Antitumor Activity of a Novel Bispecific Antibody That Targets the ErbB2/ErbB3 Oncogenic Unit and Inhibits Heregulin-Induced Activation of ErbB3
Charlotte F. McDonagh, Alexandra Huhalov, Brian D. Harms, Sharlene Adams, Violette Paragas, Shinji Oyama, Bo Zhang, Lia Luus, Ryan Overland, Stephanie Nguyen, Jinming Gu, Neeraj Kohli, Matt Wallace, Michael J. Feldhaus, Arthur J. Kudla, Birgit Schoebeli, and Ulrik B. Nielsen

A Human Fab-Based Immunocugjugate Specific for the LMP1 Extracellular Domain Inhibits Nasopharyngeal Carcinoma Growth In Vitro and In Vivo
Renjie Chen, Dawei Zhang, Yuan Mao, Jin Zhu, Hao Ming, Juan Wen, Jun Ma, Qing Cao, Hong Lin, Qi Tang, Jie Liang, and Zhengqing Feng

The Relationship of Thioredoxin-1 and Cisplatin Resistance: Its Impact on ROS and Oxidative Metabolism in Lung Cancer Cells
Medhi Wangpaichitr, Elizabeth J. Sullivan, George Theodoropoulos, Chunjing Wu, Min You, Lynn G. Feun, Theodore J. Lampidis, Macus T. Kuo, and Niramol Savaraj

Inhibition of dUTPase Induces Synthetic Lethality with Thymidylate Synthase–Targeted Therapies in Non–Small Cell Lung Cancer
Peter M. Wilson, Melissa J. LaBonte, Heinz-Josef Lenz, Philip C. Mack, and Robert D. Ladner

DLK1 as a Potential Target against Cancer Stem/Progenitor Cells of Hepatocellular Carcinoma
Xiao Xu, Rui-Fang Liu, Xin Zhang, Li-Yu Huang, Fei Chen, Qian-Lan Fei, and Ze-Guang Han

212Pb-Radioimmunotherapy Induces G2 Cell-Cycle Arrest and Delays DNA Damage Repair in Tumor Xenografts in a Model for Disseminated Intraperitoneal Disease
Kwon Joong Yong, Diane E. Milenic, Kwamena E. Baidu, and Martin W. Brechbiel
PRECLINICAL DEVELOPMENT

649 Potent Inhibition of Angiogenesis by the IGF-1 Receptor-Targeting Antibody SCH717454 Is Reversed by IGF-2
Hemant K. Bid, Jun Zhan, Doris A. Phelps, Raushan T. Kurmasheva, and Peter J. Houghton

660 MET Activation Mediates Resistance to Lapatinib Inhibition of HER2-Amplified Gastric Cancer Cells
Chin-Tung Chen, Hyaehwan Kim, David Liska, Sizhi Gao, James G. Christensen, and Martin R. Weiser

670 CEP-28122, a Highly Potent and Selective Orally Active Inhibitor of Anaplastic Lymphoma Kinase with Antitumor Activity in Experimental Models of Human Cancers
Mangeng Cheng, Matthew R. Quail, Diane E. Gingrich, Gregory R. Ott, Lihui Lu, Weihua Wan, Mark S. Albom, Thelma S. Angeles, Lisa D. Aimone, Flavio Cristofani, Rodolfo Machiorlatti, Cristina Abele, Mark A. Ator, Bruce D. Dorsey, Giorgio Inghirami, and Bruce A. Ruggeri

680 Low-Dose Metronomic Oral Dosing of a Prodrug of Gemcitabine (LY2334737) Causes Antitumor Effects in the Absence of Inhibition of Systemic Vasculosгенesis
Giulio Francia, Yuval Shaked, Kae Hashimoto, John Sun, Melissa Yin, Carolyn Costa, Ping Xu, Shan Man, Christina Hackl, Julie Stewart, Mark Uhlrik, Anne H. Dantzig, F. Stuart Foster, and Robert S. Kerbel

690 Ponatinib (AP24534), a Multitargeted Pan-FGFR Inhibitor with Activity in Multiple FGFR-Amplified or Mutated Cancer Models

