



Explore what's possible with innovative
research tools

Discover the difference>



207 (5)

J Immunol 2021; 207:1223-1492; ;
<http://www.jimmunol.org/content/207/5>

This information is current as
of October 16, 2021.

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.



TOP READS

- 1223 **Macrophage Quorum Sensing** *See article p. 1250*
Th9/Th17 Balance in Allergy *See article p. 1265*
Neuropilin-1 Expressed on CD4 Effector T Cells *See article p. 1288*
RACK1 Promotes Viral Infection *See article p. 1411*
DC Regulator Limits Neuroinflammation *See article p. 1428*
KEAP-ing Cytokines in Check *See article p. 1437*

PILLARS OF IMMUNOLOGY

- 1225 Counting on You: How MHC Tetramers Revolutionized the Study of T Cell Memory and CD8⁺ T Cell Exhaustion
Thomas H. Mann and Susan M. Kaech

CLINICAL AND HUMAN IMMUNOLOGY

- 1229 Comprehensive Immunologic Evaluation of Bronchoalveolar Lavage Samples from Human Patients with Moderate and Severe Seasonal Influenza and Severe COVID-19
Daniel Reynolds, Cristina Vazquez Guillamet, Aaron Day, Nicholas Borcherding, Rodrigo Vazquez Guillamet, José Alberto Choreño-Parra, Stacey L. House, Jane A. O'Halloran, Joaquín Zúñiga, Ali H. Ellebedy, Derek E. Byers, and Philip A. Mudd
- 1239 Th22 Cells Are a Major Contributor to the Mycobacterial CD4⁺ T Cell Response and Are Depleted During HIV Infection
Rubina Bunjun, Fidilia M. A. Omondi, Mohau S. Makatsa, Roanne Keeton, Jerome M. Wendob, Tracey L. Müller, Caryn S. L. Prentice, Robert J. Wilkinson, Catherine Riou, and Wendy A. Burgers

On the cover: *IL9*-expressing CD4 T cells (i.e., Th9 cells) in allergic individuals exhibit a strong STAT5-repressive gene signature, indicating that STAT5 transcriptional repression may play an important role in their differentiation. This work demonstrates that STAT5 enhances Th9 development by suppressing a novel STAT3-independent Th17-like differentiation program. Canaria, D. A., B. Yan, M. G. Clare, Z. Zhang, G. A. Taylor, D. L. Boone, M. Kazemian, and M. R. Olson. 2021. STAT5 represses a STAT3-independent Th17-like program during Th9 cell differentiation. *J. Immunol.* 207: 1265–1274.

The Journal of Immunology (ISSN 0022-1767) is published twice each month by The American Association of Immunologists, Inc., 1451 Rockville Pike, Suite 650, Rockville, MD 20852, Phone: 301-634-7197, Fax: 301-246-8401. Subscription terms: New subscriptions and renewals begin January 1 and expire one year later (see <http://www.jimmunol.org/subscription> 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/Subscription/Claims>). Reprints of individual articles are available only from authors. Periodicals postage paid at Rockville, MD 20852, 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, 1451 Rockville Pike, Suite 650, Rockville, MD 20852. Copyright © 2021 by The American Association of Immunologists, Inc.

IMMUNE REGULATION

- 1250 Quorum Sensing by Gelsolin Regulates Programmed Cell Death 4 Expression and a Density-Dependent Phenotype in Macrophages
Reshma Kumari Sharma, Binita Goswami, Sukhen Das Mandal, Abhishek Guha, Belinda Willard, and Partho Sarothi Ray
- 1265 STAT5 Represses a STAT3-Independent Th17-like Program during Th9 Cell Differentiation
D. Alejandro Canaria, Bingyu Yan, Maia G. Clare, Zonghao Zhang, Grace A. Taylor, David L. Boone, Majid Kazemian, and Matthew R. Olson
- 1275 Differential Regulation of ATP- and UTP-Evoked Prostaglandin E₂ and IL-6 Production from Human Airway Epithelial Cells
Timothy S. Kountz, Amit Jairaman, Candace D. Kountz, Kenneth A. Stauderman, Robert P. Schleimer, and Murali Prakriya
- 1288 Neuropilin-1 Is Expressed on Highly Activated CD4⁺ Effector T Cells and Dysfunctional CD4⁺ Conventional T Cells from Naive Mice
Hanna Abberger, Romy Barthel, Jasmin Bahr, Jacqueline Thiel, Sina Luppus, Jan Buer, Astrid M. Westendorf, and Wiebke Hansen

IMMUNOTHERAPY AND VACCINES

- 1298 Multimodal Intralesional Therapy for Reshaping the Myeloid Compartment of Tumors Resistant to Anti-PD-L1 Therapy via IRF8 Expression
Ankit Patel, Takaaki Oba, Ryutaro Kajihara, Toshibiro Yokoi, Scott I. Abrams, and Fumito Ito
- 1310 FcRn-Targeted Mucosal Vaccination against Influenza Virus Infection
Susan Park Ochsner, Weizhong Li, Arunraj Mekhemadhom Rajendrakumar, Senthilkumar Palaniyandi, Gyanada Acharya, Xiaoyang Liu, Gefei Wang, Florian Krammer, Meiqing Shi, Wenbin Tuo, C. David Pauza, and Xiaoping Zhu

