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Low PIP4K2B Expression in Human Breast Tumors Correlates with Reduced Patient Survival: A Role for PIP4K2B in the Regulation of E-Cadherin Expression

Willem-Jan Keune, Andrew H. Sims, David R. Jones, Yvette Bultsma, James T. Lynch, Karin Jirström, Goran Landberg, and Nullin Divecha

Précis: An enzyme that regulates second messengers in lipid signaling impacts the survival of breast cancer patients by modifying a pivotal tumor suppressor function.

Skin Tumorigenesis Stimulated by Raf Inhibitors Relies Upon Raf Functions That Are Dependent and Independent of ERK

Eszter Doma, Christian Rupp, Andrea Varga, Florian Kern, Bettina Riegler, and Manuela Baccarini

Précis: Provocative preclinical results suggest that B-Raf inhibitors being used currently in the clinic to treat melanoma may not only trigger development of cutaneous skin tumors, a known side effect, but also gastric tumors, which are far less manageable.

TRAF4 Is a Critical Molecule for Akt Activation in Lung Cancer

Wei Li, Cong Peng, Mee-Hyun Lee, DoYoung Lim, Feng Zhu, Yang Fu, Ge Yang, Yuqiao Sheng, Lanbo Xiao, Xin Dong, WeiYa Ma, Ann M. Bode, Ya Cao, and Zigang Dong

Précis: These findings reveal a pivotal role for a ubiquitylation enzyme in Akt control and lung cancer pathophysiology, suggesting its role as a candidate molecular target for lung cancer prevention and therapy.

SHON Is a Novel Estrogen-Regulated Oncogene in Mammary Carcinoma That Predicts Patient Response to Endocrine Therapy

Yewon Jung, Tarek M.A. Abdel-Fatah, Stephen Y.T. Chan, Christopher C. Nolan, Andrew R. Green, Ian O. Ellis, Lili Li, Baiqui Huang, Jun Lu, Bing Xu, Longxin Chen, Runlin Z. Ma, Min Zhang, Jingru Wang, ZhengSheng Wu, Tao Zhu, Jo K. Perry, Peter E. Lobie, and Dong-Xu Liu

Précis: These findings identify a human oncogene that may serve as a simple biomarker to predict the therapeutic efficacy of antiestrogen therapy in ER+ breast tumors.

Supramolecular Nanoparticles That Target Phosphoinositide-3-Kinase Overcome Insulin Resistance and Exert Pronounced Antitumor Efficacy


Précis: This study provides a preclinical foundation for the use of supramolecular nanochemistry to overcome current challenges associated with PI3K inhibitors and also offers a more general paradigm for the development of molecular targeted therapeutics for cancer treatment.

Contribution of Bcl-2 Phosphorylation to Bak Binding and Drug Resistance

Haiming Dai, Husheng Ding, X. Wei Meng, Sun-Hee Lee, Paula A. Schneider, and Scott H. Kaufmann

Précis: These findings offer a mechanistic basis to understand the enhanced antiapoptotic activity of phosphorylated Bcl-2, along with the ability of BH3 mimetics to enhance cancer cell sensitivity to taxanes.

Androgen Glucuronidation: An Unexpected Target for Androgen Deprivation Therapy, with Prognosis and Diagnostic Implications

Laurent Grosse, Sophie Pâquet, Patrick Caron, Ladan Fazli, Paul S. Rennie, Alain Bélanger, and Olivier Barbier

Précis: These findings reveal a local pathway of androgen metabolism in prostate cells that can antagonize the effects of androgen deprivation therapy in prostate cancer.

miRNA-95 Mediates Radioresistance in Tumors by Targeting the Sphingolipid Phosphatase SGPP1

Xiaoyong Huang, Samira Taeb, Sahar Jahangiri, Urban Emmenegger, Elisa Tran, Jeff Bruce, Arzu Mesci, Elina Korpela, Danny Vesprini, C. Shun Wong, Robert G. Bristow, Fei-Fei Liu, and Stanley K. Liu

Précis: This seminal report identifies a little-studied microRNA as a major mediator of radiation resistance in tumors, also showing how resistance can be reversed with a clinically approved inhibitor of sphingosine-1-phosphate signaling.
Carbon Monoxide Expedites Metabolic Exhaustion to Inhibit Tumor Growth
Barbara Wegiel, David Gallo, Eva Csizmadia, Clair Harris, John Belcher, Gregory M. Vercellotti, Nuno Penacho, Pier Paolo Pandolfi, Leszek Helczynski, Anders Bjartell, Jenny Liao Persson, and Leo E. Otterbein

Previous: Clinical trials of carbon monoxide that are being conducted as a strategy for chemosensitization may benefit from mechanistic insights into CO-induced cancer cell death provided in this study.

