BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
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NAME	POSITION TITLE
Neal F. Lue	Associate Professor
eRA COMMONS USER NAME (credential, e.g., agency login) NEALLUE	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Johns Hopkins University, Baltimore, MD	B.S.	80-84	Natural Sciences
Stanford University School of Medicine, CA	M.D. Ph.D.	84-91	Medicine Cell Biology
Harvard University, Cambridge, MA		91-95	Biochem. Struc. Biol

Please refer to the application instructions in order to complete sections A, B, and C of the Biographical Sketch.

A. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Positions and Employment

1984-1990 Graduate student in the laboratory of Roger D. Kornberg, Department of Cell Biology, Stanford University School of Medicine.
1991-1995 Postdoctoral fellow in the laboratory of Dr. James C. Wang, Department of Biochemistry and Molecular Biology, Harvard University.
1996-2001 Assistant professor of Microbiology and Immunology, Weill Medical College of Cornell University.
2002-2004 Associate professor of Microbiology and Immunology, Weill Medical College of Cornell University.
2004-2008 Associate professor with tenure of Microbiology and Immunology, Weill Medical College of Cornell University.
2007 Visiting Scholar, Institute of Biological Chemistry, Academia Sinica, Taiwan.
2008-now Professor of Microbiology and Immunology, Weill Medical College of Cornell University.

Other Experiences and Professional Memberships

1997- Ad hoc reviewers for multiple journals, including *BBA, Bioessay, Experimental Cell Research, Gene, Genetics*, *Microbiology, Molecular Biology of the Cell, Molecular and Cellular Biology*, *Mol. Cell, Nature*, *Nature Review Molecular Cell Biology, Nucleic Acids Research, Proceedings of the National Academy of Sciences,* and *Structure*
2001- Member of AAAS, ASM, ASBMB
2000, 02, 06 Grant reviewer for the U.S. Israel Binational Science Foundation
2001-2005 American Cancer Society Study Section member, Committee on Genetic Mechanisms of Cancer
2005, 06 Temporary Member, NIH study section, Nuclear Dynamics and Transport
2006 Grant reviewer for U.S. National Science Foundation
2007 Grant reviewer for Israel Science Foundation
2007 Grant reviewer for the Wellcome Trust
2007-2011 Member, NIH study section, Nuclear Dynamics and Transport

Honors

1983 Junior Phi Beta Kappa

1991 Damon Runyon/Walter Winchell Fellowship (declined)
1991 Life Sciences Research Foundation Fellowship
1996 Basil O'Connor Starter Scholar Award
1999 U.S. Army Breast Cancer Program Idea Award
1999 AMDeC Tartikoff/Perelman/EIF Award for Young Investigators
1999 Concert for the Cure Award
2000 Burroughs Wellcome New Investigator Award in Pathogenic Mycology
2000 Dorothy Rodbell Cohen Foundation for Sarcoma Research
2001 Irma Hirschl-Monique Weill Caulier career development award
2004 ACS TIAA-CREF Award in recognition of contribution to cancer research
2007 Distinguished Visiting Scholar, Academia Sinica, Taiwan

