curriculum vitae

David Gilliam Schatz

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**Education**

1976-1980 Yale University, Department of Molecular Biochemistry and Biophysics

B.S.-M.S. *Summa cum Laude* (June, 1980)

Thesis supervisor: Dr. Donald Crothers

*Tissue Specificity of 5-Methyl-Cytosine in Highly Repetitive DNA*

1980-1982 New College, Oxford University

First Class Honors B.A. in Philosophy and Politics (July, 1982)

1982-1984 Harvard Medical School/Massachusetts Institute of Technology Health Sciences and Technology Program

1984-1990 Massachusetts Institute of Technology, Biology Department

Ph.D. (February, 1990); Supervisor: Dr. David Baltimore

*The Isolation of the V(D)J Recombination Activating Gene (RAG-1) by Gene Transfer*

Career

1990-1991 Postdoctoral Associate with Dr. David Baltimore, The Whitehead Institute for Biomedical Research

1991-1997 Assistant Professor, Yale School of Medicine, Section of Immunobiology

1991-2017 Investigator, Howard Hughes Medical Institute

1997-2000 Associate Professor, Yale School of Medicine, Section of Immunobiology

2000-present Professor, Yale School of Medicine, Department of Immunobiology

2008-present Professor of Molecular Biophysics and Biochemistry, Yale University

2016-present Chairperson, Department of Immunobiology, Yale School of Medicine

**Professional Honors and Recognition**

1979-1984 Beinecke Memorial Scholarship, awarded to Yale undergraduates in recognition of outstanding academic achievement. Provided support for final undergraduate year, and two years of postgraduate study.

1980 Snow Prize, Yale University's top overall award to a graduating student

1980-1982 Rhodes Scholarship

1982-1984 Harvard National Scholarship

1985-1990 Life and Health Insurance Medical Research Fund Medical Scientist Scholarship

1987-1989 Whitaker Health Sciences Fund Predoctoral Fellowship

1991 Cheryl Whitlock/Pathology Prize; for the outstanding contribution to the fields of hematopoiesis and leukemogenesis by an individual during training.

1994 National Science Foundation Presidential Faculty Fellows Award, given to 30 individuals annually. The PFF application announcement states: "Through the PFF awards, the President of the United States recognizes the scholarly activities of some of the Nation's most outstanding science and engineering faculty members, and the Fellows’ potential for leadership in academic pursuits."

1998 Chosen as a speaker at the “Festschrift Symposium” in honor of Dr. David Baltimore’s inauguration as President of the California Institute of Technology

2000 Invited speaker at the Keystone “Millennium Symposium”

2004 AAI-BD Biosciences Investigator Award

2007 MERIT Award, NIAID, NIH (R37AI032524) "Immunoglobulin and T cell receptor gene assembly"

2013 Elected member of the Henry Kunkel Society

2014 Elected member of the American Academy of Arts and Sciences

2016 Elected fellow of the American Association for the Advancement of Science

2018 Elected member of the National Academy of Sciences

2019 Elected member of the National Academy of Medicine

Grants

Active Grants

Source: NIH

Grant #: R01 AI 032524

Title: Mechanism and Targeting of V(D)J Recombination

Principal Investigator: David Schatz

Entire Project Period: 4/1/92-8/31/22

Description: The central objective of the experiments proposed in this grant is to determine the rules that govern RAG off-target activity by understanding the interactions that dictate RAG localization in the genome and the mechanisms that determine which cryptic RSSs are cleaved by RAG and which are spared.

Source: NIH

Grant #: R01 AI 127642

Title: Targeting of somatic hypermutation in the genome

Principal Investigator: David Schatz

Entire Project Period: 6/27/17-5/31/22

Description: This project focuses on determining the mechanisms responsible for the preferential targeting of the activation induced deaminase (AID) and of somatic hypermutation to Ig genes and determining the rules that govern their mis-targeting to other regions of the genome.

