

## BREAKING ADVANCES

- 4739** Highlights from Recent Cancer Literature



## PERSPECTIVE

- 4741** Methods of Academic Course Planning for Cancer Biology PhD Students to Enhance Knowledge of Clinical Oncology  
 Malcolm D. Mattes, Elizabeth Swart, Steven M. Markwell, Sijin Wen, and Linda C. Vona-Davis

## PRIORITY REPORT

- 4745** Androgen Receptor Variants Mediate DNA Repair after Prostate Cancer Irradiation  
 Yi Yin, Rui Li, Kangling Xu, Sentai Ding, Jeffrey Li, GuemHee Baek, Susmita G. Ramanand, Sam Ding, Zhao Liu, Yunpeng Gao, Mohammed S. Kanchwala, Xiangyi Li, Ryan Hutchinson, Xihui Liu, Solomon L. Woldu, Chao Xing, Neil B. Desai, Felix Y. Feng, Sandeep Burma, Johann S. de Bono, Scott M. Dehm, Ram S. Mani, Benjamin P.C. Chen, and Ganesh V. Raj  
*Précis:* Discovery of a functionally important biochemical connection between a DNA repair response kinase and splice variants of the androgen receptor found an actionable mechanism-based strategy to improve treatment outcomes in localized prostate cancer.
- 4755** Whole-Genome Sequencing Reveals Breast Cancers with Mismatch Repair Deficiency  
 Helen Davies, Sandro Morganella, Colin A. Purdie, Se Jin Jang, Elin Borgen, Hege Russnes, Dominik Glodzik, Xueqing Zou, Alain Viari, Andrea L. Richardson, Anne-Lise Børresen-Dale, Alastair Thompson, Jorunn E. Eyfjord, Gu Kong, Michael R. Stratton, and Serena Nik-Zainal  
*Précis:* The effectiveness of PD-1 blockade against DNA mismatch repair-deficient cancers makes it paramount to reliably identify the relatively rare cases beyond those with Lynch syndrome-associated colon cancers.

## MOLECULAR AND CELLULAR PATHOBIOLOGY

- 4763** The Damaging Effect of Passenger Mutations on Cancer Progression  
 Christopher D. McFarland, Julia A. Yaglom, Jonathan W. Wojtkowiak, Jacob G. Scott, David L. Morse, Michael Y. Sherman, and Leonid A. Mirny  
*Précis:* These findings directly characterize the deleterious effect of passenger mutations on tumor progression, revealing a critical and largely overlooked role of passenger mutations in cancer.
- 4773** Huwe1 Sustains Normal Ovarian Epithelial Cell Transformation and Tumor Growth through the Histone H1.3-H19 Cascade  
 Dong Yang, Bin Sun, Xiaohong Zhang, Daomei Cheng, Xiaoping Yu, Lanzhen Yan, Lei Li, Sanqi An, Hua Jiang, Anna Lasorella, Antonio Iavarone, Shu Zhang, Fangdong Zou, and Xudong Zhao  
*Précis:* These findings describe how dysregulation of an E3 ligase with an uncertain role in ovarian cancer contributes significantly to cell transformation and tumor growth, with potential implications as a therapeutic target in this disease.
- 4785** Hsp72 and Nek6 Cooperate to Cluster Amplified Centrosomes in Cancer Cells  
 Josephina Sampson, Laura O'Regan, Martin J.S. Dyer, Richard Bayliss, and Andrew M. Fry  
*Précis:* These findings describe a novel pathway that promotes centrosome clustering in cancer cells and whose inhibition selectively disturbs mitotic progression in cancer cells but not normal cells.
- 4797** Nrf2 Mutagenic Activation Drives Hepatocarcinogenesis  
 Hoang Kieu Chi Ngo, Do-Hee Kim, Young-Nam Cha, Hye-Kyung Na, and Young-Joon Surh  
*Précis:* These findings provide a mechanistic rationale for therapeutic blockade of the master oxidative stress regulator NFE2 to prevent and possibly treat liver cancer.
- 4809** Spi-B-Mediated Silencing of Claudin-2 Promotes Early Dissemination of Lung Cancer Cells from Primary Tumors  
 Wei Du, Xing Xu, Qing Niu, Xuexi Zhang, Yiliang Wei, Ziqiao Wang, Wei Zhang, Jun Yan, Yongxin Ru, Zheng Fu, Xiaobo Li, Yuan Jiang, Zhenyi Ma, Zhenfa Zhang, Zhi Yao, and Zhe Liu  
*Précis:* A transcription factor normally expressed in lymphocytes is an epigenetic driver of lymphocyte mimicry in terms of cell-cell dissociation and invasion in lung cancer cells.

