Institute of Molecular Biology

IMB TechTalk

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"miRNA regulation of cell signaling in breast cancer"

08 May 2012, 11:00 h (*s.t.*)

Venue: 2nd Floor Seminar Room
Institute of Molecular Biology (IMB)
Johannes Gutenberg University Campus Mainz

All are welcome to attend

Host: Dr. Bernhard Korn, Director CF & Technology, IMB
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Recent advances in research on breast cancer initiation and metastasis have indicated a contribution of different signaling pathways. miRNAs are increasingly recognized as regulators of signaling and, thus, of physiological processes in health and disease. We perform unbiased whole genome miRNA (miRome) screens for modulators of the signaling pathways, applying different data acquisition technologies. In a screen investigating miRNAs regulating the NF-κB pathway we identified several microRNA families whose members induced consistent effects on NF-κB activity. One miRNA family was verified to inhibit expression of NF-κB target genes strongly reducing expression and secretion of pro-inflammatory cytokines. This same family abrogates cell invasion in a highly invasive cell line model which, however, is mediated via direct targeting of TGF-β signaling. This miRNA family thus has potential tumor suppressive activities by acting as a link between the NF-κB and TGF-β pathways and may thus contribute to the interplay of tumor progression, metastasis and inflammation. In a second screen, we used the reverse phase protein array (RPPA) technology to quantify the abundance of key proteins in EGFR signaling and cell cycle control. The results show redundancy in the activities of individual miRNAs as well as in the regulation of target mRNAs. This indicates the high complexity of the regulation network by miRNAs that may have implications for the application of miRNAs as therapeutic molecules.