



Vaccine Adjuvants

Take your vaccine to the next level

InVivoGen



196 (4)

J Immunol 2016; 196:1433-1976; ;
<http://www.jimmunol.org/content/196/4>

This information is current as
of January 23, 2022.

Why *The JI*? [Submit online.](#)

- **Rapid Reviews! 30 days*** from submission to initial decision
- **No Triage!** Every submission reviewed by practicing scientists
- **Fast Publication!** 4 weeks from acceptance to publication

**average*

Subscription Information about subscribing to *The Journal of Immunology* is online at:
<http://jimmunol.org/subscription>

Permissions Submit copyright permission requests at:
<http://www.aai.org/About/Publications/JI/copyright.html>

Email Alerts Receive free email-alerts when new articles cite this article. Sign up at:
<http://jimmunol.org/alerts>

The Journal of Immunology is published twice each month by
The American Association of Immunologists, Inc.,
1451 Rockville Pike, Suite 650, Rockville, MD 20852
All rights reserved.
Print ISSN: 0022-1767 Online ISSN: 1550-6606.



IN THIS ISSUE

- 1433 **FRETting about Naive T Cells and Calcium** See article p. 1471
IRFs Influence DC Differentiation See article p. 1666
Cytokines Skew CD8⁺ T Cells during *Mycobacterium tuberculosis* See article p. 1822
Lipid-Loving $\gamma\delta$ T Cells See article p. 1933
Regulating Raft Recruitment See article p. 1955

BRIEF REVIEWS

- 1435 The Emerging Importance of IgG Fab Glycosylation in Immunity
Fleur S. van de Bovenkamp, Lise Hafkenscheid, Theo Rispens, and Yoann Rombouts

CUTTING EDGE

- 1443 Cutting Edge: CD99 Is a Novel Therapeutic Target for Control of T Cell–Mediated Central Nervous System Autoimmune Disease
Ryan C. Winger, Christopher T. Harp, Ming-Yi Chiang, David P. Sullivan, Richard L. Watson, Evan W. Weber, Joseph R. Podojil, Stephen D. Miller, and William A. Muller
- 1449 Cutting Edge: Eomesodermin Is Sufficient To Direct Type 1 Innate Lymphocyte Development into the Conventional NK Lineage
Olga Pikovskaya, Julie Chaix, Nyanza J. Rothman, Amélie Collins, Yen-Hua Chen, Anna M. Scipioni, Eric Vivier, and Steven L. Reiner
- 1455 Cutting Edge: MicroRNA-223 Regulates Myeloid Dendritic Cell–Driven Th17 Responses in Experimental Autoimmune Encephalomyelitis
Igal Ifergan, Siqi Chen, Bin Zhang, and Stephen D. Miller

On the cover: Photomicrographs of lung sections (H&E stained) obtained from GM-CSF—deficient mice at 14 d postinfection with an encapsulated strain of *Cryptococcus neoformans*, viewed at original magnification $\times 200$. Note the paucity of mature macrophages containing intracellular organisms with the numerous “uncontained” cryptococci within alveolar spaces. Chen, G.-H., S. Teitz-Tennenbaum, L. M. Neal, B. J. Murdock, A. N. Malachowski, A. J. Dils, M. A. Olszewski, and J. J. Osterholzer. 2016. Local GM-CSF—dependent differentiation and activation of pulmonary dendritic cells and macrophages protect against progressive cryptococcal lung infection in mice. *J. Immunol.* 196: 1810–1821.

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 © 2016 by The American Association of Immunologists, Inc.

ALLERGY AND OTHER HYPERSENSITIVITIES

- 1461 Fluvastatin Suppresses Mast Cell and Basophil IgE Responses: Genotype-Dependent Effects
Elizabeth Motunrayo Kolawole, Jamie Josephine Avila McLeod, Victor Ndaw, Daniel Abebayehu, Brian O. Barnstein, Travis Faber, Andrew J. Spence, Marcela Taruselli, Anuya Paranjape, Tamara T. Haque, Amina A. Qayum, Qasim A. Kazmi, Dayanjan S. Wijesinghe, Jamie L. Sturgill, Charles E. Chalfant, David B. Straus, Carole A. Oskeritzian, and John J. Ryan