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- 4823** CIB2 Negatively Regulates Oncogenic Signaling in Ovarian Cancer via Sphingosine Kinase 1  
Wenyong Zhu, Kate E. Jarman, Noor A. Lokman, Heidi A. Neubauer, Lorena T. Davies, Briony L. Gliddon, Hounq Taing, Paul A.B. Moretti, Martin K. Oehler, Melissa R. Pitman, and Stuart M. Pitson

*Précis:* CIB2 is a novel potential tumor suppressor with prognostic impact and a promising therapeutic target in ovarian cancer.

- 4835** NSD1 Inactivation and SETD2 Mutation Drive a Convergence toward Loss of Function of H3K36 Writers in Clear Cell Renal Cell Carcinomas

Xiaoping Su, Jianping Zhang, Roger Mouawad, Eva Compérat, Morgan Roupřt, Frederick Allanic, Jérôme Parra, Marc-Olivier Bitker, Erika J. Thompson, Banumathy Gowrishankar, Jane Houldsworth, John N. Weinstein, Jorg Tost, Bradley M. Broom, David Khayat, Jean-Philippe Spano, Nizar M. Tannir, and Gabriel G. Malouf

*Précis:* This seminal work reveals that convergence toward loss of function of epigenetic writers of the H3K36 histone mark is a root feature of an aggressive type of renal cancer.

- 4846** Epigenetically Aberrant Stroma in MDS Propagates Disease via Wnt/ $\beta$ -Catenin Activation



Tushar D. Bhagat, Si Chen, Matthias Bartenstein, A. Trevor Barlowe, Dagny Von Ahrens, Gaurav S. Choudhary, Patrick Tivnan, Elianna Amin, A. Mario Marcondes, Mathijs A. Sanders, Remco M. Hoogenboezem, Suman Kambhampati, Nandini Ramachandra, Ioannis Mantzaris, Vineeth Sukrithan, Remi Laurence, Robert Lopez, Prafulla Bhagat, Orsi Giricz, Davendra Sohal, Amittha Wickrema, Cecilia Yeung, Kira Gritsman, Peter Aplan, Konrad Hochedlinger, Yiting Yu, Kith Pradhan, Jinghang Zhang, John M. Grealley, Siddhartha Mukherjee, Andrea Pellagatti, Jacqueline Boulwood, Britta Will, Ulrich Steidl, Marc H.G.P. Raaijmakers, H. Joachim Deeg, Michael G. Kharas, and Amit Verma

*Précis:* These results define novel epigenetic changes in the bone marrow microenvironment, which lead to  $\beta$ -catenin activation and progression of myelodysplastic syndrome to frank leukemias.

- 4858** Nuclear CD24 Drives Tumor Growth and Is Predictive of Poor Patient Prognosis

Jason E. Duex, Charles Owens, Ana Chauca-Diaz, Garrett M. Dancik, Lauren A. Vanderlinden, Debashis Ghosh, Mariah Z. Leivo, Donna E. Hansel, and Dan Theodorescu

*Précis:* These findings show how cancer cells lacking surface expression of the stem-like cell marker CD24 retain their aggressiveness and suggest that measuring levels of nuclear CD24 may impact patient prognosis and treatment options.

- 4868** Src Inhibits the Hippo Tumor Suppressor Pathway through Tyrosine Phosphorylation of Lats1

Yuan Si, Xinyan Ji, Xiaolei Cao, Xiaoming Dai, Lingyi Xu, Hongxia Zhao, Xiaocan Guo, Huan Yan, Haitao Zhang, Chu Zhu, Qi Zhou, Mei Tang, Zongping Xia, Li Li, Yu-Sheng Cong, Sheng Ye, Tingbo Liang, Xin-Hua Feng, and Bin Zhao

*Précis:* This important paper illuminates a mechanistic link between the Src oncogene and the Hippo tumor suppressor pathway, explaining how the latter may be inactivated in many cancers, with implications for biomarker and therapy development.

