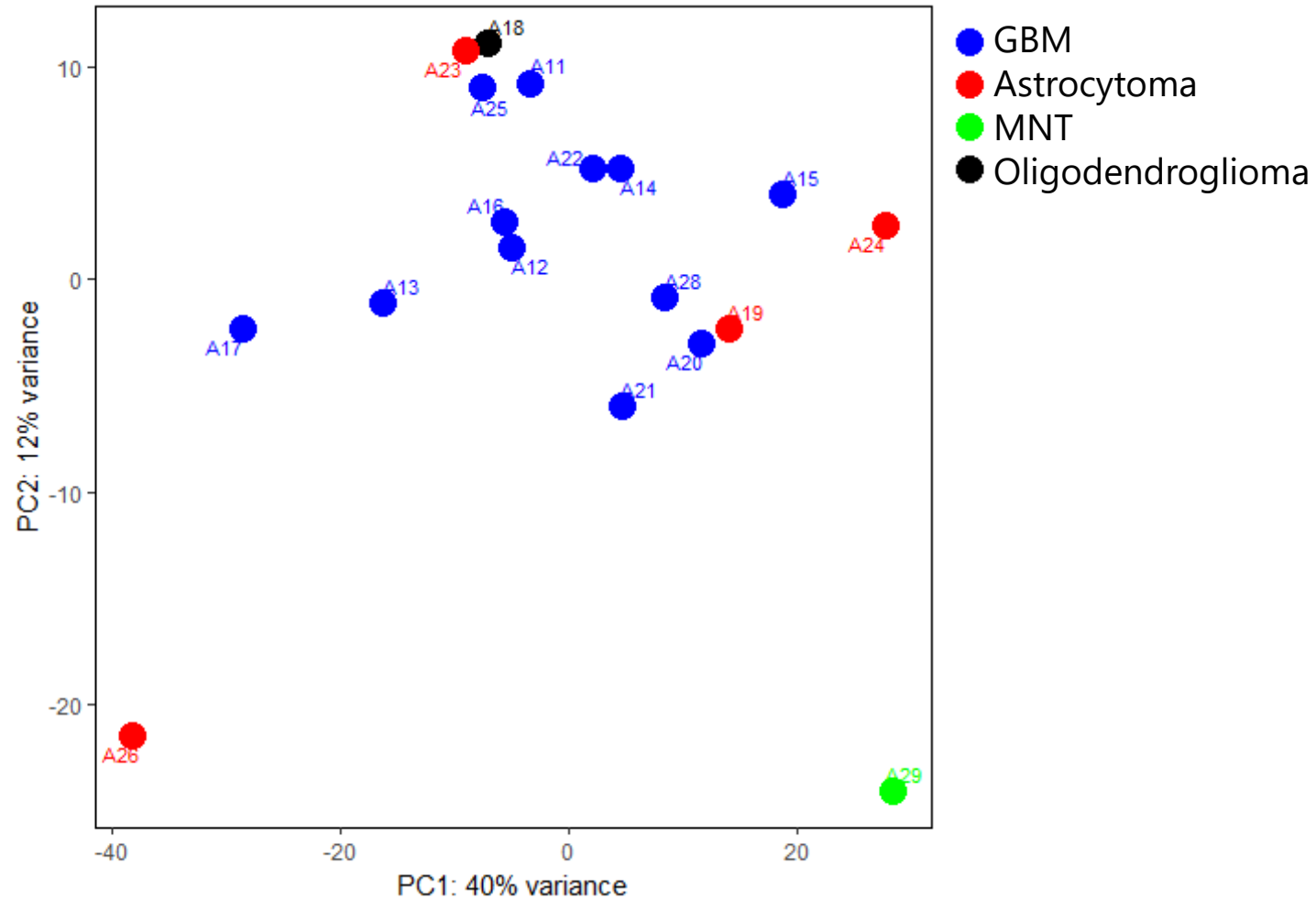


Unpublished

EVs to Separate Progression vs. Pseudoprogression

