Breaking Advances

Highlights from Recent Cancer Literature

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Reviews

JNK-Induced Apoptosis, Compensatory Growth, and Cancer Stem Cells
Fei Chen

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Metastasis-Associated Protein 1/Nucleosome Remodeling and Histone Deacetylase Complex in Cancer
Da-Qiang Li, Suresh B. Pakala, Sujit S. Nair, Jeyanthi Eswaran, and Rakesh Kumar

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Priority Reports

Stress-Regulated Transcription Factor ATF4 Promotes Neoplastic Transformation by Suppressing Expression of the INK4a/ARF Cell Senescence Factors
Michiko Horiguchi, Satoru Koyanagi, Akinori Okamoto, Satoshi O. Suzuki, Naoya Matsunaga, and Shigehiro Ohdo

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Increased Survival of Glioblastoma Patients Who Respond to Antiangiogenic Therapy with Elevated Blood Perfusion
A. Gregory Sorensen, Kyrre E. Emblems, Pavлина Polaskova, Dominique Jennings, Heisook Kim, Marek Ancukiewicz, Meryun Wang, Patrick Y. Wen, Percy Ivy, Tracy T. Batchelor, and Rakesh K. Jain

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Clinical Studies

Genetic Variants in Oxidative Stress-Related Genes Predict Chemoresistance in Primary Breast Cancer: A Prospective Observational Study and Validation
Ke-Da Yu, A-Ji Huang, Lei Fan, Wen-Feng Li, and Zhi-Ming Shao

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Microenvironment and Immunology

Interleukin-10 Ablation Promotes Tumor Development, Growth, and Metastasis
Takashi Tanikawa, Caitlin Moira Wilke, Ilona Kryczek, Grace Y. Chen, John Kao, Gabriel Náñez, and Weiping Zou

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Potent Induction of Tumor Immunity by Combining Tumor Cryoablation with Anti-CTLA-4 Therapy
Rebecca Waitz, Stephen B. Solomon, Elena N. Petre, Anne E. Trumble, Marcella Fassó, Larry Norton, and James P. Allison

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440 Platelet-Derived MHC Class I Confers a Pseudonormal Phenotype to Cancer Cells That Subverts the Antitumor Reactivity of Natural Killer Immune Cells
Theresa Placke, Melanie Orgel, Martin Schaller, Gundram Jung, Hans-Georg Rammensee, Hans-Georg Kopp, and Helmut Rainer Salih

Précis: This important paper elucidates a fascinating mechanism of immune escape from NK cells in which platelets function to shield cancer cells and promote their metastatic spread.

449 Chromogranin A Regulates Tumor Self-Seeding and Dissemination
Eleonora Dondossola, Luca Crippa, Barbara Colombo, Elisabetta Ferrero, and Angelo Corti

Précis: Findings define a role for a circulating regulator of multidirectional trafficking of tumor cells between tumors, blood, and normal tissues, with general implications for metastasis formation and tumor progression.

460 Tumor Suppressive MicroRNAs miR-34a/c Control Cancer Cell Expression of ULBP2, a Stress-Induced Ligand of the Natural Killer Cell Receptor NKG2D
Anja Heinemann, Fang Zhao, Sonali Pechlivanis, Jurgen Eberle, Alexander Steinle, Sven Diederichs, Dirk Schadendorf, and Annette Paschen

Précis: The perspective that tumor suppressor functions often manifest as immune responses against tumor cells is quickly widening with broader investigations in more valid immunocompetent models of cancer.

482 Arsenic Trioxide Treatment Decreases the Oxygen Consumption Rate of Tumor Cells and Radiosensitizes Solid Tumors
Caroline Diepart, Oussama Karroum, Julie Magat, Olivier Feron, Julien Verrax, Pedro Buc Calderon, Vincent Grègoire, Philippe Leveque, Julie Stockis, Nicolas Dauguet, Bénédicte F. Jordan, and Bernard Galiez

Précis: This study offers a sound preclinical rationale for immediate clinical repositioning of arsenic trioxide, an approved treatment for acute promyelocytic leukemias, as a radiosensitizer for any solid tumor.

