Clinical Research (Excluding Clinical Trials)

Abstract 557: A novel integrated i-FISH technology to detect and characterize non-hematopoietic heteroploid CTC subtypes with or without expressing vimentin or other tumor biomarkers

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Abstract

Most of the current circulating tumor cell (CTC) detection technologies rely on expression of EpCAM and cytokeratins (CK) as well as the size of tumor cells shed into peripheral blood of cancer patients or tumor animal models. However, it has been demonstrated that expression of EpCAM and/or cytokeratins in CTCs might be down-regulated or absent during epithelial-mesenchymal transition (EMT), potentially resulting in significant false negative detection of CTCs. Whereas expression of vimentin in EMT tumor cells has been reported. In this study, a new strategy integrating phenotypic immunofluorescent staining of vimentin and karyotypic FISH has been well developed to detect and characterize CTC and its subtypes isolated by subtraction enrichment in various biofluid samples including blood, bone marrow, malignant pleural effusion and ascites as well as cerebrospinal fluid of cancer patients or blood samples of mice bearing human tumors. Both large and small and clusters of vimentin positive or negative non-hematopoietic CTCs with heteroploid chromosome(s) were identified. The similar procedure has also been successfully extended to other desired single or combined tumor biomarkers in addition to vimentin as needed. The established SET-iFISH® platform will help identify and characterize diversified CTC subtypes which may possess distinct clinical significance in terms of drug sensitivity, resistance, and tumor metastasis as well as recurrence, respectively.

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