Biomarkers predicting the outcome of colorectal cancer

Principal investigator

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Colorectal cancer is one of the most common malignant neoplasm in the Western world. Its incidence has been increasing for many decades. Although its prognosis has gradually improved, many patients still die of the disease. There is need for markers predicting the outcome of the disease. This is important, since high risk patients benefit from adjuvant treatments to prevent the recurrent disease. It also makes possible to save patients with low risk of recurrence from the adverse effects of adjuvant treatments. During the last few years the possibilities to treat disseminated colorectal cancer have improved along with the adventure of therapy with targeted monoclonal antibodies. These include especially antibodies directed against epidermal growth factor receptor (EGFR) and those against angiogenesis. Anti-EGFR treatment can be given only to patients without RAS-mutation in the intracellular signaling route of the cancer cells, because patients with these mutations do not respond to treatment. However, even without such mutations only part of patients respond to anti-EGFR treatment for reasons not well understood.

This study aims to find biomarkers to predict the risk of recurrent disease. In addition, this study aims to predict the treatment response to anti-EGFR monoclonal antibodies cetuximab and panitumumab in patients with metastatic disease. The translational collaboration between the pathologists, cell biologists and clinical oncologist at the University of Turku has led to a significant observation. It concerns the ability of EGFR-gene copy number to predict the response to anti-EGFR treatment in patients with disseminated colorectal cancer. By combining it to RAS-analysis traditionally used for predicting the treatment response to anti-EGFR treatment, it will greatly help to select responders from non-responders. Concerning this issue we have one publication (1) and one manuscript. In the future we shall confirm our results with a larger prospective patient material. One of the most challenging group of colorectal cancer patients is that with stage II colorectal cancer. Although part of these patients will get a metastasized disease, there is shortage of biomarkers predicting the relapse in this group of patients. We have collected a tissue microarray material of 260 stage II colorectal cancer patients to find new biomarkers predicting the recurrent disease. We have a hypothesis, that markers associated especially with tumor hypoxia, cancer stem cell phenotype and tumor-stroma interaction might be good candidates in this aspect. We have also begun a collection of
fresh tumor material to establish colorectal cancer cell cultures for in vitro experiments. This is important to study more profoundly the preliminary observations obtained by tissue microarray.

Selected publications:


Personnel:

PhD Students:

Eva-Maria Birkman, Khadija M Slik

Other members and collaborators of the group:

Olli Carpén, Eija Korkeila, Raija Ristamäki, Annika Ålgars, Minnamaija Lintunen, Terhi Jokilehto, Tuulia Avoranta