

## DAVID B. LEWIS, M.D.

### A. IDENTIFYING DATA

Birthdate: January 1, 1955  
Birthplace: Los Angeles, California  
Citizenship: U.S.  
California Medical License

### B. ACADEMIC HISTORY

#### 1. EDUCATION

Yale University, New Haven, CT,	B.S., 1976	Biology
University of California, San Francisco, CA	M.D., 1981	Medicine

#### 2. SCHOLARSHIPS and HONORS

1976	Phi Beta Kappa, Yale University
1976	B.S., Summa Cum Laude in Biology, Yale University
1981	Alpha Omega Alpha, University of California

#### 3. POST-DOCTORAL AND RESIDENCY TRAINING

1981-82	Intern Pediatrics	Children's Hospital and Medical Center/University of Washington, Seattle, Washington
1982-84	Resident Pediatrics	University of California, San Francisco, California
1985-88	Senior Fellow Pediatric Infectious Disease	University of Washington/Children's Hospital and Medical Center, Seattle, Washington

#### 4. MEDICAL LICENSURE AND BOARD CERTIFICATION

1985-2012	Washington Medical License
1982-present	California Medical License
1986	American Board of Pediatrics
1994	Pediatric Infectious Diseases Sub-Board American Board of Pediatrics

#### 5. PAST GRANT SUPPORT

1985-1987	NIH, F32 HD06706, Individual National Research Award (Principal Investigator)
1988-1993	NIH First Independent Research Award, Ontogeny of Interferon-Gamma & Interleukin-4 Production (Principal Investigator)
1992-1997	NIH R01 AR41657, Mechanism of Osteoporosis in IL-4 Transgenic Mice (Principal Investigator)
1993-1997	NIH Program Project AI34578, Project 2, Regulation of Allergic Lung Inflammation by IL-4 and IFN- $\gamma$ (Principal Investigator)
1993-1997	NIH R01 AI26940, Regulation of IL-4 and IL-4-Mediated Immunity (Principal Investigator)

- 1997-2001 NIH RO1 HD36291, Mechanisms of Reduced Cytokine Production by Neonatal T Cells , Principal Investigator
- 1998-2000 NIH R21 HD37589, Differential Gene Expression by T Cells and Thymocytes, Principal Investigator
- 1998-2002 NIH R01 AI44699, Role of Viral-Induced Co-Stimulatory Molecules in the Development of Asthma, Principal Investigator
- 2000-2004 NIH P01 AI48212, Vaccine Immunology Basic Research Center Grant, Project Leader of “Postnatal ontogeny of HCMV-specific CD4 T cell immunity”
- 2001-2006 NIH P01 AI00013, Transplant Arteriosclerosis: Viral and Host Mechanisms, Project Leader, “Host-viral immune responses in transplant arteriosclerosis”, Project Leader (Project 1, Host-Viral Immune Responses in Transplant Arteriosclerosis)
- 2003-2007 NIH R01 AI053589 (C. Dekker, PI), Health Impact of Congenital Cytomegalovirus Infection, Co-investigator
- 2003-2008 NIH U19 AI-02-042 (A. Arvin, PI) Cooperative Centers for Translational Research on Human Immunology and Biodefense: Protective Mechanisms Against Pandemic Respiratory Virus, Project Leader (Project 1 CD4 T cells) and Principal Investigator (Educational Component)
- 2005-2008 Dana Foundation (PI) Mechanism of T-cell immunodeficiency in Schimke immuno-osseous dysplasia.
- 2006-2008 NIH STTR PAS-02-149 Lipid/DNA/Antigen Complexes for Influenza A Viral Vaccination (Principal Investigator for Stanford University)
- 2007-2012 NIH U01 AI-06022 Adjuvant Enhanced Antiviral Immunity (Principal Investigator for Stanford University)
- 2009-2010 NIH R56, AI-083757-01, Recent Thymic Emigrants of the CD4 T-cell Lineage. Principal Investigator (Bridge Grant for a R01 Application that was funded).
- 2010-2012 NIH AI-090448 Microfluidic Diagnostics for Primary Immunodeficiency (Butte MJ, PI). Co-investigator.
- 2010-2013 NIH R01, AI-10014. Leukocyte Signaling in the Elderly and Vaccine Immunogenicity. Principal Investigator. 2010-2015
- 2010-2015 NIH R01, AI-083757, Recent Thymic Emigrants of the CD4 T-cell Lineage. Principal Investigator.
- 2010-2015 NIH U19 Vaccination and Infection: Indicators of Immunological Health and Responsiveness. Co-Investigator, Project 1