- 4881** FBW7 Loss Promotes Chromosomal Instability and Tumorigenesis via Cyclin E1/CDK2–Mediated Phosphorylation of CENP-A

Mamoru Takada, Weiguo Zhang, Aussie Suzuki, Taruho S. Kuroda, Zhouliang Yu, Hiroyuki Inuzuka, Daming Gao, Lixin Wan, Ming Zhuang, Lianxin Hu, Bo Zhai, Christopher J. Fry, Kerry Bloom, Guohong Li, Gary H. Karpen, Wenyi Wei, and Qing Zhang

*Précis:* This potentially seminal study finds that cyclin E1/CDK2 activation is linked to chromosomal instability and centromere dysfunction in cancer, possibly explaining how aneuploidy may be promoted by cell-cycle dysregulation during tumorigenesis.

## TUMOR AND STEM CELL BIOLOGY

- 4894** Exercise-Induced Catecholamines Activate the Hippo Tumor Suppressor Pathway to Reduce Risks of Breast Cancer Development

Christine Dethlefsen, Louise S. Hansen, Christian Lillelund, Christina Andersen, Julie Gehl, Jesper F. Christensen, Bente K. Pedersen, and Pernille Hojman

*Précis:* These findings offer a mechanistic explanation for long-standing questions about how exercise suppresses cancer cell growth, with a focus on breast cancer control.

- 4905** MCP1P1 Downregulation in Clear Cell Renal Cell Carcinoma Promotes Vascularization and Metastatic Progression



Paulina Marona, Judyta Górka, Zofia Mazurek, Waclaw Wilk, Janusz Rys, Marcin Majka, Jolanta Jura, and Katarzyna Miekus

*Précis:* A negative modifier of malignant progression in the most common type of kidney cancer acts by downregulating mRNA and miRNA networks that drive tumor growth, angiogenesis, and metastasis.

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- 4921** **Deubiquitinating Enzyme USP9X Suppresses Tumor Growth via LATS Kinase and Core Components of the Hippo Pathway**  
Aleksandra Toloczko, Fusheng Guo, Hiu-Fung Yuen, Qing Wen, Stephen A. Wood, Yan Shan Ong, Pei Yi Chan, Asfa Alli Shaik, Jayantha Gunaratne, Mark J. Dunne, Wanjin Hong, and Siew Wee Chan



*Précis:* This study describes how a member of an increasingly important class of cancer modifiers termed deubiquitinases acts to suppress malignant development and progression.

- 4934** **Breast Cancer Suppression by Progesterone Receptors Is Mediated by Their Modulation of Estrogen Receptors and RNA Polymerase III**  
Jessica Finlay-Schultz, Austin E. Gillen, Heather M. Brechbuhl, Joshua J. Ivie, Shawna B. Matthews, Britta M. Jacobsen, David L. Bentley, Peter Kabos, and Carol A. Sartorius

*Précis:* These findings describe a new mechanism by which progesterone downregulates RNA polymerase III transcription in ER<sup>+</sup>/PR<sup>+</sup> breast cancers, possibly inhibiting their growth.

- 4947** **MYC-Regulated Mevalonate Metabolism Maintains Brain Tumor-Initiating Cells**  
Xiuxing Wang, Zhi Huang, Qiulian Wu, Briana C. Prager, Stephen C. Mack, Kailin Yang, Leo J.Y. Kim, Ryan C. Gimple, Yu Shi, Sisi Lai, Qi Xie, Tyler E. Miller, Christopher G. Hubert, Anne Song, Zhen Dong, Wenchao Zhou, Xiaoguang Fang, Zhe Zhu, Vaidehi Mahadev, Shideng Bao, and Jeremy N. Rich

*Précis:* These findings reveal a novel dependence of MYC-driven cancer stem-like cells on mevalonate metabolism.

- 4961** **Survival of Head and Neck Cancer Cells Relies upon LZK Kinase-Mediated Stabilization of Mutant p53**  
Zoe C. Edwards, Eleanor W. Trotter, Pedro Torres-Ayuso, Phil Chapman, Henry M. Wood, Katherine Nyswaner, and John Brognard



*Précis:* These findings identify the kinase LZK as a novel target for therapeutic intervention in head and neck cancer patients whose tumors harbor the chromosome 3q amplicon.

