

Table of Contents

The Journal of
Immunology

VOL. 192 | NO. 3 | February 1, 2014 | Pages 835–1338

IN THIS ISSUE

- 835 **Lyn-king Autoimmunity to B Cells** *See article p. 919*
Brain B Cells Make MS Mischief *See article p. 929*
Enhancing Pro-B Cell Activity *See article p. 1064*
Fishing for New B Cell Populations *See article p. 1257*
T Cell Transfer Targets Tumors *See article p. 1286*
Bridging the NK Cell Synapse Gap *See article p. 1313*

PILLARS OF IMMUNOLOGY

- 837 Celebrating Diversity in Memory T Cells
Susan M. Kaech
- 840 Pillars Article: Two Subsets of Memory T Lymphocytes with Distinct Homing Potentials and Effector Functions. *Nature*. 1999. 401: 708–712
Federica Sallusto, Danielle Lenig, Reinhold Förster, Martin Lipp, and Antonio Lanzavecchia
- 845 Pillars Article: Preferential Localization of Effector Memory Cells in Nonlymphoid Tissue. *Science*. 2001. 291: 2413–2417
David Masopust, Vaiva Vezys, Amanda L. Marzo, and Leo Lefrançois

BRIEF REVIEWS

- 851 The Autotaxin–LPA Axis Emerges as a Novel Regulator of Lymphocyte Homing and Inflammation
Sara Knowlden and Steve N. Georas

ALLERGY AND OTHER HYPERSENSITIVITIES

- 859 EGFR Signaling Blunts Allergen-Induced IL-6 Production and Th17 Responses in the Skin and Attenuates Development and Relapse of Atopic Dermatitis
Zhonghua Zhang, Chang Xiao, Aaron M. Gibson, Stacey A. Bass, and Gurjit K. Khurana Hershey

On the cover: Human B-lymphocyte precursors develop in the bone marrow proliferating at specific stages. The immunohistochemistry image shows resting and proliferating (Ki67^+ , brown) CD10^+ (red) common lymphocyte progenitors and B cell precursors in human bone marrow. Kraus, H., S. Kaiser, K. Aumann, P. Bönel, U. Salzer, D. Vestweber, M. Erlacher, M. Kunze, M. Burger, K. Pieper, H. Sic, A. Rolink, H. Eibel, and M. Rizzi. 2014. A feeder-free differentiation system identifies autonomously proliferating B cell precursors in human bone marrow. *J. Immunol.* 192: 1044–1054.

The Journal of Immunology (ISSN 0022-1767) is published twice each month by The American Association of Immunologists, Inc., 9650 Rockville Pike, Bethesda, MD 20814-3994, Phone: 301-634-7197, Fax: 301-634-7829. Subscription terms: New subscriptions and renewals begin January 1 and expire one year later (see <http://www.jimmunol.org/subscriptions> for prices and details). A special rate is available to members of The American Association of Immunologists, Inc. (see <http://www.aai.org/membership>). The American Association of Immunologists, Inc., is not responsible for undeliverable issues. Replacement issues can be obtained, if available, at the regular price of single issues (see http://www.jimmunol.org/pdf/single_issue_purchase.pdf). Reprints of individual articles are available only from authors. Periodicals postage paid at Bethesda, MD 20814-3994, and at additional mailing offices. Country of origin U.S.A. Printed on acid-free recyclable paper. Postmaster: Send address changes 60 days in advance to *The Journal of Immunology*, Subscription Department, 9650 Rockville Pike, Bethesda, MD 20814-3994. Copyright © 2014 by The American Association of Immunologists, Inc.

ANTIGEN RECOGNITION AND RESPONSES

- 867 Integrating B Cell Lineage Information into Statistical Tests for Detecting Selection in Ig Sequences
Mohamed Uduman, Mark J. Shlomchik, Francois Vigneault, George M. Church, and Steven H. Kleinstein