6. RECENT AND CURRENT GRANT, CONTRACT, AND PHILANTHROPIC SUPPORT

- 2012-2017 NIH R01 AI-100121, Transitional and Naïve CD4 T Cells and B cells in Infant Vaccine Responses. Principal Investigator.
- 2014-2019 NIH U19 AI 057229, Adaptive and Innate Immunity, Memory and Repertoire in Vaccination and Infection (M. Davis PI.) Co-Investigator, Project 1.
- 2016-2017 NIH R43 AI-22375; Development of a Universal Influenza Vaccine Produced by Cell-Free Protein Synthesis (J. Fairman, SutroVax Inc., PI). Co-Investigator
- 2017-present Schimke Immuno-Osseous Dysplasia (SIOD) Translational Research Program (Lewis, DB, PI) Lucile Packard Foundation for Child Health (Donation from Kruz’n for a Kure Foundation, Muscle Shoals, AL) The ultimate goal of this program is to identify therapies for the treatment of SIOD. The initial focus is on defining the mechanisms of the disease in T cells and other hematopoietic cell types in order to develop a high-throughput drug screening strategy.
- 2019-2024 NIH P01 CA-049605 (R.S. Negrin, PI). Bone Marrow Grafting for Leukemia and Lymphoma. Coinvestigator, Project 3 (Tumor Antigen-Reactive T-Cell Immunotherapy).

- 2019-2021 DARPA PREPARE Contract (Response to a Broad Agency Announcement). Development of a Rapidly-acting Preventative Therapy for Influenza, (Robert Debs, PI). Co-Investigator and PI of Stanford Lab 1 Subcontract.
- 2020-2026 NIH T32 AR-050942 (D.B. Lewis, W. Robinson, PIs). Training Program in Adult and Pediatric Rheumatology.

### C. EMPLOYMENT HISTORY

1988-1989	Acting Instructor	University of Washington, Seattle, Washington Department of Pediatrics
1989-1994	Assistant Professor	University of Washington, Seattle, Washington Department of Pediatrics
1992-1994	Adjunct Assistant Professor	University of Washington, Seattle, Washington Department of Immunology
1994-1997	Associate Professor	University of Washington, Seattle, Washington Department of Pediatrics
1994-1997	Adjunct Associate Professor	University of Washington, Seattle, Washington Department of Immunology
1997-1999	Affiliate Associate Professor	University of Washington, Seattle, Washington Departments of Pediatrics and Immunology
4/97-6/97	Acting Associate Professor	Stanford University Medical Center, Stanford, California, Department of Pediatrics
7/97-6/05	Associate Professor	Stanford University Medical Center, Stanford California, Department of Pediatrics
7/05-present	Professor	Stanford University Medical Center, Department of Pediatrics
8/08-5/12	Chief	Division of Immunology and Allergy, Department of Pediatrics, Stanford University Medical Center
5/12-present	Chief	Division of Allergy, Immunology, and Rheumatology, Department of Pediatrics, Stanford University Medical Center

### D. PUBLIC AND PROFESSIONAL SERVICE

#### International and National Responsibilities

- Ad Hoc Reviewer, National Institute of Aging, National Institutes of Health, July, 1992
- Ad Hoc Reviewer, Department of Veteran Affairs, April, 1993
- Council Member, Midwinter Conference of Immunologists, Asilomar, CA, 1995-2000
- Ad Hoc Reviewer, Pediatric AIDS Foundation, January, 1996
- Ad Hoc Reviewer, NIAID, July, 1996
- Ad Hoc Reviewer, NHLBI Lung Biology and Pathology Study Section, June, 1999
- Ad Hoc Reviewer, NIH SSS-3 Study Section, February, 2000
- Editorial Board, *Archives of Pediatrics and Adolescent Medicine*, Sept., 2000-2003
- Ad Hoc Reviewer, NHLBI Lung Immunobiology Study Section, July, 2001

