BREAKING ADVANCES

Highlights from Recent Cancer Literature

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Monitoring of Natural Killer Cell Immunotherapy Using Noninvasive Imaging Modalities

Priyanka Jha, Daniel Golovko, Sukhmine Bains, Daniel Hostetter, Reinhard Meier, Michael F. Wendland, and Heike E. Daldrup-Link

Cyclins, Cdks, E2f, Skp2, and More at the First International RB Tumor Suppressor Meeting

Rod Bremner and Eldad Zacksenhaus

A Novel Imaging Approach for Early Detection of Prostate Cancer Based on Endogenous Zinc Sensing

Subrata K. Ghosh, Pilhan Kim, Xiao-an Zhang, Seok-Hyun Yun, Anna Moore, Stephen J. Lippard, and Zdravka Medarova

Précis: This paper illustrates how differences in zinc levels in normal and cancerous prostates can be exploited for purposes of non-invasive imaging, with the potential for rapid clinical translation.

Gr-1+CD11b+Myeloid Cells Tip the Balance of Immune Protection to Tumor Promotion in the Premetastatic Lung

Hamnah H. Yan, Michael Pickup, Yanli Pang, Agnieszka E. Gorska, Zhaoyang Li, Anna Chytil, Yipeng Geng, Jerome W. Gray, Harold L. Moses, and Li Yang

Précis: Findings promote the concept that blocking the activity of myeloid derived suppressor cells could normalize the pre-metastatic lung environment, strengthening immune surveillance that prevents metastasis.

Receptor Activator of NF-κB Ligand Enhances Breast Cancer–Induced Osteolytic Lesions through Upregulation of Extracellular Matrix Metalloproteinase Inducer/CD147

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REVIEW

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MEETING REPORT

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Antigen-Experienced CD4+ T Cells Limit Naïve T-Cell Priming in Response to Therapeutic Vaccination *In vivo*  
Chris Schiering, Jlenia Guarnerio, Veronica Basso, Luca Muzio, and Anna Mondino  
**Précis:** Results emphasize limitations imposed by tumor-primed CD4+ T lymphocytes that block the ability of cancer vaccines to generate immunogenicity.

Antiangiogenic Agents Can Increase Lymphocyte Infiltration into Tumor and Enhance the Effectiveness of Adoptive Immunotherapy of Cancer  
Rajeev K. Shrimali, Zhiya Yu, Marc R. Theoret, Dhanalakshmi Chinnasamy, Nicholas P. Restifo, and Steven A. Rosenberg  
**Précis:** Findings rationalize testing of a combination of antiangiogenic agents with cell transfer immunotherapies in clinical oncology trials.

Single-Cell Analysis of T-Cell Receptor Repertoire of HTLV-1 Tax-Specific Cytotoxic T Cells in Allogeneic Transplant Recipients with Adult T-Cell Leukemia/Lymphoma  
Yukie Tanaka, Hideki Nakasone, Rie Yamazaki, Ken Sato, Miki Sato, Junji Nishida, Tetsuya Nakatsura, Haruo Sugiyama, and Yoshinobu Kanda  
**Précis:** This study suggests a basis to understand the efficacy of allogeneic hematopoietic stem cell transplantation as a treatment for HTLV-1-associated T cell leukemia.

The ITK-SYK Fusion Oncogene Induces a T-Cell Lymphoproliferative Disease in Mice Mimicking Human Disease  
Christine Dierks, Francisco Adrian, Paul Fisch, Hong Ma, Helga Maurer, Dieter Herchenbach, Christine Ulrike Forster, Clara Sprissler, Guoxun Liu, Sabine Rottmann, Gui-Rong Guo, Zirlik Katja, Hendrik Veelken, and Markus Warmuth  
**Précis:** Findings argue that Syk kinase fusions present in peripheral T-cell lymphomas might be effective therapeutic targets.

