REVIEWS

1539  Highlights from Recent Cancer Literature

1541  Accuracy of Molecular Data Generated with FFPE Biospecimens: Lessons from the Literature
Sarah R. Greytak, Kelly B. Engel, B. Paige Bass, and Helen M. Moore

1548  Mesoscopic and Macroscopic Optoacoustic Imaging of Cancer
Adrian Taruttis, Gooitzen M. van Dam, and Vasilis Ntziachristos

PRIORITY REPORT

1560  Evaluating Patient-Derived Colorectal Cancer Xenografts as Preclinical Models by Comparison with Patient Clinical Data
Manoel Nunes, Patricia Vrignaud, Sophie Vacher, Sophie Richon, Astrid Lièvre, Wulfian Cacheux, Louis-Bastien Weiswald, Gerald Massonnet, Sophie Chateau-Joubert, André Nicolas, Coletic Dib, Weidong Zhang, James Watters, Donald Bergstrom, Sergio Roman-Roman, Ivan Bieche, and Virginie Dangles-Marie
Précis: This study highlights the translational relevance of patient-derived colorectal cancer xenografts in both therapeutic response and genomic profiles.

INTEGRATED SYSTEMS AND TECHNOLOGIES

1567  Impact of Metabolic Heterogeneity on Tumor Growth, Invasion, and Treatment Outcomes
Mark Robertson-Tessi, Robert J. Gillies, Robert A. Gatenby, and Alexander R.A. Anderson
Précis: Models that incorporate tumor heterogeneity highlight the risks of cytotoxic and antiangiogenic treatment due to their potential to select for cell populations with more aggressive behaviors, reinforcing “watchful-waiting” clinical attitudes toward more indolent early-stage cancers such as breast and prostate cancer.

1580  Chaperone Hsp47 Drives Malignant Growth and Invasion by Modulating an ECM Gene Network
Jieqing Zhu, Gaofeng Xiong, Hanjiang Fu, B. Mark Evers, Binhua P. Zhou, and Ren Xu
Précis: These findings define a microRNA-controlled nodal hub that regulates expression and deposition of extracellular matrix proteins needed to drive malignant growth and invasion of breast cancer cells, with potential implications for therapy and prevention in this disease.

1592  Notch Suppresses Angiogenesis and Progression of Hepatic Metastases
Debashi Banerjee, Sonia L. Hernandez, Alejandro Garcia, Thaned Kangsamaksin, Emily Shiroli, John Andrews, Lynn Ann Forrester, Na Wei, Angela Kadenhe-Chiweshe, Carrie J. Shaver, Jan K. Kitajewski, Jessica J. Kandel, and Darrell J. Yamashiro
Précis: This important preclinical study suggests a new perspective on the clinical risks of Notch inhibitors in development for cancer treatment based on evidence that these agents may facilitate formation of metastatic lesions in the liver.

1603  Antitumor Immunity Triggered by Melphalan Is Potentiated by Melanoma Cell Surface–Associated Calreticulin
Aleksandra M. Dudek-Perić, Gabriela B. Ferreira, Angelika Muchowicz, Jasper Wouters, Nicole Prada, Shaun Martin, Santeri Kiviluoto, Magdalena Winiarzka, Louis Boon, Chantal Mathieu, Joost van den Oord, Margaerite Stas, Marie-Lise Gougeon, Jakub Golab, Abhishek D. Carg, and Patrizia Agostinis
Précis: Immunogenic effects of a limb-perfused chemotherapeutic used for locoregional treatment of melanoma can be leveraged by coadministration of a sterile danger signal that can heighten antitumor immunity.

1615  MDSC and TGFβ Are Required for Facilitation of Tumor Growth in the Lungs of Mice Exposed to Carbon Nanotubes
Précis: Studies in a mouse model of nanomaterial-induced pulmonary inflammation show how myeloid-derived suppressor cells act to condition a local tissue niche to support growth of lung cancer.
Interleukin-5 Facilitates Lung Metastasis by Modulating the Immune Microenvironment

Précis: These results establish a network of allergic inflammatory circuitry that can be co-opted by metastatic cancer cells to facilitate lung colonization, suggesting new therapeutic interventions to target this pathway as an antimetastatic strategy.

IL10 and PD-1 Cooperate to Limit the Activity of Tumor-Specific CD8⁺ T Cells
Zhaojun Sun, Julien Fourcade, Ornella Pagliano, Joe-Marc Chauvin, Cindy Sander, John M. Kirkwood, and Hassane M. Zarour

Précis: This study shows that IL10 blockade cooperates with PD-1 antibodies to more effectively counteract T-cell immunosuppression in melanoma, with immediate implications for the use of IL10 neutralizing antibodies to improve immune checkpoint therapy in patients with advanced melanoma.

High-Mobility Group Box 1 Promotes Hepatocellular Carcinoma Progression through miR-21–Mediated Matrix Metalloproteinase Activity
Man Chen, Yao Liu, Patrick Varley, Ying Chang, Xing-xing He, Hai Huang, Daolin Tang, Michael T. Lotze, Junsheng Lin, and Allan Tsou

Précis: This study examines a pathway of chronic sterile inflammatory signaling in the liver that may be sufficient to drive malignant progression in the absence of viral infections such as HBV and HCV, which are widely but not universally involved in liver cancer development.

MyD88-Dependent Signaling Decreases the Antitumor Efficacy of Epidermal Growth Factor Receptor Inhibition in Head and Neck Cancer Cells
Adam T. Koch, Laurie Love-Homan, Madelyn Espinosa-Cotton, Aditya Stanam, and Andrea L. Simons

Précis: These findings suggest mechanism-based approaches to improve the efficacy of EGFR inhibitors used to treat head and neck cancer.

Genetic and Pharmacological Screens Converge in Identifying FLIP, BCL2, and IAP Proteins as Key Regulators of Sensitivity to the TRAIL-Inducing Anticancer Agent ONC201/TIC10
Joshua E. Allen, Vanun V. Prabhlu, Mala Talekar, A. Pieter J. van den Heuvel, Boza Lim, David T. Dicker, Jennifer L. Fritz, Adam Beck, and Wafik S. El-Deiry

Précis: This preclinical study identifies and mechanistically rationalizes the use of a set of predictive biomarkers that may help advance phase I/II clinical evaluations of a novel TRAIL-inducing cancer drug.

Ibrutinib Exerts Potent Antifibrotic and Antitumor Activities in Mouse Models of Pancreatic Adenocarcinoma

Précis: The results of this important study provide a preclinical rationale for evaluation of the clinical efficacy of the recently approved Bruton tyrosine kinase inhibitor ibrutinib in patients with pancreatic cancer.

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ABOUT THE COVER

Bruton’s tyrosine kinase inhibitor ibrutinib triggers reduction of collagen content (red staining) in tumors from a transgenic mouse model of pancreatic ductal adenocarcinoma (PDAC). This dramatic reduction in fibrosis is accompanied by a decrease in Ki-67-positive proliferating cells, CD11b⁺ leukocytes, and F4/80⁺ macrophages. Overall, ibrutinib extends survival of PDAC-bearing mice as monotherapy or in combination with the standard of care chemotherapy gemcitabine. For details, see article by Massó-Vallés and colleagues on page 1675.
Cancer Research

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