Source: NIH

Grant #: R01 CA 218141

Title: The role of AID/APOBEC3 proteins in genome instability in multiple myeloma

Principal Investigator: David Schatz

Entire Project Period: 6/15/17-5/31/22

Description: This project focuses on the causes of the chromosomal abnormalities that lead to Multiple Myeloma (MM) and examines how this is influenced by lipid accumulation such as occurs in Gaucher Disease. We will study how the Apobec 3 family of cytidine deaminases, together with lipids and immune cell activation, influence the integrity of the genetic information in MM cells and alter the ability of these cells to cause tumors.

Source: NIH

Grant #: R01 AI 137079

Title: Function and evolutionary origins of the RAG endonuclease

Principal Investigator: David Schatz

Entire Project Period: 9/11/18-8/31/23

Description: This work studies how RAG and evolutionarily related enzymes such as ProtoRAG bind and cut DNA and how transposition into the human genome is regulated and targeted. The overarching goal is to understand the evolutionary trajectory that led to the process of V(D)J recombination and to use this information to understand vital functional properties of the RAG endonuclease.

Source: NIH

Grant #: R01 AI 153040

Title: Mechanism and Fidelity of RAG meditated DNA recombination

Principal Investigator: Eli Rothenberg; D. Schatz, co-I

Entire Project Period: 6/10/20-5/31/25

Description: This work uses innovative single-molecule techniques to study the transition from RAG-mediated DNA cleavage to NHEJ-mediated DNA repair, seeking to fill two gaps in our knowledge: 1) What are the steps and RAG-NHEJ factor interactions the mediate this process? And 2) How are the RAG and NHEJ complexes organized and regulated in the recombination centers within which V(D)J recombination takes place in vivo? The Schatz lab will produce novel reagents used in single-molecule experiments and cell lines used for imaging and conduct concurrent biochemical analyses and modeling work.

Completed Grants (last three years)

None

Patents

U. S. Patent # 5,159,066

Title: Recombination Activating Gene (RAG-1)

Date issued: October 27, 1992

U.S. Patent # 5,851,796

Title: An Autoregulatory Tetracycline-Regulated System for Inducible Gene Expression in Eukaryotes

Date issued: December 22, 1998

Professional Service

1996-present Editorial Board, *Molecular and Cellular Biology*

1996, 2001 Member of site visit teams to review branches of the National Cancer Institute

1998 Site visit of Immunology Program, University of Connecticut Health Center

1999 Co-organizer of the Memorial Symposium in Molecular Hematopoiesis, to honor the memory of Drs. Eugenia Spanopoulou and Andrew Hodtsev

2000-2003 Editor, *Immunity*

2003-2008 Editorial Board, *Immunological Reviews*

2003-present Editorial Board, *Immunity*

2002-present Principal Investigator, NIH T32 Training Grant "Yale Interdisciplinary Immunology Training Program" (total direct costs $3,293,099 for period 2017-2022)

2004-2006 Regular member, NIH Study Section CMI-A

2008-2010 Chair, NIH Study Section CMI-A

2016 Editorial Review Panel Member for NIH Director’s New Innovator Award Program

2019-present Advisory Editorial Board, *Trends in Immunology*

2020-present External Advisory Committee, Gerstner-Memorial Sloan Kettering Cancer Center Graduate School of Biomedical Sciences

Journal reviewer: BMC family journals, Blood, Cancer Cell, Cell, Cell Reports, Cell Research, Current Biology, EMBO Journal, European Journal of Immunology, Genes and Development, Immunity, Journal of Biological Chemistry, Journal of Clinical Investigation, Journal of Experimental Medicine, Journal of Immunology, Journal of Molecular Biology, Molecular Cell, Molecular and Cellular Biology, Nature, Nature Communications, Nature Immunology, Nucleic Acids Research, PLoS Biology, PLoS ONE, PNAS, Science

