

**Curriculum Vitae**  
JUDITH L. CAMPBELL

**Born:** March 24, 1943

**Education**

Degrees: B.A. Wellesley College, 1965  
Ph.D. Harvard University, 1974

**Professional Experience**

1961 - 1965 Wellesley College  
1965 - 1966 Student (German Literature), University of Bonn (West Germany)  
1966 - 1967 Special Student, Max Planck Institut fur Zellchemie, University of Munich  
1967 - 1969 Research Assistant, Boston University  
1969 - 1974 Graduate Student, Department of Biological Chemistry, Harvard Medical School  
1974 - 1977 Postdoctoral Fellow and Senior Research Associate, Department of Biological Chemistry, Harvard Medical School

**Academic Appointments**

1977 - 1983 Assistant Professor, Chemistry Division, California Institute of Technology  
1983 - 1989 Associate Professor, Chemistry Division, California Institute of Technology  
1985 - 1989 Associate Professor, Biology Division, California Institute of Technology  
1989 - present Professor of Chemistry and Biology, California Institute of Technology  
2007 - 2009 Chair of the Faculty, California Institute of Technology

**Major Research Interest**

Structure and metabolism of nucleic acids

**Honors and Awards**

2009-2012 Ellison Medical Foundation Senior Scholar  
1979-1984 Research Career Development Award, National Institutes of Health  
1966-1967 Bavarian State Scholarship  
1965 Wellesley College Pendleton Scholar

**Professional Societies and Boards**

1979-present American Society of Biological Chemists  
1982-1986 Member, Biochemistry Study Section NIH  
1989-1994 Editorial Board, *Molecular and Cellular Biology*  
1989-1994 Board of Scientific Councilors, National Cancer Institute  
1991-1995 Editorial Board, Annual Review of Biochemistry  
1993-1995 Nominating Committee - ASBMB  
1993-present Editorial Board, *Critical Reviews in Biochemistry and Molecular Biology*  
1998-2003 Damon Runyon-Walter Winchell Fellowship Review Committee  
2009-present Editorial Board, *Journal of Biological Chemistry*

## Publications

1. Campbell, J.L., Soll, J. and Richardson, C.C. (1972) Isolation and partial characterization of a mutant *Escherichia coli* deficient in DNA polymerase II. *Proc. Natl. Acad. Sci. USA* **69**, 2090-2094. PMID: 4559593. PMCID: PMC426875. [PubMed](#), [PDF](#)
2. Moses, R.E., Campbell, J.L., Fleischman, R.A. and Richardson, C.C. (1971) Enzymatic mechanisms in DNA replication. In *Nucleic Acid-Protein Interactions and Nucleic Acid Synthesis in Viral Infection*. Miami Winter Symposia, **2** (eds. D. W. Ribbons, J. F. Woessner, and J. Schultz), 48-69.
3. Moses, R.E., Campbell, J.L., Fleischman, R.A., Frenkel, G.D., Mulcahy, H.L., Shizuya, H. and Richardson, C.C. (1972) Enzymatic mechanisms of DNA replication in *Escherichia coli*. *Federation Proc.* **31**, 1415-1421. PMID: 4560272. [PubMed](#)
4. Campbell, J.L., Shizuya, H.S. and Richardson, C.C. (1974) Mapping of a mutation, polB100, affecting deoxyribonucleic acid polymerase II in *Escherichia coli* K-12. *J. Bacteriol.* **119**, 494-499. PMID: 4604726. PMCID: PMC245632. [PubMed](#), [PDF](#)
5. Richardson, C.C., X., Chase, J.W., Hinkle, D.C., Livingston, D.M., Mulcahy, H.L. and Shizuya, H. (1973) DNA polymerases of *Escherichia coli*. *DNA Synthesis In Vitro* (R. D. Wells and R. B. Inman, eds.), 65-69.
6. Fleischman, R.A., Campbell, J.L. and Richardson, C.C. (1976) Modification and restriction of T-even bacteriophages. *In vitro* degradation of deoxyribonucleic acid containing 5-hydroxymethylcytosine. *J. Biol. Chem.* **251**, 1561-1570. PMID: 767337. [PubMed](#), [PDF](#)
7. Campbell, J.L., Richardson, C.C. and Studier, F.W. (1978) Genetic recombination and complementation between bacteriophage T7 and cloned fragments of T7 DNA. *Proc. Natl. Acad. Sci. USA* **75**, 2276-2280. PMID: 276868. PMCID: PMC392535. [PubMed](#), [PDF](#)
8. Campbell, J.L., Tamanoi, F., Richardson, C.C. and Studier, F.W. (1978) Cloning of the T7 genome in *Escherichia coli*: Use of recombination between cloned sequences and phage T7 to identify genes involved in recombination and a clone containing the origin of T7 DNA replication. *Cold Spring Harbor Symposium of Quantitative Biology* **43**, 441-448. PMID: 289457. [PubMed](#)
9. Conrad, S.E., Wold, M. and Campbell, J.L. (1979) Origin and direction of DNA replication of plasmid RSF1030. *Proc. Natl. Acad. Sci. USA* **76**, 736-740. PMID: 370835. PMCID: PMC383035. [PubMed](#), [PDF](#)
10. Conrad, S.E. and Campbell, J.L. (1979) Characterization of an improved *in vitro* DNA replication system for *Escherichia coli* plasmids. *Nucl. Acid Res.* **6**, 3289-3304. PMID: 384367. PMCID: PMC327934. [PubMed](#), [PDF](#)
11. Conrad, S.E. and Campbell, J.L. (1979) Role of plasmid-coded RNA and ribonuclease III in plasmid DNA replication. *Cell* **18**, 61-71. PMID: 389434. [PubMed](#), [PDF](#)