Member, NICHD, Initial Review Group, Maternal and Child Health Research Subcommittee, 2001-2003  
 Pediatric Infectious Diseases Sub-board of American Board of Pediatrics, 2001-2008  
 Director, Jeffrey Modell Center of Excellence for Primary Immunodeficiency, Stanford University, August, 2002-present  
 External Reviewer, Institute of Medicine Immunization Safety Committee, January, 2002  
 Member, NICHD, Initial Review Group, Pediatrics Subcommittee, 2003-2006  
 Immune Deficiency Foundation Medical Advisory Committee, 2003-2010  
 Member, Grants Review Committee and Advisory Panel, NIAID, Consortium for Primary Immunodeficiency ( USImmDefNet), 2003-2008  
 American Association for Immunology, Advanced Course (Lectures “CD4 T-cell Immunity to Infections” and “Primary Immunodeficiency”), August, 2004  
 Society for Pediatric Research, Nominating Committee, 2004-2005.  
 Member, EGPAF Pediatric Cure Consortium Scientific Advisory Board (PCC-SAB), September 2013-present  
 Editor, *Current Opinion in Pediatrics*, 2011-2013  
 Ad Hoc Reviewer, NIAID, Modeling Immunity for Biodefense, December, 2014  
 WHO Ad Hoc Expert Group Meeting on Non-Specific Immunological Effects of Vaccination, February, 2015, Oxford, UK.  
 Ad Hoc Reviewer, NIAID, Cellular and Molecular Immunology B Study Section, June, 2015  
 Ad Hoc Reviewer, NIAID, Investigator Initiated Program Project Applications (P01s), June, 2016

#### Local Responsibilities

1991-1992 Seminar Committee, Department of Immunology, University of Washington,  
 1992-1997 Graduate Student Admission Committee, Department of Immunology, University of Washington  
 1998-2003 APLAC (Animal Care) Committee, Stanford University  
 1999-2001 Immunology Program Graduate Student Admissions Committee, Stanford University  
 2000-2012 Medical Student Pre-Clinical Immunology Course Director, Stanford University  
 2000-present Immunology Executive Committee, Stanford University  
 2000-2002 Head of Pediatric Pulmonary Division Chief Search Committee  
 2002-2006 Medical School Standing Committee on Courses/Curriculum  
 2003-2005 Member of Pediatric Pulmonary Search Committee  
 April, 2003 Symposium/Course Organizer, “Recognition and Treatment of Primary Immunodeficiencies”, LPCH/Stanford University Medical Center  
 May, 2003 Lecturer, M&I 206, Animal Viruses, Advanced Course, Stanford University  
 2005-present APLAC (Animal Care) Committee, Stanford University  
 2011-present Advisory Committee for Fluorescence Activated Cell Sorting (FACS), Stanford University  
 2014-present APLAC (Animal Care) Committee, Vice-Chair, Stanford University

#### **E. POST-DEGREE HONORS AND AWARDS AND PROFESSIONAL ORGANIZATIONS**

1990-93 March of Dimes Basil O'Connor Scholar Research Award  
 1992 Ross Young Investigator Award, Western Society for Pediatric Research  
 1993 Elected to Society for Pediatric Research  
 Science in Medicine New Investigator Award, University of Washington  
 2001 Henry J. Kaiser Award for Excellence in Preclinical Teaching (Immunology), Stanford University

- 2005 Henry J. Kaiser Award for Excellence in Preclinical Teaching (Immunology), Stanford University  
2008 American Pediatric Society

American Academy of Pediatrics  
American Association of Immunologists  
American Association for the Advancement of Science  
American Society for Microbiology  
Clinical Immunology Society  
Immune Deficiency Foundation  
Infectious Diseases Society of America  
Society for Pediatric Research  
Pediatric Infectious Disease Society