FOXO3 Encodes a Carcinogen-Activated Transcription Factor Frequently Deleted in Early-Stage Lung Adenocarcinoma  
Oliver R. Mikos, Daniel C. Blake, Jr., Nathan R. Jones, Yaan-Wan Sun, Shantu Amin, Carla J. Gallagher, Philip Lazarus, Judith Weisz, and Christopher R. Herzog  
**Précis:** Findings identify deletions of a suspected tumor suppressor gene in the setting of lung adenocarcinoma.

Tumor Cells Secrete Galectin-1 to Enhance Endothelial Cell Activity  
Victor L. Thijssen, Batya Barkan, Hiroki Shoji, Ingrid M. Aries, Véronique Mathieu, Louise Deltour, Tilmann Hackeng, Robert Kiss, Yoel Klooog, Françoise Poirier, and Arjan W. Griffioen  
**Précis:** This study identifies a novel angiogenic growth factor function for galectin-1 opening a new window for angiostatic cancer therapy.

Joint Loss of PAX2 and PTEN Expression in Endometrial Precancers and Cancer  
Nicolas M. Monte, Kaitlyn A. Webster, Donna Neuberg, Gregory R. Dressler, and George L. Mutter  
**Précis:** Combined loss of a tumor suppressor and a differentiation factor may drive the majority of sporadic endometrial cancers.

Met Receptor Sequence Variants R970C and T992I Lack Transforming Capacity  
Jeffrey W. Tyner, Luke B. Fletcher, Ellen Q. Wang, Wayne F. Yang, Michael L. Rutenberg-Schoenberg, Carol Beadling, Motomi Mori, Michael C. Heinrich, Michael W. Deininger, Brian J. Druker, and Marc M. Loriaux  
**Précis:** Findings illustrate the importance of distinguishing oncogenic mutations from normal polymorphisms in tumor cells before an oncogene-targeted drug strategy is justified.

Circadian Rhythm of Transferrin Receptor 1 Gene Expression Controlled by c-Myc in Colon Cancer–Bearing Mice  
Fumiyasu Okazaki, Naoya Matsunaga, Hiroyuki Okazaki, Naoki Uotoguchi, Ryo Suzuki, Kazuo Maruyama, Satoru Koyanagi, and Shigehiro Ohdo  
**Précis:** c-Myc controlled circadian rhythms that regulate colon cancer gene expression may promote new concepts in dosing regimens for cancer therapy.
| Page 6247 | Phosphomimetic Mutants of Pigment Epithelium-Derived Factor with Enhanced Antiangiogenic Activity as Potent Anticancer Agents  
**Précis:** Findings may encourage the development of a specific neovascularization-targeting anticancer agent. | Transplanting Normal Vascular Proangiogenic Cells to Tumor-Bearing Mice Triggers Vascular Remodeling and Reduces Hypoxia in Tumors  
| 6258 | DNA Damage-Induced Cytotoxicity Is Dissociated from BRCA1's DNA Repair Function but Is Dependent on Its Cytosolic Accumulation  
Hong Wang, Eddy S. Yang, Juhong Jiang, Somaira Nowsheen, and Fen Xia | Construction and Characterization of a Bispecific Anti-CD20 Antibody with Potent Antitumor Activity against B-Cell Lymphoma  
Bohua Li, Xuming Zhang, Shu Shi, Lei Zhao, Dapeng Zhang, Weizhu Qian, Lei Zheng, Jie Gao, Hao Wang, and Yajun Gao | 6293 |
| 6268 | 6-Thioguanine Selectively Kills BRCA2-Defective Tumors and Overcomes PARP Inhibitor Resistance  
| 6277 | Poly(ADP-Ribose) Polymerase Inhibitor Induces Accelerated Senescence in Irradiated Breast Cancer Cells and Tumors  
Margaret A. Park, Clint Mitchell, Guo Zhang, Adly Yacoub, Jeremy Allegood, Dieter Häussinger, Roland Reinherz, Andrew Larner, Sarah Spiegel, Paul B. Fisher, Christina Voelkel-Johnson, Besim Ogtmen, Steven Grant, and Paul Dent | 6313 |

