BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE
Suo, Zucai	Associate Professor of Biochemistry
eRA COMMONS USER NAME ZSUO03	

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
Fudan University, Shanghai, P.R.China	B.S.	1986	Chemistry
Fudan University, Shanghai, P.R.China	M.S.	1989	Physical Chemistry
Pennsylvania State University, Univ. Park, PA. (Advisor: Kenneth A. Johnson)	Ph.D.	1997	Chemistry
Harvard Medical School, Boston, MA (Advisor: Christopher T. Walsh)	Postdoc	1998-2000	Biological Chemistry

A. Professional Positions

10/2007-present Associate Professor, Department of Biochemistry, The Ohio State University.
11/2001-9/2007 Assistant Professor, Department of Biochemistry, The Ohio State University.
7/2000-10/2001 Senior Biochemist, Eli Lilly & Company, Indianapolis, IN 46285.
9/1989-7/1991 Semiconductor Scientist, Shanghai Institute of Technology and Physics, Chinese Academy of Sciences, Shanghai, P.R. China.

B. Honors and Awards

2009 Distinguished Faculty Award from the Chinese-American Chemistry & Chemical Biology Professors Association in USA
2007 Dean's Award for Excellence in Undergraduate Research Mentoring
2006 Dean's Award for Classroom Teaching for Faculty at The Ohio State University
2005 The National Science Foundation Career Award
1999 Postdoctoral Fellowship from the Jane Coffin Childs Memorial Fund
1997 Award, the 12th Annual Graduate Student Research Exhibition at Pennsylvania State University
1996 Bristol-Meyers Squibb Travel Award

C. Funding Agency Reviewer

2007-present *Ad hoc* member, panel MSFE, the National Institutes of Health
2007 Panel member, the Chemistry Research Instrumentation and Facilities: Departmental Multi-User Instrumentation (CRIF-MU) program, the National Science Foundation (NSF)
2005-present *Ad hoc* reviewer, Division of Molecular & Cellular Biosciences, NSF
2007 *Ad hoc* reviewer, the Commonwealth Universal Research Enhancement (CURE) Program, the Department of Health, Pennsylvania
2004-2005 *Ad hoc* reviewer, the American Chemical Society

D. Patent Applications

2000-2001 Nine Pending Patents on Antiviral Drug Discovery at Eli Lilly & Company
1998 A Potential Combination Chemotherapy against AIDS, Cancer, and Viral Infections

E. Drug Discovered

2000-2001 a) Discovered an anti-hepatitis C nucleoside analog which was evaluated in Phase I clinical trial by Eli Lilly & Company.

b) Being a member of the team at Eli Lilly which successfully developed an HCV protease inhibitor Telaprevir in collaboration with Vertex Pharmaceuticals, Inc. Telaprevir is currently in Phase III clinical trial by Vertex Pharmaceuticals, Inc.