Ad hoc reviewer: Australian Office of the National Health and Medical Research Council, Israel Science Foundation, Human Frontiers of Science, Macromolecular Structure and Function B (NIH), March of Dimes, National Science Foundation, National Cancer Institute intramural review panels (NIH), The Netherlands Organisation for Health Research and Development, Wellcome Trust

University Administrative Activities

1993-2001 Yale Health Professions Advisory Board

1994-2003, 2012-2013: Director of Graduate Studies, Department of Immunobiology

1994-2007 Director of Graduate Admissions, Immunology Track, BBS Program

1995-1996 Chair, Committee to establish independent Immunology Graduate Program

1995-1997 Committee to establish the BBS Program, Yale Graduate School

1997-present Executive Committee, BBS Program

2000-2004 Executive Committee, Department of Immunobiology

2000-2003 Yale Medical School Senior Faculty Slot Allotment Committee

2004-2007 Yale University Biological Sciences Advisory Committee

2004-2007 Yale University Biological Sciences Tenure Appointments Committee

2009-2012 MD-PhD Program Admissions Committee, Yale Medical School

2011-2014 Term Appointments and Promotion Committee, Yale Medical School

2013-2015 Medical School Curriculum Revision Executive Committee

2013-2014 Yale College Joint Committee for the Marshall and Rhodes Scholarships

2013-2016 Vice Chair for the basic sciences, Department of Immunobiology

2016-present Chairperson, Department of Immunobiology, Yale School of Medicine

2018-2020 Co-chair, Academic Leadership Committee, Yale School of Medicine

2018-2019 Teaching Award Selection Committee, Yale School of Medicine

2020 Chair, Search committee for chair of the Department of Neuroscience

Invited Lectures (Selected Lectures and National/International Meetings)

1992

Keystone Symposium “Molecular Mechanisms in DNA Replication and Recombination”, Taos, NM

Stony Brook Symposium on Molecular Biology, Molecular and Developmental Regulation of the Immune System, Stony Brook, NY

American Society of Nephrology, Conference on Transcriptional Control and Differentiation, Phoenix, AZ

1994

Medical Research Council Meeting “V(D)J Recombination, DNA Repair and Hypermutation”, Brighton, England

1995

International Congress of Immunology, San Francisco, CA

1996

Gordon Conference on Immunochemistry & Immunobiology, Ventura, CA

INSERM meeting “V(D)J Recombination and Other Models of DNA Repair and Mutagenesis, Aix-les-Bain, France

1997

Keystone Symposium “Transposition and Site-Specific Recombination”, Santa Fe, NM

1998

Midwinter Conference of Immunologists, Asilomar, CA

California Institute of Technology, “Festshrift Symposium” in honor of David Baltimore, Pasadena, CA

International Workshop on Site-Specific Recombination and Transposition, Oxford, England

1999

Keystone Symposium “B Lymphocyte Biology and Disease” (Workshop Chairman), Taos, NM

Gordon Conference “Immunochemistry and Immunobiology” Il Ciocco, Italy

DIBIT, San Raffaele Scientific Institute, Milan, Italy

Memorial Symposium in Molecular Hematopoiesis, New York, NY

2000

Keystone Symposium, “Millenium Symposium”, Keystone, CO

American Associate of Immunologists Annual Meeting, Seattle, WA

2001

FASEB Summer Conference on Genetic Recombination and Genome Rearrangements The Leukemia and Lymphoma Society’s Stohlman Scholar Symposium

Mount Sinai School of Medicine, Spanopoulou Memorial Lecture, New York, NY

2002

Cold Spring Harbor Immunology Meeting, Gene Expresion and Signaling in the Immune System, Chair, Session on Control of Antigen Receptor Gene Assembly, Cold Spring Harbor, NY

Whitehead Alumni Symposium, Whitehead Institute

Gordon Research Conference on Mutagenesis

2003

Keystone Meeting, B Cells and Antibodies: Laboratory to Clinic, Keystone, C)

