### BREAKING ADVANCES

829 Highlights from Recent Cancer Literature

### REVIEWS

831 The Dark Side of Mast Cell–Targeted Therapy in Prostate Cancer
Paola Pittoni and Mario Paolo Colombo

836 Regulation of Cancer Progression by β-Endorphin Neuron
Dipak K. Sarkar, Sengottuvelan Murugan, Changjing Zhang, and Nadka Boyadjieva

### MEETING REPORT

841 Twenty-Third Annual Pezcoller Symposium: Engineering Influences in Cancer Research
Peter Friedl, Jeff Hubbell, David Livingston, and Enrico Mihich

### CLINICAL STUDIES

845 N-Myc Regulates Expression of the Detoxifying Enzyme Glutathione Transferase GSTP1, a Marker of Poor Outcome in Neuroblastoma

### INTEGRATED SYSTEMS AND TECHNOLOGIES

854 Hyperpolarized ¹³C Spectroscopy Detects Early Changes in Tumor Vasculature and Metabolism after VEGF Neutralization
Sarah E. Bohndiek, Mikko I. Kettunen, De-en Hu, and Kevin M. Brindle

### MICROENVIRONMENT AND IMMUNOLOGY

865 Metastatic Cells Can Escape the Proapoptotic Effects of TNF-α through Increased Autocrine IL-6/STAT3 Signaling
Shun Li, Ni Wang, and Pnina Brodt

Précis: This study defines an IGF-1-driven mechanism of cancer cell survival that is critical for metastatic colonization of the liver, suggesting that IGF-1 receptor antagonists currently in clinical trials may have particular utility in treating colon cancers and other cancers that metastasize frequently to liver.

876 Monocytic CCR2⁺ Myeloid-Derived Suppressor Cells Promote Immune Escape by Limiting Activated CD8 T-cell Infiltration into the Tumor Microenvironment
Alexander M. Lesokhin, Tobias M. Hohl, Shigehisa Kitano, Cristina Cortez, Daniel Hirschhorn-Cymerman, Francesca Avogadri, Gabriele A. Rizzuto, John J. Lazarus, Eric G. Pamer, Alan N. Houghton, Taha Merghoub, and Jedd D. Wolchok

Précis: The cytokine GM-CSF, which is used to enhance white cell counts in many cancer patients, also expands a population of immune-suppressive monocytic cells that can block the entry of activated antitumor T cells into the tumor microenvironment, perhaps unwittingly contributing to immune escape.

887 CD8⁺ T Cells Specific for Tumor Antigens Can Be Rendered Dysfunctional by the Tumor Microenvironment through Upregulation of the Inhibitory Receptors BTLA and PD-1
Julien Fourcade, Zhaojun Sun, Ornella Pugliano, Philippe Guillaume, Immanuel F. Luesser, Cindy Sander, John M. Kirkwood, Daniel Olive, Vijay Kuchroo, and Hassane M. Zarour

Précis: This study extends knowledge concerning how an important inhibitory class of co-receptor molecules on T cells acts to block their specific cytotoxic activity against tumor cells, thereby deepening insights into how to reverse this key mechanism of immune escape in tumors for therapeutic benefit.

897 Hedgehog Signaling Inhibition Blocks Growth of Resistant Tumors through Effects on Tumor Microenvironment

Précis: This study describes an MRI imaging method that can be used to noninvasively monitor vascular disruption and normalization following VEGF blockade, addressing a clinical need to rapidly evaluate the likely impact of antiangiogenic therapy in patients.
**MOLECULAR AND CELLULAR PATHOBIOLOGY**

939  Regulation of Monocarboxylate Transporter MCT1 Expression by p53 Mediates Inward and Outward Lactate Fluxes in Tumors
Romain Boidot, Frédérique Végran, Aline Meulle, Aude Le Breton, Chantal Dessy, Pierre Sonveaux, Sarah Lizard-Nacol, and Olivier Feron

**THERAPEUTICS, TARGETS, AND CHEMICAL BIOLOGY**

969  Resistance to Selective BRAF Inhibition Can Be Mediated by Modest Upstream Pathway Activation

**PREVENTION AND EPIDEMIOLOGY**

958  A Positive Feedback Signaling Loop between ATM and the Vitamin D Receptor Is Critical for Cancer Chemoprevention by Vitamin D
Huei-Ju Ting, Sayeda Yasmin-Karim, Shian-Jang Yan, Jong-Wei Hsu, Tzu-Hua Lin, Wei Si Zeng, James Messing, Tzong-Jeng Sheu, Bo-Ying Bao, Willis X. Li, Edward Messing, and Yi-Fen Lee

