

CURRICULUM VITAE

Name: Sankar Swaminathan, M.D.

April 3, 2023

Present Position and Address:

Professor and Chief, Division of Infectious Disease,
Don Merrill Rees Presidential Endowed Chair
Department of Internal Medicine, University of Utah School of
Medicine, Salt Lake City, UT 84132

Date of Birth: July 4, 1958

Place of Birth: Trivandrum, India

Citizenship: USA

Education:

1979 A.B magna cum laude, Biochemistry and Molecular
Biology, Harvard College, Cambridge, Massachusetts
1982 M.S. Microbiology and Immunology, Emory University School
of Medicine, Atlanta, Georgia
1984 M.D. Emory University School of Medicine, Atlanta, Georgia

Professional and Teaching Experience:

1984-1985 Intern, Internal Medicine, University of Chicago Medical
Center, Chicago, IL.
1985-1987 Resident, Internal Medicine, University of Chicago Medical
Center, Chicago, IL
1987-1988 Clinical Fellow, Division of Infectious Disease, Beth Israel
Hospital, Brigham & Women's Hospital, Dana Farber Cancer
Institute, Boston, MA.
1987-1988 Clinical Fellow in Medicine, Harvard Medical School, Boston,
MA.
1988-1990 Research Fellow, Division of Infectious Disease, Beth Israel
Hospital, Brigham & Women's Hospital, Dana Farber Cancer
Institute, Boston, MA.
1988-1990 Research Fellow, Department of Microbiology and Molecular
Genetics, Harvard Medical School, Boston, MA.
1990-1992 Instructor in Medicine, Division of Infectious Disease, Brigham &
Women's Hospital, Boston, MA.

- 1992-1995 Assistant Professor, Division of Infectious Disease, Departments of Medicine and Microbiology and Immunology, Thomas Jefferson University, Philadelphia, PA.
- 1992-1995 Member, Graduate Faculty, College of Graduate Studies, Thomas Jefferson University, Philadelphia, PA.
- 1995-1997 Assistant Professor, Division of Infectious Diseases, Department of Internal Medicine, University of Texas Medical Branch, Galveston.
- 1995-2000 Scientist, Sealy Center for Oncology and Hematology, University of Texas Medical Branch, Galveston.
- 1996-2000 Member, Graduate Faculty, Department of Microbiology and Immunology, University of Texas Medical Branch, Galveston.
- 1997-2000 Associate Professor, Division of Infectious Diseases, Departments of Internal Medicine and Microbiology & Immunology, University of Texas Medical Branch, Galveston.
- 2000-2008 Associate Professor, Departments of Internal Medicine and Molecular Genetics and Microbiology, University of Florida, Gainesville, FL.
- 2008-2010 Professor, Departments of Internal Medicine and Molecular Genetics and Microbiology, University of Florida, Gainesville, FL.
- 2009-2010 Acting Chief, Division of Infectious Disease, Department of Internal Medicine University of Florida, Gainesville, FL.
- 2005-2010 Program Co-Director: Cancer Epigenetics and Tumor Virology, UF Shands Cancer Center, University of Florida, Gainesville, FL.
- 2010- curr. Professor and Chief, Infectious Diseases Division, University of Utah School of Medicine, Salt Lake City, UT.
- 2012- curr. Attending Physician, George E. Wahlen VA Medical Center, Salt Lake City, UT.
- 2013- curr. Adjunct Professor, University of Utah, Department of Experimental Pathology.

Research Activities:

- A. 1. Epstein-Barr Virus.
 2. Kaposi's sarcoma-associated herpesvirus (KSHV, Human herpesvirus 8).
 3. Transcriptional and post-transcriptional gene regulation in oncogenic herpesviruses.
 4. Clinical and basic research in mechanisms of SARS CoV-2 infection and therapeutics
- B. 1988-1993 Physician Scientist Award K11, National Cancer Institute, National Institutes of Health.