ANTIGEN RECOGNITION AND RESPONSES

- 1471 Real-Time Analysis of Calcium Signals during the Early Phase of T Cell Activation Using a Genetically Encoded Calcium Biosensor
Marie Le Borgne, Saravanan Raju, Bernd H. Zinselmeyer, Viet T. Le, Jiafia Li, Yingxiao Wang, Mark J. Miller, and Andrey S. Shaw
- 1480 The Length Distribution of Class I–Restricted T Cell Epitopes Is Determined by Both Peptide Supply and MHC Allele–Specific Binding Preference
Thomas Trolle, Curtis P. McMurtrey, John Sidney, Wilfried Bardet, Sean C. Osborn, Thomas Kaefer, Alessandro Sette, William H. Hildebrand, Morten Nielsen, and Bjoern Peters

AUTOIMMUNITY

- 1488 C1q Modulates the Response to TLR7 Stimulation by Pristane-Primed Macrophages: Implications for Pristane-Induced Lupus
Francesco Carlucci, Attia Ishaque, Guang Sheng Ling, Marta Szajna, Ann Sandison, Philippe Donatien, H. Terence Cook, and Marina Botto
- 1495 Loss of Peripheral Protection in Pancreatic Islets by Proteolysis–Driven Impairment of VTCN1 (B7-H4) Presentation Is Associated with the Development of Autoimmune Diabetes
Ilian A. Radichev, Lilia V. Maneva-Radicheva, Christina Amatya, Maryam Salehi, Camille Parker, Jacob Ellefson, Paul Burn, and Alexei Y. Savinov
- 1507 Fatty Acid Amide Hydrolase Regulates Peripheral B Cell Receptor Revision, Polyreactivity, and B1 Cells in Lupus
Simanta Pathak, Kirthi Raman Kumar, Hasna Kanta, Ferdicia Carr-Johnson, Jie Han, Anna Bashmakov, Lionel Faure, Huihua Ding, Kamala Vanarsa, Shaheen Khan, Quan-Zhen Li, Kent Chapman, Edward K. Wakeland, and Chandra Mohan
- 1517 $\gamma\delta$ T Cells Protect the Liver and Lungs of Mice from Autoimmunity Induced by Scurfy Lymphocytes
Hideyuki Ujiie and Ethan M. Shevach
- 1529 CTL-Promoting Effects of IL-21 Counteract Murine Lupus in the Parent→F1 Graft-versus-Host Disease Model
Vinh Nguyen, Horea Rus, Ching Chen, and Violeta Rus
- 1541 Autoreactive CD19⁺CD20[−] Plasma Cells Contribute to Disease Severity of Experimental Autoimmune Encephalomyelitis
Ding Chen, Sara J. Ireland, Laurie S. Davis, Xiangmei Kong, Ann M. Stowe, Yue Wang, Wendy I. White, Ronald Herbst, and Nancy L. Monson
- 1550 Gut Microbiota Regulates K/BxN Autoimmune Arthritis through Follicular Helper T but Not Th17 Cells
Katharine E. Block, Zhong Zheng, Alexander L. Dent, Barbara L. Kee, and Haochu Huang

CLINICAL AND HUMAN IMMUNOLOGY

- 1558 Pivotal Role for CD16⁺ Monocytes in Immune Surveillance of the Central Nervous System
Anne Waschbisch, Sina Schröder, Dana Schraudner, Laura Sammet, Babette Weksler, Arthur Melms, Sabine Pfeifenbring, Christine Stadelmann, Stefan Schwab, and Ralf A. Linker
- 1568 Memory Stem T Cells in Autoimmune Disease: High Frequency of Circulating CD8⁺ Memory Stem Cells in Acquired Aplastic Anemia
Kobei Hosokawa, Pawel Muranski, Xingmin Feng, Danielle M. Townsley, Baoying Liu, Jared Knickelbein, Keyvan Keyvanfar, Bogdan Dumitriu, Sawa Ito, Sachiko Kajigaya, James G. Taylor, VI, Mariana J. Kaplan, Robert B. Nussenblatt, A. John Barrett, John O'Shea, and Neal S. Young

- 1579 S1PR4 Signaling Attenuates ILT 7 Internalization To Limit IFN- α Production by Human Plasmacytoid Dendritic Cells
Christina Dillmann, Christian Ringel, Julia Ringleb, Javier Mora, Catherine Olesch, Annika F. Fink, Edward Roberts, Bernhard Brüne, and Andreas Weigert