B. Peer-reviewed publications (partial listing, in chronological order).

1. Bram, R.J., Lue, N.F., and Kornberg, R.D. (1986) A GAL family of upstream activation sequences in yeast: roles in both induction and repression of transcription. *EMBO J.* **5,** 603-608.
2. Sutrina, S.L., Lue, N.F., Chen, G.L., and Chen, W.W. (1987) Effect of dimethyl sulfoxide on transformed rat Schwann cells. *Biochem. Biophys. Acta* **923,** 451-462.
3. Chen, G.L., Halligan, N.L., Lue, N.F., and Chen, W.W. (1987) Biosynthesis of myelin-associated proteins in simian virus 40 (SV40)-transformed Schwann cell lines. *Brain Res.* **414,** 35-48.
4. Lue, N.F., Chasman, D.I., Buchman, A.R., and Kornberg, R.D. (1987) Interaction of GAL4 and GAL80 gene regulatory proteins in vitro. *Mol. Cell. Biol.* **7,** 3446-3451.
5. Lue, N.F., and Kornberg, R.D. (1987) Accurate initiation at RNA polymerase II promoters in extracts from Saccharomyces cerevisiae. *Proc. Natl. Acad. Sci. USA* **84,** 8839-8843.
6. Fedor, M.J., Lue, N.F., and Kornberg, R.D. (1988) Statistical positioning of nucleosomes by specific protein binding to an upstream activating sequence in yeast. *J. Mol. Biol.* **204,** 109-127.
7. Buchman, A.R., Lue, N.F., and Kornberg, R.D. (1988) Connections between transcriptional activators, silencers, and telomeres as revealed by functional analysis of a yeast DNA-binding protein. *Mol. Cell. Biol.* **8,** 5086-5099.
8. Lue, N.F., Buchman, A.R., and Kornberg, R.D. (1989) Activation of yeast RNA polymerase II transcription by a thymidine-rich upstream element in vitro. *Proc. Natl. Acad. Sci. USA* **86,** 486-490.
9. Lue, N.F., Flanagan, P.M., Sugimoto, K., and Kornberg, R.D. (1989) Initiation by yeast RNA polymerase II at the adenoviral major late promoter in vitro. *Science* **246,** 661-664.
10. Chasman, D.I., Lue, N.F., Buchman, A.R., LaPointe, J.W., Lorch, Y., and Kornberg, R.D. (1990) A yeast protein that influences the chromatin structure of UASG and functions as a powerful auxilliary gene activator. *Genes & Dev.* **4,** 503-514.
11. Flanagan, P.M., Kelleher III, R.J., Feaver, W.J., Lue, N.F., LaPointe, J.W., and Kornberg, R.D. (1990) Resolution of factors required for the initiation of transcription by yeast RNA polymerase II. *J. Biol. Chem.* **265,** 11105-11107.
12. Lue, N.F., and Kornberg, R.D. (1990) Accurately initiated, enhancer-dependent transcription by RNA polymerase I in yeast extracts. *J. Biol. Chem.* **265,** 18091-18094.
13. Lorch, Y., Lue, N.F., and Kornberg, R.D. (1990) Interchangeable RNA polymerase I and II enhancers. *Proc. Natl. Acad. Sci. USA* **87,** 8202-8206.
14. Lue, N.F., Flanagan, P.M., Kelleher III, R.J., Edward, A.M., and Kornberg, R.D. (1990) RNA polymerase II transcription in vitro. *Methods in enzymology* **194,** 545-550.
15. Lue, N. F., and Kornberg, R.D. (1993) A possible role for the yeast TATA-element binding protein in DNA replication. *Proc. Natl. Acad. Sci. UAS* **90,** 8018-8022.
16. Lue, N.F., Sharma, A., Mondragon, A., and Wang, J.C. (1995) A 26K yeast DNA topoisomerase I fragment: crystallographic structure and mechanistic implications. *Structure* **3,** 1315-1322.
17. Lue, N.F., and Wang, J.C. (1995) ATP-dependent processivity of a telomerase activity from Saccharomyces cerevisiae. *J. Biol. Chem.* **270,** 21453-21456.
18. Nugent, C., Hughes, T.R., Lue, N.F., and Lundblad, V. (1996). Cdc13 is a single-strand telomere binding protein with a dual role in yeast telomere maintenance. *Science* **274,** 249-252.
19. Lue, N.F., & Peng, Y. (1997). Identification and characterization of a telomerase activity from Schizosaccharomyces pombe. *Nucl. Acids Res.* **25,** 4331-4337.