## E. BIBLIOGRAPHIC INFORMATION

### Peer-Reviewed Articles (selected)

1. Wilson, C.B., Westall, J., Johnston, L., **Lewis, D.B.**, and Alpert, A.R: Decreased production of interferon gamma by human neonatal cells: Intrinsic and regulatory deficiencies. *J. Clin. Invest.* 77:860-867, 1986.
2. **Lewis, D.B.**, Larsen, A., and Wilson, C.B: Reduced interferon gamma mRNA levels in neonates: Evidence for an intrinsic T-cell deficiency independent of other genes involved in T-cell activation. *J. Exp. Med.* 163:1018-1023, 1986.
3. Ziegler, S.F., Marth, J.D., **Lewis, D.B.**, and Perlmutter, R.M: Novel protein-tyrosine kinase gene (hck) preferentially expressed in cells of hematopoietic origin. *Mol. Cell. Biol.* 7:2276-2285, 1987.
4. Marth, J.D., **Lewis, D.B.**, Wilson, C.V., Gearn, M.E., Krebs, E.G., and Perlmutter, R.M: Regulation of pp56lck during T cell activation: Functional implications for the src-like protein tyrosine kinases. *Eur. Mol. Biol. Org. J.* 6:2727-2734, 1987.
5. deVillartay, J.-P., **Lewis, D.B.**, Hockett, R., Korsmeyer, S., Waldmann, T., and Cohen, D: A new type of rearrangement involving the human T cell receptor  $\alpha$  gene. *Proc. Natl. Acad. Sci. USA* 84:8608-8612, 1987.
6. Perlmutter, R.M., Peet, R., Marth, J.D., **Lewis, D.B.**, Ziegler, C.F., and Wilson, C.B: The structure and expression of lck transcripts in human lymphoid cells. *J. Cellular Biochem.* 38:117-126, 1988.
7. **Lewis, D.B.**, Prickett, K., Larsen, A., Grabstein, K., Weaver, M. and Wilson, C.B: Restricted production of interleukin-4 by activated human T cells. *Proc. Natl. Acad. Sci. USA* 85:9743-9747, 1988.
8. Marth, J.D., **Lewis, D.B.**, Cooke, M.P., Mellins, E.D., Gearn, M.E., Samelson, L.E., Wilson, C.B., Miller, A.D., Perlmutter, R.M: Lymphocyte activation provokes modification of a lymphocyte-specific protein tyrosine kinase (p56lck). *J. Immunol.* 142:2430-2437, 1989.
9. Wilson, C.B. and **Lewis, D.B.**: The basis and implications of selectively diminished cytokine production in neonatal susceptibility to infection. *Rev. Infect. Dis.* 12(Suppl. 4):S410-S420, 1990.
10. Vercelli, D., Jabara, H.H., Cunningham-Rundles, C., Abrams, J.S., **Lewis, D.B.**, Meyer, J., Schneider, L.C., Leung, D.Y.M., and Geha, R.S: Regulation of IgE synthesis in the hyper-IgE syndrome. *J. Clin. Invest.* 85:1666-1671, 1990.