12. Broach, J.R., Guarascio, V.R., Musiewicz, M.H. and Campbell, J.L. (1980) Replication of the yeast plasmid, 2 $\mu$  circle. *Molecular Genetics in Yeast*, Alfred Benzon Symposium 16, Munksgaard (Copenhagen), 227-241.
13. Kuo, C.-L. and Campbell, J.L. (1982) Purification of the cdc8 protein of *Saccharomyces cerevisiae* by complementation in an aphidicolin-sensitive *in vitro* DNA replication system. *Proc. Natl. Acad. Sci. USA* **79**, 4243-4247. PMID: 6812044. PMCID: PMC346646. [PubMed](#), [PDF](#)
14. Celniker, S.E. and Campbell, J.L. (1982) Yeast DNA replication *in vitro*: Initiation and elongation events mimic *in vivo* processes. *Cell* **31**, 201-213. PMID: 6297748. [PubMed](#), [PDF](#)
15. Campbell, J.L. (1983) Yeast DNA Replication. *Genetic Engineering, Principles and Methods* **5**, 109-156.
16. Moser, D.R. and Campbell, J.L. (1983) Characterization and complementation of pMB1 copy number mutant: Effect of RNA I gene dosage on plasmid copy number and incompatibility. *J. Bacteriol.* **154**, 809-818. PMID: 6188748. PMCID: PMC2117533. [PubMed](#), [PDF](#)
17. Srienc, F., Campbell, J.L. and Bailey, J.E. (1983) Detection of bacterial  $\beta$ -galactosidase activity in individual *Saccharomyces cerevisiae* cells by flow cytometry. *Biotechnology Letters* **5**, 43-48.
18. Moser, D.R., Moser, C.D., Sinn, E. and Campbell, J.L. (1983) Suppressors of a temperature-sensitive copy-number mutation in plasmid NTP1. *Mol. Gen. Genet.* **192**, 95-100. PMID: 6196607. [PubMed](#)
19. Kuo, C.-L. and Campbell, J.L. (1983) Cloning of *Saccharomyces cerevisiae* DNA replication genes: Isolation of the CDC8 gene and two genes that compensate for the cdc8-1 mutation. *Mol. Cell. Biol.* **3**, 1730-1737. PMID: 6358860. PMCID: PMC370034. [PubMed](#), [PDF](#)
20. Kuo, C.-L., Huang, N.-H. and Campbell, J.L. (1983) Isolation of yeast DNA replication mutants using permeabilized cells. *Proc. Natl. Acad. Sci. USA* **80**, 6465-6469. PMID: 6356128. PMCID: 390134. [PubMed](#), [PDF](#)
21. Moser, D.R., Ma, D., Moser, C.D. and Campbell, J.L. (1984) *cis*-acting mutations that affect rop protein control of plasmid copy number. *Proc. Natl. Acad. Sci. USA* **81**, 4465-4470. PMID: 6205397. PMCID: PMC345622. [PubMed](#), [PDF](#)
22. Jong, A.Y.-S., Kuo, C.-L. and Campbell, J.L. (1984) The CDC8 gene of yeast encodes thymidylate kinase. *J. Biol. Chem.* **259**, 11052-11058. PMID: 6088527. [PubMed](#), [PDF](#)
23. Celniker, S.E., Sweder, K., Srienc, F., Bailey, J.E. and Campbell, J.L. (1984) Deletion mutations affecting autonomously replicating sequence ARS1 of *Saccharomyces cerevisiae*. *Mol. Cell. Biol.* **4**, 2455-2466. PMID: 6392851. PMCID: PMC369077. [PubMed](#), [PDF](#)