- 1992-1997 FIRST Award R29, National Cancer Institute, National Institutes of Health: Role of the EBV interleukin BCRF1 in B cell infection and transformation.
- 1995-1998 Investigator, NIH Grant NO1-DE-52606: Passive Immunization: Treatment of Rabies Virus with Human Monoclonal Antibodies.
- 1997-1999 John Sealy Memorial Endowment Fund Recruitment Grant: The Role of Epstein-Barr Virus BMLF1 in Gene Regulation and Expression.
- 1998-2000 T32 AI07536-01, Emerging and Reemerging Infectious Diseases.
- 1999-2002 R21 CA82985-03 (HL), Regulation of angiogenesis by human herpesvirus 8.
- 2001-2006 T32 AI07110, Basic Microbiology and Infectious Diseases, Preceptor.
- 2006-2011 T32 CA09126 Training in Cancer Biology, Preceptor.
- 2009-2011 RC2 CA148407, Building a recombinant Herpesvirus core laboratory to systematically analyze the role of viral miRNAs in innate and adaptive immunity.
- 2006-2012 1R01CA119905, Viral and cellular gene regulation during lytic KSHV replication.
- 2008-2012 1R01CA119917, MicroRNAs in the KSHV life cycle, Co-investigator.
- 2014-2017 K08 Immune Responses to Vibrio Cholerae in Children
Principal Investigator(s): Daniel T. Leung; Sankar Swaminathan
- 2014-2019 1I01BX002262, Restriction of Oncogenic Herpesviruses by Host Cell Factors (VA Merit Review), Principal Investigator.
- 2018-2020 CSSG P30 supplement: Epigenetic Risk Factors for Lymphoma in HIV patients
- 1999-2024 1R01 CA81133, Post-transcriptional gene regulation by EBV SM protein.

Committee Responsibilities:

A. National and International:

- 1997 Ad hoc member, Virology study section (VR), National Institutes of Health.
- 1998-2001 Fellowship & Young Investigator Grants Award Committee, Infectious Diseases Society of America.
- 1999 Ad hoc member, Virology study section (VR), National Institutes of Health.
- 1999 Member, CSR Special Emphasis Panel, ZRG1 VR(01), National Institutes of Health.

- 1999 Member, CSR Special Emphasis Panel, ZRG1 AARR-1 (03), National Institutes of Health.
- 2000 Member, AIDS study section AARR-4 01 S, National Institutes of Health.
Member, CSR Special Emphasis Panel, ZRG1 AARR-1 (07), April 2000, National Institutes of Health.
Member, CSR Special Emphasis Panel, ZRG1 AARR-1 (08), July 2000, National Institutes of Health.
Member, CSR Special Emphasis Panel, ZRG1 AARR-1 (09) Oct 2000, National Institutes of Health.
- 2001-2003 Member, AIDS study section AARR-4 01 S, National Institutes of Health.
- 2004 Ad hoc member, VirB study section, National Institutes of Health. Program Project Special Emphasis Panel NCI-C RPRB (S1) (P).
- 2005 Member, Special Emphasis Panel, NIH AARR (A) 03.
Member, Special Emphasis Panel, NIH, AARR-A 94.
- 2006 Member, Special Emphasis Panel NIH, AOIC.
- 2006 Reviewer, Science Foundation Ireland, Dublin, Ireland.
- 2006 Member, ZRG1 AARR-C 04, NIH Special Emphasis Panel.
- 2006 NCI Cellular and Molecular Biology P01 Cluster Review Panel BBRPD.
- 2007 Ad hoc member, AOIC study section, National Institutes of Health.
- 2007 Member, Molecular Oncology P01 Special Emphasis Panel
- 2008 Ad hoc member, DDR Study Section, National Institutes of Health.
- 2009 Member, Molecular Oncology P01 Special Emphasis Panel
Member, ZRG1 IDM-C 58 R, RFA09-003 Challenge Grants Panel 9
Member, 2009/10 ZRG1 IMM-E (58) R
- 2010 Member, Molecular Oncology P01 Special Emphasis Panel
- 2010-2012 CSR College of Reviewers, NIH.
- 2011 Member, European Commission Evaluation Panel. FP7-HEALTH-2011.2.4.1-3: Epidemiology and aetiology of infection-related cancers. Brussels, Belgium.
- 2011-2015 Member, National Comprehensive Cancer Network (NCCN) Prevention and Treatment of Cancer-Related Infections.
- 2011 ZRG1 AARR-K(02) Special Emphasis Panel
Ad Hoc Member, VirA NIH Study section
Member, ZAI1 LGR-I (M1) PO1 Review Panel
- 2012 Member ZRG1 IDM-M (02) M, NIH Special Emphasis Panel.
Member ZAI1-LGR-I-M1, NIH PO1 Review Panel
Member, ZCA1 RPRB-0 (O1) P, NCI PO1 Review Panel
Ad Hoc Member, VirB NIH Study section

