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**Précis:** Cancer immunotherapies that recruit an IL-4-dependent class of memory T helper cells that can activate antitumor natural killer cells may achieve more potent and durable clinical outcomes.
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<td><strong>CD8</strong>+ T Cells Regulate Bone Tumor Burden Independent of Osteoclast Resorption**</td>
<td>Kaihua Zhang, Seokho Kim, Viviana Cremasco, Angela C. Hirbe, Deborah V. Novack, Katherine Weilbaecher, and Roberta Faccio</td>
<td><em>This is the first report analyzing the relative contribution of osteoclasts and immune cells in development of bone metastases.</em></td>
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<td>Stephen R. Mattarollo, Sherene Loi, Helene Duret, Yuting Ma, Laurence Zitvogel, and Mark J. Smyth</td>
<td><em>This study adds to growing evidence that the therapeutic efficacy of cytotoxic chemotherapy relies upon antitumor contributions of the innate and adaptive immune systems.</em></td>
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<td><em>Findings define the qualities of 'immunogenic' cancer cell deaths that chemotherapeutic drugs may need to trigger in order to elicit efficacious clinical responses, with implications for the design of effective regimens of immunochemotherapy.</em></td>
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<td><em>Cognitive dysfunction is a common and serious side-effect of radiotherapy in brain cancer patients which the findings of this study suggest might be reversed by stem cell transplantation.</em></td>
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<td><strong>Engagement of I-Branching β-1, 6-N-Acetylglucosaminyltransferase 2 in Breast Cancer Metastasis and TGF-β Signaling</strong></td>
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<td><em>Findings reveal that breast cancer metastasis driven by TGF-β signaling relies upon the activity of a novel glycosyltransferase, identifying a tractable therapeutic target to the development of broad-acting treatments for advanced disease.</em></td>
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<td><em>This mechanistic study shows how a member of the ETS transcription family fine tunes the DNA damage response that is orchestrated by the central regulatory kinase ATM, with implications for understanding cancer susceptibility and chemotherapeutic responses.</em></td>
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<td><strong>Two Novel Determinants of Etoposide Resistance in Small Cell Lung Cancer</strong></td>
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<td><em>The identification of two new genes that mediate resistance to etoposide chemotherapy may offer rational strategies to prevent or relieve chemoresistance that causes the demise of patients suffering relapse.</em></td>
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<td><strong>Notch Signaling in CD66⁺ Cells Drives the Progression of Human Cervical Cancers</strong></td>
<td>Jeevisha Bajaj, Tessy Thomas Maliekal, Eric Vivien, Chitra Pattabiraman, Sweta Srivastava, H. Krishnamurthy, V. Giri, Deepa Subramaniam, and Sudhir Krishna</td>
<td><em>This study presents a powerful mechanistic rationale to inhibit Notch signaling as a generalized therapeutic strategy to treat metastatic cancers.</em></td>
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**PREVENTION AND EPIDEMIOLOGY**

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Pre-diagnostic Serum Levels of Cytokines and Other Immune Markers and Risk of Non-Hodgkin Lymphoma  
Mark P. Purdue, Qing Lan, Rachel Bagui, William G. Hocking, Dalsu Baris, Douglas J. Reding, and Nathaniel Rothman  

**Précis:** This prospective study identifies elevations in serologic markers associated with future risk of non-Hodgkin lymphoma.

**THERAPEUTICS, TARGETS, AND CHEMICAL BIOLOGY**

4908  

SPARC Stimulates Neuronal Differentiation of Medulloblastoma Cells via the Notch1/STAT3 Pathway  
Praveen Bhoopathi, Chandramu Chetty, Ranadheer Dontula, Meena Gujrati, Dzung H. Dinh, Jasti S. Rao, and Sajani S. Lakka  

**Précis:** This study suggests a differentiation-inducing strategy to increase therapeutic responses in a commonly deadly form of pediatric brain cancer.

4920  

Insights into ALK-Driven Cancers Revealed through Development of Novel ALK Tyrosine Kinase Inhibitors  
Christine M. Lovly, Johannes M. Heuckmann, Elisa de Stanchina, Heidi Chen, Roman K. Thomas, Chris Liang, and William Pao  

**Précis:** Acquired resistance arising in ALK-fusion positive cancers to a first generation ALK tyrosine kinase inhibitor in clinical trials might be addressed by a novel, more potent, and specific second generation inhibitor.

4932  

Caveolin-1 Upregulation Mediates Suppression of Primary Breast Tumor Growth and Brain Metastases by Stat3 Inhibition  
Wen-Tai Chiu, Hsueh-Te Lee, Feng-Ju Huang, Kenneth D. Aldape, Jun Yao, Patricia S. Steeg, Cheng-Yang Chou, Zhimin Lu, Keping Xie, and Suyun Huang  

**Précis:** The mediator of brain metastasis identified in this study is likely a core modifier node of many cancer signaling pathways, since it functions in controlling the formation of plasma membrane lipid rafts that organize many cell surface adhesion and signaling complexes.

