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CIRCULATING EPITHELIOID CELLS AND PERSONALIZED MEDICINE: THE GOOD, THE BAD AND THE UGLY AND MANY OTHERS

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When tissues are damaged, such as during inflammation or cancer, epithelial cells circulates in the blood at low frequencies. Circulating epithelioid cells (CECs) represent a non-invasive way to access to information on distant damaged tissue sites. Recent technologies now allow the detection of CECs with a very high sensitivity. However, not all CECs are informative. In the case of cancer, only a minority of these CECs is at risk to give rise to metastases, and is thus the actual population to identify. We develop new models for Personalized Oncology. We search for markers related to tumor evolution and drug resistance in CECs, and more specifically in true Circulating tumor cells (CTCs) from breast and colorectal tumors. Using histological (count, morphology) and phenotypical (multi-color staining) analyses, we identified several types of CECs in the blood of cancer patients: normal epithelial cells (most certainly collateral damage), epithelioid cells of unknown significance, isolated tumor cells at different degree of epithelial-to-mesenchymal transition (EMT) stages, and tumor micro-emboli. We established the multidrug resistance phenotype and stemness status of these cells. The data were correlated to patients' clinical information and response to treatment. Our results show that specific subsets of CTCs, rather than the unselected population, should be considered and characterized, if one wants to use CTCs as a window for patient's tumor heterogeneity and/or evolution. This makes more complex a situation already difficult due to limited number of available cells, but which should be workable now in the single-cell era.

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