Canadian Society of Immunology, Alberta, Canada

FASEB Summer Research Conferences, Saxtons River, VT

2004

American Associate of Immunologists Annual Meeting, 2004 AAI-BD Investigator Award Lecture, Washington, DC

Cold Spring Harbor Immunology Meeting, Gene Expresion and Signaling in the Immune System, Cold Spring Harbor, NY

12th International Congress of Immunology, Montreal, Canada

2005

Keystone Symposia, Innate Immunity to Pathogens, Steamboat Springs, CO

President’s Research Seminar, Memorial Sloan-Kettering Cancer Center, New York, NY

Annual Meeting of the Japanese Society for Immunology, Kyoto, Japan

2006

Cold Spring Harbor Meeting, Gene Expresion and Signaling in the Immune System, Cold Spring Harbor, NY

Workshop on Site-Specific Recombination, Transposition and DNA Dynamics, St. Catherines College, Oxford

2007

Keystone Meeting, Biology of B Cells in Health and Disease, Banff, Alberta, Canada

American Society of Biochemistry and Molecular Biology Annual Meeting, Washington, DC

Cold Spring Harbor Immunology Meeting, Gene Expresion and Signaling in the Immune System, Cold Spring Harbor, NY

AID Biology Workshop, Chapel Hill, NC

2009

ASM Conference on DNA Repair and Mutagenesis, Whistler, Canada

FASEB Meeting, Molecular Mechanisms of Lymphocyte Differentiation: from Stem Cells to Effector Cells, Carefree, AZ

American College of Rheumatology, State of the Art Lecture, ACR Meeting, Philadelphia, PA

2010

Cold Spring Harbor Meeting, Gene Expression and Signaling in the Immune System, Cold Spring Harbor, NY

NIH Symposium, Mechanisms and Consequences of Chromosomal Translocations, Bethesda, MD

3rd International Symposium on Regulators of Adaptive Immunity, Erlangen, Germany

2011

Keystone Meeting, B Cells: New Insights into Normal Versus Dysregulated Function, Whistler, British Columbia, Canada

2012

Keystone Meeting, Mutations, Malignancy and Memory, Boston, MA

Cold Spring Harbor Meeting, Gene Expression and Signaling in the Immune System, Cold Spring Harbor, NY

2013

Cold Spring Harbor Symposium on Immunity and Tolerance, Cold Spring Harbor, NY

FASEB Meeting, Molecular Mechanisms of Lymphocyte Development and Function, Steamboat Springs, CO

American Society of Hematology Annual Meeting, New Orleans, LA

2014

Keystone Meeting, Biology of B Cell Responses, Keystone, CO

Cold Spring Harbor Meeting, Gene Expression and Signaling in the Immune System, Cold Spring Harbor, NY

Keynote lecture, "Infections, Immunity and Vaccines”, University of Texas Health Science Center, San Antonio, TX

2015

FASEB Meeting, Molecular Mechanisms of Lymphocyte Development and Function, Big Sky, MT

B cell Affinity Maturation: a celebration of the life of Herman Eisen; Washington University, St Louis, MO

2016

Cold Spring Harbor Meeting, Gene Expression and Signaling in the Immune System, Cold Spring Harbor, NY

2017

Gordon Research Conference, RNA Editing: Biology and Mechanisms of RNA and DNA Modification, Ventura, CA

FASEB Meeting, Molecular Mechanisms of Lymphocyte Development and Function, Snowmass, CO (meeting co-organizer)

EMBO/EMBL Symposium: The Mobile Genome: Genetic and Physiological Impacts of Transposable Elements, Heidelberg, Germany

2018

National Cancer Institute Center of Excellence in Immunology: Frontiers in Basic Immunology, Bethesda, MD