700 TAK-960, a Novel, Orally Available, Selective Inhibitor of Polo-Like Kinase 1, Shows Broad-spectrum Preclinical Antitumor Activity in Multiple Dosing Regimens
Yuichi Hikichi, Kohei Honda, Kouki Hikami, Hitoshi Miyashita, Isao Kaieda, Saomu Murai, Noriko Uchiyama, Maki Hasegawa, Tomohiro Kawamoto, Takashi Satoh, Takashi Ichikawa, Sheldon Cao, Zhe Nie, Lilly Zhang, Johnny Yang, Keisuke Kuida, and Erik Kupperman

An Integrated Genomic Approach to Identify Predictive Biomarkers of Response to the Aurora Kinase Inhibitor PF-03814735
Kenneth E. Hook, Scott J. Garza, Maruja E. Lira, Keith A. Ching, Nathan V. Lee, Joan Cao, Jing Yuan, Jingjing Ye, Mark Ozeck, Stephanie T. Shi, Xianxian Zheng, Paul A. Rejto, Julie L.C. Kan, James G. Christensen, and Adam Pavlincek

Comprehensive Predictive Biomarker Analysis for MEK Inhibitor GSK1120212
Junping Jing, Joel Greshock, Joanna Dawn Holbrook, Aidan Gilmartin, Xiping Zhang, Elizabeth McNeil, Theresa Conway, Christopher Moy, Sylvie Laquerre, Kurt Bachman, Richard Wooster, and Yan Degennhardt

The Novel Oral Hsp90 Inhibitor NVP-HSP990 Exhibits Potent and Broad-spectrum Antitumor Activities In Vitro and In Vivo

Molecular and Cellular Pharmacology of the Hypoxia-Activated Prodrug TH-302
Fanying Meng, James W. Evans, Deepthi Bhupathi, Monica Banica, Leslie Lan, Gustavo Lorente, Jian-Xin Duan, Xiaohong Cai, Alexandra M. Mowday, Christopher P. Guse, Andrej Maroz, Robert F. Anderson, Adam V. Patterson, Gregory C. Stachelek, Peter M. Glazer, Mark D. Matteucci, and Charles P. Hart

Effects of Anti-VEGF on Pharmacokinetics, Biodistribution, and Tumor Penetration of Trastuzumab in a Preclinical Breast Cancer Model
Cynthia V. Pastuskovas, Eduardo E. Mundo, Simon P. Williams, Tapan K. Nayak, Jason Ho, Sheila Ulufatu, Suzanna Clark, Sarajane Ross, Eric Cheng, Kathryn Parsons-Reponto, Gary Cain, Marjie Van Hyl, Nicholas Majidy, Sheila Bhedda, Josefina dela Cruz Chuh, Katherine R. Kozak, Nicholas Lewin-Koh, Peter Nauka, Daniela Bumbaca, Mark Slivkowsky, Jay Tibbits, Frank-Peter Theil, Paul J. Fielder, Leslie A. Khawil, and C. Andrew Boswell
The Aurora Kinase A Inhibitor MLN8237 Enhances Cisplatin-Induced Cell Death in Esophageal Adenocarcinoma Cells
Vikas Sehdev, DunFa Peng, Mohammed Soutto, M. Kay Washington, Frank Revetta, Jeffrey Ecsedy, Alexander Zaika, Tilman T. Rau, Regine Schneider-Stock, Abbes Belkhiri, and Wael El-Rifai

MOLECULAR MEDICINE IN PRACTICE

Next Generation Sequencing of Prostate Cancer from a Patient Identifies a Deficiency of Methylthioadenosine Phosphorylase, an Exploitable Tumor Target

ABOUT THE COVER

The uracil-metabolizing enzyme dUTPase is a key component of de novo thymidine nucleotide biosynthesis and its expression is tightly regulated in replicating tissues such as the follicular germinal centers of human palatine tonsil (pictured). However, dUTPase is frequently overexpressed in human cancers and this has been firmly linked to drug resistance to chemotherapeutic agents that target thymidylate synthase (TS). Using immunohistochemistry and quantitative RT-PCR, evidence of dUTPase overexpression in a cohort of non-small cell lung cancers (NSCLC) was observed. Small interfering RNA-mediated gene silencing of dUTPase induced a strong synthetic lethal effect in NSCLC cell lines to two class-specific TS-targeted therapies including pemetrexed and fluorodeoxyuridine. Inhibition of dUTPase represents a promising, mechanism-based therapeutic approach to significantly enhance the efficacy of TS-targeted chemotherapeutic agents by overcoming a critical drug resistance pathway. For details, see article by Wilson and colleagues on page 616.
Molecular Cancer Therapeutics

11 (3)


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