CANCER IMMUNOLOGY RESEARCH

TABLE OF CONTENTS

WHAT WE’RE READING
853 A Sampling of Highlights from the Literature

IN THE SPOTLIGHT
854 Arid5a: A Missing Link between EMT and Tumoral Immune Resistance
Benot J. Van den Eynde
See related article, p. 862
855 Noncanonical Functions of C1s Complement Its Canonical Functions in Renal Cancer
Elena Magrini and Cecilia Garlanda
See related article, p. 891

CANCER IMMUNOLOGY AT THE CROSSROADS
856 Mitochondria as Playmakers of CAR T-cell Fate and Longevity
Hosein Rostamian, Mohammad Khakpoor-Koosheh, Keyvan Fallah-Mehrjardi, Hamid R. Mirzaei, and Christine E. Brown

RESEARCH ARTICLES
862 Arid5a Promotes Immune Evasion by Augmenting Tryptophan Metabolism and Chemokine Expression
Arid5a is a key molecule in inflammatory and autoimmune diseases, yet its role in cancer progression is unknown. Arid5a expression is shown to increase in mesenchymal tumors and augment immune evasion by promoting tryptophan catabolism and chemokine expression.
See related Spotlight, p. 854

877 Site-Dependent Immune Escape Due to Impaired Dendritic Cell Cross-Priming
Mark S. Diamond, Jeffrey H. Lin, and Robert H. Vonderheide
Data show that tumor antigenicity is necessary, but not sufficient, for effective cancer immune surveillance. Neoantigen-expressing tumors can escape in certain host tissue microenvironments in the absence of immunoediting despite displaying high tumor immunogenicity at other sites.

891 Complement C1s and C4d as Prognostic Biomarkers in Renal Cancer: Emergence of Noncanonical Functions of C1s
Marie V. Daugan, Margot Revel, Jules Russick, Marie-Agnès Dragon-Durey, Christine Gaboriaud, Tania Robe-Rybkin, Victoria Poillerat, Anne Grunenwald, Guillaume Lacroix, Antoine Bougouin, Maxime Meylan, Virginie Verkarre, Stephane M. Oudard, Arnaud Mejean, Yann A. Vano, Geraldine Perkins, Pierre Validire, Xavier Cathelineau, Rafael Sanchez-Salas, Diane Damotte, Veronique Fremaux-Bacchi, Isabelle Cremer, Catherine Sautès-Fridman, Wolf H. Fridman, and Lubka T. Roumenina
C1s is shown to drive renal cell carcinoma progression by local complement activation and complement cascade–unrelated, intracellular, noncanonical functions. This modulates the tumor microenvironment by impacting tumor cell proliferation, survival, and interaction with T cells.
See related Spotlight, p. 855

909 Intracellular Factor H Drives Tumor Progression Independently of the Complement Cascade
Marie V. Daugan, Margot Revel, Romane Thouenon, Marie-Agnès Dragon-Durey, Tania Robe-Rybkin, Carine Torset, Nicolas S. Merle, Rémi Noé, Virginie Verkarre, Stéphane Marie Oudard, Arnaud Mejean, Pierre Validire, Xavier Cathelineau, Rafael Sanchez-Salas, Mathew C. Pickering, Isabelle Cremer, Audrey Mansuet-Lupo, Marco Alifano, Catherine Sautès-Fridman, Diane Damotte, Wolf H. Fridman, and Lubka T. Roumenina
The complement regulator factor H (FHR) is shown to exert protumoral actions through an intracellular, noncanonical mechanism that alters proliferation, cell cycle, morphology, and migration in clear cell renal cell carcinoma and lung adenocarcinoma.
Metabolic Screening of Cytotoxic T-cell Effector Function Reveals the Role of CRAC Channels in Regulating Lethal Hit Delivery

A microscopy-based, automated 3D interface coculture model was developed that allows for screening modulators of antitumor responses. Among the metabolic and signaling conditions compromising CTL responses, deregulation of CRAC channels caused particularly strong impairment of lethal hit delivery.

Single-Cell Analysis of the Pan-Cancer Immune Microenvironment and scTIME Portal
Fang Hong, Qianqian Meng, Weiyu Zhang, Ruiqin Zheng, Xiaoyun Li, Tao Cheng, Deqing Hu, and Xin Gao

Single-cell, pan-cancer analysis of multiple tumor immune microenvironments (TIME) reveals the relationships of immune subsets within specific tumor types and is used to develop the scTIME Web portal, a user-friendly tool available to the community for TIME analysis.

ST8Sia6 Promotes Tumor Growth in Mice by Inhibiting Immune Responses
David J. Friedman, Sydney B. Crotts, Michael J. Shapiro, Matthew Rajcula, Shaylene McCue, Xin Liu, Khashayarsha Khazaie, Haidong Dong, and Virginia Smith Shapiro

Expression of sialyltransferase ST8Sia6 by tumor cells generates ligands that bind to Siglec-E on macrophages, resulting in their repolarization to an M2-like phenotype. The data highlight the potential targeting of ST8Sia6 to enhance antitumor responses.

Integrin β7 Inhibits Colorectal Cancer Pathogenesis via Maintaining Antitumor Immunity
Youhua Zhang, Ruting Xie, Hailong Zhang, Yajuan Zheng, Changdong Lin, Lei Yang, Mengwen Huang, Man Li, Feifei Song, Ling Lu, Muqing Yang, Ying Liu, Qing Wei, Jiuyu Li, and Jianfeng Chen

ITGB7 (integrin β7) inhibits tumorigenesis and progression of colorectal cancer (CRC) by maintaining sufficient tumor infiltration of various immune cell subsets essential for cancer cell recognition and killing. The data highlight an immune-supportive role of ITGB7 in CRC.

Viral Molecular Mimicry Influences the Antitumor Immune Response in Murine and Human Melanoma

Molecular mimicry can induce autoimmunity. By developing and using a bioinformatic tool to analyze molecular mimicry between tumor and viral antigens, the authors show this phenomenon can also play a role in antitumor immune responses.

Immunediting is a mechanism by which tumors evade antitumor responses, but how tissue site of origin plays into the process is not yet clear. By testing different routes of tumor-cell administration, Diamond et al. show that tumors can undergo selective immune escape in some tissues, whereas tumors are eliminated in others. This process is independent of immunediting and can occur even if tumors are highly immunogenic. Mechanistically, conventional dendritic cells (cDC1) in the tumor-permissive tissues have reduced CD8+ T-cell priming ability, thus, leading to insufficient induction of antitumor immunity, and can be rescued by enhancing cross-presentation via a CD40 agonist. The data highlight that although antigenicity is key for inducing antitumor responses, it alone is not sufficient, and tissue of origin needs to be considered. Read more in this issue on page 877. Original image from Supplementary Fig. S1E. Artwork by Lewis Long.