- 4973** **Transglutaminase 2 Inhibition Reverses Mesenchymal Transdifferentiation of Glioma Stem Cells by Regulating C/EBP $\beta$  Signaling**  
Jinlong Yin, Young Taek Oh, Jeong-Yub Kim, Sung Soo Kim, Eunji Choi, Tae Hoon Kim, Jun Hee Hong, Nakho Chang, Hee Jin Cho, Jason K. Sa, Jeong Cheol Kim, Hyung Joon Kwon, Saewhan Park, Weiwei Lin, Ichiro Nakano, Ho-Shin Gwak, Heon Yoo, Seung-Hoon Lee, Jeongwu Lee, Jong Heon Kim, Soo-Youl Kim, Do-Hyun Nam, Myung-Jin Park, and Jong Bae Park

*Précis:* Inhibition of a cellular enzyme that blocks the conversion from nonmesenchymal to mesenchymal forms of glioblastoma may prevent recurrence and resistance to radiation therapy, the latter of which continues to pose a major clinical challenge.

- 4985** **SOX5/6/21 Prevent Oncogene-Driven Transformation of Brain Stem Cells**  
Idha Kurtsdotter, Danijal Topcic, Alexandra Karlén, Bhumica Singla, Daniel W. Hagey, Maria Bergsland, Peter Siesjö, Monica Nistér, Joseph W. Carlson, Veronique Lefebvre, Oscar Persson, Johan Holmberg, and Jonas Muhr

*Précis:* These findings show how SOX transcription factors, involved in regulating stem cell function, act as tumor suppressors in brain stem cells upon an oncogenic insult.

- 4998** **EZH2 Palmitoylation Mediated by ZDHHC5 in p53-Mutant Glioma Drives Malignant Development and Progression**  
Xueran Chen, Huihui Ma, Zhen Wang, Shangrong Zhang, Haoran Yang, and Zhiyou Fang



*Précis:* These findings identify a novel mechanism through which mutant p53 affects glioma stem-like cells, with potential implications for their eradication.

## THERAPEUTICS, TARGETS, AND CHEMICAL BIOLOGY

- 5011** **Posttranscriptional Regulation of PARG mRNA by HuR Facilitates DNA Repair and Resistance to PARP Inhibitors**  
Saswati N. Chand, Mahsa Zarei, Matthew J. Schiewer, Akshay R. Kamath, Carmella Romeo, Shruti Lal, Joseph A. Cozzitorto, Avinoam Nevler, Laura Scolaro, Eric Londin, Wei Jiang, Nicole Meisner-Kober, Michael J. Pishvaian, Karen E. Knudsen, Charles J. Yeo, John M. Pascal, Jordan M. Winter, and Jonathan R. Brody


*Précis:* The clinical benefit of PARP inhibitors can be optimized by targeting an mRNA stability factor that sustains a core DNA repair pathway common to most solid tumors.

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- 5026** **An Essential Role for the Tumor-Suppressor Merlin in Regulating Fatty Acid Synthesis**  
Dina S. Stepanova, Galina Semenova, Yin-Ming Kuo, Andrew J. Andrews, Sylwia Ammoun, C. Oliver Hanemann, and Jonathan Chernoff  
*Précis:* These results suggest a mechanistic rationale for the use of inhibitors of fatty acid synthase to eradicate neurofibromatosis, which are driven by mutations in the tumor suppressor gene *NF2/Merlin*.

- 5039** **HDAC1 Upregulation by NANOG Promotes Multidrug Resistance and a Stem-like Phenotype in Immune Edited Tumor Cells**  
Kwon-Ho Song, Chel Hun Choi, Hyo-Jung Lee, Se Jin Oh, Seon Rang Woo, Soon-Oh Hong, Kyung Hee Noh, Hanbyoul Cho, Eun Joo Chung, Jae-Hoon Kim, Joon-Yong Chung, Stephen M. Hewitt, Seungki Baek, Kyung-Mi Lee, Cassian Yee, Minjoo Son, Chih-Ping Mao, T.C. Wu, and Tae Woo Kim  
*Précis:* These findings link a regulator of cancer stem-like cells to epigenetic silencing events that may improve immunotherapy outcomes.

- 5054** **Mitochondrial Superoxide Increases Age-Associated Susceptibility of Human Dermal Fibroblasts to Radiation and Chemotherapy**  
Kranti A. Mapuskar, Kyle H. Flippo, Joshua D. Schoenfeld, Dennis P. Riley, Stefan Strack, Taher Abu Hejleh, Muhammad Furqan, Varun Monga, Frederick E. Domann, John M. Buatti, Prabhat C. Goswami, Douglas R. Spitz, and Bryan G. Allen  
*Précis:* Age-associated risks of injury to normal tissues by radiotherapy or chemotherapy can be limited by treatment with a small molecule mimetic of superoxide dismutase, an enzyme that limits the biological reactions of superoxide.