Ad Hoc Member, AOIC NIH study section
 Chair, NIH Special Emphasis Panel ZRG1 AARR-K(03)
 Member, Special Emphasis Panel, NCI-I R
 Grant reviewer, Medical Research Council, United Kingdom
 2012-2015 Research Committee, Infectious Diseases Society of America
 2012 NIAID/IDSA ID Research Careers Meeting Program Committee
 2013 Member, NCI-I NIH study section
 Member, Special Emphasis Panel II Program Project Review Panel
 2013-2017 Chair, NIAID/IDSA ID Research Careers Meeting Program
 Committee
 2014-2018 Member VirA NIH study section.
 2015 Member, NIH AIDS Malignancy Consortium Review Panel, NIH.
 2015 Member, NCI UNC Lineberger Comprehensive Cancer Center Site
 Visit Committee, Chapel Hill, NC.
 2015 European Commission Evaluation Panel. PHC 14 – 2015: New
 therapies for rare diseases. Brussels, Belgium.
 2016 Member, European Commission Evaluation Panel. SC1-PM-08-
 2017: New therapies for rare diseases. Brussels, Belgium.
 2017 Member, NIH SEP ZCA1 RTRB-R (M2) R. RFA-CA-16-018
 Collaborative Consortia for the Study of HIV-Associated Cancers:
 U.S. and Low- and Middle-Income Country (LMIC) Partnerships
 (U54).
 2017 Member, NCI Cancer Center Site Visit Committee, University of
 Wisconsin, Madison, WI.
 2018 Ad hoc member, AOIC study section, NIH, NCI.
 2018 Ad hoc member AOIC study section ZRG1-AARR-K-95
 2018 NIAID (P01) Review Committee (ZAI1 PTM-I J4)
 2015-current Vice-Chair, National Comprehensive Cancer Network (NCCN)
 Panel - Prevention and Treatment of Cancer-Related Infections.
 2018-2020 Member, Antimicrobial Drugs Advisory Committee, FDA.
 2019 Member, Program Project (P01) Review Panel, NIH/NCI, ZCA1
 RPRB-L (M1)
 2019 Member, NCI Cancer Center Site Visit Committee, University of
 Washington, Seattle, WA. NCI-A-RTRB-0-E1
 2019 Ad hoc member, NIH ZRG1 IDM-W Topics in Virology study
 section
 2019 NIH/NCI Special review panel. Provocative Question RFA
 ZCA1-SRB-1-J2.
 2020 Pac-12 COVID-19 Medical Advisory Committee
 2020 SEP-6: NCI Clinical and Translational R21 and Omnibus R03 Review
 Study Section

2022 NIH/NCI EBV lymphoma U01 Special Emphasis Panel Reviewer

B. OTHER:

- 1993-1994 Thesis Committee for Gloria Chang, M.S. candidate in Department of Microbiology and Immunology, Thomas Jefferson University, Philadelphia, PA.
- 1994-1995 Thesis Committee for John Maggioncalda, Ph.D. candidate in Department of Microbiology and Immunology, Thomas Jefferson University, Philadelphia, PA.
- 1995-2000 Bone Marrow Transplant Task Force, University of Texas Medical Branch, Galveston.
- 1997-1998 Graduate Medical Education Subcommittee for the LCME Self Study Task Force, University of Texas Medical Branch, Galveston.
- 1998-2000 Student Evaluation Committee, NIAID Training Grant on Emerging and Tropical Infectious Diseases, University of Texas Medical Branch, Galveston.
- 1998-2000 McLaughlin Fellowship Fund Committee, University of Texas Medical Branch, Galveston, TX.
- 1999-2000 Biological Safety Committee, University of Texas Medical Branch, Galveston, TX.
- 1999-2000 Antimicrobial Advisory Subcommittee of the Pharmacy & Therapeutics Committee, University of Texas Medical Branch, Galveston, TX.
- 2000-2001 Joint Faculty Search Committee, Department of Pharmacology and Therapeutics and UF Shands Cancer Center.
Laboratory Utilization Review Committee, Shands Hospital at University of Florida.
- 2002-2006 Chair, Tumor Virology Faculty Search Committee, UF Shands Cancer Center
- 2000-2004 Ph. D. supervisory committee, Jerome O'Neil, Molecular Genetics and Microbiology.
- 2005-2008 Ph. D. supervisory committee, Rebecca Skalsky, Molecular Genetics and Microbiology.
- 2005-2010 Co-Chair, UF Shands ACS Institutional Research Grant Review Committee.
- 2005-2008 Member, Harn Museum Faculty Council.
- 2005-present Mentor, ASM Minority Mentoring Program.

- 2006 Organizing Committee, Twelfth International Symposium on EBV and Associated Diseases, Boston, U.S.A., July 8-12th, 2006.
- 2006 External Reviewer, Viral Oncology Program of the University of Maryland Greenbaum Cancer Center.
- 2006-2009 Faculty Council, Department of Medicine representative.
- 2007-2010 Member, University of Florida Performing Arts Advisory Committee for Policy and Operations.
- 2007-2009 Member, Senate Nominating Committee.
- 2009-2010 Member, University of Florida Cultural Plaza Advisory Committee
- 2011 Grant Reviewer for Landsteiner Foundation for Blood Transfusion Research, Netherlands
- 2012 Member, University of Utah School of Medicine, Surgery Chairman Search Committee
- 2012-2014 Mission Based Management Advisory Committee, University of Utah
- 2014- 2018 Pharmacy and Therapeutics Committee, University of Utah Health Plans
- 2020-present Infectious Disease Consultant to the Utah Jazz, National Basketball Association
- 2022 Chair, Geriatrics Division Chief Search Committee