**PREVENTION AND EPIDEMIOLOGY**

949  Myc Posttranscriptionally Induces HIF1 Protein and Target Gene Expression in Normal and Cancer Cells
Megan R. Doe, Janice M. Ascano, Mandeep Kaur, and Michael D. Cole

**CHEMICAL BIOLOGY**

949  miR-20a Encoded by the miR-17–92 Cluster Increases the Metastatic Potential of Osteosarcoma Cells by Regulating Fas Expression
Gangzong Huang, Kazumasa Nishimoto, Zhichao Zhou, Dennis Hughes, and Eugenie S. Kleinerman

**PREVENTION AND EPIDEMIOLOGY**

949  Precis: Findings demonstrate a novel role for hedgehog signaling in osteoclast function and demonstrate that hedgehog inhibitors reduce tumor burden through direct effects on tumor cells, osteoclasts, and stromal cells within the tumor microenvironment.

949  Precis: This study identifies the lactate transporter MCT1 as a critical mediator of p53-driven metabolic controls on glycolysis and respiration, and thus also potentially critical for supporting malignant progression of p53-deficient cancers.

949  Precis: Myc overexpression is linked to induction of a core regulator of tumor hypoxia, highlighting a previously unrecognized effector pathway for oncogenic transformation by Myc.

949  Precis: Findings demonstrate a novel role for hedgehog inhibitors that regulate Fas expression and further enhance the antitumor activity of Fas-targeted drugs, this study shows how combination strategies for immunotherapeutic antibodies that target important negative regulatory immune receptors can produce powerful antitumor effects, in essence, by correcting immune escape.

949  Precis: Analogous to combination strategies for targeted drugs, this study shows how combination strategies for immunotherapeutic antibodies that target important negative regulatory immune receptors can produce powerful antitumor effects, in essence, by correcting immune escape.

949  Precis: Findings suggest that vitamin D prevents cancer by stimulating a positive feedback signaling loop from the vitamin D receptor to the DNA repair machinery, increasing its efficiency.

949  Precis: Findings address the present clinical challenge to prevent or reverse acquired resistance to mutant BRAF inhibition, which can produce powerful but only transient therapeutic responses in melanoma.

949  Precis: This study identifies the lactate transporter MCT1 as a critical mediator of p53-driven metabolic controls on glycolysis and respiration, and thus also potentially critical for supporting malignant progression of p53-deficient cancers.
Histone Deacetylase Inhibition Increases Levels of Choline Kinase a and Phosphocholine Facilitating Noninvasive Imaging in Human Cancers
Mounia Beloueche-Babari, Vaitha Arunan, Helen Troy, Robert H. te Poele, Anne-Christine Wong Te Fong, L. Elizabeth Jackson, Geoffrey S. Payne, John R. Griffiths, Ian R. Judson, Paul Workman, Martin O. Leach, and Yuen-Li Chung

Précis: Noninvasive biomarkers offer critical tools for clinical trials of targeted drugs, as illustrated in this study providing mechanistic support for the use of phosphocholine as a candidate noninvasive biomarker for imaging the pharmacodynamic response to HDAC inhibitors.

LETTERS TO THE EDITOR

Impact of Epithelial Organization on Myc Expression and Activity—Letter
Johanna I. Partanen and Juha Klefstrom

Impact of Epithelial Organization on Myc Expression and Activity—Response
David Simpson Senthil Muthuswamy, and William P. Tansey

CORRECTIONS

Correction: Endoglin Regulates Cancer–Stromal Cell Interactions in Prostate Tumors

Correction: Sirtuin 1 Is Upregulated in a Subset of Hepatocellular Carcinomas where It Is Essential for Telomere Maintenance and Tumor Cell Growth

Correction: Long Noncoding RNA HOTAIR Regulates Polycomb-Dependent Chromatin Modification and Is Associated with Poor Prognosis in Colorectal Cancers

ABOUT THE COVER

Vemurafenib recently achieved FDA approval for treating patients with metastatic melanoma harboring the BRAF V600E mutation. The BRAFV600E-driven uncontrolled proliferation is effectively blocked by vemurafenib, reflected in the remarkable regressions observed in the clinic. However, most patients eventually relapse, and in many instances, progression is associated with reactivation of ERK signaling, as observed by high levels of ERK phosphorylation in tumor biopsies taken at progression. The cover shows an example of a tumor biopsy taken at progression. Su and colleagues identify a novel KRAS mutation that mediates the acquired resistance of melanoma cells to vemurafenib. Both MAPK and PI3K pathways are active despite the presence of drug. Combinations of vemurafenib with either MEK or AKT inhibitors are able to overcome this resistance, providing hope that these combinations could mitigate disease relapse in patients. For details, see the article by Su and colleagues on page 969 of this issue.