24. Jong, A.Y.-S. and Campbell, J.L. (1984) Characterization of *Saccharomyces cerevisiae* thymidylate kinase, the CDC8 gene product. *J. Biol. Chem.* **259**, 14394-14398. PMID: 6094555. [PubMed](#), [PDF](#)
25. Srienc, F., Bailey, J.E. and Campbell, J.L. (1985) Effect of ARS1 mutations on chromosome stability in *Saccharomyces cerevisiae*. *Mol. Cell. Biol.* **5**, 1676-1684. PMID: 3894934. PMCID: PMC367286. [PubMed](#), [PDF](#)
26. Johnson, L.M., Snyder M., Chang, L.M.S., Davis, R.W. and Campbell, J.L. (1985) Isolation of the gene encoding yeast DNA polymerase I. *Cell* **43**, 369-377. PMID: 3907855. [PubMed](#), [PDF](#)
27. Campbell, J.L., Johnson, L.M., Jong., A.Y.-S., Budd, M., Sweder, K. and Srienc, F. (1986) Yeast Chromosomal DNA Replication. *Yeast Cell Biology, UCLA Symposia on Molecular and Cellular Biology*, **33**, 173-191.
28. Jong, A.Y.-S., Aebersold, R. and Campbell, J.L. (1985) Multiple species of single-stranded DNA binding proteins in *Saccharomyces cerevisiae*. *J. Biol. Chem.* **260**, 16367-16374. PMID: 3905814. [PubMed](#), [PDF](#)
29. Jong, A.Y.-S. and Campbell, J.L. (1986) Isolation of the gene encoding yeast single-stranded nucleic acid binding protein 1 (SSB-1). *Proc. Natl. Acad. Sci. USA* **83**, 877-881. PMID: 3513165. PMCID: PMC322973. [PubMed](#), [PDF](#)
30. Srienc, F., Campbell, J.L. and Bailey, J. (1986) Flow cytometry analysis of recombinant *Saccharomyces cerevisiae* populations. *Cytometry* **7**, 132-131. PMID: 2419058. [PubMed](#)
31. Campbell, J.L., Budd, M., Gordon, C., Jong, A.Y.-S., Sweder, K., Oehm, A. and Gilbert, M. (1986) Yeast DNA Replication. *Extrachromosomal Elements in Lower Eukaryotes*, 463-478.
32. Campbell, J.L. (1986) Eukaryotic DNA Replication. *Ann. Rev. Biochem.* **55**, 733-71. PMID: 3017196. [PubMed](#), [PDF](#)
33. Srienc, F., Campbell, J.L. and Bailey, J.E. (1986) Analysis of unstable recombinant *Saccharomyces cerevisiae* population growth in selective medium. *Biotech. and Bioengineering*, Vol XVIII, 996-1006. PMID: 18555421. [PubMed](#)
34. Campbell, J.L., Budd, M., Gordon, C., Jong, A.Y.-S., Sweder, K., Oehm, A. and Gilbert, M. (1986) Yeast DNA replication. *DNA Replication and Recombination, UCLA Symposia on Molecular and Cellular Biology*, **47**, 265-287.
35. Budd, M. and Campbell, J.L. (1987) Temperature-sensitive mutations in the yeast DNA polymerase I gene. *Proc. Natl. Acad. Sci. USA* **84**, 2838-2842. PMID: 3554248. PMCID: PMC304755. [PubMed](#), [PDF](#)
36. Jong, A., Clark, M.W., Gilbert, M. and Campbell, J.L. (1987) *Saccharomyces cerevisiae* SSB-1 protein and its relationship to nucleolar RNA binding proteins. *Mol. Cell. Biol.* **7**, 2947-2955. PMID: 2823109. PMCID: PMC367914. [PubMed](#), [PDF](#)