Teaching Responsibilities:

Courses Directed

- 2000 - 2010 Co-Director, GMS 6181 Virology Seminar, University of Florida, Gainesville, FL
- 2011- curr. Director, INTMD 7650 - Infectious Disease Clinical Clerkship
Director, INTMD 7880 - Research Problems in Infectious Disease

Course Lectures

- 1997 - 2000 Instructor, University of Texas Medical Branch. Infectious Diseases Core Curriculum, Galveston, TX.
- 1997 - 2000 Instructor, Epstein Barr Virus, University of Texas Medical Branch, Microbiology & Immunology. Graduate Virology Course, Galveston, TX.
- 1997 - 2000 Instructor, University of Texas Medical Branch. Infections in patients with impaired immune response, JMS Lecture series, Galveston, TX
- 2000 - 2010 Instructor, GMS 6181, University of Florida. Virology Seminar

- 2000 - 2010 Instructor, BMS 5300, University of Florida. Medical Microbiology & Infectious Diseases-Herpesviruses
- 2000 - 2010 Instructor, Controversies in Microbiology, University of Florida
- 2000 - 2005 Instructor, GMS 6001, University of Florida. IDP Fundamentals, X.pigmentosum, Ataxia-Telangiectasia
- 2001 - 2010 Instructor, University of Florida. Clinical Microbiology Conferences (CMC's)
- 2002 - 2010 Instructor, GMS6035, University of Florida. Cancer Biology, Viral Oncogenesis
- 2005 - 2010 Instructor, GMS 6036, University of Florida. Advanced Virology III.
- 2007 - 2010 Instructor, GMS 6001: DNA Replication, University of Florida. IDP Core Course.
- 2011 Instructor, PATH 6410: Molecular Virology, University of Utah, Pathology
- 2012 Instructor (1): MS2015 H+D - Basic Virology, University of Utah
- 2012 Instructor (1): MS2015 H+D - Viral Pathogenesis, University of Utah
- 2012 Instructor (1): MS2015 H+D - CNS Infections, University of Utah
- 2012 Instructor (1): MS2015 H+D - Bioterrorism, University of Utah
- 2013 Instructor (1): MS2016 H+D - Basic Virology, University of Utah
- 2013 Instructor (1): MS2016 H+D - Viral Pathogenesis, University of Utah
- 2013 Instructor (1): MS2016 H+D - Select Agents/Zoonoses, University of Utah
- 2013 Instructor (1): MS2016 H+D - GI Infections, University of Utah
- 2013 Instructor (1): MS2016 H+D - CNS Infections, University of Utah
- 2013 Instructor, PATH 6410: Molecular Virology, University of Utah, Pathology
- 2014 Instructor, MD ID (1): MS2017 H+D - Introduction to Virology, University of Utah, Deans Office - SOM
- 2014 Instructor, MD ID (1): MS2017 H+D - Viral Pathogenesis, University of Utah, Deans Office - SOM
- 2014 Instructor, MD ID (1): MS2017 H+D - GI Infections, University of Utah, Deans Office - SOM
- 2014 Instructor, MD ID (1): MS2017 H+D - Zoonoses, University of Utah, Deans Office - SOM
- 2014 Instructor, MD ID (1): MS2017 H+D - CNS Infections, University of Utah, Deans Office - SOM
- 2015 Instructor, MD ID (1): MS2017 H+D - Introduction to Virology, University of Utah, Deans Office - SOM

- 2015 Instructor, MD ID (1): MS2017 H+D - Viral Replication, University of Utah, Deans Office - SOM
- 2015 Instructor, MD ID (1): MS2017 H+D - Viral Genetics, University of Utah, Deans Office - SOM
- 2015 Instructor, MD ID (1): MS2017 H+D - Viral Pathogenesis, University of Utah, Deans Office - SOM
- 2015 Instructor, MD ID (1): MS2017 H+D - Zoonoses, University of Utah, Deans Office - SOM
- 2015 Instructor, MD ID (1): MS2017 H+D - CNS Infections, University of Utah, Deans Office – SOM
- 2020 Instructor, MD ID (1): MS2017 H+D – Viral Pathogenesis, University of Utah, Deans Office – SOM
- 2021 Instructor, MD ID (1): MS2017 H+D - Viral Pathogenesis, University of Utah, Deans Office – SOM
- 2022 Instructor, MD ID (1): MS2017 H+D - Viral Pathogenesis, University of Utah, Deans Office - SOM