11. **Lewis, D.B.** and Wilson, C.B: Gamma-interferon: An immunoregulatory lymphokine with immunotherapeutic potential. *Pediatr. Infect. Dis. J.* 9:642-651, 1990.
12. **Lewis, D.B.**, Yu, C.C., Forbush, K.A., Carpenter, J., Sato, T.A., Grossmann, A., Liggitt, D.A., and Perlmutter, R.M: IL-4 expressed *in situ* selectively alters thymocyte development. *J. Exp. Med.* 173:89-100, 1991.
13. **Lewis, D.B.**, Yu, C.C., Meyer, J., English, B.K., Kahn, S.J. and Wilson, C.B: Cellular and molecular mechanisms for reduced interleukin-4 and interferon-gamma production by neonatal T cells. *J. Clin. Invest.* 87:194-202, 1991.
14. Wildin, R.S., Garvin, A.M., Pawar, S., **Lewis, D.B.**, Abraham, K.M., Forbush, K.A., and Perlmutter, R.M: Developmental regulation of *Ick* gene expression in T lymphocytes. *J. Exp. Med.*, 173:383-393, 1991.
15. Wilson, C.B., **Lewis, D.B.** and English, B.K: T cell development in the fetus and neonate. *Advances in Experimental Medicine and Biology* 310:17-29, 1991.
16. English, B.K., Hammond, W.P., **Lewis, D.B.**, Brown, C.B., and Wilson, C.B: Decreased granulocyte-macrophage colony-stimulating factor (GM-CSF) production by human neonatal blood mononuclear cells and T cells. *Pediatr. Res.* 31:211-216, 1992.
17. **Lewis, D.B.**, Liggitt, H.D., Effmann, E.L., Motley, S.T., Teitelbaum, S.L., Jepsen, K.J., Bonadio, J., Goldstein, S.A., Carpenter, J., and Perlmutter, R.M: Osteoporosis induced in mice by overproduction of interleukin-4. *Proc. Natl. Acad. Sci. USA* 90:11618-11622, 1993.
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29. **Lewis D.B.** Cellular Immunity of the Human Fetus and Neonate. *Immunol. Clin. North Amer.* 18:291-298, 1998.
30. Cron, R.Q., Bort, S.J., Wang, Y., Brunvand, M., **Lewis D.B.**: T cell priming enhances IL-4 gene expression by increasing NFAT. *J. Immunol.* 162:860-870, 1999.
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58. Tu W, Lau YL, Zheng J, Liu Y, Chan PL, Mao H, Dionis K, Schneider P, **Lewis DB**. Efficient generation of human alloantigen-specific CD4<sup>+</sup> regulatory T cells from naive precursors by CD40-activated B cells. *Blood* 112:2554-2562, 2008.
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109. Nishiga M, Wang DW, Han Y, **Lewis DB**, Wu JC. COVID-19 and cardiovascular disease: from basic mechanisms to clinical perspectives. *Nat Rev Cardiol.* 2020 Jul 20;1-16. doi: 10.1038/s41569-020-0413-9.

## Recent Book Chapters

1. Hong, DK, **Lewis, D.B.** Developmental immunology and role of host defenses in the fetal and neonatal susceptibility to infection. In: Infectious Diseases of the Fetus and Newborn Infant, 8th edition, J.S. Remington, J.O. Klein, C.B. Wilson, V. Nizet, Y.A. Maldonado, Editors, Elsevier, Philadelphia, Chapter 4, pgs. 81-188, 2014.
2. **Lewis, D.B.** Ontogeny of the immune system. In: Neonatology: Clinical Practice and Procedures, 1st edition, Stevenson, D.K., Sunshine, P., Cohen, R.S., Editors, McGraw Hill Education, Chapter 49, pgs. 705-716, 2015.
3. Gans, H and **Lewis, D.B.** Hemophagocytic lymphohistiocytosis and macrophage activation syndrome In: Principles and Practice of Pediatric Infectious Diseases, 5th edition, S.S. Long, C.G. Prober, M. Fisher, Editors, Elsevier, Philadelphia, Chapter 12, pgs. 102-108, 2018.
4. **Lewis, D.B.** Infectious complications of deficiencies of cell-mediated immunity other than AIDS: primary immunodeficiencies In: Principles and Practice of Pediatric Infectious Diseases, 5th edition, S.S. Long, C.G. Prober, M. Fisher, Editors, Elsevier, Philadelphia, Chapter 105, pgs. 635-643, 2018.

5. Weitkamp J.-H., **Lewis, D.B.**, Levy O. Immunology of the fetus and newborn. In: Avery's Diseases of the Newborn, 10<sup>th</sup> edition, C.A. Gleason and S.E. Juul, Editors, Elsevier, Philadelphia, Chapter 36, pgs. 453-481, 2018.
6. Gernez, Y. and **Lewis, D.B.** Infectious complications of deficiencies of cellular immunity other than AIDS: primary immunodeficiencies In: Principles and Practice of Pediatric Infectious Diseases, 6th edition, S.S. Long, C.G. Prober, M. Fisher, Editors, Elsevier, Philadelphia, Chapter 105, in press.
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### Editorials and Invited Reviews