**Précis:** These studies suggest a novel mechanism for radiosensitization by PARP inhibitors, mediated by persistent DNA damage response resulting in accelerated cellular senescence both in vitro and in vivo, with significant implications for cancer therapy.
A Chemosensitization Screen Identifies TP53RK, a Kinase that Restrains Apoptosis after Mitotic Stress
David Peterson, James Lee, Xingye C. Lei, William F. Forrest, David P. Davis, Peter K. Jackson, and Lisa D. Belmont

Précis: A novel chemo-sensitization screen identifies a molecule that may confer taxane resistance and serve as a novel therapeutic target.

Reprogramming Human Cancer Cells in the Mouse Mammary Gland
Karen M. Bussard, Corinne A. Boulanger, Brian W. Booth, Robert D. Bruno, and Gilbert H. Smith

Précis: Findings argue that human cancer cells can be reprogrammed to a non-cancerous phenotype by the microenvironment of a regenerating mammary gland.

GlcNAcylation Plays an Essential Role in Breast Cancer Metastasis
Yuchao Gu, Wenyi Mi, Yaqian Ge, Haiyan Liu, Qiong Fan, Cuifang Han, Jing Yang, Feng Han, Xinzhi Lu, and Wengong Yu

Précis: This study elucidates how a nuclear and cytoplasmic carbohydrate modification in breast cancer cells influences their malignant properties.

CIIA Is a Novel Regulator of Detachment-Induced Cell Death
Kwang Je Kim, Je-Wook Yu, Hyan Sub Hwang, and Eui-Ju Choi

Précis: Findings define a novel mechanistic realm to trigger anoikis in cancer cells as a possible therapeutic strategy.

Suppression of Integrin α3β1 in Breast Cancer Cells Reduces Cyclooxygenase-2 Gene Expression and Inhibits Tumorigenesis, Invasion, and Cross-Talk to Endothelial Cells

Précis: Findings reveal a novel role for COX-2 as a downstream effector of integrin α3β1 in tumor cells, identifying this integrin as a potential therapeutic target in breast cancer treatment.

LETTER TO THE EDITOR

Fructose Induces Transketolase Flux to Promote Pancreatic Cancer Growth
Haibo Liu, Danshan Huang, David L. McArthur, Laszlo G. Boros, Nicholas Nissen, and Anthony P. Heaney

Précis: Dietary fructose which is commonly added to processed foods may promote pancreatic cancer growth, given a distinct metabolism relative to glucose that more strongly favors DNA and RNA synthesis.

Transforming Growth Factor-β (TGF-β)-Inducible Gene TMEPAI Converts TGF-β from a Tumor Suppressor to a Tumor Promoter in Breast Cancer
Prajjal K. Singha, I-Tien Yeh, Manjeri A. Venkatachalam, and Pothana Saikumar

Précis: Findings suggest novel insights into how cancer cell responses to TGF-beta are converted from growth inhibitory to growth promoting in nature.

HERC2 Is an E3 Ligase That Targets BRCA1 for Degradation

Précis: This study identifies an E3 ligase that may balance regulation of BRCA1 stability and influence breast carcinogenesis.

Spontaneous Malignant Transformation of Human Mesenchymal Stem Cells Reflects Cross-Contamination: Putting the Research Field on Track — Letter

CORRECTIONS

Correction: Oncogenic Ras Promotes Reovirus Spread by Suppressing IFN-β Production through Negative Regulation of RIG-I Signaling

Correction: Myc-Induced MicroRNAs Integrate Myc-Mediated Cell Proliferation and Cell Fate
ABOUT THE COVER

DNA damage induced by 6-thioguanine is repaired by homologous recombination. Cells treated with 6-thioguanine were fixed, and DNA (blue), RAD51 (red), and $\gamma$H2AX (green) were visualized by immunofluorescence. RAD51 foci formed in V-C8+B2 cells and colocalized with $\gamma$H2AX foci. For details, see the article by Helleday and colleagues on page 6268 of this issue.