20. Lue, N.F., & Peng, Y. (1998). Negative regulation of yeast telomerase activity through an interaction with an upstream region of the DNA primer. *Nucl. Acids Res.* **26,** 1487-1494.
21. Lue, N.F., and Xia, J. (1998). Species-specific and sequence-specific recognition of the dG-rich strand of telomeres by yeast telomerase. *Nucl. Acids Res*. **26,** 1495-1502.
22. Lue, N.F. (1999). Sequence-specific and conformation-dependent binding of yeast telomerase RNA to single-stranded telomeric DNA. *Nucl. Acids Res.* **27,** 2560-2567.
23. Xia, J., Peng, Y., Mian, I.S., and Lue, N.F. (2000). Identification of functionally important domains in the N-terminal region of telomerase reverse transcriptase. *Mol. Cell. Biol.* **20,** 5196-5207.
24. Niu, H., Xia, J., and Lue, N.F. (2000). Characterization of the interaction between the nuclease and reverse transcriptase activity of the yeast telomerase complex. *Mol. Cell. Biol.* **20,** 6806-6815.
25. Peng, Y., Mian, I.S., and Lue, N.F. (2001). Analysis of determinants of telomerase processivity: similarity to HIV-1 reverse transcriptase and role in telomere maintenance. *Molecular Cell* **7,** 1201-1211.
26. Bosoy, D., and Lue, N.F. (2001). Functional analysis of conserved residues in the putative "finger" domain of telomerase reverse transcriptase. *J. Biol. Chem.* **276,** 46305-46312.
27. Hossain, S., Singh, S., and Lue, N.F. (2002). Functional analysis of the C-terminal extension of telomerase reverse transcriptase: a putative thumb domain. *J. Biol. Chem*. **277,** 36174-36180.
28. Singh, S., Steinberg-Neifach, O., Mian, I.S., and Lue, N.F. (2002) Analysis of *Candida* telomerase: a potential role in telomere end protection. *Eukaryotic Cell* **1,** 967-977.
29. Bosoy, D., Peng, Y., Mian, I. S., and Lue, N.F. (2003). Conserved N-terminal motifs of telomerase reverse transcriptase required for ribonucleoprotein assembly in vivo. *J. Biol. Chem.* **278,** 3882-3890.
30. Lew-Smith, J., Lelivelt, M.J., Enomoto, S., Dahlseid, J.N., Ford, A., McClellan, M., Lue, N.F., Culbertson, M.R., and Berman, J. (2003). The accumulation of mRNAs encoding telomerase components and regulators is controlled by the UPF genes in Saccharomyces cerevisiae. *Eukaryotic Cell* **2,** 134-142.
31. Singh, S., and Lue, N.F. (2003). Ever Shorter Telomere 1 (EST1)-dependent reverse transcription by *Candida* telomerase *in vitro*: evidence in support of an activating function. *Proc. Natl. Acad. Sci. USA* **100,** 5718-5723.
32. Lue, N.F., Lin, Y.-C., and Mian, I.S. (2003). A conserved telomerase motif within the catalytic domain of TERT is specifically required for repeat addition processivity. *Mol. Cell. Biol.* **23,** 8440-8449.
33. Bosoy, D., and Lue, N.F. (2004). Yeast telomerase is capable of limited repeat addition processivity. *Nucl. Acids Res.* **32,** 92-101.
34. Ciudad, T., AndaLuz, E., Steinberg-Neifach, O., Lue, N.F., Gow, N.A.R., Calderone, R.A., and Larriba, G. (2004). Homologous recombination in Candida albicans: role of CaRad52p in DNA repair, integration of linear DNA fragments, prevention of chromosome loss and telomere length. *Mol. Microbiol.* **53,** 1177-1194.
35. Lue, N.F. (2004). Adding to the ends: what makes telomerase processive and how important is it? *BioEssay* **26,** 955-962.
36. Lue, N.F. and Jiang, S. (2004). Reverse transcriptase at bacterial telomeres. *Proc. Natl. Acad. Sci. USA* **101,** 14307-14308.
37. Lue, N.F. (2005). A physical and functional constituent of telomerase anchor site. *J. Biol. Chem.* **280,** 26586-26591.
38. Lue, N.F., Bosoy, D., Moriarty, T., Autexier, C., Altman, B., and Leng, S. (2005). Telomerase can act as a template- and RNA-independent terminal transferase. *Proc. Natl. Acad. Sci. USA* **102,** 9778-9783.
39. Autexier, C., and Lue, N.F. (2006). The structure and function of telomerase reverse transcriptase. *Ann. Rev. Biochem.* **75,** 493-517.
40. Steinberg-Neifach, O., and Lue, N.F. (2006) Modulation of telomere terminal structure by telomerase components in *Candida albicans*. *Nucl. Acids Res.* **34,** 2710-2722.
41. Hsu, M., McEachern, M., Dandjinou, T.A., Tzfati, Y., Orr, E., Blackburn, E.H., and Lue, N.F. (2007) The Candida albicans telomerase core components protects telomeres from aberrant degradation. *Proc. Natl. Acad. Sci. USA*, **104,** 11682-11687.
42. Yu, E.Y., Steinberg-Neifach, O., Dandjinou, T.A., Kang, F., Morrison, A., Shen, X., and Lue, N.F. (2007) Regulation of telomere structure and function by the INO80 chromatin remodeling complex. *Mol. Cell. Biol.,* **27,** 5639-5649.
43. Hsu, M., Yu, E.Y., Singh, S.M., and Lue, N.F. (2007) The mutual dependence of *Candida* Est1p and Est3p in telomerase assembly and activation. *Eukaryotic Cell,* **6,** 1330-1338.