INFECTIOUS DISEASE AND HOST RESPONSE

- 1322 MicroRNA-21 Deficiency Promotes the Early Th1 Immune Response and Resistance toward Visceral Leishmaniasis
Sanjay Varikuti, Chaitanya Verma, Erin Holcomb, Bijay Kumar Jha, Agostinho Viana, Ritvik Maryala, Felipe Lamenza, Bryan K. McElwain, Nebiye Yentur Doni, Tracey Papenfuss, Steve Oghumu, Sreenivas Gannavaram, Hira L. Nakhasi, and Abhay R. Satoskar
- 1333 NK Cell Responses in Zika Virus Infection Are Biased towards Cytokine-Mediated Effector Functions
Christopher Maucourant, Gabriel Andrade Nonato Queiroz, Aurelien Corneau, Luana Leandro Gois, Aida Meghraoui-Kheddar, Nadine Tarantino, Antonio Carlos Bandeira, Assia Samri, Catherine Blanc, Hans Yssel, Maria Fernanda Rios Grassi, and Vincent Vieillard
- 1344 Protracted yet Coordinated Differentiation of Long-Lived SARS-CoV-2-Specific CD8⁺ T Cells during Convalescence
Tongcui Ma, Heeju Ryu, Matthew McGregor, Benjamin Babcock, Jason Neidleman, Guorui Xie, Ashley F. George, Julie Frouard, Victoria Murray, Gurjot Gill, Eliver Ghosn, Evan W. Newell, Sulggi A. Lee, and Nadia R. Roan
- 1357 Critical Role of Zinc Transporter (ZIP8) in Myeloid Innate Immune Cell Function and the Host Response against Bacterial Pneumonia
Sannette C. Hall, Deandra R. Smith, Shetty Ravi Dyavar, Todd A. Wyatt, Derrick R. Samuelson, Kristina L. Bailey, and Daren L. Knoell
- 1371 IFN- γ Drives TNF- α Hyperproduction and Lethal Lung Inflammation during Antibiotic Treatment of Postinfluenza *Staphylococcus aureus* Pneumonia
Atul K. Verma, Christopher Bauer, Sunil Palani, Dennis W. Metzger, and Keer Sun
- 1377 Ubiquitin Specific Protease 1 Expression and Function in T Cell Immunity
Kyla D. Omilusik, Marija S. Nadjsombati, Tomomi M. Yoshida, Laura A. Shaw, John Goulding, and Ananda W. Goldrath

- 1388 Protein Immunization Induces Memory CD4⁺ T Cells That Lack Th Lineage Commitment
Linda M. Sircy, Malia Harrison-Chau, Camille Leite Novis, Andrew Baessler, Jacklyn Nguyen, and J. Scott Hale
- 1401 Critical Roles of Phosphoinositide 3-Kinase δ in the Humoral Immune Response to *Trypanosoma congolense* Infection
Folayemi Olayinka-Adefemi, Chukwunonso Onyilagha, Nipun Jayachandran, Sen Hou, Ping Jia, Jude Uzonna, and Aaron J. Marshall

INNATE IMMUNITY AND INFLAMMATION

- 1411 RACK1 T50 Phosphorylation by AMPK Potentiates Its Binding with IRF3/7 and Inhibition of Type 1 IFN Production
Cheng Qin, Chunxiao Niu, Zhuo Shen, Yaolin Zhang, Genyu Liu, Chunmei Hou, Jie Dong, Min Zhao, Qianqian Cheng, Xiqin Yang, and Jiyan Zhang
- 1419 Non-Lyn Src Family Kinases Activate SIRP α -SHP-1 to Inhibit PI3K-Akt2 and Dampen Proinflammatory Macrophage Polarization
Lei Shi, Zhen Bian, Koby Kidder, Hongwei Liang, and Yuan Liu
- 1428 Activation of Transcription Factor 4 in Dendritic Cells Controls Th1/Th17 Responses and Autoimmune Neuroinflammation
Indumathi Manoharan, Daniel Swafford, Arulkumaran Shanmugam, Nikhil Patel, Puttur D. Prasad, Muthusamy Thangaraju, and Santhakumar Manicassamy
- 1437 Virus Infection Induces Keap1 Binding to Cytokine Genes, Which Recruits NF- κ B p50 and G9a-GLP and Represses Cytokine Transcription
Veronica Elizabeth Burns and Tom Klaus Kerppola
- 1448 Role of Endosomal TLRs in *Staphylococcus aureus* Infection
Germana Lentini, Agata Famà, Giuseppe Valerio De Gaetano, Roberta Galbo, Francesco Coppolino, Mario Venza, Giuseppe Teti, and Concetta Beninati

TUMOR IMMUNOLOGY

- 1456 IL-33 Induces Sema4A Expression in Dendritic Cells and Exerts Antitumor Immunity
Yasuhiko Suga, Izumi Nagatomo, Yubei Kinehara, Shohei Koyama, Daisuke Okuzaki, Akio Osa, Yujiro Naito, Hyota Takamatsu, Masayuki Nishide, Satoshi Nojima, Daisuke Ito, Takeshi Tsuda, Takeshi Nakatani, Yoshimitsu Nakanishi, Yu Futami, Taro Koba, Shingo Satoh, Yuki Hosono, Kotaro Miyake, Kiyoharu Fukushima, Takayuki Shiroyama, Kota Iwahori, Haruhiko Hirata, Yoshito Takeda, and Atsushi Kumanogoh

NOVEL IMMUNOLOGICAL METHODS

- 1468 Converting an Anti-Mouse CD4 Monoclonal Antibody into an scFv Positron Emission Tomography Imaging Agent for Longitudinal Monitoring of CD4⁺ T Cells
Ashraful Islam, Novalia Pishesha, Thibault J. Harmand, Hailey Heston, Andrew W. Woodham, Ross W. Cheloha, Djenet Bousbaine, Mohammad Rashidian, and Hidde L. Ploegh
- 1478 Continuous Culture of Mouse Primary B Lymphocytes by Forced Expression of *Bach2*
Joel Finney and Garnett Kelsoe

- 1493 AUTHOR INDEX