AUTOIMMUNITY

- 875 Requirement for MyD88 Signaling in B Cells and Dendritic Cells for Germinal Center Anti-Nuclear Antibody Production in Lyn-Deficient Mice
Zhaolin Hua, Andrew J. Gross, Chrystelle Lamagna, Natalia Ramos-Hernández, Patrizia Scapini, Ming Ji, Haitao Shao, Clifford A. Lowell, Baidong Hou, and Anthony L. DeFranco
- 886 CCR1 Inhibition Ameliorates the Progression of Lupus Nephritis in NZB/W Mice
Alexandre Bignon, Françoise Gaudin, Patrice Hémon, Hugo Tharinger, Katia Mayol, Thierry Walzer, Pius Loetscher, Michel Peuchmaur, Dominique Berrebi, and Karl Balabanian
- 897 Follicular B Cells in Thyroids of Mice with Spontaneous Autoimmune Thyroiditis Contribute to Disease Pathogenesis and Are Targets of Anti-CD20 Antibody Therapy
So-Hee Hong and Helen Braley-Mullen
- 906 Neutrophil-Mediated IFN Activation in the Bone Marrow Alters B Cell Development in Human and Murine Systemic Lupus Erythematosus
Arumugam Palanichamy, Jason W. Bauer, Srilakshmi Yalavarthi, Nida Meednu, Jennifer Barnard, Teresa Owen, Christopher Cistrone, Anna Bird, Alfred Rabinovich, Sarah Nevarez, Jason S. Knight, Russell Dedrick, Alexander Rosenberg, Chungwen Wei, Javier Rangel-Moreno, Jane Liesveld, Inaki Sanz, Emily Baechler, Mariana J. Kaplan, and Jennifer H. Anolik
- 919 B Cell-Specific Loss of Lyn Kinase Leads to Autoimmunity
Chrystelle Lamagna, Yongmei Hu, Anthony L. DeFranco, and Clifford A. Lowell
- 929 B Cells Promote Induction of Experimental Autoimmune Encephalomyelitis by Facilitating Reactivation of T Cells in the Central Nervous System
Emily R. Pierson, Ingunn M. Stromnes, and Joan M. Goverman

CLINICAL AND HUMAN IMMUNOLOGY

- 940 HTLV-1 bZIP Factor–Specific CD4 T Cell Responses in Adult T Cell Leukemia/Lymphoma Patients after Allogeneic Hematopoietic Stem Cell Transplantation
Tomoko Narita, Takashi Ishida, Ayako Masaki, Susumu Suzuki, Asahi Ito, Fumiko Mori, Tomiko Yamada, Masaki Ri, Shigeru Kusumoto, Hirokazu Komatsu, Yasuhiko Miyazaki, Yoshifusa Takatsuka, Atae Utsunomiya, Akio Niimi, Shinsuke Iida, and Ryuzo Ueda
- 948 Attenuation of Respiratory Syncytial Virus–Induced and RIG-I–Dependent Type I IFN Responses in Human Neonates and Very Young Children
Nico Marr, Ting-I Wang, Sarah H. Y. Kam, Yuan Shen Hu, Ashish A. Sharma, Angie Lam, Joy Markowski, Alfonso Solimano, Pascal M. Lavoie, and Stuart E. Turvey
- 958 Autophagy Induction by SIRT6 through Attenuation of Insulin-like Growth Factor Signaling Is Involved in the Regulation of Human Bronchial Epithelial Cell Senescence
Naoki Takasaka, Jun Araya, Hiromichi Hara, Saburo Ito, Kenji Kobayashi, Yusuke Kurita, Hiroshi Wakui, Yutaka Yoshii, Yoko Yumino, Satoko Fujii, Shunsuke Minagawa, Chikako Tsurushige, Jun Kojima, Takanori Numata, Kenichiro Shimizu, Makoto Kawaishi, Yumi Kaneko, Noriki Kamiya, Jun Hirano, Makoto Odaka, Toshiaki Morikawa, Stephen L. Nishimura, Katsutoshi Nakayama, and Kazuyoshi Kuwano
- 969 Pathological Role of Regulatory T Cells in the Initiation and Maintenance of Eczema Herpeticum Lesions
Ryo Takahashi, Yohei Sato, Maiko Kurata, Yoshimi Yamazaki, Momoko Kimishima, and Tetsuo Shiohara
- 979 Deficient Leptin Signaling Ameliorates Systemic Lupus Erythematosus Lesions in MRL/Mp-Fas^{lpr} Mice
Yoshimasa Fujita, Takao Fujii, Tsuneyo Mimori, Tomomi Sato, Takuji Nakamura, Haruka Iwao, Akio Nakajima, Miyuki Miki, Tomoyuki Sakai, Takafumi Kawanami, Masao Tanaka, Yasufumi Masaki, Toshihiro Fukushima, Toshiro Okazaki, and Hisanori Umehara

