

Curriculum Vitae

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Education: B.A. Biology (1976) *summa cum laude*
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Postgraduate Positions Held:

1983-86 Medical House Officer, Medical Services
Massachusetts General Hospital

1986-88 Medical Staff Fellow, Laboratory of Viral Diseases
National Institute of Allergy and Infectious Diseases
National Institutes of Health

1988-92 Assistant Member, Molecular Biology Program, Sloan-Kettering Institute, and
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1992-95 Associate Member, Molecular Biology Program, Sloan-Kettering Institute, and
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1995- Member, Molecular Biology Program, Sloan-Kettering Institute, and
Member, Dept. of Medicine, Memorial Sloan-Kettering Cancer Center

Certification: American Board of Internal Medicine (1986)

Honors: Member of the American Academy of Arts and Sciences (2015)
Fellow of the American Academy of Microbiology (2013)
NIH MERIT Award (2007-2017)
American Cancer Society Research Professor (2005 -)
American Society for Virology, Wolfgang Joklik Lectureship (2004)
Burroughs Wellcome Fund Award - New Initiatives in Malaria Research (2001-03)
Simon H. Rifkind Chair (1999 -)
American Cancer Society Faculty Research Award (1994-99)
Pew Scholar (1990-94)
American Cancer Society Junior Faculty Research Award (1989-92)
Alpha Omega Alpha (1982)
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Editorial: Associate Editor, *Virology* (1993 - 2013)
Editorial Board, *Journal of Virology* (1996 - 2007)
Editorial Board, *Journal of Biological Chemistry* (2000-05)
Editorial Board, *Nucleic Acids Research* (2001-03)

Other Service: Chair, 2019 Gordon Research Conference on "Nucleic Acids"
Vice Chair, 2017 Gordon Research Conference on "Nucleic Acids"
Organizer, 2006 FASEB Summer Research Conference on "Poxviruses"
Organizer, 2000 FASEB Summer Research Conference on "Nucleic Acid Enzymes"
Member, National Science Foundation MCB review panel (1993-1999)
Member, NIH Molecular Genetics B (MGB) Study Section (2012 - present)

Publications:

1. Shuman, S., and Hurwitz, J. (1979) 5' Hydroxyl polyribonucleotide kinase from HeLa cell nuclei. *J. Biol. Chem.* 254, 10396-10404.
2. Spencer, E., Shuman, S., and Hurwitz, J. (1980) Purification and properties of vaccinia virus DNA-dependent RNA polymerase. *J. Biol. Chem.* 255, 5388-5395.
3. Shuman, S., Spencer, E., Furneaux, H., and Hurwitz, J. (1980) The role of ATP in *in vitro* vaccinia virus RNA synthesis: effects of AMP-PNP and ATP γ S. *J. Biol. Chem.* 255, 5396-5403.
4. Shuman, S., Surks, M., Furneaux, H., and Hurwitz, J. (1980) Purification and characterization of a GTP-pyrophosphate exchange activity from vaccinia virions: association of the GTP-pyrophosphate exchange activity with vaccinia mRNA guanylyltransferase•RNA (guanine-7-) methyltransferase complex (capping enzyme). *J. Biol. Chem.* 255, 11588-11598.
5. Shuman, S., and Hurwitz, J. (1981) Mechanism of mRNA capping by vaccinia virus guanylyltransferase: characterization of an enzyme-guanylate intermediate. *Proc. Natl. Acad. Sci. USA* 78, 187-191. PMID: PMC319016
6. Shuman, S., and Hurwitz, J. (1982) Capping Enzyme. *The Enzymes* 15, 245-265.
7. Shuman, S. (1982) RNA capping by HeLa cell RNA guanylyltransferase: characterization of a covalent protein-guanylate intermediate. *J. Biol. Chem.* 257, 7237-7245.
8. Shuman, S., Broyles, S., and Moss, B. (1987) Purification and characterization of a transcription termination factor from vaccinia virions. *J. Biol. Chem.* 262, 12372-12380.
9. Shuman, S., and Moss, B. (1987) Identification of a vaccinia virus gene encoding a type I DNA topoisomerase. *Proc. Natl. Acad. Sci. USA.* 84, 7478-7482. PMID: PMC299319
10. Shuman, S., and Moss, B. (1988) Factor-dependent transcription termination by vaccinia RNA polymerase: evidence for a cis-acting termination signal in nascent RNA. *J. Biol. Chem.* 263, 6220-6225.
11. Shuman, S., and Moss, B. (1988) Vaccinia virus poly(A) polymerase: specificity for nucleotides and nucleotide analogs. *J. Biol. Chem.* 263, 8405-8412.
12. Broyles, S., Yuen, L., Shuman, S., and Moss, B. (1988) Purification of a factor required for transcription of vaccinia virus early genes. *J. Biol. Chem.* 263, 10754-10760.
13. Shuman, S., Golder, M., and Moss, B. (1988) Characterization of vaccinia virus DNA topoisomerase I expressed in *Escherichia coli*. *J. Biol. Chem.* 263, 16401-16407.

