

CANCER IMMUNOLOGY RESEARCH

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Vincenzo Bronte

See related article, p. 167

CANCER IMMUNOLOGY AT THE CROSSROADS

- 161 **Immunotherapy of Pediatric Solid Tumors: Treatments at a Crossroads, with an Emphasis on Antibodies**

A C Dana L. Casey and Nai-Kong V. Cheung

RESEARCH ARTICLES

- 167 **Cross-talk between Colon Cells and Macrophages Increases ST6GALNAC1 and MUC1-sTn Expression in Ulcerative Colitis and Colitis-Associated Colon Cancer**

Michael Kvorjak, Yasmine Ahmed, Michelle L. Miller, Raahul Sriram, Claudia Coronello, Jana G. Hashash, Douglas J. Hartman, Cheryl A. Telmer, Natasa Miskov-Zivanov, Olivera J. Finn, and Sandra Cascio

Posttranslational modifications of oncoproteins can promote tumor development, yet it is unclear what induces these alterations. In UC and CACC, M2-like macrophages produce CCL17 and IL13, which increases ST6GALNAC1 glycosyltransferase, leading to glycosylated MUC1 in colon cancer cells.

See related Spotlight, p. 160

- 179 **Targeting CMTM6 Suppresses Stem Cell-Like Properties and Enhances Antitumor Immunity in Head and Neck Squamous Cell Carcinoma**

Lei Chen, Qi-Chao Yang, Yi-Cun Li, Lei-Lei Yang, Jian-Feng Liu, Hao Li, Yao Xiao, Lin-Lin Bu, Wen-Feng Zhang, and Zhi-Jun Sun

Elevated CMTM6 in patients with HNSCC predicted poor prognosis. Without CMTM6, cancer stem cell features and the proportion of exhausted T cells decrease, concomitantly improving antitumor immunity. Thus, CMTM6 may have potential as a therapeutic target.

- 192 **Impact of TCR Diversity on the Development of Transplanted or Chemically Induced Tumors**

Karin Schreiber, Theodore G. Karrison, Steven P. Wolf, Kazuma Kiyotani, Madeline Steiner, Eric R. Littmann, Eric G. Pamer, Thomas Kammertoens, Hans Schreiber, and Matthias Leisegang

Sibling mice from the same parental breeding pair and with similar microbiomes exhibit differing TCR repertoires. Thus, rejection of inoculated or chemically induced tumors differs, highlighting the important role of T-cell diversity in response to cancer.

- 203 **Self-Maintaining CD103⁺ Cancer-Specific T Cells Are Highly Energetic with Rapid Cytotoxic and Effector Responses**

A C Megat Abd Hamid, Huw Colin-York, Nasullah Khalid-Alham, Molly Browne, Lucia Cerundolo, Ji-Li Chen, Xuan Yao, Samara Rosendo-Machado, Craig Waugh, David Maldonado-Perez, Emma Bowes, Clare Verrill, Vincenzo Cerundolo, Christopher P. Conlon, Marco Fritzsche, Yanchun Peng, and Tao Dong

Antigen-specific CD103⁺CD8⁺ T cells can self-regulate their CD103 expression by producing active TGFβ1 and have better TCR antigen sensitivity and enhanced effector functions versus CD103⁻ populations. However, this population undergoes increased death with prolonged exposure to tumor cells.

- 217 **Aggressive Mammary Cancers Lacking Lymphocytic Infiltration Arise in Irradiated Mice and Can Be Prevented by Dietary Intervention**

Coral Omene, Lin Ma, Jade Moore, Haoxu Ouyang, Irineu Illa-Bochaca, William Chou, Manan S. Patel, Christopher Sebastiano, Sandra Demaria, Jian-Hua Mao, Kubra Karagoz, Michael L. Gatzka, and Mary Helen Barcellos-Hoff

Systemic effects of whole-body irradiation can fuel carcinogenesis by repressing antitumor immunity in a mouse model of breast cancer. Aggressive tumors lacking lymphocytic infiltrate can be prevented by dietary intervention with a nontoxic, immunomodulatory agent known as CAPE.

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230 CD40 Enhances Type I Interferon Responses Downstream of CD47 Blockade, Bridging Innate and Adaptive Immunity

AC Suresh de Silva, George Fromm, Casey W. Shuptrine, Kelsey Johannes, Arpita Patel, Kyung Jin Yoo, Kaiwen Huang, and Taylor H. Schreiber

Blocking CD47/SIRP α interactions induces antitumor efficacy. A dual fusion protein incorporating SIRP α and CD40L potentiates tumor cell phagocytosis and type I interferon responses, improving control of established tumors and sensitivity to immune checkpoint blockade.

