BREAKING ADVANCES

6107  Highlights from Recent Cancer Literature

6109  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

6114  Cyclins, Cdk5, E2f, Skp2, and More at the First International RB Tumor Suppressor Meeting
Rod Bremner and Eldad Zacksenhaus

6119  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.

REVIEW

6119  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

6119  Cyclins, Cdk5, E2f, Skp2, and More at the First International RB Tumor Suppressor Meeting
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6119  A Microfluidic Platform for Systems Pathology: Multiparameter Single-Cell Signaling Measurements of Clinical Brain Tumor Specimens

Précis: This study describes a microfluidic imaging technology that can enhance pathological analysis of tumor biopsies.

MEETING REPORT

6119  Cyclins, Cdk5, E2f, Skp2, and More at the First International RB Tumor Suppressor Meeting
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6119  A Microfluidic Platform for Systems Pathology: Multiparameter Single-Cell Signaling Measurements of Clinical Brain Tumor Specimens

Microenvironment and Immunology

6119  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.

6119  Receptor Activator of NF-κB Ligand Enhances Breast Cancer–Induced Osteolytic Lesions through Upregulation of Extracellular Matrix Metalloproteinase Inducer/CD147
Nadia Rucci, Danilo Millimaggi, Marianna Mari, Andrea Del Fattore, Mauro Bologna, Anna Teti, Adriano Angelucci, and Vincenza Dolo

Précis: A cancer cell surface molecule plays a critical role in supporting breast cancer metastasis to bone, validating a target for therapeutic blockade of this process.
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. Shriramal, 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, Aki Tanihara, Junji Nishida, Yoshiaki Yoshikawa, Tetsuya Nakatsuru, 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.

MOLECULAR AND CELLULAR PATHOBIOLOGY

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.
Phosphomimetic Mutants of Pigment Epithelium-Derived Factor with Enhanced Antiangiogenic Activity as Potent Anticancer Agents
Alexander Konson, Sunila Pradeep, and Rony Seger

Findings may encourage the development of a specific neovascularization-targeting anticancer agent.

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

BRCA1 nucleocytoplasmic shuttling may serve as marker of tumor response and possibly a mechanistic focus to sensitize cancer cells to DNA damage-based therapy.

6-Thioguanine Selectively Kills BRCA2-Defective Tumors and Overcomes PARP Inhibitor Resistance
Natalia Issaeva, Huw D. Thomas, Tatjana Djurenovic, Janneke E. Jaspers, Ivaylo Stoimenov, Suzanne Kyle, Nicholas Pedley, Pomnari Gottipati, Rafal Zur, Kate Sleeth, Vicky Chatzakos, Evan A. Mulligan, Cecilia Lundin, Evgenia Gubaeva, Ariena Kernbergen, Adrian L. Harris, Ricky A. Sharma, Sven Rottenberg, Nicola J. Curtin, and Thomas Hellday

Strategies to anticipate and address resistance to PARP inhibitors that target tumors defective in BRCA1 or BRCA2 will extend patient survival and may help rationalize more effective combinatorial treatments.

Poly(ADP-Ribose) Polymerase Inhibitor Induces Accelerated Senescence in Irradiated Breast Cancer Cells and Tumors

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.

Transplanting Normal Vascular Proangiogenic Cells to Tumor-Bearing Mice Triggers Vascular Remodeling and Reduces Hypoxia in Tumors

This study describes a microfluidic imaging technology that can enhance pathological analysis of tumor biopsies.

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

A bispecific anti-CD20 antibody that engages both apoptosis and complement dependent cytotoxicity offers a promising agent to improve treatment of B cell neoplasms.

EGFRvIII Antibody–Conjugated Iron Oxide Nanoparticles for Magnetic Resonance Imaging–Guided Convection-Enhanced Delivery and Targeted Therapy of Glioblastoma

Target directed magnetic nanoparticles are being developed for MRI contrast enhancement and treatment of brain tumors.

Vorinostat and Sorafenib Increase CD95 Activation in Gastrointestinal Tumor Cells through a Ca2+-De novo Ceramide-PP2A-Reactive Oxygen Species–Dependent Signaling Pathway
Margaret A. Park, Clint Mitchell, Guo Zhang, Adly Yacoub, Jeremy Allegood, Dieter Häussinger, Roland Reinehr, Andrew Larner, Sarah Spiegel, Paul B. Fisher, Christina Voelkel-Johnson, Besim Ogtremen, Steven Grant, and Paul Dent

Mechanistic investigations reveal the critical steps through which a combination of targeted therapies now entering clinical trials activates a central cancer cell death pathway.
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

Precis: 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

Precis: 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, Yaqing Ge, Haiyan Liu, Qiong Fan, Cuifang Han, Jing Yang, Feng Han, Xinzhi Lu, and Wengong Yu

Precis: 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

Precis: 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 Tumorogenesis, Invasion, and Cross-Talk to Endothelial Cells

Precis: 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

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

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

Precis: 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

Precis: Findings suggest novel insights into how cancer cell responses to TGF-beta are converted from growth inhibitory to growth promoting in nature.
DNA damage induced by 6-thioguanine is repaired by homologous recombination. Cells treated with 6-thioguanine were fixed, and DNA (blue), RAD51 (red), and γH2AX (green) were visualized by immunofluorescence. RAD51 foci formed in V-C8+B2 cells and colocalized with γH2AX foci. For details, see the article by Hellday and colleagues on page 6268 of this issue.