Clinical Cancer Research Highlights

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Selected Articles from This Issue

The Relation of [^{18}F]FLT–PET Imaging and Tumor Proliferation

Zhang *et al.* Page 1303

[^{18}F]FLT (3′-Fluoro-3′ deoxythymidine)–positron emission tomographic imaging ([^{18}F]FLT–PET) has been used to measure *in vivo* tumor cell proliferation; however, its use in clinical tumor staging is limited due to the lower overall uptake of FLT. Zhang and colleagues evaluated the factors other than tumor cell proliferation that could affect the outcome of imaging to understand the translational aspects of the [^{18}F]FLT–PET imaging modality. The preclinical use of [^{18}F]FLT–PET imaging for tracking therapeutic response was also assessed. The results of this study strongly agreed with the clinical outcome. This work highlights the preclinical understanding of [^{18}F]FLT–PET imaging and provides insights into the technologic applications in the oncology arena.

Telomestatin in Targeting Glioma Stem Cells

Miyazaki *et al.* Page 1268

Glioma stem cells (GSC) are a critical therapeutic target of glioblastoma multiforme (GBM). Miyazaki and colleagues addressed the hypothesis that a G-quadruplex ligand, telomestatin (TMS), eradicates GSCs. TMS treatment induced apoptosis of GSCs *in vitro* and *in vivo* through both telomeric and nontelomeric DNA damage. A proto-oncogene, c-Myb, was identified as a novel target of TMS by the cDNA microarray and pharmacodynamic analysis. c-Myb knockdown significantly reduced the growth of GSCs both *in vitro* and *in vivo*, and c-Myb expression in surgical specimens of GBM patients was statistically significantly elevated. These data suggest a novel GSC-directed therapeutic strategy for GBM through telomere disruption and c-Myb inhibition.

Clinically Relevant Mouse Model of Human Prostate Cancer

Lange *et al.* Page 1364

The prostate cancer field is critically lacking a metastasis xenograft model that respects the entire physiologic metastatic cascade and provides evidence for its clinical relevance. Lange and colleagues established subcutaneous xenograft models using 4 prostate cancer cell lines and quantified tumor development and spontaneous metastasis formation. Metastatic xenografts revealed an increased activity of Mgat5b, a β(1,6)-branching glycosyltransferase previously found in neurons and testes, as detected by *Phaseolus vulgaris* leukoagglutinin (PHA-L) binding. According to a clinical part of the study (n = 2,085), PHA-L intensity was correlated with serum prostate-specific antigen (PSA) levels, and a cytoplasmic localization of PHA-L binding adversely affected PSA recurrence-free survival.

PI3K/Akt Pathway as a Novel Therapeutic Target

Schwarz *et al.* Page 1464

Few studies have explored the connection between tumor imaging results and gene expression. To identify signaling pathways associated with treatment-related changes in tumor 2[^{18}F]fluoro-2-deoxy-D-glucose–positron emission tomographic (FDG–PET) imaging, Schwarz and colleagues performed gene expression profiling using 62 pretreatment cervical cancer biopsies from patients treated with definitive chemoradiation. All patients underwent pre- and post-treatment FDG–PET. Alterations in expression of genes from the phosphoinositide 3-kinase (PI3K)/Akt pathway were associated with abnormal FDG uptake on the posttreatment PET. These results were validated using immunohistochemistry for p-Akt and comparing results with patient survival outcome data after treatment (n = 174). These results suggest that PI3K/Akt inhibition may improve response to chemoradiation.

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