IMMUNE REGULATION

- 985 Bach2 Regulates Homeostasis of Foxp³⁺ Regulatory T Cells and Protects against Fatal Lung Disease in Mice
Eui Ho Kim, David J. Gasper, Song Hee Lee, Erin Hemmila Plisch, John Svaren, and M. Suresh
- 996 STAT5-Induced Lunatic Fringe during Th2 Development Alters Delta-like 4-Mediated Th2 Cytokine Production in Respiratory Syncytial Virus–Exacerbated Airway Allergic Disease
Sumanta Mukherjee, Andrew J. Rasky, Phil A. Lundy, Nicolai A. Kittan, Steven L. Kunkel, Ivan P. Maillard, Paul E. Kowalski, Philaretos C. Kousis, Cynthia J. Guidos, and Nicholas W. Lukacs
- 1004 Myeloid Cells Limit Production of Antibody-Secreting Cells after Immunization in the Lymph Node
David R. Fooksman, Michel C. Nussenzweig, and Michael L. Dustin
- 1013 Activation of the Epidermal Growth Factor Receptor in Macrophages Regulates Cytokine Production and Experimental Colitis
Ning Lu, Libong Wang, Hailong Cao, Liping Liu, Luc Van Kaer, Mary K. Washington, Michael J. Rosen, Philip E. Dubé, Keith T. Wilson, Xiubao Ren, Xishan Hao, D. Brent Polk, and Fang Yan
- 1024 Premature Terminal Differentiation Protects from Deregulated Lymphocyte Activation by ITK-Syk
Martina P. Bach, Eva Hug, Markus Werner, Julian Holch, Clara Sprissler, Konstanze Pechloff, Katja Zirlit, Robert Zeiser, Christine Dierks, Jürgen Ruland, and Hassan Jumaa
- 1034 MicroRNA-155 and MicroRNA-21 Promote the Expansion of Functional Myeloid-Derived Suppressor Cells
Limin Li, Jing Zhang, Wenli Diao, Dong Wang, Yao Wei, Chen-Yu Zhang, and Ke Zen

IMMUNE SYSTEM DEVELOPMENT

- 1044 A Feeder-Free Differentiation System Identifies Autonomously Proliferating B Cell Precursors in Human Bone Marrow
Helene Kraus, Sandra Kaiser, Konrad Aumann, Peter Bönel, Ulrich Salzer, Dietmar Vestweber, Miriam Erlacher, Mirjam Kunze, Meike Burger, Kathrin Pieper, Heiko Sic, Antonius Rolink, Hermann Eibel, and Marta Rizzi
- 1055 Id3 and Id2 Act as a Dual Safety Mechanism in Regulating the Development and Population Size of Innate-like $\gamma\delta$ T Cells
Baojun Zhang, Yen-Yu Lin, Meifang Dai, and Yuan Zhuang

IMMUNOGENETICS

- 1064 Targeted Chromatin Profiling Reveals Novel Enhancers in Ig H and Ig L Chain Loci
Alexander V. Predeus, Subasni Gopalakrishnan, Yue Huang, Jun Tang, Ann J. Feeney, Eugene M. Oltz, and Maxim N. Artyomov

IMMUNOTHERAPY AND VACCINES

- 1071 Nanoparticle Adjuvant Sensing by TLR7 Enhances CD8⁺ T Cell–Mediated Protection from *Listeria Monocytogenes* Infection
Marie-Ève Lebel, Jean-François Daudelin, Karine Chartrand, Esther Tarrab, Ulrich Kalinke, Pierre Savard, Nathalie Labrecque, Denis Leclerc, and Alain Lamarre

INFECTIOUS DISEASE AND HOST RESPONSE

- 1079 PD-L1 Limits the Mucosal CD8⁺ T Cell Response to *Chlamydia trachomatis*
Sarah C. Fankhauser and Michael N. Starnbach
- 1091 Identification of B7-H1 as a Novel Mediator of the Innate Immune/Proinflammatory Response as well as a Possible Myeloid Cell Prognostic Biomarker in Sepsis
Xin Huang, Yaping Chen, Chun-Shiang Chung, Zhenglong Yuan, Sean F. Monaghan, Fei Wang, and Alfred Ayala
- 1100 Antibodies VRC01 and 10E8 Neutralize HIV-1 with High Breadth and Potency Even with Ig-Framework Regions Substantially Reverted to Germline
Ivelin S. Georgiev, Rebecca S. Rudicell, Kevin O. Saunders, Wei Shi, Tatsiana Kirys, Krisha McKee, Sijy O'Dell, Gwo-Yu Chuang, Zhi-Yong Yang, Gilad Ofek, Mark Connors, John R. Mascola, Gary J. Nabel, and Peter D. Kwong

- 1107 C-Type Lectin Receptors Differentially Induce Th17 Cells and Vaccine Immunity to the Endemic Mycosis of North America
Huafeng Wang, Vanessa LeBert, Chiung Yu Hung, Kevin Galles, Shinobu Saijo, Xin Lin, Garry T. Cole, Bruce S. Klein, and Marcel Wüthrich