Clinical Teaching

- 2009 Infectious Disease Fellow lectures: Herpesviruses, Catheter-related infections, Bioterrorism agents
- 2009 2nd year medical student EPC (Physical Diagnosis)
- 2011 Primary Instructor, INTMD 7880 (1): Infectious Dis Research, 4 SCH, 1 student, University of Utah, Internal Medicine
- 2012 Primary Instructor, INTMD 7650 (1): Inf Dis Clerkship, 6 SCH, 2 students, University of Utah, Internal Medicine
- 2013 Primary Instructor, INTMD 7650 (1): Inf Dis Clerkship, 8 SCH, 2 students, University of Utah, Internal Medicine
- 2014 Primary Instructor, INTMD 7650 (1): Inf Dis Clerkship, 2 SCH, 1 student, University of Utah, Internal Medicine

Laboratory Teaching

- 2012 Path 6830, [Lab Orientation, 6830]
Eun A Kim
- 2014 Primary Instructor, INTMD 7880 (1): Infectious Dis Research, 4 SCH, 1 student, University of Utah, Internal Medicine

Trainee Supervision

PhD/Doctorate

- 1995-1998 Eryu Wang, Ph.D., Mechanism of SM function. *Current position*.
Research Scientist, Department of Pathology and Center for

- Tropical Diseases, University of Texas Medical Branch, Galveston, TX.
- 2000 - 2004 Advisor, Ashish Gupta, University of Florida. Role of KSHV-SM protein in angiogenesis and endothelial cell transformation
Trainee's Current Career Activities: Physician, Cardiology.
- 2000-2004 Supervisor, Garnet Suck, Medizinische Universitaet zu Luebeck, Germany. Protein interactions of Epstein-Barr Virus SM Protein.
Trainee's Current Career Activities: Head of Production/Preparation DRK-Blutspendedienst West, largest blood bank in Europe, Essen, Germany
- 2006 - 2007 Advisor, Melusine Gaillard, University of Western Brittany, France. Protein interactions of Epstein-Barr Virus SM Protein.
Trainee's Current Career Activities: Scientific Communication Officer at France Énergies Marines
- 2006 - 2010 Supervisor, Dinesh Verma, University of Florida. *Trainee's Current Career Activities:* Research Assistant Professor, University of Utah.
- 2007 - 2009 Advisor, Bindhu Monica Selvakumar, University of Florida. Effect of Interferon-stimulated genes on virus replication
Trainee's Current Career Activities: Staff position, Christian Medical College, Vellore.
- 2009 - 2015 Supervisor, Dajiang Li, University of Florida. *Trainee's Current Career Activities:* Research Assistant Professor, University of Utah, Salt Lake City, UT.
- 2010 - 2011 Supervisor, Eleonora Forte, University of Utah. Innate immune responses to EBV and KSHV. *Trainee's Current Career Activities:* Postdoctoral fellow, Northwestern University, Chicago, IL.
- 2011 - 2012 Supervisor, Dominique Kagele, University of Utah. *Trainee's Current Career Activities:* Global Product Strategy and Business Development, Genentech/Roche, San Francisco, CA.
- 2015-2017 Maud Contrant, PhD. RNA binding specificities of EBV SM protein.
Current Position: Post-doctoral associate, Institut de Biologie Moléculaire et Cellulaire (IBMC). France
- 2016- 2019. Supervisor, Wenmin Fu. University of Utah. Host chromatin factor control of herpesvirus replication. *Trainee's Current Career Activities:* Postdoctoral fellow, University of Utah, Salt Lake City, UT.

Masters

- 2007 - 2008 Preceptor, Zhao Han, University of Florida
- 2014-2018 Advisor, Eun A Kim, M.S. A high-throughput assay for EBV SM function. *Current position:* Laboratory Supervisor, Myriad Genetics.

Undergraduate

- 1994 Tracy Evans, Ph.D. Role of Bam C promoter in EBV transformation of B lymphocytes. *Current position:* Senior Research Analyst (Centre for Adolescent Health)MCRI: Melbourne, Victoria, AU
- 2004 Advisor, Zhao Han, MS. University of Florida. RNA binding characteristics of EBV SM protein. *Trainee's Current Career Activities:* Internal Medicine Physician.
- 2003-2004 Advisor, John Nicewonger 2003-2004. EBV SM protein recruitment and functional interaction with Sp110b. *Current position:* Research Associate, Vaccine Research Center, NIAID, National Institutes of Health.
- 2004-2005 Advisor, Jose Contreras. EBV SM functional mutants. *Current position:* Specialist in Pulmonary Medicine, Cleveland Clinic.

