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Insulin like growth factor receptor I (IGF-IR) and vascular endothelial growth factor receptor 2 (VEGFR-2) are detectable on circulating epithelial tumor cells (CETCs) in patients with solid tumors

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Background: Analysis of epithelial circulating tumor cell analysis in the blood of cancer patients is a promising diagnostic field for estimating the risk for metastatic relapse and progression. The phenotypic characterization of CETCs may provide real-time information and can be of great value in therapy monitoring. IGF-IR and VEGFR-2 play a crucial role in tumor growth and the progression of cancer disease. Therefore the purpose of the current study was to investigate their expression on the CETCs.
Methods: CETCs were determined from blood of 163 patients suffering from breast, prostate, colorectal and lung cancer. The number of vital CETCs and the expression of IGF-IR and VEGFR-2 were investigated using the maintrac® method.
Results: The expression of IGF-IR and VEGFR-2 on the surface of CETCs was detected in all types of cancer. The prevalence of CETCs with positive staining for IGF-IR and VEGFR-2 in patients with solid tumors is summarized in the Table 1. The highest number of vital CETCs was observed in prostate cancer patients in comparison with other tumor types. A statistically high correlation was found between IGF-IR and VEGFR-2 expression on the CETCs in all cancer types. IGF-IR and VEGFR-2 expression on CETCs were positively associated with a higher number of CETCs only in breast cancer patients.

Table 1. The prevalence of CETCs with positive staining for

Tumor type	Number of patients with positive staning for IGF-IR on CETCs (%)	Number of patients with positive staning for VEGFR-2 on CETCs (%)
Breast	42/50 (84)	42/50 (84)
Prostate	30/30 (100)	30/30 (100)
Colorectal	45/49 (91.8)	47/49 (96)
Lung	27/34 (79)	27/34 (79)

Conclusion: Our results demonstrate for the first time the expression of IGF-IR and VEGFR-2 on the CETCs in patients with breast, prostate, colorectal and lung cancer and thus constitute the basis for using anti-IGF-IR and anti-angiogenic therapy for their elimination. With the maintrac® approach we are able to precisely enumerate and characterize phenotypically CETCs, despite the fact that these cells occur rarely in the blood.

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