Cold Spring Harbor Meeting, Transposable Elements, Cold Spring Harbor, NY

2019

Seventh Australian B Cell Dialogue, Melbourne, Australia

Immunobiology in the Twenty-First Century; Joint Yale University- Shanghai Jiao Tong University School of Medicine Symposium; Shanghai, China

Heidelberger-Kabat Lecture, Columbia University, Department of Microbiology & Immunology

FASEB Meeting, Molecular Mechanisms of Lymphocyte Development and Function, Snowmass, CO (meeting co-organizer)

International Titisee Conference, Evolution of Immune Defense Mechanisms, Titisee/Black Forest, Germany (meeting co-organizer)

2020

Cold Spring Harbor Meeting, Gene Expression and Signaling in the Immune System, Cold Spring Harbor, NY (postponed to October, 2020; now in virtual format)

Keynote lecture, Johns Hopkins Graduate Program in Immunology Retreat

Koshland Lecture, University of Chicago, Department of Immunology

2021

Non-homologous end joining in development, cancer, and the response to DNA damage, Paris, France (postponed from 2020)

Antibody Diversification and DNA Deaminases in Immunity and Cancer, Quebec City, Canada (postponed from 2020)

The Mobile Genome: Genetic and Physiological Impacts of Transposable Elements, keynote lecture, EMBL Advanced Training Center, Heidelberg, Germany