Graduate Student Committees

- 1993 - 1994 Member, Gloria Chang, Masters Thesis Committee. Department of Microbiology and Immunology, Thomas Jefferson University, Philadelphia, PA.
- 1994 - 1995 Member, John Maggioncalda, PhD/Doctorate Committee. Department of Microbiology and Immunology, Thomas Jefferson University, Philadelphia, PA.
- 2000 - 2004 Member, Jerome O'Neil, University of Florida, PhD/Doctorate Committee. Ph. D. supervisory committee, Molecular Genetics and Microbiology
- 2005 - 2008 Member, Rebecca Skalsky, University of Florida, PhD/Doctorate Committee. Ph. D. supervisory committee, Molecular Genetics and Microbiology.
- 2011-2015 Ph.D. Thesis Committee, Peter Ramirez, Experimental Pathology, University of Utah
- 2013-2015 Ph.D. Thesis Committee, John Frank, Biochemistry, University of Utah
- 2022 PhD Thesis Committee, Abdalla Elhakiem, Viral non-coding RNAs

Membership in Scientific Societies:

American College of Physicians

International Association for Research on Epstein-Barr Virus and
Associated Diseases

American Society for Microbiology

Infectious Diseases Society of America

Board Certification:

1987 Board Certified, American Board of Internal Medicine.
1990 Board Certified, Infectious Disease, American Board of Internal
Medicine.
2003 Board Certified, Infectious Disease, American Board of Internal
Medicine.
2014 Board Certified, Infectious Disease, American Board of Internal
Medicine.

Licensure:

2015 Utah License Registration 7746146-1205

Awards and Honors:

1975 Presidential Scholar
1977-1979 Harvard Scholar
1979 magna cum laude, Harvard College
1999 Fellow, American College of Physicians
2000 Department of Internal Medicine Basic Science Research Award,
University of Texas Medical Branch, Galveston, TX.
2008 University of Florida Department of Medicine Teaching Excellence
Award
2011 Fellow, Infectious Diseases Society of America
2008-2011 University of Florida Research Foundation Professorship
2004-present Member, Governing Board, International Association for Research
on Epstein-Barr virus and Associated Diseases.
2005-present Editorial Board, Journal of Virology.
2006-present Editorial Board, Future Microbiology.
2006-present Treasurer, International Association for Research on Epstein-Barr
virus and Associated Diseases.
2009-2017 Editorial Board, Advances in Tumor Virology
2014-present Associate Editor, PLOS Pathogens

Additional Information:

1996- Reviewer, Clinical Infectious Diseases
1996- Reviewer, Journal of Biological Chemistry

2000- Reviewer, Journal of Clinical Microbiology
 2001- Reviewer, Journal of Virology
 2002- Reviewer, Cancer Research
 2003- Reviewer, Virology
 2003- Reviewer, Clinical Cancer Research
 2003- Reviewer, Proc. Natl. Acad. Sci. USA
 2004- Reviewer, Journal of the National Cancer Institute
 2005- Reviewer, Blood
 2005 Reviewer, Human Gene Therapy
 2006 Reviewer, Laboratory Investigation
 2007 Reviewer, Journal of Cellular Physiology
 2007 Reviewer, EMBO Journal
 2007 Reviewer, Journal of Leukocyte Biology
 2007 Reviewer, Virus Research
 2008 Reviewer, PLOS Pathogens
 2008 Reviewer, Journal of Bacteriology
 2008 Reviewer, Journal of Cellular Biochemistry
 2009 Reviewer, Journal of General Virology
 2009 Reviewer, Cancer Biology and Therapy
 2013 Guest Editor, PLOS Pathogens
 2015 Reviewer, Oncogene, Proc. Natl. Acad. Sci. USA
 2017 Reviewer, Nature Microbiology
 2020-2021 Investigator, Gilead 5773: A Phase 3 Randomized Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734™) in Participants with Severe COVID-19
 Investigator, Gilead 5774: A Phase 3 Randomized Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734™) in Participants with Moderate COVID-19 Compared to Standard of Care Treatment
 Investigator, NIH Adaptive COVID-19 Treatment Trial 3 (ACTT-3)
 Investigator, NIH Adaptive COVID-19 Treatment Trial 4 (ACTT-4)
 Investigator, NIAID ACTIV-5 / Big Effect Trial (BET-B) for the Treatment of COVID-19

Bibliography:

