### IN THIS ISSUE
Highlighted research articles ....................... 973

### NEWS IN BRIEF
Important news stories affecting the community ................ 978

### RESEARCH WATCH
Selected highlights of recent articles of exceptional significance from the cancer literature ................ 983

### ONLINE
For more News and Research Watch, visit Cancer Discovery online at http://CDnews.aacrjournals.org.

### VIEWS
In The Spotlight

**RADical Response Puts an Exceptional Responder in CHKmate: A Synthetic Lethal Curative Response to DNA-Damaging Chemotherapy?** ................ 988
G. Peng, S.E. Woodman, and G.B. Mills
See article, p. 1014

**A HER 1-2 Punch: Dual EGFR Targeting Deals Resistance a Deadly Blow** ................ 991
D.L. Gibbons and L.A. Byers
See article, p. 1036

**Tracing the Roots of Cancer Evolution** ................ 995
Y. Jiang and O. Elemento
See article, p. 1088

### REVIEW
Patient-Derived Xenograft Models: An Emerging Platform for Translational Cancer Research ................ 998

### RESEARCH BRIEF
Synthetic Lethality in ATM-Deficient RAD50-Mutant Tumors Underlies Outlier Response to Cancer Therapy ................ 1014
Précis: Whole-genome sequencing of an outlier responder identified a tumor-specific synthetic lethal relationship between RAD50 mutation, checkpoint inhibition, and genotoxic chemotherapy. See commentary, p. 988

### RESEARCH ARTICLES
**Cell-Cycle Reprogramming for PI3K Inhibition Overrides a Relapse-Specific C481S BTK Mutation Revealed by Longitudinal Functional Genomics in Mantle Cell Lymphoma** ................ 1022
Précis: Longitudinal analysis of MCL tumors identified the relapse-specific BTK C481S mutation and provided evidence that targeting CDK4 overcomes ibrutinib resistance.

**Dual Inhibition of EGFR with Afatinib and Cetuximab in Kinase Inhibitor–Resistant EGFR-Mutant Lung Cancer with and without T790M Mutations** ................ 1036
Précis: The combination of afatinib and cetuximab shows antitumor activity and a manageable safety profile in heavily pretreated patients with EGFR-mutant lung cancer and acquired resistance to erlotinib/gefitinib. See commentary, p. 991

---

Downloaded from cancerdiscovery.aacrjournals.org on March 25, 2021. © 2014 American Association for Cancer Research.
AZD9291, an Irreversible EGFR TKI, Overcomes T790M-Mediated Resistance to EGFR Inhibitors in Lung Cancer .....................1046
Précis: A third-generation EGFR inhibitor selectively targets EGFR mutants, including T790M, but not wild-type EGFR, and induces durable antitumor responses in preclinical models and patients with NSCLC.

Defining Key Signaling Nodes and Therapeutic Biomarkers in NF1-Mutant Cancers ......................1062
C.F. Malone, J.A. Fromm, O. Maertens, T. DeRaedt, R. Ingraham, and K. Cichowski
Précis: mTORC1 and MEK are the critical mediators of malignancy in NF1-mutant MPNST, and their combined inhibition induces tumor regression that can be measured by reduced 18F-FDG uptake.

Maturation Stage of T-cell Acute Lymphoblastic Leukemia Determines BCL-2 versus BCL-XL Dependence and Sensitivity to ABT-199 ............1074
Précis: Unlike most T-ALLs, which are dependent on BCL-XL, early T-cell progenitor ALL shows selective dependence on BCL-2 and is sensitive to BCL-2 inhibition with the BH3 mimetic ABT-199.

Acquired Initiating Mutations in Early Hematopoietic Cells of CLL Patients ......................1088
Précis: CLL develops from preleukemic hematopoietic progenitor cells harboring mutations that converge on deregulation of B-cell receptor signaling and early B-cell differentiation.
See commentary, p. 995

Using whole-genome sequencing, Al-Ahmadie, Iyer, Hohl, and colleagues identified a clonal hemizygous RAD50<sup>L1237F</sup> mutation in an outlier patient with metastatic small-cell ureter cancer who achieved a complete and durable response to treatment with a checkpoint kinase 1 inhibitor and irinotecan. RAD50<sup>L1237F</sup> was accompanied by LOH of the wild-type allele and mutated a highly conserved residue required for proper MRE11 complex function in DNA repair. RAD50 mutation impaired activation of ataxia telangiectasia mutated (ATM) signaling, leading to a synthetic lethal effect when checkpoint inhibition was combined with DNA-damaging chemotherapy. These findings highlight the utility of this approach to dissect tumor-specific dependencies and provide a rationale for combining checkpoint inhibitors with DNA-damaging chemotherapy in patients whose tumors harbor MRE11 complex mutations. For details, please see the article by Al-Ahmadie, Iyer, Hohl, and colleagues on page 1014.

AC icon indicates Author Choice
For more information please visit http://www.aacrjournals.org

ON THE COVER

Using whole-genome sequencing, Al-Ahmadie, Iyer, Hohl, and colleagues identified a clonal hemizygous RAD50<sup>L1237F</sup> mutation in an outlier patient with metastatic small-cell ureter cancer who achieved a complete and durable response to treatment with a checkpoint kinase 1 inhibitor and irinotecan. RAD50<sup>L1237F</sup> was accompanied by LOH of the wild-type allele and mutated a highly conserved residue required for proper MRE11 complex function in DNA repair. RAD50 mutation impaired activation of ataxia telangiectasia mutated (ATM) signaling, leading to a synthetic lethal effect when checkpoint inhibition was combined with DNA-damaging chemotherapy. These findings highlight the utility of this approach to dissect tumor-specific dependencies and provide a rationale for combining checkpoint inhibitors with DNA-damaging chemotherapy in patients whose tumors harbor MRE11 complex mutations. For details, please see the article by Al-Ahmadie, Iyer, Hohl, and colleagues on page 1014.
CANCER DISCOVERY

4 (9)

Cancer Discovery 2014;4:OF6-1101.

| Updated version | Access the most recent version of this article at: http://cancerdiscovery.aacrjournals.org/content/4/9 |

| E-mail alerts       | Sign up to receive free email-alerts related to this article or journal. |
| Reprints and Subscriptions | To order reprints of this article or to subscribe to the journal, contact the AACR Publications Department at pubs@aacr.org. |
| Permissions         | To request permission to re-use all or part of this article, use this link http://cancerdiscovery.aacrjournals.org/content/4/9. Click on "Request Permissions" which will take you to the Copyright Clearance Center's (CCC) Rightslink site. |