IMMUNE REGULATION

- 1591 IL-4 Inhibits the Biogenesis of an Epigenetically Suppressive PIWI-Interacting RNA To Upregulate CD1a Molecules on Monocytes/Dendritic Cells
Xue Zhang, Xin He, Chao Liu, Jun Liu, Qifei Hu, Ting Pan, Xiaobing Duan, Bingfeng Liu, Yiwen Zhang, Jingliang Chen, Xingru Ma, Xu Zhang, Haihua Luo, and Hui Zhang
- 1604 The Neonatal CD8⁺ T Cell Repertoire Rapidly Diversifies during Persistent Viral Infection
Vanessa Venturi, Kito Nzingha, Timothy G. Amos, Wisler C. Charles, Iryna Dekhtiarenko, Luka Cicin-Sain, Miles P. Davenport, and Brian D. Rudd
- 1617 Hepatic Stellate Cells Directly Inhibit B Cells via Programmed Death–Ligand 1
Yan Li, Lina Lu, Shiguang Qian, John J. Fung, and Feng Lin
- 1626 Allergy-Protective Arabinogalactan Modulates Human Dendritic Cells via C-Type Lectins and Inhibition of NF- κ B
Marcus Peters, Patrick M. Guidato, Karin Peters, Dominik A. Megger, Barbara Sitek, Birgit Classen, Esther M. Heise, and Albrecht Buße
- 1636 CD46 Activation Regulates miR-150–Mediated Control of GLUT1 Expression and Cytokine Secretion in Human CD4⁺ T Cells
Ben C. King, Jonathan L. S. Esguerra, Ewelina Golec, Lena Eliasson, Claudia Kemper, and Anna M. Blom
- 1646 Ecdysone Titer Determined by 3DE-3 β -Reductase Enhances the Immune Response in the Silkworm
Wei Sun, Yi-Hong Shen, Liang-Xiao Zhou, and Ze Zhang

IMMUNE SYSTEM DEVELOPMENT

- 1655 Hepatocyte Nuclear Factor 1A Is a Cell-Intrinsic Transcription Factor Required for B Cell Differentiation and Development in Mice
Karin von Wnuck Lipinski, Katherine Sattler, Susann Peters, Sarah Weske, Petra Keul, Hannes Klump, Gerd Heusch, Joachim R. Göthert, and Bodo Levkau
- 1666 IRF4 and IRF8 Act in CD11c⁺ Cells To Regulate Terminal Differentiation of Lung Tissue Dendritic Cells
Sandra Bajaña, Sean Turner, Jinny Paul, Erola Ainsua-Enrich, and Susan Kovats
- 1678 Kras Is Critical for B Cell Lymphopoiesis
Yuhong Chen, Yongwei Zheng, Xiaona You, Mei Yu, Guoping Fu, Xinlin Su, Fen Zhou, Wen Zhu, Zhihong Wu, Jing Zhang, Renren Wen, and Demin Wang

IMMUNOGENETICS

- 1686 Essential Roles of TIM-1 and TIM-4 Homologs in Adaptive Humoral Immunity in a Zebrafish Model
Xiao-gang Xu, Jing-fang Hu, Jun-xia Ma, Li Nie, Tong Shao, Li-xin Xiang, and Jian-zhong Shao

IMMUNOTHERAPY AND VACCINES

- 1700 Vaccine Induction of Lymph Node–Resident Simian Immunodeficiency Virus Env-Specific T Follicular Helper Cells in Rhesus Macaques
Diego A. Vargas-Inchaustegui, Andrew Demers, Julia M. Shaw, Guobin Kang, David Ball, Iskra Tuero, Thomas Musich, Venkatramanan Mohanram, Thorsten Demberg, Tatiana S. Karpova, Qingsheng Li, and Marjorie Robert-Guroff
- 1711 Long-Peptide Cross-Presentation by Human Dendritic Cells Occurs in Vacuoles by Peptide Exchange on Nascent MHC Class I Molecules
Wenbin Ma, Yi Zhang, Nathalie Vigneron, Vincent Stroobant, Kris Thielemans, Pierre van der Bruggen, and Benoît J. Van den Eynde
- 1721 A Recombinant G Protein Plus Cyclosporine A–Based Respiratory Syncytial Virus Vaccine Elicits Humoral and Regulatory T Cell Responses against Infection without Vaccine-Enhanced Disease
Chaofan Li, Xian Zhou, Yiwei Zhong, Changgui Li, Aihua Dong, Zhonghuai He, Shuren Zhang, and Bin Wang