A. Articles in peer-reviewed journals:

1. Swaminathan S, Gooding L. Inhibition of glycosylation prevents surface H-2 K and D antigen expression on SV40 virus-transformed cells. *Eur J. Immunol.* 1983; 13:335-339.
2. Swaminathan S, Tomkinson B, Kieff E. Recombinant Epstein-Barr virus with deleted small RNA (EBER) genes transforms lymphocytes and replicates in vitro. *Proc. Natl. Acad. Sci.* 1991; 88:1546-1550.
3. Swaminathan S, Huneycutt B, Reiss C, Kieff E. Epstein-Barr virus encoded small RNAs (EBERs) do not modulate interferon effects in infected lymphocytes. *J. Virol.* 1992; 66: 5133-5136.
4. Swaminathan S, Hesselton R, Sullivan J, Kieff E. 1993. Epstein-Barr virus recombinants with specifically mutated BCRF1 genes. *J. Virol.* 1993; 67: 7406-7413.
5. Kurilla M, Swaminathan S, Welsh R, Kieff E, Brutkiewicz R. 1993. The effects of virally expressed interleukin-10 on vaccinia virus infection in mice. *J. Virol.* 1993; 67: 7623-7628.
6. Swaminathan S. Characterization of Epstein-Barr Virus recombinants with deletions of the BamHI C EBNA promoter. *Virology* 1996; 217: 532-541.
7. Evans TJ, Farrell, P and Swaminathan, S. Molecular genetic analysis of Epstein-Barr virus Cp promoter function. *J. Virol.* 1996; 70: 1695-1705.
8. Ruvolo, V, Wang, E, Boyle, S, Swaminathan, S. The Epstein-Barr virus nuclear protein SM is both a post-transcriptional inhibitor and activator of gene expression. *Proc. Natl. Acad. Sci.* 1998; 95:8852-8857.
9. Fuentes-Panana, EM, Swaminathan, S, Ling, PD. Transcriptional activation signals found in the EBV latency C promoter are conserved in the latency C promoter sequences from baboon and rhesus monkey EBV-like lymphocryptoviruses (cercopithicine herpesviruses 12 and 15). *J. Virol.* 1999, 73:826-833.
10. Boyle, S, Ruvolo, V, Gupta, AK, Swaminathan, S. Association with the cellular export receptor CRM1 mediates function and intracellular localization of the EBV SM protein, a regulator of gene expression. *J. Virol.* 1999, 73:6872-6881.

11. Gupta, AK, Ruvolo, V, Patterson, C, Swaminathan, S. The HHV8 homolog of Epstein Barr Virus SM protein (KS-SM) is a post-transcriptional activator of gene expression. *J. Virol.* 2000, 74:1038-44.
12. Ruvolo V, Gupta, AK, Swaminathan, S. Epstein-Barr virus SM protein interacts with messenger RNA in vivo and mediates a gene-specific increase in cytoplasmic mRNA. *J. Virol.* 2001, 75: 6033-6041.
13. Boyer JL, Swaminathan, S and Silverstein, SJ. The Epstein-Barr virus SM protein is functionally similar to ICP27 from herpes simplex virus. *J. Virol.* 2002, 76(18):9420-33.
14. Ruvolo V, Navarro L, Sample C, David M, Swaminathan S. The Epstein-Barr Virus SM protein activates STAT1 and induces interferon stimulated gene expression. *J. Virol.* 2003, 77(6):3690-701.
15. Swaminathan, S. Molecular biology of Epstein-Barr virus and Kaposi's sarcoma-associated herpesvirus. *Semin. Hematol.* 2003, 40(2):107-15.
16. Ruvolo V, Sun L, Howard K, Sung S, Delecluse H-J, Hammerschmidt W, Swaminathan S. Functional analysis of Epstein-Barr virus SM protein: identification of amino acids essential for structure, trans-activation, splicing inhibition and virion production. *J. Virol.* 2004, 78(1):340-352.
17. Nicewonger, J, Suck, G, Bloch D, Swaminathan, S. Epstein Barr virus SM protein induces and recruits cellular Sp110b to stabilize mRNAs and enhance EBV lytic gene expression. *J. Virol.* 2004, 78(17):9412-22.
18. Swaminathan, S. Post-transcriptional gene regulation in gamma-herpesviruses. *J. Cell. Biochem.* 2005, 95(4):698-711.
19. Han, Z and Swaminathan, S. The KSHV lytic gene ORF57 is essential for infectious virion production. *J Virol.* 2006, 80(11):5251-60.
20. Han, Z, Marendy, E, Wang, Y-D, Yuan, J, Sample, JT, Swaminathan, S. Multiple roles of Epstein Barr virus SM protein in lytic replication. *J. Virol.* 2007 81(8): 4058-69.
21. Nekorchuk, M, Han, Z, Hsieh, T and Swaminathan, S. Kaposi's sarcoma-associated herpesvirus ORF 57 protein enhances nuclear mRNA accumulation independent of effects on RNA export. *J Virol.* 2007, 81:(18): 9990-9998.