37. Ma, D. and Campbell, J.L. (1988) The effect of dnaA protein and n' sites on the replication of plasmid ColE1. *J. Biol. Chem.* **263**, 15008-15915. PMID: 2844794. [PubMed](#), [PDF](#)
38. Sweder, K.S., Rhode, P.R. and Campbell, J.L. (1988) Purification and characterization of proteins that bind to yeast ARSs. *J. Biol. Chem.* **263**, 17270-17277. PMID: 3053706. [PubMed](#), [PDF](#)
39. Budd, M., Gordon, C., Sitney, K., Sweder, K. and Campbell, J.L. (1988) Yeast DNA polymerases and ARS-binding proteins. In *Cancer Cells: Eukaryotic DNA Replication*. Cold Spring Harbor Symp. **6**, 347-357.
40. Campbell, J.L., Budd, M., Burbee, D., Sitney, K., Sweder, K. and Heffron, F. (1988) Reverse genetics and yeast DNA replication and repair. Proceedings of the DNA Replication and Mutagenesis Meeting, November 8-12, 1987. *DNA Replication and Mutagenesis*, Amer. Soc. for Microbiol.: Washington, DC, Ch. 9, 98-102.
41. Budd, M.E., Wittrup, K.D., Bailey, J.E. and Campbell, J.L. (1989) DNA polymerase I is required for premeiotic DNA replication and sporulation but not for X-ray repair in *Saccharomyces cerevisiae*. *Mol. Cell. Biol.* **9**, 365-376. PMID: 2651896. PMCID: PMC362610. [PubMed](#), [PDF](#)
42. Campbell, J.L. (1988) Eukaryotic DNA replication — yeast bares its ARSs. *TIBS* **13**, 212-217.
43. Sitney, K.C., Budd, M.E. and Campbell, J.L. (1989) DNA polymerase III, a second essential DNA polymerase, is encoded by the *S. cerevisiae* CDC2 gene. *Cell* **56**, 599-605. PMID: 2645055. [PubMed](#), [PDF](#)
44. Budd, M.E., Sitney, K.C. and Campbell, J.L. (1989) Purification of DNA polymerase II, a distinct DNA polymerase, from *Saccharomyces cerevisiae*. *J. Biol. Chem.* **264**, 6557-6565. PMID: 2649504. [PubMed](#), [PDF](#)
45. Burbee, D., Campbell, J.L. and Heffron, F. (1988) The purification and characterization of the NUC1 gene product, a yeast endodeoxyribonuclease required for double-strand break repair. In *Mechanisms and Consequences of DNA Damage Processing* (E. Friedberg and P. Hanawalt, eds.), UCLA Symp. *Mol. Cell. Biol.* **83**, 223-230.
46. Choi, W.-J., Campbell, J.L., Kuo, C.-L. and Jong, A.Y. (1989) The *Saccharomyces cerevisiae* SOC8-1 gene and its relationship to a nucleotide kinase. *J. Biol. Chem.* **264**, 15593-15599. PMID: 2549068. [PubMed](#), [PDF](#)
47. Sitney, K.C. and Campbell, J.L. (1990) The yeast DNA replication apparatus — genetic and biochemical analysis. *The Eukaryotic Nucleus: Molecular Biochemistry and Macromolecular Assemblies*, **1**, 125-146.
48. Rhode, P.R., Sweder, K.S., Oegema, K.F. and Campbell, J.L. (1989) The gene encoding ARS-binding factor I is essential for the viability of yeast. *Genes & Develop.* **3**, 1926-1939. PMID: 2620828. [PubMed](#), [PDF](#)

