Poster-3.5 Expression profiles of cancer stem cell markers in colorectal cancer

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Aim Cancer stem cells (CSCs) are thought to be responsible for tumor progression and therapy resistance. They have been identified in a variety of human solid tumors and cancer cell lines. Cell lines might therefore serve as an attractive source for CSC in vitro research. We investigated to which extent colorectal cancer cell lines contain CSC-like cell clones and if their expression profiles correlate with clinical measures.

Material & Methods Altogether, 12 colorectal cancer cell lines and 30 primary colorectal carcinomas and adjacent normal colon mucosa were analyzed by flow cytometry using a panel of six cell surface markers of CSC-like phenotype. Markers comprised CD326, CD133, CD44, CD166, Msi-1 and Gpr49. Expression frequency of CSC-like markers was divided into four categories with high (> 70% of cells), moderate (≤ 70% and ≥ 30%), low (< 30% and ≥ 1%), and absent (< 1%) expression.

Results All cell lines but one (HT29) showed a stable expression pattern throughout all four replicates. HT29 showed an increased expression for CD133 and CD166 over time and was thus excluded from further analyses. The majority of cell lines showed high expression for CD326. About half to one third of the cell lines expressed at high frequency CD44, CD166 and CD133. In contrast, most cell lines expressed Msi-1 and Gpr49 at low frequency. Comparing primary colorectal carcinomas with the cell lines, we found the expression of cancer stem cell markers to be fairly similar in both sources. Comparison of adjacent normal mucosa and primary carcinoma detected the most prominent expression differences for CD326, CD133, CD44 and CD166. Markers were subsequently evaluated by immunohistochemistry on a tissue micro array consisting of 78 primary colorectal carcinoma and normal mucosa and correlated to clinical parameters. Established cell lines do harbour to a substantial amount cells with CSC-like properties. A comparison of cell lines with clinical tissue shows similar pattern of CSC-markers expression. Some cell lines present higher variability of cancer stem cell marker expression than others. Overall we conclude that commercial cell lines do reflect CSC properties of clinical tissue and could serve for CSC in-vitro research to different extents.