44. Lue, N.F., and Li, Z. (2007). Modeling and structure functional analysis of the putative anchor site of yeast telomerase. *Nucl. Acids Res.,* **35,** 5213-5222.
46. Yu, E.Y., Li, Z., Lei, M., and Lue, N.F. (2008) A proposed OB-fold structure with a protein-interaction surface in the *Candida albicans* telomerase protein Est3. *Nat. Struc. Mol. Biol.* In press.

C. Research Support. List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

Ongoing Research Support

"Analysis of Telomerase Reverse Transcriptase"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: National Institute of Health
Type: RO1 (GM62631) Period: Sept. 1, 2007 to July 31, 2011.
The major goal of this project is to investigate the mechanisms of telomerase and a telomere-associated chromatin remodeling complex in *Saccharomyces cerevisiae*.

"Telomerase function and regulation in a new model system"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: National Institute of Health
Type: RO1 (GM69507) Period: Aug. 1, 2004 to July 31, 2009.
The major goal of this project is to understand the regulatory mechanisms of telomerase accessory proteins and the telomere-protective function of telomerase in Candida albicans.

Completed Research Support

"Analysis of the Recruitment of Telomerase to Telomere Ends"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: Irma Hirschl Monique Weill Caulier Trust
Type: Career Development Award Period: Jan. 1, 2002 to Dec. 31, 2006.
The major goal of this project is to determine the biochemical and structural basis of interaction between telomere-binding proteins and telomerase.

"Analysis of Telomerase Reverse Transcriptase"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: National Institute of Health
Type: RO1 (GM62631) Period: April 1, 2001 to March 31, 2006.
The major goal of this project is structure-function analysis of the catalytic subunit of telomerase in Saccharomyces.

"Structural and Functional Analysis of a Telomerase-Associated Nuclease"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: Army Breast Cancer Research Program
Type: Idea Award (DAMD 17-99-1-9160) Period: May 1, 1999 to April 30, 2002.
The major goal of this project is to determine the identity and function of a nuclease associated with yeast telomerase.

"Purification of the Yeast Telomerase Complex"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: AMDeC Foundation
Type: Tartikoff/Perelman/EIF Award for Young Investigators Period: May 1, 1999 to April 30, 2002.

The major goal of this project is to purify the native yeast telomerase complex and identify novel constituents of the enzyme.

"Analysis of Telomerase Components in Candida albicans"
Principal Investigator: Neal F. Lue, M.D. & Ph.D.
Agency: Burroughs Wellcome Fund
Type: New Investigator in Pathogenic Mycology Period: July 1, 2000 to June 30, 2003.
The major goal of this project is to analyze the function and mechanisms of putative telomerase proteins in Candida.