F. Publications (*Corresponding Author)

1. Xu, C., Maxwell, B., Brown, J. A., Zhang, L., and **Suo, Z.*** (2009) Global Conformational Dynamics of A Y-family DNA Polymerase during Catalysis. *PLoS Biology*, in press.
2. Zhang, L., Brown. J. A., Newmister, S. A., and **Suo, Z*** (2009) Polymerization Fidelity of a Replicative DNA Polymerase from the Hyperthermophilic Archaeon *Sulfolobus solfataricus* P2. *Biochemistry,* **48**, 7492–7501.
3. Brown. J. and **Suo, Z*** (2009) Elucidating the Kinetic Mechanism of DNA Polymerization Catalyzed by *Sulfolobus solfataricus* P2 DNA Polymerase B1*. Biochemistry,* **48**, 7502–7511.
4. Fowler, J. D., Brown, J.A., Kvaratskhelia, M. and **Suo, Z*** (2009) Probing Protein Conformational Changes of A Human DNA Polymerase Using Mass Spectrometry. *J. Mol. Biol*. **390**, 368-379.
5. Sherrer, S. M., Brown, J.A., Pack, L. R., Fowler, J. D., Basu, A. K. and **Suo, Z*** (2009) Mechanistic studies of the bypass of a bulky single-base lesion catalyzed by a Y-family DNA polymerase. *J. Biol. Chem.* **284**, 6379-6388.
6. Brown, J. A., Newmister, S. A., Fiala, K. A., & **Suo, Z.*** (2008) Mechanism of Double-Base Lesion Bypass Catalyzed by a Y-Family DNA Polymerase, *Nucleic Acids Res.* **36**, 3867-3878.
7. DeCarlo, L., Prakasha Gowda, A. S., **Suo, Z.** and Spratt, T. E.* (2008) Formation of purine-purine mispairs by *Sulfolobus solfataricus* DNA polymerase IV, *Biochemistry* **47**, 8157–8164.
8. Wong, J. H. Y., Fiala, K. A., **Suo, Z.** & Ling, H.* (2008) Snapshots of a Y-family DNA polymerase in replication: substrate-induced conformational transitions and implications for fidelity of Dpo4, *J. Mol. Biol*. **379**, 317-330.
9. Fowler, J. D., Brown, J.A., Johnson, K.A. and **Suo, Z*** (2008) Kinetic Investigation of the Inhibitory Effect of Gemcitabine on DNA Polymerization Catalyzed by Human Mitochondrial DNA Polymerase. *J Biol. Chem.* **283**, 15339-15348.
10. Fiala, K. A., Sherrer, S. M., Brown, J. A., and **Suo, Z.*** (2008) Mechanistic consequences of temperature on DNA polymerization catalyzed by a Y-family DNA polymerase, *Nucleic Acids Research, **36**,* 1990-2001.
11. Fiala, K. A., Hypes, C., and **Suo, Z.*** (2007) Mechanism of Abasic Lesion Bypass Catalyzed by a Y-Family DNA Polymerase, *J. Biol. Chem.* **282**, 8188-8198.
12. Fiala, K. A. and **Suo, Z.*** (2007) Sloppy Bypass of an Abasic Lesion Catalyzed by a Y-Family DNA Polymerase. *J. Biol. Chem.* **282**, 8199-8206.
13. Fiala, K. A., Brown, J. A., Ling, H., Kshetry, A. K., Zhang, J., Taylor, J.-S., Yang, W. and **Suo, Z.*** (2007) Mechanism of Template-Independent Nucleotide Incorporation Catalyzed by a Template-Dependent DNA Polymerase. *J. Mol. Biol*. **365**, 590-602.
14. Abdullah, M. A. F. and **Suo, Z*** (2007) Unique composite active site of the Hepatitis C virus NS2-3 protease: a new opportunity for antiviral drug design. *ChemMedChem* **2**, 283-284.
15. Brown, J. A., Duym, W. W., Fowler, J. D., and **Suo, Z.*** (2007) Single-Turnover Kinetic Analysis of the Mutagenic Potential of 7,8-Dihydro-8-oxoguanine During Gap-Filling Synthesis Catalyzed by Human DNA Polymerases λ and β, *J. Mol. Biol*. **367**, 1258-1269.
16. Fowler, J. & **Suo, Z.*** (2006) Enzymatic, Structural, and Physiological Properties of Terminal Deoxynucleotidyl Transferase. *Chemical Reviews* **106**, 2092-2110.
17. Fiala, K. A., Duym, W. W., Zhang, J. and **Suo, Z.*** (2006) Upregulation of the Fidelity of Human DNA Polymerase lambda by Its Non-Enzymatic Proline-Rich Domain. *J. Biol. Chem.* **281**, 19038-19044.
18. Duym, W. W., Fiala, K. A., Bhatt N., and **Suo, Z.*** (2006) Kinetic Effect of a Downstream Strand and Its 5'-Terminal Moieties on Single-Nucleotide Gap-Filling Synthesis Catalyzed by Human DNA Polymerase Lambda. *J. Biol. Chem.* **281**, 35649–35655.
19. Johnson, A. A., Fiala, K. A. and **Suo, Z.*** (2005) "Chapter 6: DNA Polymerases and Their Interactions with DNA and Nucleotides", pp133-168. *In* M. M. Vaghefi (ed.), *Nucleoside Triphosphates and their Analogs: Chemistry, Biotechnology, and Biological Applications*, Marcel Dekker, New York, NY.
20. Abdel-Gawad, W., Tan, S. L. and **Suo, Z.*** (2005) "Chapter 7: RNA polymerases", pp169-206. *In* M. M. Vaghefi (ed.), *Nucleoside Triphosphates and their Analogs: Chemistry, Biotechnology, and Biological Applications*, Marcel Dekker, New York, NY.
21. Wang, L. and **Suo, Z.*** (2005) "Chapter 8: Reverse Transcriptase", pp207-246. *In* M. M. Vaghefi (ed.), *Nucleoside Triphosphates and their Analogs: Chemistry, Biotechnology, and Biological Applications*, Marcel Dekker, New York, NY.