1. Wilson CB, Penix L, Weaver WM, Melvin A, **Lewis DB**. Ontogeny of T lymphocyte function in the neonate. *Amer J Reprod Immunol* 28:132-135, 1992.
2. Wilson CB, Lewis DB, English, B.K. Immunity in the neonate. *Semin Ped Infect Dis* 10:83-90, 1999.
3. **Lewis DB**. Simple febrile seizures: Do polymorphisms of the IL-1 gene cluster simplify our understanding? *Arch Pediatr Adolesc Med* 156:529-530, 2002.
4. **Lewis DB**. Allergy Immunotherapy and inhibition of Th2 immune response: a sufficient strategy? *Curr Opin Immunol* 14:644-651, 2002.
5. Dabbagh K., **Lewis DB**. Toll-like receptors and the Th1 and Th2 response. *Curr Opin Infect Dis* 16:199-204, 2003.
6. Bobey-Wright N, Tcheurekdjian H, Wara D, **Lewis DB**. Immunologic Aspects of DiGeorge Syndrome. *NeoReview* 6:e471-e478, 2005.
7. **Lewis DB**, Gern JE, Hill HR, Friedlander SL, La Pine TR, Lemanske RF, Stiehm ER. Newborn immunology: relevance to the clinician. *Curr Prob Pediatr Adolesc Health Care* 5:189-204, 2006.
8. Randolph DA, **Lewis DB**. Transient deficiencies of T-cell-mediated immunity in the neonate. *Adv Exp Med Biol* 582:55-69, 2006.
9. **Lewis, D.B.** Avian flu to human influenza. *Ann. Rev. Med.*, 57:139-154, 2006.

### Clinical Reports

1. Krogstad P, Mendelman PM, Miller, VL, Clausen C., Abbott S, Weagant S, Wilson, CL, and **Lewis DB**. Clinical and microbiologic characteristics of cutaneous infection with *Yersinia enterocolitica*. *J. Infect. Dis.* 165:740-743, 1992.
2. Borden M, Holm J, Leslie J, Sweetman L, Nyhan WL, Fleisher L, Nadler H, **Lewis DB**, and Scott CR. Hawkinsinuria in two families. *Am. J. Med. Genet.* 44:52-56, 1992.
3. Shetty AK, Frankel LM, Maldonado Y, Falco DA, **Lewis DB**. Group A streptococcal meningitis: report of a case and a review of the literature since 1976. *Pediatr Emerg Care* 17:430-434, 2001.

**Recent Invited Research-Related Presentations (selected 15 of 45+ since 2000 of total of >80 over career)**

1. Influenza: immune-mediated consequences of natural infection and vaccine strategies. Keystone Symposium on Molecular and Cellular Biology, January, 2009.
2. Cationic lipid-DNA complexes (CLDC): Novel immunobiology and its mechanisms. Cold Spring Harbor Meeting "Harnessing Immunity to Prevent and Treat Disease, Cold Spring Harbor, NY, November, 2011.
3. Novel Vaccine Adjuvants: Finding Ways to Boost the Immune Response. Pediatric Academic Societies Annual Meeting, Boston, MA, April, 2012.
4. Newborn Screening for Severe Combined Immunodeficiency. Paediatric Infectious Diseases Conference, Calgary, Alberta, February 2013.
5. Translational and Naïve CD4 T Cells and B Cells in Infant Vaccine Responses. NIH/NIAID Conference, "First Annual Infant Immunity Program Meeting," Bethesda, MD, March, 2013.
6. Developmental Immunology and Neonates: Implications for HIV Latency. NIH/NIAID Conference, IMPAACT HIV Scientific CURE Committee Think Tank Session, Washington, DC, May, 2013.
7. Protein tyrosine kinase 7 (PTK7) expression and function in human naïve CD4 T-cell development. NIH/NIAID Conference, "Second Annual Infant Immunity Program Immunity," Bethesda, MD, March, 2014.
8. An Introduction to Neonatal T Cells: Implications for Establishment of Perinatal HIV-1 Infection. AmFAR Think Tank on Pediatric HIV Infection. Las Vegas, NV, 2015.
9. Protein tyrosine kinase 7 and the immunobiology of human recent thymic emigrants and naïve CD4 T cells, Seminar Speaker at University of California at Irvine, Immunology Program, April, 2015.
10. New Kids on the Block: Human Recent Thymic Emigrant T Cells – Biology and Immunodeficiency, Grand Rounds, Rady Children's Hospital/UCSD Dept. of Pediatrics, October, 2015.
11. Human Recent Thymic Emigrant T Cells – Biology and Immunodeficiency, Pediatric Grand Rounds, Lucile Packard Children's Hospital/Dept. of Pediatrics, Stanford University, January, 2016.
12. NIH/NIAID sponsored US-India Conference on Contemporary Topics in Immunology, "Postnatal Ontogeny of Phenotypic and Functional Immaturities in Naïve CD4 T cells and B cells," New Delhi, India, January, 2016.
13. NIH CCHI U19 Site Visit . "CD4 T-cell Immunity of the Human Neonate and Infant: Unique Epigenetic, Genetic, and Metabolic Signatures". Stanford University, August, 2016.
14. DARPA Kickoff Meeting. "Development of a rapidly active preventative therapy for influenza." New York, NY, April, 2019.
15. DARPA Meeting. "Development of a rapidly acting preventative therapy for influenza and SARS-CoV-2." Online July, 2020.

