Informatics-based characterization of T cell exhaustion associated with human breast cancer

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Abstract

Cytotoxic T cells become exhausted after long exposure to antigens and inflammatory signals in tumors. There have been various research reports on the transcriptome characteristics of the exhaustion of cytotoxic T cells, however, they are not yet fully understood. Besides further research is needed on the mechanism of transition into the exhaustion state. In this study, we obtained single-cell transcriptome data from immune cells infiltrating breast cancer for 14 individuals, from a database (Sandra Tietscher *et al.* 2023 *Nature Communications*) and performed pseudo-bulk processing for each sample and cell type, then performed various comparative analyses. As a result, in samples where exhausted T cells were frequently observed, down-regulations of several genes encoding ribosomal proteins were observed in T cells before they reached exhausted states. It suggested the involvement of control of protein synthesis through ribosome activity.