- 1732 A Novel Factor H–Fc Chimeric Immunotherapeutic Molecule against *Neisseria gonorrhoeae*
Jutamas Shaughnessy, Sunita Gulati, Sarika Agarwal, Magnus Unemo, Makoto Ohnishi, Xia-Hong Su, Brian G. Monks, Alberto Visintin, Guillermo Madico, Lisa A. Lewis, Douglas T. Golenbock, George W. Reed, Peter A. Rice, and Sanjay Ram
- 1741 In Vivo Synthesis of Cyclic-di-GMP Using a Recombinant Adenovirus Preferentially Improves Adaptive Immune Responses against Extracellular Antigens
Fadel S. Alyaqoub, Yasser A. Aldhamen, Benjamin J. Koestler, Eric L. Bruger, Sergey S. Seregin, Cristiane Pereira-Hicks, Sarah Godbehere, Christopher M. Waters, and Andrea Amalfitano

INFECTIOUS DISEASE AND HOST RESPONSE

- 1753 NK Cell–Specific Gata3 Ablation Identifies the Maturation Program Required for Bone Marrow Exit and Control of Proliferation
Alaa Kassim Ali, Jun Seok Oh, Eric Vivier, Meinrad Busslinger, and Seung-Hwan Lee
- 1768 HIV-1 Env Glycoprotein Phenotype along with Immune Activation Determines CD4 T Cell Loss in HIV Patients
Anjali Joshi, Melina Sedano, Bethany Beauchamp, Erin B. Punke, Zuber D. Mulla, Armando Meza, Ogechika K. Alozie, Debabrata Mukherjee, and Himanshu Garg
- 1780 Differential Effects of *Escherichia coli* Nissle and *Lactobacillus rhamnosus* Strain GG on Human Rotavirus Binding, Infection, and B Cell Immunity
Sukumar Kandasamy, Anastasia N. Vlasova, David Fischer, Anand Kumar, Kuldeep S. Chattha, Abdul Rauf, Lulu Shao, Stephanie N. Langel, Gireesh Rajashekara, and Linda J. Saif
- 1790 TLR-Activated Gap Junction Channels Protect Mice against Bacterial Infection through Extracellular UDP Release
Juliang Qin, Guangxu Zhang, Xiaoyu Zhang, Binghe Tan, Zhangsheng Lv, Mingyao Liu, Hua Ren, Min Qian, and Bing Du
- 1799 Critical Role of Antimicrobial Peptide Cathelicidin for Controlling *Helicobacter pylori* Survival and Infection
Lin Zhang, William K. K. Wu, Richard L. Gallo, Evandro F. Fang, Wei Hu, Thomas K. W. Ling, Jing Shen, Ruby L. Y. Chan, Lan Lu, Xiao M. Luo, Ming X. Li, Kam M. Chan, Jun Yu, Vincent W. S. Wong, Siew C. Ng, Sunny H. Wong, Francis K. L. Chan, Joseph J. Y. Sung, Matthew T. V. Chan, and Chi H. Cho
- 1810 Local GM-CSF–Dependent Differentiation and Activation of Pulmonary Dendritic Cells and Macrophages Protect against Progressive Cryptococcal Lung Infection in Mice
Gwo-Hsiao Chen, Seagal Teitz-Tennenbaum, Lori M. Neal, Benjamin J. Murdock, Antoni N. Malachowski, Anthony J. Dils, Michal A. Olszewski, and John J. Osterholzer
- 1822 Multiple Inflammatory Cytokines Converge To Regulate CD8⁺ T Cell Expansion and Function during Tuberculosis
Matthew G. Booty, Cláudio Nunes-Alves, Stephen M. Carpenter, Pushpa Jayaraman, and Samuel M. Behar
- 1832 Potential Role of the Formation of Tunneling Nanotubes in HIV-1 Spread in Macrophages
Michihiro Hashimoto, Farzana Bhuyan, Masateru Hiyoshi, Osamu Noyori, Hesham Nasser, Mitsue Miyazaki, Tamio Saito, Yasumitsu Kondoh, Hiroyuki Osada, Shunsuke Kimura, Koji Hase, Hiroshi Ohno, and Shinya Suzu
- 1842 Swift and Strong NK Cell Responses Protect 129 Mice against High-Dose Influenza Virus Infection
Kai Zhou, Jing Wang, An Li, Wenming Zhao, Dongfang Wang, Wei Zhang, Jinghua Yan, George Fu Gao, Wenjun Liu, and Min Fang
- 1855 Inducible Expression of CXCL1 within the Central Nervous System Amplifies Viral-Induced Demyelination
Brett S. Marro, Jonathan J. Grist, and Thomas E. Lane
- 1865 Degranulating Neutrophils Promote Leukotriene B₄ Production by Infected Macrophages To Kill *Leishmania amazonensis* Parasites
Natália Tavares, Lilian Afonso, Martha Suarez, Mariana Ampuero, Deboraci Brito Prates, Théo Araújo-Santos, Manoel Barral-Netto, George A. DosReis, Valéria Matos Borges, and Cláudia Brodskyn