246 Intratumoral Plasmid IL12 Electroporation Therapy in Patients with Advanced Melanoma Induces Systemic and Intratumoral T-cell Responses

AC Samantha K. Greaney, Alain P. Algazi, Katy K. Tsai, Kathryn T. Takamura, Lawrence Chen, Christopher G. Twitty, Li Zhang, Alan Paciorek, Robert H. Pierce, Mai H. Le, Adil I. Daud, and Lawrence Fong

Systemic IL12 use is limited due to toxicity, yet intratumoral administration of an IL12 plasmid via electroporation is safe and efficacious, even at distant sites. In melanoma patients, this treatment induces local and systemic antigen-specific T-cell responses.

255 MicroRNAs in Tumor Exosomes Drive Immune Escape in Melanoma

Virginie Vignard, Maureen Labbé, Nadège Marec, Gwennan André-Grégoire, Nicolas Jouand, Jean-François Fonteneau, Nathalie Labarrière, and Delphine Fradin

CD8⁺ T cells not only interact with tumor exosomes but also internalize them, providing a route by which miRNAs encapsulated in exosomes contribute to immune escape mechanisms.

268 Immunoregulation and Clinical Implications of ANGPT2/TIE2⁺ M-MDSC Signature in Non-Small Cell Lung Cancer

Elodie Lauret Marie Joseph, Caroline Laheurte, Marine Jary, Laura Boullerot, Kamal Asgarov, Eléonore Gravelin, Adeline Bouard, Laurie Rangan, Magalie Dosset, Christophe Borg, and Olivier Adotévi

Tumor immune evasion in NSCLC is promoted by overexpression of angiopoietin-2 (ANGPT2) and overaccumulation of M-MDSCs that express the ANGPT2-receptor, TIE2. The ANGPT2/TIE2⁺ M-MDSC axis could be useful for stratification of NSCLC patients and for therapy decisions.

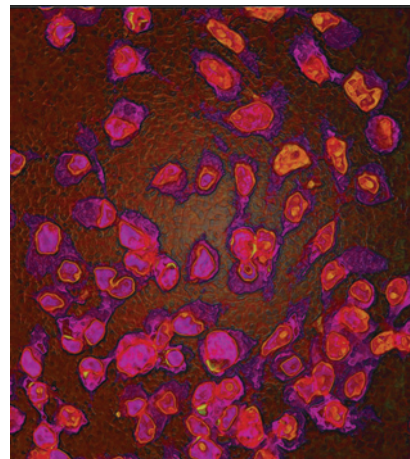
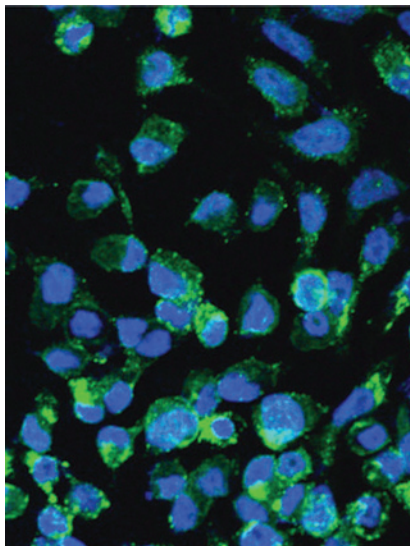
CORRECTION

280 Correction: All-Trans Retinoic Acid Prevents Osteosarcoma Metastasis by Inhibiting M2 Polarization of Tumor-Associated Macrophages

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ABOUT THE COVER

Colon cancer can be initiated by certain types of chronic gut inflammation, such as ulcerative colitis. During inflammation, the glycosylation patterns of various proteins, such as the glycoprotein Mucin-1 (MUC1), in epithelial cells are stimulated to change. This altered glycosylation contributes to the development and progression of colon cancer. Kvorjak et al. investigate what causes these different glycosylation patterns and find that myeloid cells contribute to this phenomenon. M2-like macrophages produce IL13 and CCL17, stimulating colon cancer cells to express ST6GALNAC1, a glycotransferase that subsequently alters the glycan composition of MUC1. Utilizing a computational model, the authors demonstrate that IL13 inhibition is a possible therapeutic avenue for colon cancer patients by hindering glycosylation-dependent tumorigenesis. To read more, Kvorjak et al. begins on page 167. This work is also highlighted "In the Spotlight" by Vincenzo Bronte on page 160. Original immunofluorescence imaging of MUC1 on HT-29 cells cocultured with M2 macrophages by the Cascio laboratory. Artwork by Lewis Long.



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