- 5068** **Gemcitabine and Chk1 Inhibitor AZD7762 Synergistically Suppress the Growth of Lkb1-Deficient Lung Adenocarcinoma**  
 Yan Liu, Yuyang Li, Xiaoen Wang, Feiyang Liu, Peng Gao, Max M. Quinn, Fei Li, Ashley A. Merlino, Cyril Benes, Qingsong Liu, Nathanael S. Gray, and Kwok-Kin Wong  
*Précis:* These results offer preclinical proof of concept for use of a Chk1 inhibitor to safely enhance the efficacy of gemcitabine, particularly in aggressive KRAS-driven LKB1-deficient lung adenocarcinomas.

- 5077** **TBK1 Provides Context-Selective Support of the Activated AKT/mTOR Pathway in Lung Cancer**  
Jonathan M. Cooper, Yi-Hung Ou, Elizabeth A. McMillan, Rachel M. Vaden, Aubhishek Zaman, Brian O. Bodemann, Gurbani Makkar, Bruce A. Posner, and Michael A. White  
*Précis:* These findings reveal how a mesenchymal subtype of KRAS-mutant lung cancer becomes resistant to therapy, with potential implications to improve clinical treatment.

- 5095** **GUCY2C Signaling Opposes the Acute Radiation-Induced GI Syndrome**  
Peng Li, Evan Wuthrick, Jeff A. Rappaport, Crystal Kraft, Jieru E. Lin, Glen Marszalowicz, Adam E. Snook, Tingting Zhan, Terry M. Hyslop, and Scott A. Waldman  
*Précis:* Oral ligands of the intestinal enzyme GUCY2C that are FDA approved for the treatment of irritable bowel syndrome may have uses in limiting the gastrointestinal side effects of radiotherapy.

- 5107** **Dual Targeting of Insulin Receptor and KIT in Imatinib-Resistant Gastrointestinal Stromal Tumors**  
Weicai Chen, Ye Kuang, Hai-Bo Qiu, Zhifa Cao, Yuqing Tu, Qing Sheng, Grant Eilers, Quan He, Hai-Long Li, Meijun Zhu, Yuexiang Wang, Rongqing Zhang, Yeqing Wu, Fanguo Meng, Jonathan A. Fletcher, and Wen-Bin Ou  
*Précis:* Inactivation of the insulin receptor dramatically increases the sensitivity of GIST cells to imatinib, providing a mechanistic rationale for blocking the insulin/IGF2 signaling pathway as a strategy to address imatinib-resistant GIST.

## MICROENVIRONMENT AND IMMUNOLOGY

- 5118** **CTLA4 Promotes Tyk2-STAT3-Dependent B-cell Oncogenicity**  
Andreas Herrmann, Christoph Lahtz, Toshikage Nagao, Joo Y. Song, Wing C. Chan, Heehyoung Lee, Chanyu Yue, Thomas Look, Ronja Mülthart, Wenzhao Li, Kurt Jenkins, John Williams, Lihua E. Budde, Stephen Forman, Larry Kwak, Thomas Blankenstein, and Hua Yu  
*Précis:* These findings reveal that CTLA-4 functions beyond its role as a T-cell regulator, including as an oncogene in diverse types of B-cell lymphoma or in nonmalignant B cells that support melanoma growth, with immediate potential implications for broader uses of anti-CTLA-4 antibodies in cancer management.

- 5129** **Kindlin-2 Regulates the Growth of Breast Cancer Tumors by Activating CSF-1-Mediated Macrophage Infiltration**  
Khalid Sossey-Alaoui, Elzbieta Pluskota, Katarzyna Bialkowska, Dorota Szpak, Yvonne Parker, Chevaun D. Morrison, Daniel J. Lindner, William P. Schiemann, and Edward F. Plow  
*Précis:* These results illuminate how breast cancer cells capture host macrophage functions that drive malignant progression.



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## 5142 Cancer-Associated Fibroblasts Share Characteristics and Protumorigenic Activity with Mesenchymal Stromal Cells

Lucia Borriello, Rie Nakata, Michael A. Sheard, G. Esteban Fernandez, Richard Sposto, Jemily Malvar, Laurence Blavier, Hiroyuki Shimada, Shahab Asgharzadeh, Robert C. Seeger, and Yves A. DeClerck

*Précis:* These findings show how cancer-associated fibroblasts drive the malignant properties of neuroblastoma, a commonly aggressive pediatric tumor, with potential implications for improving its clinical management.

