**Detection and Characterization of CTCs Isolated by ScreenCell® Size Exclusion Technology in Metastatic Breast Cancer**

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### Background

Circulating Tumor cells (CTCs) detection has prognostic and predictive implications in patients with metastatic breast cancer (MBC). Genomic and phenotypic analysis of CTCs hold enormous promise as blood-based molecular characterization and monitoring disease progression and treatment benefit with a strong potential to be translated into more individualized targeted treatments. FDA-approved CellSearch™ detection allows only enumeration of CTCs expressing EpCAM. CTCs represent very heterogeneous populations of tumorigenic cancer cells and some subpopulations have undergone epithelial-Mesenchymal transition (EMT), which is associated metastasis process and an unfavorable outcome. EpCAM-based enrichment technique has failed to detect EMT subpopulations due to the decreased expression or loss of epithelial markers. Non-EpCAM-based approaches are needed for identifying EMT CTCs. The ScreenCell® device is single-use and low-cost size exclusion technology for enrichment-free isolation of CTCs by a two-steps combining size-based separation and staining using different markers. The DEPArray™ system is the ideal downstream isolation system to collect single or pooled CTCs for molecular and genetic analysis. In this study, we evaluated CTCs-CTC-clusters and EMT CTCs, and tested the feasibility of achieving CTCs enrichment using ScreenCell® technology followed by single cell isolation with the DEPArray™ in MBC patients.

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### Results

**Figure 1.** CTCs and CTC-clusters were detected in the blood from metastatic breast cancer patients

**Figure 2.** Vimentin and N-Cadherin expression in CTCs of metastatic breast cancer patient samples

**Figure 3.** Sample processing flow on ScreenCell® device and DEPArray platform

**Figure 4.** WGA and genome analysis-Sanger sequencing

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### Conclusions

1. CTCs and CTC-clusters were captured by ScreenCell® size exclusion technology without EpCAM selection in MBC.

2. EMT CTCs were identified by Vimentin and N-Cadherin staining in MBC. It is feasible that CTCs can be enriched by ScreenCell® size exclusion technology followed by single cell isolaion using DEPArray™ platform to achieve single cell genomic analysis.

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### References