503 Circulating Insulin-Like Growth Factors and IGF-Binding Proteins in PSA-Detected Prostate Cancer: The Large Case–Control Study ProtecT
Mari-Anne Rowlands, Jeff M.P. Holly, David Gunnell, Jenny Donovan, J. Athene Lane, Freddie Hamdy, David E. Neal, Steven Oliver, George Davey Smith, and Richard M. Martin

Précis: This large UK-based case–control study suggests potentially important associations of circulating IGF-II, IGFBP-2, and IGFBP-3 in prostate cancers that are detected by the PSA test.

PREVENTION AND EPIDEMIOLOGY

Role of JNK in Mammary Gland Development and Breast Cancer
Cristina Cellurale, Nomeda Girmaius, Feng Jiang, Julie Cavanagh-Kyros, Shaolei Lu, David S. Garlick, Arthur M. Mercurio, and Roger J. Davis

Précis: This study offers in vivo evidence that the JNK stress kinases have a tumor suppressor function in the setting of mammary carcinogenesis, a role that likely extends to many other settings of epithelial carcinogenesis.

MOLECULAR AND CELLULAR PATHOBIOLOGY
THERAPEUTICS, TARGETS, AND CHEMICAL BIOLOGY

516 | Regulation of Matrix Metalloproteinase Genes by E2F Transcription Factors: Rb–Raf-1 Interaction as a Novel Target for Metastatic Disease
Jackie L. Johnson, Smitha Pillai, Danielle Pernazza, Said M. Sebti, Nicholas J. Lawrence, and Srikumar P. Chellappan

Précis: Matrix metalloproteases regulated by the Rb–E2F pathway may serve as its major connection to invasion and metastasis control, with implications for therapeutic intervention such as through targeting the Rb–Raf-1 interaction as illustrated in this study.

527 | Androgen Deprivation Causes Epithelial–Mesenchymal Transition in the Prostate: Implications for Androgen-Deprivation Therapy
Yuting Sun, Bu-Er Wang, Kevin G. Leong, Peng Yue, Li Li, Suchit Jhunjhunwala, Darrell Chen, Kyounghee Seo, Zora Modrusan, Wei-Qiang Gao, Jeffrey Settleman, and Leisa Johnson

Précis: Findings argue that androgen-deprivation therapy, used widely in prostate cancer treatment, can trigger epithelial–mesenchymal transition, a foreboding event that may detract from the response to other treatments.

537 | Hyaluronan Synthase HAS2 Promotes Tumor Progression in Bone by Stimulating the Interaction of Breast Cancer Stem–Like Cells with Macrophages and Stromal Cells

Précis: Findings define a mechanism used by cancer stem cells to produce an extracellular matrix glycosaminoglycan that may help seed a metastatic niche in foreign organ microenvironments, with major implications for antimetastatic therapy.

CORRECTION

568 | Correction: CD8⁺ T Cells Regulate Bone Tumor Burden Independent of Osteoclast Resorption

TUMOR AND STEM CELL BIOLOGY

548 | Metastatic Progression with Resistance to Aromatase Inhibitors Is Driven by the Steroid Receptor Coactivator SRC-1
Jean McBryan, Sarah M. Theissen, Christopher Byrne, Eamon Hughes, Sinead Cocchiglia, Stephen Sande, Jane O’Hara, Paul Tibbitts, Arnold D.K. Hill, and Leonie S. Young

Précis: This study reveals insights into the mechanism by which clinical resistance and metastatic progression occur with aromatase inhibitors, a first-line treatment for endocrine-sensitive breast cancers.

560 | p53 Negatively Regulates Transcription of the Pyruvate Dehydrogenase Kinase Pdk2
Tanupriya Contractor and Chris R. Harris

Précis: This study reveals how p53 controls the Warburg effect, a universal property of cancer cells in which glycolysis is driven powerfully despite aerobic conditions that should otherwise favor oxidative phosphorylation.
ABOUT THE COVER

Epithelial–mesenchymal transition (EMT) is a key developmental process and has also been implicated in cancer metastasis and therapeutic resistance. The factors contributing to EMT in human cancers remain unclear. Sun and colleagues show that androgen deprivation can promote EMT in normal mouse prostate as well as in human prostate cancer, revealing a potentially important consequence of a standard of care treatment for prostate malignancies. This image corresponds to an immunofluorescence staining of E-cadherin (epithelial marker) and vimentin (mesenchymal marker) in postcastration (androgen-deprived) mouse prostate tissue. Cells that express both markers are likely to be undergoing EMT. Red, Vimentin; green, E-cadherin; blue, DAPI. For details, see the article by Sun and colleagues on page 527 of this issue.
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