4944  

Poly(ADP-Ribose) Polymerase Inhibition Synergizes with 5-Fluorodeoxyuridine but not 5-Fluorouracil in Ovarian Cancer Cells  
Amelia M. Huehls, Jill M. Wagner, Catherine J. Hunttoon, Liyi Geng, Charles Erlichman, Anand G. Patel, Scott H. Kaufmann, and Larry M. Karnitz  

**Précis:** An analysis of the checkpoint and DNA repair pathway responses activated by floxuridine reveals how to combine these existing chemotherapeutic agents with PARP inhibitors to achieve the best therapeutic efficacy.

4955  

Sorafenib Enhances Pemetrexed Cytotoxicity through an Autophagy-Dependent Mechanism in Cancer Cells  

**Précis:** This study defines a novel combination of clinically approved drugs that may prove to be highly effective in the treatment of many types of solid tumors, prompting immediate clinical attention.

4968  

Effect of ON 01910.Na, an Anticancer Mitotic Inhibitor, on Cell-Cycle Progression Correlates with RanGAP1 Hyperphosphorylation  
Irina A. Oussenko, James F. Holland, E. Premkumar Reddy, and Takao Ohnuma  

**Précis:** This drug mechanism study offers evidence of a new therapeutic pathway that can achieve pathobiological selectivity for cancer cells.

4977  

Small-Molecule Anticancer Compounds Selectively Target the Hemopexin Domain of Matrix Metalloproteinase-9  
Antoine Dufour, Nicole S. Sampson, Jian Li, Cem Kuscu, Robert C. Rizzo, Jennifer L. DeLeon, Jizu Zhi, Nadia Jaber, Eric Liu, Stanley Zucker, and Jian Cao  

**Précis:** Although early MMP inhibitors moved into clinical development were not successful, the central importance of MMPs in cancer invasion and metastasis has driven the development of later generation inhibitors that offer considerable therapeutic potential.
Positive Feedback Loop Between PI3K-Akt-mTORC1 Signaling and the Lipogenic Pathway Boosts Akt Signaling: Induction of the Lipogenic Pathway by a Melanoma Antigen
Yoshio Yamauchi, Keiko Furukawa, Kazunori Hamamura, and Koichi Furukawa

Precise: This study suggests a mechanistic explanation for why cancer cells synthesize high levels of cholesterol and fatty acids, which by promoting formation of plasma membrane lipid rafts can reinforce signaling events that sustain cancer cell survival.

Suppression of Apoptosis by PIF1 Helicase in Human Tumor Cells
Mary E. Gagou, Anil Ganesh, Ruth Thompson, Geraldine Phear, Cyril Sanders, and Mark Meuth

Precise: Findings define the function of a DNA helicase that is crucial for the viability of cancer cells under DNA replication stress, with potential implications for how to increase cancer chemosensitivity.

Notch Signaling Activated by Replication Stress–Induced Expression of Midkine Drives Epithelial–Mesenchymal Transition and Chemoresistance in Pancreatic Cancer
Cenap Gungör, Hlike Zander, Katharina E. Effenberger, Yogesh K. Vashist, Tatyana Kalinina, Jakob R. Izbicki, Emre Yekebas, and Maximilian Bockhorn

Precise: Findings suggest that overexpression of the growth factor Midkine plays a role in the inherent chemoresistance of pancreatic cancer cells, suggesting that depleting this factor might heighten their sensitivity to chemotherapy.

STAT3 Plays a Critical Role in KRAS-Induced Pancreatic Tumorigenesis
Ryan B. Corcoran, Gianmarco Contino, Vikram Deshpande, Alexandros Tzatsos, Claudia Conrad, Cyril H. Benes, David E. Levy, Jeffrey Sellement, Jeffrey A. Engelman, and Nabeel Bardeesy

Precise: Findings show that JAK2-STAT3 signaling is required for pancreatic cancer initiation, progression, and maintenance, and that this pathway predicts the response to JAK2 inhibitors in clinical development.

Correction: Hsp27 Promotes Insulin-Like Growth Factor-I Survival Signaling in Prostate Cancer via p90Rsk-Dependent Phosphorylation and Inactivation of BAD

Myeloid Suppressor Cells Regulate the Lung Environment—Letter
Momir Bosiljcic, Melisa J. Hamilton, Judit P. Banath, Nancy E. LePard, Denise C. McDougal, Jessica X. Jia, Gerald Krystal, and Kevin L. Bennewith

Myeloid Suppressor Cells Regulate the Lung Environment—Response
Hannah H. Yan, Michael Pickup, Yanli Pang, Agnieszka E. Gorska, Zhaoyang Li, Anna Chytil, Yipeng Geng, Jerome W. Gray, Harold L. Moses, and Li Yang
ABOUT THE COVER

Tumor antigen-reactive CTLs by programming iPS cells infiltrated into tumor tissue. Tumor antigen TCR gene-transduced iPS cells were adoptively transferred into C57BL/6 mice, which were subjected to challenge with E.G7 tumor cells. On day 35 after tumor challenge, tumor tissues were examined for tumor-reactive T-cell infiltration by immunohistological staining. Tumor antigen-specific CTLs (red) infiltrated into lymphoma tissue (green). For details, see the article by Lei and colleagues on page 4742 of this issue.
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