14. Shuman, S., Golder, M., and Moss, B. (1989) Insertional mutagenesis of the vaccinia virus gene encoding a type I DNA topoisomerase: evidence that the gene is essential for virus growth. *Virology* 170, 302-306.
15. Niles, E.G., Lee-Chen, G., Shuman, S., Moss, B., and Broyles, S. (1989) Vaccinia virus gene D12L encodes the small subunit of the viral mRNA capping enzyme. *Virology* 172, 513-522.
16. Shuman, S., and Moss, B. (1989) Bromouridine triphosphate inhibits transcription termination and mRNA release by vaccinia virions. *J. Biol. Chem.* 264, 21356-21360.
17. Shuman, S. (1989) Vaccinia DNA topoisomerase I promotes illegitimate recombination in *Escherichia coli*. *Proc. Natl. Acad. Sci. USA* 86, 3489-3493. PMID: PMC287163
18. Shuman, S. (1989) Functional domains of vaccinia virus mRNA capping enzyme: analysis by limited tryptic digestion. *J. Biol. Chem.* 264, 9690-9695.
19. Shuman, S., Kane, E.M., and Morham, S.G. (1989) Mapping the active site tyrosine of vaccinia virus DNA topoisomerase I. *Proc. Natl. Acad. Sci. USA* 86, 9793-9797. PMID: PMC298588
20. Shuman, S., and Moss, B. (1990) Purification and use of vaccinia virus capping enzyme. *Methods in Enzymology: RNA Processing* 181, 170-180.
21. Morham, S.G., and Shuman, S. (1990) Phenotypic selection and characterization of mutant alleles of a eukaryotic DNA topoisomerase I. *Genes Dev.* 4, 515-524.
22. Shuman, S. (1990) Catalytic activity of vaccinia mRNA capping enzyme subunits coexpressed in *Escherichia coli*. *J. Biol. Chem.* 265, 11960-11966.
23. Shuman, S., and Morham, S.G. (1990) Domain structure of vaccinia virus mRNA capping enzyme: activity of the Mr 95,000 subunit expressed in *Escherichia coli*. *J. Biol. Chem.* 265, 11967-11972.
24. Shuman, S., and Prescott, J. (1990) Specific DNA cleavage and binding by vaccinia virus DNA topoisomerase I. *J. Biol. Chem.* 265, 17826-17836.
25. Shuman, S. (1991) Site-specific DNA cleavage by vaccinia virus DNA topoisomerase I: role of nucleotide sequence and DNA secondary structure. *J. Biol. Chem.* 266, 1796-1803.
26. Shuman, S. (1991) Site-specific interaction of vaccinia virus DNA topoisomerase with duplex DNA: minimal DNA substrate for strand cleavage *in vitro*. *J. Biol. Chem.* 266, 11372-11379.
27. Luo, Y., Hagler, J., and Shuman, S. (1991) Discrete functional stages of vaccinia virus early transcription during a single round of RNA synthesis *in vitro*. *J. Biol. Chem.* 266, 13303-13310.
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35. Cong, P., and Shuman, S. (1992) Methyltransferase and subunit association domains of vaccinia virus mRNA capping enzyme. *J. Biol. Chem.* 267, 16424-16429.
36. Shuman, S. (1992) Two classes of DNA end-joining reactions catalyzed by vaccinia topoisomerase I. *J. Biol. Chem.* 267, 16755-16758.
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38. Hagler, J., and Shuman, S. (1992) Structural analysis of ternary complexes of vaccinia RNA polymerase. *Proc. Natl. Acad. Sci. USA* 89, 10099-10103. PMID: PMC50285
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Schizosaccharomyces pombe and viral capping enzymes and among polynucleotide ligases. Proc. Natl. Acad. Sci. USA 91, 12046-12050. PMID: PMC45373

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Jeremiah Hagler	Ph.D. 1993
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Yan Luo	Ph.D. 1993
Peijie Cong	Ph.D. 1995
JoAnn Sekiguchi	Ph.D. 1996
Xiangdong Mao	Ph.D. 1996
Liang Deng	Ph.D. 1996
Lei Yu	M.S. 1996
Birgitte Ø. Petersen	Ph.D. 1997
Kiong Ho	Ph.D. 1997
John Wittschieben	Ph.D. 1997
Chonghui Cheng	Ph.D. 2000
Kevin Lehman	Ph.D. 2001
Yi Pei	Ph.D. 2002
Berit Krogh	Ph.D. 2002
Rana Sawaya	Ph.D. 2004
Chunling Gong	Ph.D. 2004
Ligeng Tian	Ph.D. 2004
Hui Zhu	Ph.D. 2006
Christopher Hoess	M.S. 2007
JK Nandakumar	Ph.D. 2007
Jideofor Aniukwu	Ph.D. 2008
Sushuang Zheng	Ph.D. 2008
Niroshika Keppetipola	Ph.D. 2008
Alejandro Ramirez	Ph.D. 2009
Ruchi Jain	Ph.D. 2010
Birthe Meineke	Ph.D. 2011
Jonathan Chang	Ph.D. 2012
Poulami Samai	Ph.D. 2012
Ray Qiu	Ph.D. 2012
Anupam Chakravarty	Ph.D. 2013
Ushati Das	Ph.D. 2014
Heather Ordonez	Ph.D. 2014
William Maughan	Ph.D. 2016

Current Graduate Students

Radhika Agarwal
Anam Ejaz
Annum Munir
Loressa Uson

Current Postgraduate Scientists

Mihaela Unciuleac
Barbara Remus
Brad Schmier
Angad Garg
Shreya Ghosh
Ankan Banerjee