INNATE IMMUNITY AND INFLAMMATION

- 1874 Depletion of CD8⁺ T Cells Exacerbates CD4⁺ T Cell-Induced Monocyte-to-Fibroblast Transition in Renal Fibrosis
Yanjun Dong, Min Yang, Jing Zhang, Xiaogang Peng, Jizhong Cheng, Taigeng Cui, and Jie Du
- 1882 Pro- and Anti-Inflammatory Role of ChemR23 Signaling in Pollutant-Induced Inflammatory Lung Responses
Sharen Provoost, Katrien C. De Grove, Graeme L. Fraser, Vincent J. Lannoy, Kurt G. Tournoy, Guy G. Brusselle, Tania Maes, and Guy F. Joos
- 1891 p52 Overexpression Increases Epithelial Apoptosis, Enhances Lung Injury, and Reduces Survival after Lipopolysaccharide Treatment
Jamie A. Saxon, Dong-Sheng Cheng, Wei Han, Vasily V. Polosukhin, Allyson G. McLoed, Bradley W. Richmond, Linda A. Gleaves, Harikrishna Tanjore, Taylor P. Sherrill, Whitney Barham, Fiona E. Yull, and Timothy S. Blackwell
- 1900 CD28 Deficiency Enhances Type I IFN Production by Murine Plasmacytoid Dendritic Cells
Monica Macal, Miguel A. Tam, Charles Hesser, Jeremy Di Domizio, Pylvia Leger, Michel Gilliet, and Elina I. Zuniga
- 1910 Galectin-1 Couples Glycobiology to Inflammation in Osteoarthritis through the Activation of an NF- κ B-Regulated Gene Network
Stefan Toegel, Daniela Weinmann, Sabine André, Sonja M. Walzer, Martin Bilban, Sebastian Schmidt, Catharina Chiari, Reinhard Windhager, Christoph Krall, Idriss M. Bennani-Baiti, and Hans-Joachim Gabius
- 1922 Proresolving Actions of Synthetic and Natural Protease Inhibitors Are Mediated by Annexin A1
Juliana P. Vago, Luciana P. Tavares, Michelle A. Sugimoto, Grazielle Letícia N. Lima, Izabela Galvão, Thais R. de Caux, Kátia M. Lima, Ana Luíza C. Ribeiro, Fernanda S. Carneiro, Fernanda Freire C. Nunes, Vanessa Pinho, Mauro Perretti, Mauro M. Teixeira, and Lirlândia P. Sousa

MOLECULAR AND STRUCTURAL IMMUNOLOGY

- 1933 Molecular Analysis of Lipid-Reactive V δ 1 $\gamma\delta$ T Cells Identified by CD1c Tetramers
Sobhan Roy, Dalam Ly, Caitlin D. Castro, Nan-Sheng Li, Andrew J. Hawk, John D. Altman, Stephen C. Meredith, Joseph A. Piccirilli, D. Branch Moody, and Erin J. Adams
- 1943 Structural Illumination of Equine MHC Class I Molecules Highlights Unconventional Epitope Presentation Manner That Is Evolved in Equine Leukocyte Antigen Alleles
Shugang Yao, Jun Liu, Jianxun Qi, Rong Chen, Nianzhi Zhang, Yanjie Liu, Junya Wang, Yanan Wu, George Fu Gao, and Chun Xia
- 1955 Phosphatidylinositol 4-Phosphate 5-Kinase β Controls Recruitment of Lipid Rafts into the Immunological Synapse
Marinos Kallikourdis, Anna Elisa Trovato, Giuliana Roselli, Michela Muscolini, Nicla Porciello, Loretta Tuosto, and Antonella Viola

TUMOR IMMUNOLOGY

- 1964 Low-Intensity Focused Ultrasound Induces Reversal of Tumor-Induced T Cell Tolerance and Prevents Immune Escape
Sanmay Bandyopadhyay, Thomas J. Quinn, Lisa Scandiuizzi, Indranil Basu, Ari Partanen, Wolfgang A. Tomé, Fernando Macian, and Chandan Guba

- 1977 AUTHOR INDEX