Abstract

Epithelial-mesenchymal transition (EMT) is a biological process by which epithelial cells acquire mesenchymal characteristics. In malignant tumors, EMT is crucial for acquisition of a mesenchymal phenotype with invasive and metastatic properties, leading to tumor progression. An inflammatory microenvironment is thought to be responsible for the development and progression of colorectal cancer (CRC); however, the precise role of inflammatory microenvironments in EMT-related CRC progression remains unclear. Here, we show the spatiotemporal visualization of CRC cells undergoing EMT using a fluorescence-guided EMT imaging system in which the mesenchymal vimentin promoter drives red fluorescent protein (RFP) expression. An inflammatory microenvironment including TNF-α, IL-1β, and cytokine-secreting inflammatory macrophages induced RFP expression in association with the EMT phenotype in CRC cells. *In vivo* experiments further demonstrated the distribution of RFP-positive CRC cells in rectal and metastatic tumors. Our data suggest that the EMT imaging system described here is a powerful tool for monitoring EMT in inflammatory microenvironment–CRC networks.