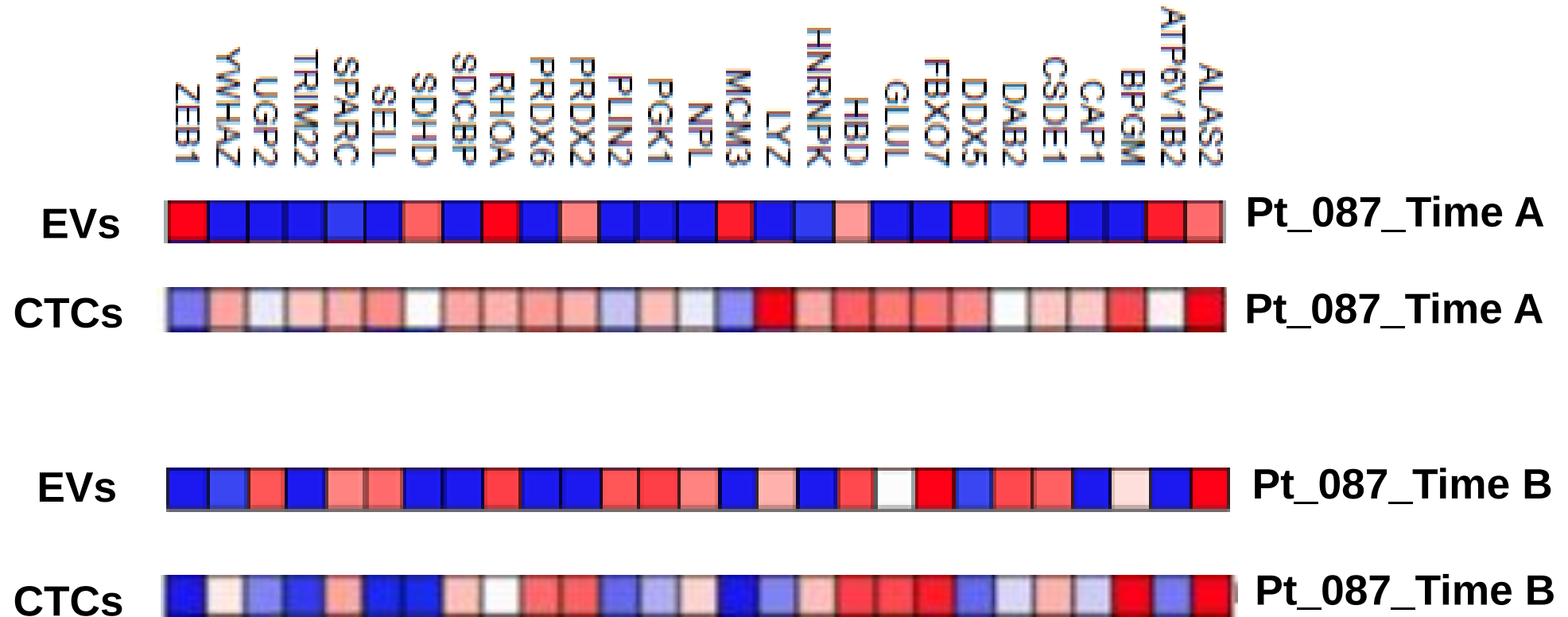


EVs for Tumor Subtyping (pre-biopsy samples)