INNATE IMMUNITY AND INFLAMMATION

- 1120 Engulfment of Apoptotic Cells by Macrophages: A Role of MicroRNA-21 in the Resolution of Wound Inflammation
Amitava Das, Kasturi Ganesh, Savita Khanna, Chandan K. Sen, and Sashwati Roy
- 1130 Prostaglandin E₂-EP3 Signaling Induces Inflammatory Swelling by Mast Cell Activation
Kazushi Morimoto, Naritoshi Shirata, Yoshitaka Taketomi, Soken Tsuchiya, Eri Segi-Nishida, Tomoaki Inazumi, Kenji Kabashima, Satoshi Tanaka, Makoto Murakami, Shuh Narumiya, and Yukihiko Sugimoto
- 1138 Unbiased Expression Mapping Identifies a Link between the Complement and Cholinergic Systems in the Rat Central Nervous System
Rickard P. F. Lindblom, Mikael Ström, Matthias Heinig, Faiez Al Nimer, Shahin Aeinehband, Alexander Berg, Cecilia A. Dominguez, Swetha Vijayaraghavan, Xing-Mei Zhang, Karin Harnesk, Johan Zelano, Norbert Hübner, Staffan Cullheim, Taher Darreh-Shori, Margarita Diez, and Fredrik Piehl
- 1154 Complement Activation by Ceramide Transporter Proteins
Gerard H. Bode, Mario Losen, Wim A. Buurman, Robert Veerhuis, Peter C. Molenaar, Harry W. M. Steinbusch, Marc H. De Baets, Mohamed R. Daha, and Pilar Martinez-Martinez
- 1162 An Alternative Splicing Isoform of MITA Antagonizes MITA-Mediated Induction of Type I IFNs
Honghe Chen, Rongjuan Pei, Wandi Zhu, Rui Zeng, Yun Wang, Yanyi Wang, Mengji Lu, and Xinwen Chen
- 1171 A Novel Mitochondrial MAVS/Caspase-8 Platform Links RNA Virus-Induced Innate Antiviral Signaling to Bax/Bak-Independent Apoptosis
Souhayla El Maadidi, Laura Faletti, Birgit Berg, Christin Wenzl, Katrin Wieland, Zhijian J. Chen, Ulrich Maurer, and Christoph Borner
- 1184 Phosphatase Wip1 Negatively Regulates Neutrophil Migration and Inflammation
Bo Sun, Xuelian Hu, Guangwei Liu, Bo Ma, Yamei Xu, Tao Yang, Jianfeng Shi, Fan Yang, Hongran Li, Lianfeng Zhang, and Yong Zhao
- 1196 Chronic Exposure to Glucocorticoids Shapes Gene Expression and Modulates Innate and Adaptive Activation Pathways in Macrophages with Distinct Changes in Leukocyte Attraction
Martijn D. B. van de Garde, Fernando O. Martinez, Barbro N. Melgert, Machteld N. Hylkema, René E. Jonkers, and Jörg Hamann
- 1209 Cell Death Triggered by *Yersinia enterocolitica* Identifies Processing of the Proinflammatory Signal Adapter MyD88 as a General Event in the Execution of Apoptosis
Lena Novikova, Nicole Czymmek, Anne Deuretzbacher, Friedrich Buck, Kathleen Richter, Alexander N. R. Weber, Martin Aepfelbacher, and Klaus Ruckdeschel
- 1220 Generation of Multiple Fluid-Phase C3b:Plasma Protein Complexes during Complement Activation: Possible Implications in C3 Glomerulopathies
Mahalakshmi Ramadas, Berhane Ghebrehiwet, Richard J. Smith, and Richard R. Kew
- 1231 The SOCS3-Independent Expression of IDO2 Supports the Homeostatic Generation of T Regulatory Cells by Human Dendritic Cells
Sara Trabanelli, Darina Očadlíková, Marilena Ciciarello, Valentina Salvestrini, Mariangela Lecciso, Camilla Jandus, Richard Metz, Cecilia Evangelisti, Lisa Laury-Kleintop, Pedro Romero, George C. Prendergast, Antonio Curti, and Roberto M. Lemoli
- 1241 Activin A as a Mediator of NK-Dendritic Cell Functional Interactions
Pascal Seeger, Daniela Bosisio, Silvia Parolini, Raffaele Badolato, Angela Gismondi, Angela Santoni, and Silvano Sozzani