Peer Reviewed Publications

1. Landau, N. R., **Schatz, D. G.**, Rosa, M. and Baltimore, D. (1987). Increased frequency of N-region insertion in a murine pre-B-cell line infected with a terminal deoxynucleotidyl transferase retroviral expression vector. Mol. Cell. Biol. 7 , 3237-3243.
2. **Schatz, D. G.** and Baltimore, D. (1988). Stable expression of immunoglobulin gene V(D)J recombinase activity by gene transfer into 3T3 fibroblasts. Cell 53, 107-115.
3. Hendrickson, E. A., **Schatz, D. G.** and Weaver, D. T. (1988). The scid gene encodes a trans-acting factor that mediates the rejoining event of Ig gene rearrangement. Genes Dev. 2 , 817-829.
4. **Schatz, D. G.**, Oettinger, M. A. and Baltimore, D. (1989) The V(D)J recombination activating gene, RAG-1. Cell 59, 1035-1048.
5. Oettinger, M. A., **Schatz, D. G.**, Gorka, C. and Baltimore, D. (1990). RAG-1 and RAG-2, adjacent genes that synergistically activate V(D)J recombination. Science 248, 1517-1523.
6. Chun, J. J. M., **Schatz, D. G.**, Oettinger, M. A., Jaenisch, R. and Baltimore, D. (1991). The recombination activating gene-1 (RAG-1) transcript is present in the murine central nervous system. Cell 64, 189-200.
7. Carlson, L. M., Oettinger, M. A., **Schatz, D. G.**, Masteller, E. L., Hurley, E. A., McCormack, W. T., Baltimore, D. and Thompson, C. B. (1991). Selective expression of RAG-2 in chicken B cells undergoing immunoglobulin gene conversion. Cell 64, 201-208.
8. Turka, L. A., **Schatz, D. G.**, Oettinger, M. A., Chun, J. J. M., Gorka, C., Lee, K., McCormack, W. T., Baltimore, D. and Thompson, C. B. (1991). Thymocyte expression of the recombination activating genes RAG-1 and RAG-2 is terminated by T-cell receptor stimulation. Science 253, 778-781.
9. Hendrickson, E. A., Qin, X., Bump, E. A., **Schatz, D. G.**, Oettinger, M. A. and Weaver, D. T. (1991). A link between double-stranded break repair and V(D)J recombination: the scid mutation. Proc. Natl. Acad. Sci. USA 88, 4061-4065.
10. Oettinger, M. A., Stanger, B., **Schatz, D. G.**, Glaser, T., Call, K., Housman, D. and Baltimore, D. (1991). The recombination activating genes, RAG-1 and RAG-2, are on chromosome 11p in humans and chromosome 2 in mice. Immunogenetics, 35, 97-101.
11. Petrie, H. T., Livàk, F., **Schatz, D. G.**, Strasser, A., Crispe, I. N., and Shortman, K. (1993). Multiple rearrangements in TCR- chain genes maximize the production of useful thymocytes. J. Exp. Med. 178, 615-622.
12. Hubank, M. and **Schatz, D. G.** (1994). Identifying differences in mRNA expression by representation difference analysis of cDNA. Nucl. Acids Res. 22, 5640-5648.
13. Livàk, F., Petrie, H. T., Crispe, I. N., and **Schatz, D. G.** (1995). In frame TCR  gene rearrangements play a critical role in the  T cell lineage decision. Immunity 2, 617-627.
14. Shockett, P., Difilippantonio, M., Hellman, N., and **Schatz, D. G.** (1995) A modified tetracycline-regulated system provides autoregulatory inducible gene expression in cultured cells and transgenic mice. Proc. Natl. Acad. Sci. USA 92, 6522-6526.
15. Leu, M. J., and **Schatz, D. G.** (1995). Rag-1 and rag-2 are components of a high molecular weight complex and association of rag-2 with this complex is rag-1 dependent. Mol. Cell. Biol. 15, 5657-5670.
16. Grawunder, U., Leu, T. M. J., **Schatz, D. G.**, Werner, A., Rolink, A. G., Melchers, F., and Winkler, T. H. (1995). Downregulation of RAG-1 and RAG-2 gene expression in preB cells after functional immunoglobulin heavy chain rearrangement. Immunity 3, 601-608.
17. Livàk, F., and **Schatz, D. G.** (1996). T-cell receptor alpha locus V(D)J recombination by-products are abundant in thymocytes and mature T cells. Mol. Cell. Biol. 16, 609-618.
18. Eastman, Q. M., Leu, T. M. J., and **Schatz, D. G.** (1996). Initiation of V(D)J recombination in vitro obeying the 12/23 rule. Nature 380, 85-88.
