

# DISEASE PROGRESSION AND TUMOR STAGE IN COLORECTAL CANCER CORRELATE WITH CEA AND EGFR GENE EXPRESSION IN DISSEMINATED TUMOR CELLS

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## **Abstract**

### ***Specific objective:***

Disease progression and tumor stage in colorectal cancer patients was correlated with tumor-associated gene expression in disseminated tumor cells (DTC) to evaluate a clinical utility of DTC detection and expression of tumor-associated genes with respect to individual patient prognosis and monitoring of therapy.

**Methods:** A DTC detection assay consisting of immunomagnetic enrichment and expression analysis of the tumor-associated genes CEA, EGFR, and GA733-2 was developed to analyze a total of 196 peripheral blood samples collected from 76 patients with tumor stage Duke A, B, C, and D in a multicenter study. Tumor-associated gene expression in metastatic patients was compared with the results in patients with tumor stage Duke A, B, C assessed prior to surgery and post surgery. CEA mRNA expression was compared with CEA serum protein levels.

**Summary of Results:** Prior to surgery EGFR and CEA expression was assessed in 88 % ( $p=0.001$ ) and 0 % ( $p=0.002$ ), post surgery in 66 % ( $p=0.001$ ) and 20 % ( $p=0.002$ ) as well as in 15 % ( $p<0.0001$ ) and 66 % ( $p<0.0001$ ) of blood samples collected from metastatic patients in a comparison analysis, respectively. Prior to surgery and in follow-up samples an expression of tumor-associated genes in DTC indicated an ongoing metastatic process. There was no correlation between DTC expressing CEA and elevation of CEA serum protein levels.

**Conclusions:** A statistical significant correlation of EGFR and CEA gene expression with disease progression and tumor stage was assessed. Detection of CEA expression in DTC might have a predictive value in colorectal cancer and may help to identify patients at a greater risk of relapse.