MUCOSAL IMMUNOLOGY

- 1249 Identification of Hypoxia-Inducible Factor HIF-1A as Transcriptional Regulator of the A2B Adenosine Receptor during Acute Lung Injury
Tobias Eckle, Emily M. Kewley, Kelley S. Brodsky, Eunyoung Tak, Stephanie Bonney, Merit Gobel, Devon Anderson, Louise E. Glover, Ann K. Riegel, Sean P. Colgan, and Holger K. Eltzschig
- 1257 CCR7 Is Mainly Expressed in Teleost Gills, Where It Defines an IgD⁺IgM⁻ B Lymphocyte Subset
Rosario Castro, Erin Bromage, Beatriz Abós, Jaime Pignatelli, Aitor González Granja, Alfonso Luque, and Carolina Tafalla
- 1267 IFN- γ -Mediated Induction of an Apical IL-10 Receptor on Polarized Intestinal Epithelia
Douglas J. Kominsky, Eric L. Campbell, Stefan F. Ehrentraut, Kelly E. Wilson, Caleb J. Kelly, Louise E. Glover, Colm B. Collins, Amanda J. Bayless, Bejan Saeedi, Evgenia Dobrinskikh, Brittelle E. Bowers, Christopher F. MacManus, Werner Müller, Sean P. Colgan, and Dunja Bruder

TRANSPLANTATION

- 1277 IL-1 β and TLR4 Signaling Are Involved in the Aggravated Murine Acute Graft-versus-Host Disease Caused by Delayed Bortezomib Administration
Yong Liang, Shoubao Ma, Yanming Zhang, Ying Wang, Qiao Cheng, Yan Wu, Yue Jin, Donghui Zheng, Depei Wu, and Haiyan Liu

TUMOR IMMUNOLOGY

- 1286 Adoptively Transferred Immune T Cells Eradicate Established Tumors despite Cancer-Induced Immune Suppression
Ainhoa Arina, Karin Schreiber, David C. Binder, Theodore G. Garrison, Rebecca B. Liu, and Hans Schreiber
- 1294 Mannan-Binding Protein, a C-Type Serum Lectin, Recognizes Primary Colorectal Carcinomas through Tumor-Associated Lewis Glycans
Motohiro Nonaka, Hirotugu Imaeda, Shogo Matsumoto, Bruce Yong Ma, Nobuko Kawasaki, Eiji Mekata, Akira Andoh, Yasuharu Saito, Tohru Tani, Yoshihide Fujiyama, and Toshisuke Kawasaki
- 1302 The (1 \rightarrow 6)- β -Glucan Moiety Represents a Cross-Reactive Epitope of Infection-Induced Malignancy Surveillance
Hongliang Dong, Hui Dai, Xiaomin Hu, Si-Dong Xiong, and Xiao-Ming Gao
- 1313 Gap Junction Intercellular Communications Regulate NK Cell Activation and Modulate NK Cytotoxic Capacity
Andrés Tittarelli, Ariadna Mendoza-Naranjo, Marcela Farías, Israel Guerrero, Fumitaka Ihara, Erik Wennerberg, Sebastian Riquelme, Alejandra Gleisner, Alexis Kalergis, Andreas Lundqvist, Mercedes N. López, Benedict J. Chambers, and Flavio Salazar-Onfray
- 1320 Transmembrane TNF- α Promotes Suppressive Activities of Myeloid-Derived Suppressor Cells via TNFR2
Xin Hu, Baihua Li, Xiaoyan Li, Xianxian Zhao, Lin Wan, Guohong Lin, Min Yu, Jing Wang, Xiaodan Jiang, Wei Feng, Zhihai Qin, Bingjiao Yin, and Zhuoya Li

CORRECTIONS

- 1332 Correction: In Vivo Ablation of Plasmacytoid Dendritic Cells Inhibits Autoimmunity through Expansion of Myeloid-Derived Suppressor Cells
Marianna Ioannou, Themis Alissafi, Louis Boon, Dimitrios Boumpas, and Panayotis Verginis
- 1333 Correction: Substrate-Induced Protein Stabilization Reveals a Predominant Contribution from Mature Proteins to Peptides Presented on MHC Class I
Jeff D. Colbert, Diego J. Farfán-Arribas, and Kenneth L. Rock
- 1334 Correction: Crucial Role of Granulocytic Myeloid-Derived Suppressor Cells in the Regulation of Central Nervous System Autoimmune Disease
Marianna Ioannou, Themis Alissafi, Iakovos Lazaridis, George Deraos, John Matsoukas, Achille Gravanis, Vasileios Mastorodemos, Andreas Plaitakis, Arlene Sharpe, Dimitrios Boumpas, and Panayotis Verginis

1335 AUTHOR INDEX