Circulating tumor cells

Circulating tumor cells (CTCs) have now emerged as a type of promising circulating biomarkers in liquid biopsy and can predict the occurrence and development of cancers.

Sha et al. in a work, fabricated an integrated and renewable interface for the capture, release and quantitative analysis of CTCs. As designed, folate receptor-positive CTCs are captured by folic acid-modified DNA probes at the interface through the receptor-ligand interaction, and are efficiently released from the interface with the aid of bleomycin-ferrous complex-regulated cleavage. Taking MCF-7 cells as the model, the functional interface demonstrates high efficiency to selectively capture the folate receptor-positive tumor cells, and the bleomycin-ferrous complex-regulated cleavage not only easily releases the captured cells with well-maintained viability and proliferation ability, but also releases silver nanoparticles that are labeled at the cell surface for highly sensitive quantification by adopting electrochemical techniques with a detection limit of 6 cells/mL. At the meanwhile, the interface is proved to be regenerated through a simple cleavage-hybridization event and reused with high stability. Therefore, our work may provide a new idea for the collection and downstream researches of circulating tumor cells in the future [1)].

1)
Sha L, Wang W, Liu Q, Dong L, Zhao J, Tu M. An integrated and renewable interface for capture, release and analysis of circulating tumor cells. Anal Chim Acta. 2023 Sep 15;1274:341556. doi: 10.1016/j.aca.2023.341556. Epub 2023 Jun 29. PMID: 37455076.