19. Grawunder, U., **Schatz, D. G.**, Leu, T. M. J., Rolink, A., and Melchers, F. (1996). The half-life of RAG-1 protein in precursor B cells is increased in the absence of RAG-2 expression. J. Exp. Med. 183, 1731-1737.
20. Hoffman, E. S., Passoni, L., Crompton, T., Leu, T. M. J., **Schatz, D. G.**, Koff, A., Owen, M. J., and Hayday, A. C. (1996). Productive T-cell receptor chain gene rearrangement: coincident regulation of cell cycle and clonality during development in vivo. Genes Dev. 10, 948-962.
21. Rodgers, K. K., Bu, Z., Fleming, K. G., **Schatz, D. G.**, Engelman, D. M., and Coleman, J. E. (1996). A unique zinc-binding dimerization motif domain in RAG-1 includes the C3HC4 motif. J. Mol. Biol. 260, 70-84.
22. Livàk, F., Welsh, S. C., Guidos, C. J., Crispe, I. N., Danska, J. S., and **Schatz, D. G.** (1996). Transient restoration of gene rearrangement at multiple T cell receptor loci in  irradiated scid mice. J. Exp. Med. 184, 419-428.
23. Difilippantonio, M. J., McMahan, C. J., Eastman, Q. M., Spanopoulou, E., and **Schatz, D. G.** (1996). RAG1 mediates signal sequence recognition and recruitment of RAG2 in V(D)J recombination. Cell 87, 253-262.
24. Han, S., Zheng, B., **Schatz, D. G.**, Spanopoulou, E., and Kelsoe, G. (1996). Neotany in lymphocytes: Rag1 and Rag2 expression in germinal center B cells. Science 274, 2094-2097.
25. McMahan, C. J., Sadofsky, M. J., and **Schatz, D. G.** (1997). Definition of a large region of RAG1 that is important for co-immunoprecipitation of RAG2. J. Immunol. 158, 2202-2210.
26. Livàk, F., and **Schatz, D. G.** (1997). Identification of V(D)J recombination coding end intermediates in normal thymocytes. J. Mol. Biol. 267, 1-9.
27. Agrawal, A., and **Schatz, D. G.** (1997). RAG1 and RAG2 form a stable post-cleavage synaptic complex with DNA containing signal ends in V(D)J recombination. Cell 89, 43-53.
28. McMahan, C. J., Difilippantonio, M. J., Rao, N., Spanopoulou, E. S., and **Schatz, D. G.** (1997). A basic motif in the N-terminal region of RAG1 enhances recombination activity. Mol. Cell. Biol. 17, 4544-4552.
29. Bellon, S. F., Rodgers, K. K., **Schatz, D. G.**, Coleman, J. E., and Steitz, T. A. (1997). The crystal structure of the RAG1 dimerization domain reveals multiple zinc-binding motifs including a novel zinc binuclear cluster. Nature Struct. Biol. 4, 586-591.
30. Leu, T. M. J., Eastman, Q. M., and **Schatz, D. G.** (1997). Coding joint formation in a cell free V(D)J recombination system. Immunity 7, 303-314.
31. Livàk, F., Wilson, A., MacDonold, H. R., and **Schatz, D. G.** (1997).  lineage committed thymocytes can be rescued by the  TCR in the absence of TCR-. Eur. J. Immunol. 27, 2948-2958.
32. Eastman, Q. M., and **Schatz, D. G.** (1997). Nicking is asynchronous and stimulated by synapsis in 12/23-rule regulated V(D)J recombination. Nucleic Acids Res. 25, 4370-4378.
33. Livàk, F., and **Schatz, D. G.** (1998). Alternative splicing of rearranged T-cell receptor  sequences to the constant region of the  locus. Proc. Natl. Acad. Sci. USA, 95, 5694-5699.
34. Agrawal, A., Eastman, Q.M., **Schatz, D. G.** (1998) Transposition mediated by RAG1 and RAG2 and its implications for the evolution of the immune system. Nature 394, 744-751.
35. Eynon, E. E., Livàk, F., Kuida, K., **Schatz, D. G.**, and Flavell, R. A. (1999). Distinct effects of JAK3 signaling on  and  thymocyte development. J. Immunol., 162, 1448-1459.
36. Livàk, F., Tourigny, M., **Schatz, D. G.**, and Petrie, H. T. (1999). Characterization of TCR gene rearrangements during adult murine T cell development. J. Immunol., 162, 2575-2580.
37. Eastman, Q. M., Villey, I. J., and **Schatz, D. G.** (1999). Detection of RAG protein-V(D)J recombination signal interactions near the site of DNA cleavage by UV cross-linking. Mol. Cell. Biol., 19, 3788-3797.
38. Shockett, P. E., and **Schatz, D. G.** (1999). DNA hairpin opening mediated by the RAG1 and RAG2 proteins. Mol. Cell. Biol., 19, 4159-4166.