22. Verma, D and Swaminathan, S. Epstein-Barr virus SM protein functions as an alternative splicing factor, *J Virol.* 2008, 82(14): 7180-8.
23. Swaminathan S. Noncoding RNAs produced by oncogenic human herpesviruses. *J Cell Physiol.* 2008 Aug;216(2):321-6. doi: 10.1002/jcp.21480. Review. PubMed PMID: 18484093.
24. Verma, D, Ling, C, Johannsen, E, Nagaraja, T, Swaminathan, S. Negative autoregulation of EBV replicative gene expression by Epstein-Barr virus (EBV) SM protein, *J. Virol.* 2009 Aug;83(16):8041-50.
25. Han Z, Verma D, Hilscher C, Dittmer DP, Swaminathan S. General and target-specific RNA binding properties of Epstein Barr virus SM post-transcriptional regulatory protein. *J Virol.* 2009, 83(22): 11635-11644.
26. Swaminathan, S. 2009. Gamma-secretase inhibitors - Do they have a role in the treatment of B cell lymphoma? *Cancer Biol. Ther.* 8(22):2126-43.
27. Verma, D, Bais, S, Gaillard, M and Swaminathan, S. Epstein-Barr virus SM protein utilizes cellular splicing factor SRp20 to mediate alternative splicing. *J. Virol.* 2010, 84(22):11781-9.
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Funded projects in the last five years

1999-2024 1R01 CA81133, Post-transcriptional gene regulation by EBV SM protein.

The current project is based on findings made in the previous funding cycle that: 1. SM affects both EBV transcription and RNA stability. 2. Spironolactone (SPR), a clinically approved drug, potently inhibits SM function and EBV virus production by transcriptional mechanisms. 3. SPR targets cellular XPB, a component of TFIIH, which is critical for SM mediated transcriptional enhancement of EBV genes.

Based on this work, we hypothesize that:

- 1) The net effect of SM on an individual gene depends on a combination of transcriptional activation and mRNA stabilization that is specific to the gene target.
- 2) Spironolactone inhibits transcriptional activation mediated by SM.
 - a) These transcriptional effects of spironolactone are distinct from its mineralocorticoid blocking activity and depend on modification of SM or host cell proteins.
 - b) Spironolactone derivatives that lack mineralocorticoid activity will retain antiviral activity, and spironolactone-targeted cellular proteins can be identified by chemical and proteomic methods.
- 3) Human XPB is a major cofactor for SM activity in transcription initiation/elongation and virion production.

Specific Aims:

1. Determine SM effects on transcription or elongation versus RNA stabilization and delineate the mechanisms by which transcription is specifically enhanced and RNA targets are stabilized by SM.
2. Investigate the mechanism by which spironolactone (SPR) inhibits SM function and expand its utility as an antiviral agent.
3. Investigate the role of XPB in SM mediated RNA transcription enhancement
XPB, a cellular target of SPR, is known to be involved in transcription initiation; its role in SM mediated transcription/elongation will be investigated.

2014-2019 1I01BX002262, Restriction of Oncogenic Herpesviruses by Host Cell Factors (VA Merit Review), Principal Investigator.

S.A. 1. Determine how CTCF and cohesin regulate EBV lytic replication and transcription.

S.A.2 Delineate the mechanisms by which cohesin and CTCF inhibit KSHV reactivation

S.A. 3. Investigate the role of cohesin in the mechanisms of KSHV immune evasion.

These experiments will help define the role of cohesin during initial cell infection and transformation, a critical phase of KSHV infection that could be targeted with antiviral drugs.

2018-2020 CSSG P30 supplement: Epigenetic Risk Factors for Lymphoma in HIV patients

The major goals of this project are to identify the factors that result in an association between EBV and diffuse large B cell lymphomas (DLBCLs) in AIDS patients and to investigate the following hypotheses.

1. Driver mutations of DLBCL also regulate EBV gene expression in EBV positive tumors: the epigenetic regulatory state of EBV is altered in DLBCL with specific mutations, thereby altering EBV gene expression which can reciprocally affect lymphoma growth.
2. EBV can also substitute for the role of such mutations in DLBCL that arise in HIV patients. The presence of EBV will correlate with an ability of lymphomas to arise without as many cellular driver mutations.

The specific aims are to answer the following questions:

What is the role of CTCF and cohesin in AIDS-associated EBV-driven lymphomas?

What is the role of epigenetic modification in AIDS-associated EBV-driven lymphomas?

Recent Keynotes and Symposia Presentations

2022 Effects of RAD21 and CTCF on EBV reactivation from latency. 20th International Symposium on EBV and Associated Diseases, Siena, Italy.

2021 Invited Symposium speaker, International Herpesvirus Workshop 2021: Targeting cellular transcription factors essential for EBV replication.

2020 19th International Symposium on EBV and Associated Diseases: Potential role of EBV lytic reactivation in enhancing ACE2-dependent SARS-CoV-2 infection

2019 Transcriptional Virus-Host Relationships of Gammaherpesviruses. Duke-UNC Symposium on Viral Oncology and AIDS Malignancy.