Breaking Advances

Highlights from Recent Cancer Literature

Reviews

Circular RNA and miR-7 in Cancer
Thomas B. Hansen, Jørgen Kjems, and Christian K. Damgaard

Antitumor Immunity: Easy as 1, 2, 3 with Monoclonal Bispecific Trifunctional Antibodies?
John Maher and Antonella A. Adami

Perspective

The Relationship between Tumor Blood Flow, Angiogenesis, Tumor Hypoxia, and Aerobic Glycolysis
Leif Østergaard, Anna Tietze, Thomas Nielsen, Kim Ryun Drasbek, Kim Mouridsen, Sune Nurhaj Jespersen, and Michael R. Horsman

Priority Report

A Novel Algorithm for Simplification of Complex Gene Classifiers in Cancer

Microenvironment and Immunology

Infiltrating Macrophages Promote Prostate Tumorigenesis via Modulating Androgen Receptor-Mediated CCL4–STAT3 Signaling
Lei-Ya Fang, Kouji Izumi, Kuo-Pao Lai, Liang Liang, Lei Li, Hiroshi Miyamoto, Wen-Jye Lin, and Chawen Chang

Molecular and Cellular Pathobiology

Interferon-c Suppresses cAMP to Disarm Human Regulatory T Cells

Précis: These findings suggest a new application for IFN-α in cancer treatment by using it to inactivate T-regulatory cells in combination with vaccines as a means to degrade immune escape barriers that limit therapeutic responses.

Adipoctye-Derived Fibroblasts Promote Tumor Progression and Contribute to the Desmoplastic Reaction in Breast Cancer
Ludivine Bochet, Camille Lehuédé, Stéphanie Dauviller, Yuan Yuan Wang, Béatrice Dirat, Victor Laurent, Cédric Dray, Romain Guiet, Isabelle Marikonneau-Parini, Sophie Le Gonidec, Bettina Coudrec, Ghislaine Escourrou, Philippe Valet, and Catherine Muller

Précis: This article reports the discovery of a new stromal cell population in the breast tumor microenvironment that may offer unique new opportunities for targeted therapy in breast cancer.

Tumor Microenvironmental Conversion of Natural Killer Cells into Myeloid-Derived Suppressor Cells
Young-Jun Park, Boyeong Song, Yun-Sun Kim, Eun-Kyung Kim, Jung-Mi Lee, Ga-Eun Lee, Jae-Ouk Kim, Yeon-Jeong Kim, Woo-Sung Chang, and Chang-Yuil Kang

Précis: Striking findings in this study reveal new insights into how tumor cells hijack their local immune microenvironment to escape immune surveillance.

Reg3β Deficiency Impairs Pancreatic Tumor Growth by Skewing Macrophage Polarization
Meritxell Gironella, Carlos Calvo, Anna Fernández, Daniel Closa, Juan L. Iovanna, Joan Rosello-Catafau, and Emma Folch-Puy

Précis: The findings reported in this article may guide further clinical research based on the inhibition of the Reg3β in the treatment pancreatic cancer.
Oncogenic Herpesvirus HHV-8 Promotes Androgen-Independent Prostate Cancer Growth
Justin G. Mygatt, Adit Singhal, Gauthaman Sukumar, Clifton L. Dalgaard, and Johnan A.R. Kaleeba

Précis: This provocative study prompts deeper investigations of the relationship between infection with human herpesvirus 8 (HHV-8) and risks of advanced prostate cancer, given findings that HHV-8 infection of primary prostate epithelial cells can drive several features of androgen-independent metastatic disease.

SOX10 Ablation Arrests Cell Cycle, Induces Senescence, and Suppresses Melanomagenesis

Précis: Definition of a core determining factor for cell-cycle control in melanoma suggests a rational new direction for targeted treatment or prevention of this disease.

Epimorphin Is a Novel Regulator of the Progesterone Receptor Isoform-A
Jamie L. Bascom, Derek C. Radisky, Eileen Koh, Jimmie E. Fata, Alvin Lo, Hideoishi Mori, Neda Roosta, Yohei Hirai, and Mina J. Bissell

Précis: This study offers new insights into control of the expression of the progesterone receptor, a key driver and prognostic determinant in hormone-dependent breast cancers.

Rapid Induction of Lung Adenocarcinoma by Fibroblast Growth Factor 9 Signaling through FGF Receptor 3
Yongjun Yin, Tomoko Betsuyaku, Joel R. Garbow, Jinbai Miao, Ramaswamy Govindan, and David M. Ornitz

Précis: These findings highlight a mouse model of lung adenocarcinomas that form near the bronchioalveolar duct junction that may be useful to evaluate a growing number of experimental anticancer drugs that interfere with FGF signaling.