22. **Suo, Z.*** (2005) Thioesterase Portability and Peptidyl Carrier Protein Swapping in Yersiniabactin Synthetase from Yersinia pestis. *Biochemistry* **44**, 4926-4938.
23. Roettger, M. P., Fiala, K. A., Sompalli, S., Dong, Y. and **Suo. Z.*** (2004) Pre-Steady state Kinetic Studies of the Fidelity of Human DNA Polymerase Mu. *Biochemistry* **43**, 13827-13838.
24. Fiala, K. A, Abdel-Gawad, W. & **Suo, Z.*** (2004) Pre-Steady-State Kinetic Studies of the Fidelity and Mechanism of Polymerization Catalyzed by Truncated Human DNA Polymerase Lambda. *Biochemistry* **43**, 6751-6762.
25. Zhang G. & **Suo, Z.*** (2004) A Mild and Convenient Synthetic Method for Arylhydrazones of Methyl Benzoate. *Synthetic Communications* **34 (4),** 673-678.
26. Fiala, K. A & **Suo, Z.*** (2004) Pre-Steady State Kinetic Studies of the Fidelity of Sulfolobus solfataricus P2 DNA Polymerase IV. *Biochemistry* **43**, 2106-2115
27. Fiala, K. A & **Suo, Z.*** (2004) Mechanism of DNA Polymerization Catalyzed by Sulfolobus solfataricus P2 DNA Polymerase IV. *Biochemistry* **43**, 2116-2125
28. Johnson, A. A., Ray, A., Hanes, J., **Suo, Z.**, Colacino, J. M., Andeson, K. S. and Johnson, K.A.* (2001) Toxicity of Antiviral Nucleoside Analogs and the Human Mitochondrial DNA Polymerase. *J. Biol. Chem.* **276**, 40847-40857.
29. **Suo, Z.**, Tseng, C. and Walsh, C. T.* (2001) Purification, Priming, and Catalytic Acylation of Carrier Protein Domains in the Polyketide Synthase and Nonribosomal Peptidyl Synthetase Modules of the HMWP1 Subunit of Yersiniabactin Synthetase. *Proc. Natl. Acad. Sci. U.S.A.* **98**, 99-104.
30. **Suo, Z**., Chen, H. and Walsh, C. T.* (2000) Acyl CoA Hydrolysis by the HMWP1 Subunit of Yersiniabactin Synthetase: Mutational Evidence for A Cascade of Four Acyl-Enzyme Intermediates during Hydrolytic Editing. *Proc. Natl. Acad. Sci. U.S.A.* **97**, 14188-14193.
31. Keating, T. A., **Suo, Z.**, Ehmann, D. D. and Walsh, C. T.* (2000) Selectivity of the Yersiniabactin Synthetase Adenylation Domain in the Two Step Process of Amino Acid Activation and Transfer to a Holo-Carrier Protein. *Biochemistry* **39**, 2297-2306.
32. **Suo, Z.**, Walsh, C. T.* and Miller, D. A. (1999) Tandem Heterocyclization Activity of the Multidomain 230 kDa HMWP2 Subunit of *Yersinia pestis* Yersiniabactin Synthetase: Interaction of the 1-1382 and 1383-2035 Fragments. *Biochemistry* **38**, 14023-14035.
33. **Suo, Z.**, Lippard, S. J., and Johnson, K. A.* (1999) Single *d*(GpG)/*cis*-Diammineplatinum(II) Adduct-Induced Inhibition of DNA Polymerization. *Biochemistry* **38**, 715-726.
34. **Suo, Z.** and Johnson, K. A.* (1998) Selective Inhibition of HIV-1 Reverse Transcriptase by an Antiviral Inhibitor, (*R*)-9-(2-Phosphonylmethoxypropyl)adenine. *J. Biol. Chem.* **273**, 27250-27258.
35. **Suo, Z.** and Johnson, K. A.* (1998) DNA Secondary Structure Effects on DNA Synthesis Catalyzed by HIV-1 Reverse Transcriptase. *J. Biol.Chem*. **273**, 27259-27267.
36. **Suo, Z.** and Johnson, K. A.* (1997) RNA Secondary Structure Switching during DNA Synthesis Catalyzed by HIV-1 Reverse Transcriptase. *Biochemistry* **36**, 14778-14785.
37. **Suo, Z.** and Johnson, K. A.* (1997) Effect of RNA Secondary Structure on the Kinetics of DNA Synthesis Catalyzed by HIV-1 Reverse Transcriptase. *Biochemistry* **36**, 12459-12467.
38. **Suo, Z.** and Johnson, K. A.* (1997) Effect of RNA Secondary Structure on RNA Cleavage Catalyzed by HIV-1 Reverse Transcriptase. *Biochemistry* **36**, 12468-12476.
39. **Suo, Z.** and Li, Q. (1990) Comparison of the Acidic and Catalytic Properties of Two Zeolites ZSM-12 and ZSM-5. *The 9th National Conference of Heterogeneous Catalysis*, Shanghai, P. R. China.
40. **Suo, Z.**, Zhu, C., Li, Q.*, Zhou, L. & Xu, H. (1992) Structural Behavior of the ZSM-12 Zeolite at Various Molar Ratios of SiO_2/Al_2O_3. *J. Fudan U. (Natural Sci.)* **31**, 32-40.
41. **Suo, Z.**, Zhu, C., Li, Q.*, Zhou, L. & Xu, H. (1992) Acidic and Catalytic Properties of the ZSM-12 Zeolite at Various Molar Ratios of SiO_2/Al_2O_3. *J. Fudan U. (Natural Sci.)* **31**, 41-48.