**Abstracts (selected 6 of 40 since 2001, of approximately 100 over career)**

1. Dahl, M.E., **Lewis, D.B.** Persistent viral-induced alteration of chemokine expression contributes to the accumulation of dendritic cells and CD4 T cells in the lungs of mice. Keystone Symposium on



Hygiene, Allergy, and Asthma/The Regulation of Mucosal Inflammation, April, 2003 (oral presentation).

2. Dahl, M.E, Coyle, A., **Lewis, D.B.** ICOS engagement of CD4 T cells following pulmonary influenza infection: Evidence for negative regulation of T-cell effector function. Fifth Annual FOCIS (Federation of Clinical Immunology Societies) Meeting, Boston, MA, May 2005 (oral presentation).
3. Hong, D.K., Giffon, T., Fairman, J, **Lewis, D.B.** IgG2c Anti-Influenza Antibodies Are More Protective Than IgG1 Antibody Against Intranasal Infection with Influenza A Virus, APS/SPR Meeting, Toronto, CANADA, May, 2007 (oral presentation).
4. Lewis, D.B., Chmura, S., Botham, C., Hong, D. Nguyen, D., Draghi, M., Giffon, T., Miller, C., Fairman, J. Mechanisms underlying the potent activity of cationic lipid-DNA complexes (CLDC) as an immunostimulant. "Harnessing Immunity to Treat and Prevent Disease", Cold Spring Harbor, New York, November 2011 (oral presentation).
5. Acharya S., Dionis-Petersen, K.Y., Adams, C.J., Jackson, P., **Lewis, D.B.** PTK7 promotes PI3K/AKT signaling and survival in primary CD4T-lineage and neoplastic cells. American Association of Immunology, Pittsburg, May, 2014 (oral presentation).
6. Lippner E.A., Aubert, G., Ramachandran, V., Lewis, D.B. Telomeres in Schimke Immuno-Osseous Dysplasia: Comparing Telomere Length in Individuals with Homozygous and Heterozygous SMARCAL1 Mutations. CIS Meeting/SPRINGER/PLENUM PUBLISHERS. 2019: S70–S71.

## Patents

1. Lewis, David B. Inventor. IL-4 bone therapy. U.S. Patent 5714146, filed 4/7/1995 and issued 2/3/1998.
2. Lewis, David B. Inventor. Identification of thymically derived CD4 T cells by protein tyrosine kinase 7 expression. US Patent 7960125, filed 9/25/08 and issued 6/14/11.
3. Lewis, David. 2011. Inventor. Method to induce and expand therapeutic alloantigen-specific human regulatory T cells in large-scale. U.S. Patent PCT/CN2009000484, filed 5/4/09, and issued 2/4/11.
4. Lewis, David B. 2019 Inventor. Systems and Methods for In Vivo Gene Expression. Filed 9/27/19.
5. Lewis, David B. 2020 Inventor. Compositions and methods for viral genome targeting. U.S. Patent Application 62/989,087. Filed 3/13/20.
6. Lewis David B. 2020 Inventor. Compositions and methods for viral genome targeting. U.S. Patent Application 62/989,181. Filed 3/13/20.