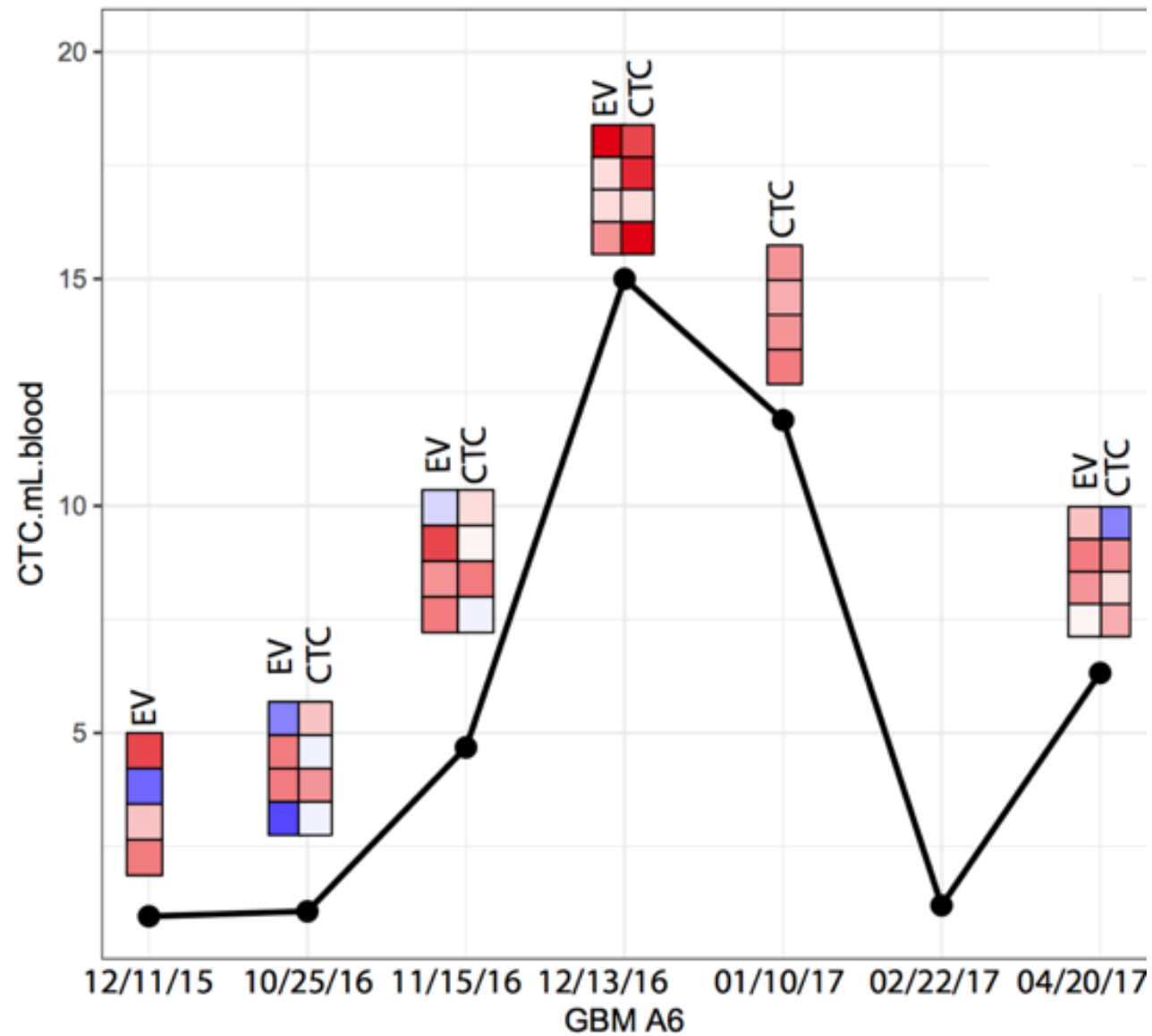


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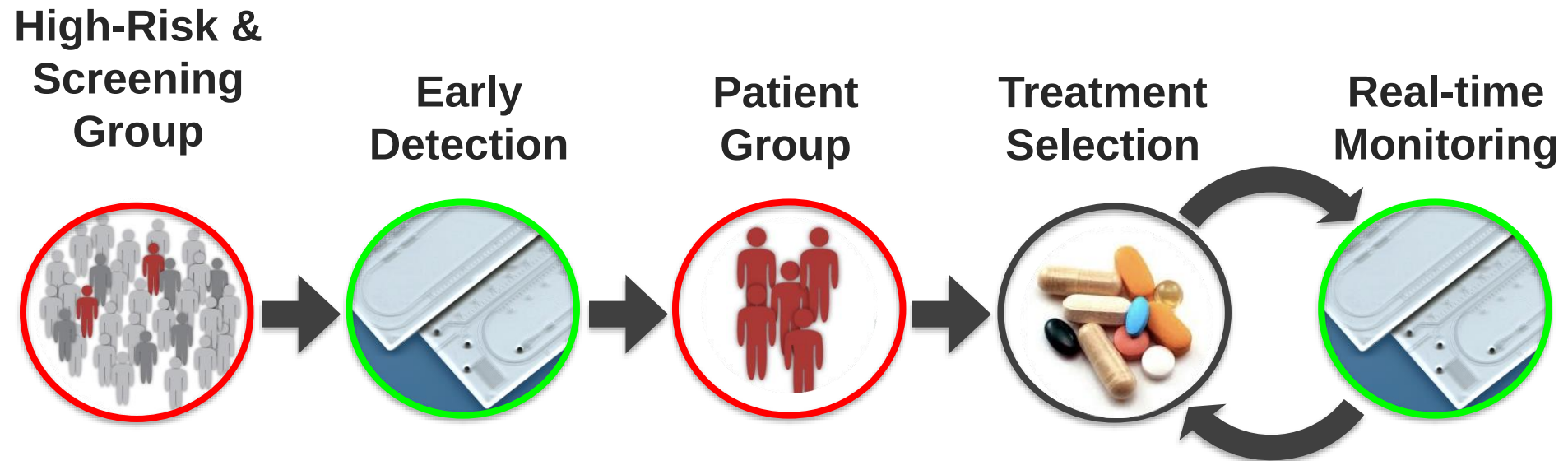
CTCs and EVs at same time point



Dual CTC and EV Assay



Microfluidics for Liquid Biopsy: An Enabling Technology for Cancer Care



Acknowledgments

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