39. Rodgers, K. K., Villey, I. J., Ptaszek, L., Corbett, E., **Schatz, D. G.**, and Coleman, J. E. (1999). A dimer of the lymphoid protein RAG1 recognizes the recombination signal sequence and the complex stably incorporates the high mobility group protein HMG2. Nucleic Acids Res., 27, 2938-2946.
40. Fugmann, S. D., Villey, I. J., Ptaszek, L. M., and **Schatz, D. G.** (2000). Identification of two catalytic residues in RAG1 that define a single active site within the RAG1/RAG2 protein complex. Mol. Cell 5, 97-107.
41. Tevelev, A., and **Schatz, D. G.** (2000). Intermolecular V(D)J recombination. J. Biol. Chem. 12, 8341-8348.
42. Livàk, F., Burtrum, D., Rowen, L., **Schatz, D. G.**, and Petrie, H. T. (2000). Genetic modulation of TCR gene segment usage during somatic recombination. J. Exp. Med. 192, 1191-1196.
43. Papavasiliou, F. N., and **Schatz, D. G.** (2000). Cell-cycle-regulated DNA double-stranded breaks in somatic hypermutation of immunoglobulin genes. Nature 408, 216-221.
44. Fugmann, S. D., and **Schatz, D. G.** (2001). Identification of basic residues in RAG2 critical for DNA binding by the RAG1-RAG2 complex. Mol. Cell, 8, 899-910.
45. Papavasiliou, F. N., and **Schatz, D. G.** (2002). The activation induced deaminase functions in a post-cleavage step of the somatic hypermutation process. J. Exp. Med., 195, 1193-1198.
46. Chen, J. S., Kelz, M. B., Zeng, G. Q., Steffen, C., Shockett, P. E., Terwilliger, G., **Schatz, D. G.**, and Nestler, E. J. (2002). Inducible, reversible hair loss in transgenic mice. Transgenic Res. 11, 241-247.
47. Tsai, C. L., Drejer, A. H., and **Schatz, D. G.** (2002). Evidence of a critical architectural function for the RAG proteins in end processing, protection, and joining in V(D)J recombination. Genes Dev 16, 1934-49.
48. Hesslein, D. G. T., Pflugh, D. L., Chowdhury, D., Bothwell, A. L. M., Sen, R., and Schatz, D. G. (2003). Pax5 is required for recombination of transcribed, acetylated, 5' IgH V gene segments. Genes Dev., 17, 37-42.
49. Ciubotaru, M., Ptaszek, L. M., Baker, G. A., Baker, S. N., Bright, F. V., and **Schatz, D. G.** (2003). RAG1-DNA binding in V(D)J recombination. Specificity and DNA-induced conformational changes revealed by fluorescence and CD spectroscopy. J. Biol. Chem. 278, 5584-96.
50. Jung, D., Bassing, C. H., Fugmann, S. D., Cheng, H. L., **Schatz, D. G.**, and Alt, F. W. (2003). Extrachromosomal recombination substrates recapitulate beyond 12/23 restricted V(D)J recombination in nonlymphoid cells. Immunity 18, 65-74.
51. Rooney, S., Alt, F. W., Lombard, D., Whitlow, S., Eckersdorff, M., Fleming, J., Fugmann, S., Ferguson, D. O., **Schatz, D. G.**, and Sekiguchi, J. (2003). Defective DNA repair and increased genomic instability in Artemis-deficient murine cells. J. Exp. Med. 197, 553-65.
52. Tsai, C. L., and **Schatz, D. G.** (2003). Regulation of RAG1/RAG2-mediated transposition by GTP and the C-terminal region of RAG2. EMBO J. 22, 1922-30.
53. Lee, A. I., Fugmann, S. D., Cowell, L. G., Ptaszek, L. M., Kelsoe, G., and **Schatz, D. G.** (2003). A functional analysis of the spacer of V(D)J recombination signal sequences. PLoS Biol., 1, 56-69.
54. Tsai, C. L., Chatterji, M., and **Schatz, D. G.** (2003). DNA mismatches and GC-rich motifs target transposition by the RAG1/RAG2 transposase. Nucl. Acids. Res., 31, 6180-6190.
55. Shockett, P. E., Zhou, S., Hong, X., and **Schatz, D. G.** (2004). Partial reconstitution of V(D)J rearrangement and lymphocyte development in RAG-deficient mice expressing inducible, tetracycline-regulated RAG transgenes. Mol. Immunol., 40, 813-829.
56. Zheng, W.-P., Zhao, Q., Zhao, X., Li, B., Hubank, M., **Schatz, D. G.**, and Flavell, R. A. (2004). Up-regulatin of Hlx in early developing T helper cells promotes IFN- expression. J. Immunol., 172, 114-122.
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