## Training Record for the Previous Twelve Years

Training Faculty Member	Trainee (Pre/Postdoc)	Training Period	Education Prior to Training		Title of Research Project	Current Position (Past Trainees), or Source of Support (Current Trainees)
			Institution	Deg/Date		

<b>Lewis, David B.</b>  <b>Past Trainees</b>	Thierry Giffon, PhD (Post/Research Associate)	2000-2009	University of Rennes, France	PhD/1996	Function and phenotype of recent thymic CD4 T cell emigrants in humans and mice	BN-Immuno-therapeutics, Inc. Mountain View, CA
	Chris Haines (Post)	2008-2009	Stanford University Medical School	MS/1998 PhD/2007	Role of surface protein receptor tyrosine kinases lacking catalytic activity in T cell development	Post-doctoral Fellow, SP-Merck Research Institute, Palo Alto, CA
	Minna Koskvenvuo (Post)	2007-2009	Turku University Medical School, Turku, FINLAND	MD/1998 PhD/2008	T-cell immunity to influenza vaccination	Hematology Fellow, Turku University Medical School, Turku, FINLAND
	Monia Draghi (Post)	2008-2009	University of Padova, Padova, ITALY	PhD/2002	Innate immune activation by cationic lipid/DNA complexes adjuvant	Investigator, Novartis Institutes for BioMedical Research, Inc. Cambridge, MA
	David Tiber (Post)	2009-2011	University of Medicine and Dentistry, Newark, NJ	MD/2001	T-cell and B-cell immunity to natural 2009 H1N1 infection	Division of Critical Care, University of Massachusetts, Worcester, MA
	Crystal Botham (Post)	2007-2011	University of Oregon	PhD/2007	Mechanism of cationic liposome DNA complex vaccination for influenza	Academic Research Program Officer, Falk Cardiovascular Research Center, Stanford University
	Katharine Nelson (Post)	2009-2011	University of Wisconsin, Madison, WI	MD/2005	Recent thymic emigrants and 22q11.2 Deletion	Private Practice, Allergy and Immunology, Mountain View, CA
	Roshni Mathew (Post)	2009-2011	University of Illinois, Chicago	BS/2003	Influenza A humoral immunity to nucleoprotein	Division of Infectious Diseases, Stanford University Dept. of Pediatrics

<b>Current Trainees</b>	Amy Palin (Pre)	2006-2012	Yale University	BS/2003 PhD/2012	Signal transduction/epigenetic-mediated limitations in T cells	Contractor/Biologist at Kelly Services/NCI, NIH, Bethesda, MD
	David Hong (Post, Instructor)	2005-2014	Northwestern University Medical School, Chicago, IL	MD/2001	Induction of influenza-specific immunity by cationic liposome/DNA complex vaccination	Chief Medical Director, Karius, Inc., Redwood City, CA
	Stephen Chmura	2011-2017	University of California, San Francisco, CA	PhD/2011	Mechanisms of CLDC-induced adjuvant activity	Research Scientist, DNARx, San Francisco, CA
	Janell Sherr	2013-2015	University of Maryland	MD/2007	B-cell immunity in response to vaccination in infants	Instructor, Division of Allergy, Immunology, and Rheumatology
	Elizabeth Lippner	2017-2019	Loyola University, Chicago, IL	MD/2013	Defining the immunodeficiency of Schimke immuno-osseous dysplasia	Assistant Professor, Division of Allergy and Immunology, Northwestern University, Chicago, IL
	Rebecca Saenz	2018- 2019	University of California, San Diego	MD/PhD/2014	Role of ATM protein in human peripheral T-cell survival and function	Clinical Research Director, Genentech, Inc.
	Juanita Valdes Camacho	2020-2021	Rosario University, Bogota, Colombia	MD/2013	CITE-Seq analysis of biallelic and monoallelic SMARCA1-deficient Schimke immune-osseous dysplasia	Clinical Immunologist, Department of Public Health, State of Louisiana
	Carlos Salgado	2021-present	University of Maryland	MD/2017	Development of a comprehensive registry for Schimke immuno-osseous dysplasia	