49. Brown, W.C., Smiley, J.K. and Campbell, J.L. (1990) Purification of DNA polymerase II stimulatory factor I, a yeast single-stranded DNA-binding protein. *Proc. Natl. Acad. Sci. USA* **87**, 677-681. PMID: 2153962. PMCID: PMC53328. [PubMed](#), [PDF](#)
50. Clark, M.W., Yip, M.L.R., Campbell, J. and Abelson, J. (1990) SSB-1 of the yeast *Saccharomyces cerevisiae* is a nucleolar-specific, silver binding protein that is associated with the snR10 and snR11 small nuclear RNAs. *J. Cell. Biol.* **111**, 1741-1751. PMID: 2121740. [PubMed](#), [PDF](#)
51. Burgers, P.M.J., Bambara, R.A., Campbell, J.L., Chang, L.M.S., Downey, K.M., Hübscher, U., Lee, M.Y.W.T., Linn, S.M., So, A.G. and Spadari, S. (1990) Revised nomenclature for eukaryotic DNA polymerases. *Eur. J. Biochem.* **191**, 617-618. PMID: 2390988. [PubMed](#)
52. Yoon, H.-J. and Campbell, J.L. (1991) The CDC7 protein of *Saccharomyces cerevisiae* is a phosphoprotein that contains protein kinase activity. *Proc. Natl. Acad. Sci. USA* **88**, 3574-3578. PMID: 2023904. PMCID: PMC51494. [PubMed](#), [PDF](#)
53. Gordon, C.B. and Campbell, J.L. (1991) A cell cycle-responsive transcriptional control element and a negative control element in the gene encoding DNA polymerase  $\alpha$  in *Saccharomyces cerevisiae*. *Proc. Natl. Acad. Sci. USA* **88**, 6058-6062. PMID: 2068085. PMCID: PMC52021. [PubMed](#), [PDF](#)
54. Campbell, J.L. and Newlon C.S. (1991) Chromosomal DNA replication. In *The Molecular and Cellular Biology of the Yeast Saccharomyces*. Cold Spring Harbor: New York, 41-146.
55. Verma, R., Patapoutian, A., Gordon, C. and Campbell, J. (1991) Identification and purification of a factor that binds to the *Mlu* I cell cycle box of yeast DNA replication genes. *Proc. Natl. Acad. Sci. USA* **88**, 7155-7159. PMID: 1871128. PMCID: PMC52252. [PubMed](#), [PDF](#)
56. Verma, R. and Campbell, J.L. (1991) Identification and purification of DBF-A, a double-stranded DNA-binding protein from *Saccharomyces cerevisiae*. *J. Biol. Chem.* **267**, 1648-1654. PMID: 1730709. [PubMed](#), [PDF](#)
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  63. Yoon, H.-J., Loo, S. and Campbell, J.L. (1993) Regulation of *Saccharomyces cerevisiae* CDC7 function during the cell cycle. *Mol. Biol. Cell* **4**, 195-208. PMID: 8382976. PMCID: PMC300915. [PubMed](#), [PDF](#)
  64. Brown, W.C., Duncan, J. and Campbell, J.L. (1993) Purification and characterization of the *Saccharomyces cerevisiae* DNA polymerase  $\delta$  overproduced in *Escherichia coli*. *J. Biol. Chem.* **268**, 982-990. PMID: 8380419. [PubMed](#), [PDF](#)
  65. Park, C., Campbell, J.L. and Goddard, W.A. III (1993) Design superiority of palindromic DNA sites for site-specific recognition of proteins: Tests using protein stitchery. *Proc. Natl. Acad. Sci. USA* **90**, 4892-4896. PMID: 8506333. PMCID: PMC46619. [PubMed](#), [PDF](#)
  66. Brown, W.C. and Campbell, J.L. (1993) Interaction of proliferating cell nuclear antigen with yeast DNA polymerase  $\delta$ . *J. Biol. Chem.* **268**, 21706-21710. PMID: 8104944. [PubMed](#), [PDF](#)
  75. Budd, M.B. and Campbell, J.L. (1993) DNA polymerases  $\delta$  and  $\epsilon$  are required for chromosomal replication in *Saccharomyces cerevisiae*. *Mol. Cell. Biol.* **13**, 496-505. PMID: 8417347. PMCID: PMC358929. [PubMed](#), [PDF](#)
  68. Campbell, J.L. (1993) Yeast DNA replication. *J. Biol. Chem.* **268**, 25261-25264. PMID: 8244955. [PubMed](#), [PDF](#)
  69. Bertani, L.E. and Campbell, J.L. (1993) The isolation and characterization of the gene (*dfp1*) encoding dihydrofolate reductase (DHFR) in *Schizosaccharomyces pombe*. *Gene* **147**, 131-135. PMID: 8088538. [PubMed](#), [PDF](#)
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  71. Park, C., Campbell, J.L. and Goddard, W.A. III (1995) Design and synthesis of a new peptide recognizing a specific 16 base pair site of DNA. *J. Am. Chem. Soc.* **117**, 6287-6291.
  72. Budd, M.E. and Campbell, J.L. (1995) DNA polymerases required for repair of UV-induced damage in *Saccharomyces cerevisiae*. *Mol. Cell. Biol.* **15**, 2173-2179. PMID: 7891712. PMCID: PMC230445. [PubMed](#), [PDF](#)

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80. Budd, M.E. and Campbell, J.L. (1997) A yeast replicative helicase, Dna2 helicase, interacts with  $\gamma$ -FEN-1 nuclease in carrying out its essential function. *Mol. Cell. Biol.* **17**, 2136-2142. PMID: 9121462. PMCID: PMC232061. [PubMed](#), [PDF](#)
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88. Elsasser, S.E., Chi, Y., Yang, P. and Campbell, J.L. (1999) Phosphorylation controls timing of Cdc6p destruction: A biochemical analysis. *Mol. Biol. Cell* **10**, 3263-3277. PMID: 10512865. PMCID: PMC25589. [PubMed](#), [PDF](#)
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91. Budd, M.E., Choe, W.-c. and Campbell, J.L. (2000) The nuclease activity of the yeast Dna2 protein, which is related to the RecB-like nucleases, is essential *in vivo*. *J. Biol. Chem.* **275**, 16518-16519. PMID: 10748138. [PubMed](#), [PDF](#)
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