Akt SUMOylation Regulates Cell Proliferation and Tumorigenesis
Rong Li, Jie Wei, Cong Jiang, Dongmei Liu, Lu Deng, Kai Zhang, and Ping Wang

Précis: This important study reveals a fundamental feature for controlling the function of Akt, which is broadly activated in many human cancers where it contributes to survival, invasion, and therapeutic resistance.

c-Kit Is Suppressed in Human Colon Cancer Tissue and Contributes to L1-Mediated Metastasis
Nancy Gavert, Anna Shvab, Michal Sheffer, Amir Ben-Shmuel, Gal Haase, Eszter Bakos, Eytan Domany, and Avri Ben-Ze’ev

Précis: This report challenges the paradigm of c-Kit as an oncogene in demonstrating the importance of its suppression in colorectal cancer for its metastasis to liver, the most common site for dissemination of this disease.

Src Family Kinases as Novel Therapeutic Targets to Treat Breast Cancer Brain Metastases
Siyuan Zhang, Wen-Chien Huang, Lin Zhang, Chenyu Zhang, Frank J. Lowery, Zhaoli Ding, Hua Guo, Hai Wang, Suyun Huang, Aysegul A. Sahin, Kenneth D. Aldape, Patricia S. Steeg, and Dihua Yu

Précis: Inhibitors of Src family tyrosine kinases that have been examined clinically might have excellent prospects for treatment of brain metastases of breast cancer, a deadly and untreatable step in disease progression occurring in many patients with advanced disease.

KIT Signaling Governs Differential Sensitivity of Mature and Primitive CML Progenitors to Tyrosine Kinase Inhibitors
Amie S. Corbin, Thomas O’Hare, Zhimin Gu, Ira L. Kraft, Anna M. Eiring, Jamshid S. Khorashad, Anthony D. Pomicter, Tian Y. Zhang, Christopher A. Eide, Paul W. Manley, Jorge E. Cortes, Brian J. Druker, and Michael W. Deininger

Précis: These findings may explain the limited effects that imatinib (Gleevec) has on CML progenitors, a long-standing question that appears to relate to KIT as a core element for understanding therapeutic responses to this iconic drug.

Targeting ERBB Receptors Shifts Their Partners and Triggers Persistent ERK Signaling through a Novel ERBB/EFNB1 Complex
Paola D. Vermeer, Paul L. Colbert, Bryant G. Wieking, Daniel W. Vermeer, and John H. Lee

Précis: This study provides a mechanistic explanation for why EGFR targeting drugs work poorly in head and neck carcinoma despite common involvement of EGFR in this cancer.
### TUMOR AND STEM CELL BIOLOGY

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<td>5798</td>
<td>Stem Cell Differentiation and Lumen Formation in Colorectal Cancer Cell Lines and Primary Tumors</td>
<td>Neil Ashley, Trevor M. Yeung, and Walter F. Bodmer</td>
<td><em>Précis:</em> An in vitro model for functional characterization of colorectal stem-like cells and their differentiation also offers applications to enable high-throughput screening for novel anticancer compounds.</td>
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<td>5810</td>
<td>Breast Tumor Kinase (Brk/PTK6) Is a Mediator of Hypoxia-Associated Breast Cancer Progression</td>
<td>Tarah M. Regan Anderson, Danielle L. Peacock, Andrea R. Daniel, Gregory K. Hubbard, Kristopher A. Lofgren, Brian J. Girard, Alexandra Schorg, David Hoogewijs, Roland H. Wenger, Tiffany N. Seagroes, and Carol A. Lange</td>
<td><em>Précis:</em> These findings define a kinase-based mechanism that drives the aggressive behavior of triple-negative breast cancers, which may offer a tractable target for therapy in this challenging disease.</td>
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<td>5821</td>
<td>ANTXR1, a Stem Cell-Enriched Functional Biomarker, Connects Collagen Signaling to Cancer Stem-like Cells and Metastasis in Breast Cancer</td>
<td>Daohong Chen, Poornima Bhat-Nakshatri, Chirayu Goswami, Sunil Badve, and Harikrishna Nakshatri</td>
<td><em>Précis:</em> These findings illuminate functional links between the tumor microenvironment and stemness functions that contribute to metastatic progression, with potential implications for understanding breast cancer pathophysiology and therapy.</td>
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**CORRECTION**

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<tr>
<td>5845</td>
<td>Correction: Quantitative In Vivo Characterization of Intracellular and Extracellular pH Profiles in Heterogeneous Tumors: A Novel Method Enabling Multiparametric pH Analysis</td>
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ABOUT THE COVER

The importance of natural killer (NK) cells for eradicating cancer cannot be overemphasized. It was found that the tumor environment impairs the development and function of NK cells and even diminishes the number of NK cells in patients with chronic myelogenous leukemia. Here, Park and colleagues show that a part of CD11b^{high}CD27^{high} NK cells obtained from tumor-bearing mice were converted into CD11b^{+}Gr1^{+} MDSC phenotype by GM-CSF, while the phenotype of NK cells was retained in the presence of IL-2. For details, see article by Park and colleagues on page 5669.