## 5158 Proinflammatory CXCL12–CXCR4/CXCR7 Signaling Axis Drives Myc-Induced Prostate Cancer in Obese Mice

Achinto Saha, Songyeon Ahn, Jorge Blando, Fei Su, Mikhail G. Kolonin, and John DiGiovanni

*Précis:* These findings identify an established pro-inflammatory signaling axis as a critical mediator of the progression-promoting effects of obesity in prostate cancer, with potential implications for its prevention or treatment.

## 5169 Adipose Progenitor Cell Secretion of GM-CSF and MMP9 Promotes a Stromal and Immunological Microenvironment That Supports Breast Cancer Progression



Francesca Reggiani, Valentina Labanca, Patrizia Mancuso, Cristina Rabascio, Giovanna Talarico, Stefania Orecchioni, Andrea Manconi, and Francesco Bertolini

*Précis:* These findings reveal how adipose progenitor cells drive metastatic progression of breast cancer, potentially illuminating new strategies for prevention and treatment.

## INTEGRATED SYSTEMS AND TECHNOLOGIES

### 5183 Mathematical Modeling of Tumor–Tumor Distant Interactions Supports a Systemic Control of Tumor Growth

Sebastien Benzekry, Clare Lamont, Dominique Barbolosi, Lynn Hlatky, and Philip Hahnfeldt

*Précis:* This paper describes a mathematical model of tumor-distant interactions that may assist in regimens of neoadjuvant and adjuvant therapy in cancer patients and help tailor their care for best outcomes.

## CLINICAL STUDIES

### 5194 Poor Prognosis Indicated by Venous Circulating Tumor Cell Clusters in Early-Stage Lung Cancers



Vasudha Murlidhar, Rishindra M. Reddy, Shamileh Fouladdel, Lili Zhao, Martin K. Ishikawa, Svetlana Grabauskiene, Zhuo Zhang, Jules Lin, Andrew C. Chang, Philip Carrott, William R. Lynch, Mark B. Orringer, Chandan Kumar-Sinha, Nallasivam Palanisamy, David G. Beer, Max S. Wicha, Nithya Ramnath, Ebrahim Azizi, and Sunitha Nagrath

*Précis:* Circulating tumor cells that are closest to the primary tumor may serve as useful biomarkers to predict progression and relapse.

## LETTER TO THE EDITOR

### 5207 An Essential Role of Maspin in Embryogenesis and Tumor Suppression—Letter

James C. Whisstock and Phillip I. Bird

### 5208 An Essential Role of Maspin in Embryogenesis and Tumor Suppression—Response

Ming Zhang, Mary J.C. Hendrix, Philip A. Pemberton, Wael A. Sakr, and Shijie Sheng

## RETRACTION

### 5211 Retraction: CYP1B1 Gene Polymorphisms Have Higher Risk for Endometrial Cancer, and Positive Correlations with Estrogen Receptor $\alpha$ and Estrogen Receptor $\beta$ Expressions

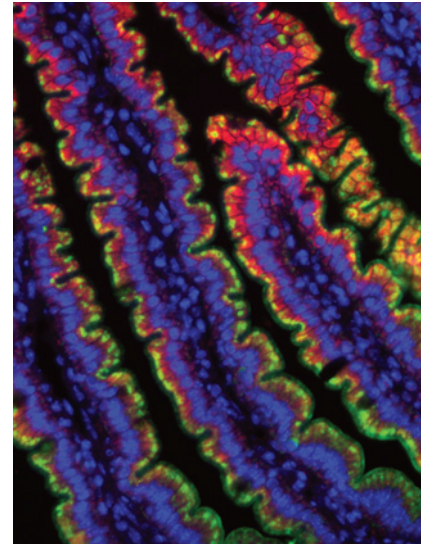
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## ABOUT THE COVER

GUCY2C paracrine signaling plays an essential role in homeostatic mechanisms maintaining the crypt-villus axis in intestine. Radiation disrupts those mechanisms, inducing toxicity underlying the potentially lethal gastrointestinal (GI) syndrome. Expression of the GUCY2C receptor (green) and its paracrine hormone uroguanylin (red) was preserved in small intestine 48 hours following exposure of mice to toxic doses of radiation. These results suggest a role for the GUCY2C signaling axis in compensatory responses to intestinal radiation. Further, they support the utility of oral GUCY2C ligands to prevent and treat the radiation-induced GI syndrome. For details, see article by Li and colleagues on page 5095.



# Cancer Research

The Journal of Cancer Research (1916–1930) | The American Journal of Cancer (1931–1940)

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