

DETECTION OF RARE CELL TYPES AND PATIENT PROGNOSIS IN LIVER CANCER

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Cancer is a disease that emerges as a result of complex aberrant processes involving cells that grow and divide uncontrollably and has many patient-specific characteristics. Mutations in genes or changes in the expression of transcripts produce cellular heterogeneity, cancer cells, and tumors, and finally invade other healthy tissues [1]. Primary liver cancer is the second most lethal malignancy worldwide and comprises many molecularly unique subtypes and a highly diverse microenvironment [2]. Among this diversity (immune cells, malignant cells, non-malignant cells, hepatic cells, etc.) the rarest and difficult to define cell types are dormant and cancer stem cells. Dormant cells are in the dormancy state that have stopped dividing but are ready to reproduce under proper environmental conditions, while cancer stem cells are stem cells with self-renewal, differentiation, and tumorigenicity features [3].

Identification of cellular heterogeneity in liver tumors is an important step toward the prevention of the failure of treatments. In addition, rare cells in liver cancer affect the overall survival, therefore their identification is also crucial. The single-cell transcriptomic landscape of liver cancer can identify the biodiversity of single cells in the tumor. Within the scope of this work, the focus was on the detection of cell types that rarely appear in liver cancer. First, rare cell-specific markers were determined and the tools used for the detection of these cells were compared. The noise and heterogeneity of single-cell cancer data have been important considerations in the analysis pipeline. Following the identification of rare cells in single-cell data, their proportions in the bulk data were analyzed and their effects on overall survival analysis were examined [4]. With the survival models we established, survival times were analyzed and cell types with prognostic characteristics were determined.

Keywords: Liver cancer, single-cell analysis, rare cells, prognosis

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