The HSP90 Inhibitor Ganetespib Synergizes with the MET Kinase Inhibitor Crizotinib in both Crizotinib-Sensitive and -Resistant MET-Driven Tumor Models
Naoto Miyajima, Shinji Tsutsumi, Kristin Beebe, Mehdi Mollapour, Candy Rivas, Naohiro Yoshida, Jane B. Trepel, Ying Huang, Manabu Tatokoro, Nobuo Shinohara, Katsuya Nonomura, and Len Neckers

Previous: Hsp90 inhibition synergizes with MET tyrosine kinase inhibition and restores sensitivity to drug-resistant MET mutants.

PTEN Loss Mitigates the Response of Medulloblastoma to Hedgehog Pathway Inhibition

Previous: This study offers new insights into the potential efficacy of Hedgehog pathway inhibitors being tested clinically against a common pediatric cancer.

Antitumor Activity of the Selective Pan-RAF Inhibitor TAK-632 in BRAF Inhibitor-Resistant Melanoma
Akito Nakamura, Takeo Arita, Shuntarou Tsujiya, Jill Donelan, Jouhara Chouit, Elizabeth Carideo, Katherine Galvin, Masanori Okaniwa, Tomoyasu Ishikawa, and Sei Yoshida

Previous: This pan-RAF inhibitor may offer needed therapeutic options for patients with NRAS- or BRAF-driven melanomas that are refractory to BRAF inhibitor treatment.
7101  
**In Vivo MAPK Reporting Reveals the Heterogeneity in Tumoral Selection of Resistance to RAF Inhibitors**
Kevin J. Basile, Ethan V. Abel, Neda Dadpey, Edward J. Hartsough, Paolo Fortina, and Andrew E. Aplin

**Précis:** This article describes a novel in vivo system for noninvasive evaluation of a kinase-mediated mechanism of acquired resistance to BRAF-targeting drugs, an area of present clinical challenge for treating metastatic melanoma.

7111  
**Neuropilin-2 Is Upregulated in Lung Cancer Cells during TGF-β1–Induced Epithelial–Mesenchymal Transition**
Patrick Nasarre, Robert M. Gemmill, Vincent A. Potiron, Joëlle Roche, Xian Lu, Anna E. Barón, Christopher Korch, Elizabeth Garrett-Mayer, Alessandro Lagana, Philip H. Howe, and Harry A. Drabkin

**Précis:** These findings provide insights into how TGF-β1 mediates invasion and tumorigenesis and identify a novel therapeutic target that may prevent or reverse EMT associated with metastatic progression.

7122  
**BCCIP Suppresses Tumor Initiation but Is Required for Tumor Progression**
Yi-Yuan Huang, Li Dai, Dakim Gaines, Roberto Droz-Rosario, Huimei Lu, Jingmei Liu, and Zhiyuan Shen

**Précis:** This study describes a paradoxical tumor suppressor that can also promote cancer progression, serving as a prototype for a class of suppressors that does not need to be permanently inactivated to trigger tumorigenesis.

**LETTERS TO THE EDITOR**

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**Benefits of Vascular Normalization Are Dose and Time Dependent—Letter**
Yuhui Huang, Triantafyllos Stylianopoulos, Dan G. Duda, Dai Fukumura, and Rakesh K. Jain

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**Bevacizumab-Induced VesselNormalization Hampers Tumor Uptake of Antibodies—Response**
Marlous Arjaans, Sjoukje F. Oosting, Carolina P. Schröder, and Elisabeth G.E. de Vries

**ABOUT THE COVER**

Carbon monoxide (CO) at therapeutic concentrations induces growth arrest of lung and prostate cancer cell lines and tumors. CO is generated endogenously as a bioactive signaling molecule by the cytoprotective gene heme oxygenase-1 (HO-1). In cancer cells, HO-1 activity, and thus endogenous CO levels, is decreased and can be rescued by delivery of exogenous CO. Astonishingly, CO sensitizes cancer cells to chemotherapeutic agents while simultaneously protecting normal cells from genotoxin-induced cell death. The mechanism of CO involves its propensity to bind to heme-containing oxidases in mitochondria. Shown here are prostate cancer cells (PC3) exposed to CO in the presence of the genotoxin doxorubicin, which resulted in a dramatic shift in mitochondrial membrane potential and metabolic collapse driven by an anti-Warburg effect. Using MitoTracker Red CMXRos staining (red), which fluoresces when a cell is actively respiring, Wegiel and colleagues observed that CO decreased respiration and mitochondrial membrane potential, indicative of mitochondrial failure. Nuclei were stained with Hoechst (blue). For details, see article by Wegiel and colleagues on page 7009.