G. Research Support

ONGOING

MCB-0447899 The National Science Foundation Career Award 4/15/2005 to 4/14/2010
Role: sole PI
"Kinetic, Dynamic, and Structure-Function Relationship Studies of a Y-family Polymerase"
Goals: this proposal is to carry out Kinetic, Dynamic, and Structure-Function Relationship Studies of Dpo4, a model Y-family DNA polymerase from *Sulfolobus solfataricus*.

2R01CA040463-22A1 (PI: John-Stephen Taylor) NIH/NCI 9/21/06 to 9/20/2011

Role: Co-PI
"DNA Photolesion Structure-Activity Relationships"
Goals: determine the DNA photoproduct and polymerase structure-activity relationships involved in the deamination and tautomerization bypass mechanisms for the formation of C to T mutations.

1R01GM079403-01A2 NIH/GM 9/14/2007 to 8/31/2012
Role: sole PI
"Mechanistic and Structure-Function Studies of Human DNA Polymerase Lambda"
Goals: establish kinetic, thermodynamic, and structural bases for the gap-filling fidelity, efficiency, and processivity of human DNA polymerase lambda, a novel X-family enzyme, and elucidate the role of its individual domains both *in vitro* and *in vivo*.

1R01GM079403-02S1 NIH/NIGMS 8/1/2009 to 7/31/2011
Role: sole PI
"Mechanistic and Structure-Function Studies of Human DNA polymerase lambda"
Note: this is an administrative supplement to GM079403.

2R56ES009127 NIH/NIEHS 8/1/2009 to 7/31/2010
Role: one of two equal PIs
"Biological Effects of DNA Adducts Formed by Nitroaromatic Compounds"
Goals: *In vitro* and *in vivo* studies will be carried out to define the genomic toxicities of environmental pollutants nitropyrenes.

A grant from Gilead Sciences, Inc. in California, $35,000, starting 6/1/2009 and has no time limit.
Role: sole PI
"Toxicity and Efficacy of Anti-cancer and Antiviral Nucleoside Analogs"
Goals: Utilize pre-steady state kinetic methods to investigate potential toxicity and efficacy of FDA-approved nucleoside drugs.

<u>PENDING</u>
NIH proposal 1R21AI088061-01
Role: sole PI
"Hepatitis C Virus Influences the Innate Immune Response Through Cleavage of IKK-alpha, IKK-beta, IKK-epsilon and TBK1"
Goals: Investigate the impact on the kinase activities of four human kinases by hepatitis C protease Complex NS3/NS4A both *in vitro* and *in vivo*.

NIH proposal 2R01ES009127-10A2
Role: one of two equal PIs (Contact PI: Prof. Ashis Basu at University of Connecticut)
"Biological Effects of DNA Adducts Formed by Nitroaromatic Compounds".
Goals: *In vitro* and *in vivo* studies will be carried out to define the genomic toxicities of environmental pollutants nitropyrenes.

NSF proposal 0960961
Role: sole PI
"Mechanistic Investigation of DNA Lesion Bypass"
Goals: kinetic and dynamics studies of DNA lesion bypass catalyzed by a model Y-family DNA polymerase from *Sulfolobus solfataricus.*