MEMORIAL SLOAN-KETTERING CANCER CENTER

Curriculum Vitae and Bibliography

Name: Jerard Hurwitz

Date of Birth: November 20, 1928

Place of Birth: New York, New York

Nationality: U.S. Citizen

Office Address: Memorial Sloan-Kettering
Cancer Center
1275 York Avenue
New York, NY 10021

Telephone #: 212-794-5896
E-Mail: j-hurwitz@ski.mskcc.org
Fax#: (212) 717-3627

Home Address: 418 East 59th Street
New York, NY 10022

Telephone No. 212-223-4364

Education:

Indiana University
1949, B.A., Chemistry

Western Reserve University
1953, Ph.D., Biochemistry

Postdoctoral Training:

1953-1954 American Cancer Society, Postdoctoral Fellow
National Medical Research Council, Mill Hill, London, England

1955-1956 American Cancer Society, Postdoctoral Fellow
National Institutes of Health, Bethesda, Maryland

Positions and Appointments:

1956-1958 Instructor of Microbiology, Washington University, St. Louis, MO

1958-1960 Assistant Professor of Microbiology, New York University School of Medicine, New York, New York

1960-1963 Associate Professor of Microbiology, New York University School of Medicine, New York, New York

1963-1965 Professor of Molecular Biology, Albert Einstein College of Medicine, Bronx, New York

1965-1984 Professor and Chairman Dept. of Developmental Biology and Cancer, Albert Einstein College of Medicine, Bronx, New York

1984-Present Member, Sloan-Kettering Institute Professor, Sloan-Kettering Division of the Cornell University Medical College, New York, New York

1989-Present Head, William Randolph Hearst Laboratory of Radiation Biology, Memorial Sloan-Kettering Cancer Center, New York, New York

1991-2003 Vice-chairman, Sloan-Kettering Institute, Memorial Sloan-Kettering Cancer Center, New York, New York

Scientific and Medical Societies:

American Society of Biological Chemists
New York Academy of Sciences

Member of the National Academy of Sciences
American Academy of Arts and Sciences

Honors and Awards:

1962	Eli Lilly Award in Biochemistry
1962	Sigma Xi Award
1963-1998	American Cancer Society Professorship
1964-1968	N000.I.H. Physiological Chemistry Study Section
1967	Charles Mickle Fellowship Award of Canada
1968	Guggenheim Fellowship Award
1971-1975; 1991-97	American Cancer Society Study Section
1972	Institut Pasteur Hazen Lectureship
1973-1975	Special Viral Cancer Program
1974	Member of the National Academy of Sciences
1980	Fogarty Scholar
1982	Louis and Bert Freeman Foundation Prize for Research in Biochemistry of the New York Academy of Science
1981-1984	N.I.H. Physiological Chemistry Study Section
1984-1989	Pfizer Science Award
1986-1995	John Simon Guggenheim Memorial Foundation

Editorial Boards:

1965-1970	Journal of Molecular Biology
1968-1971	Journal of Bacteriology

Languages: Spoken: English
Written: English

Publications:

1. Muntz JA, Hurwitz J. Effect of potassium and ammonium Ions upon glycolysis catalyzed by extract of rat brain. Arch of Bioch and Biophys 1951; 32:124-136.

2. Muntz JA, Hurwitz J. The Effect of ammonium Ions upon Isolated reactions of the glycolytic scheme. Arch of Bioch and Biophys 1951; 32:137-149.

3. Hurwitz J. The enzymic phosphorylation of vitamin B6 derivatives and their effects on tyrosine decarboxylase. Biochim Biophys Acta 1952; 9:496-498.

4. Hurwitz J. The enzymatic phosphorylation of pyridoxal. J Biol Chem 1953; 205:935-947.

5. Hurwitz J. Inhibition studies on aldehyde oxidase. J Biol Chem 1955; 212:757-769.

6. Hurwitz J, Cooperstein SJ. Reduction of cytochrome oxidase by liver aldehyde oxidase. J Biol Chem 1955; 212:771-785.

7. Hurwitz J. Enzymatic phosphorylation of vitamin B_6 analogues and their effect on tyrosine decarboxylase. J Biol Chem 1955; 217:513-525.

8. Hurwitz J, Weissbach A, Horecker BL, Smyrniotis PZ. Spinach phosphoribulokinase. J Biol Chem 1956; 218:769-783.

9. Horecker BL, Hurwitz J, Weissbach A. The enzymatic synthesis and properties of ribulose-1.5 diphosphate. J Biol Chem 1956; 218:785-794.

10. Weissbach A, Horecker BL, Hurwitz J. The enzymatic formation of phosphoglyceric acid from ribulose diphosphate. J Biol Chem 1956; 213:795-810.

11. Horecker BL, Hurwitz J, Smyrniotis PZ. Xylulose 5-phosphate and the formation of sedoheptulose 7-phosphate with liver transketolase. JACS 1956; 78:692-693.

12. Hurwitz J. Metabolism of vitamin β6 and its derivatives. Nutrition Symposium 1956; 13:49-64.

13. Hurwitz J, Jakoby WB, Horecker BL. On the mechanism of C02 fixation leading to phosphoglyceric acid. Biochim Biophys Acta 1956; 22:194-195.

14. Hurwitz J, Horecker BL. The purification of phosphoketopentoepimerase from *lactobacillus pentosus* and the preparation of xylulose 5-phosphate. J Biol Chem 1956; 223:993-1008.

15. Horecker BL, Smyrniotis PZ, Hurwitz J. The role of xylulose 5-phosphate in the transketolase reaction. J Biol Chem 1956; 223:1009-1019.

16. Heath EC, Hurwitz J, Horecker BL. Acetyl phosphate formation in the phosphorolytic cleavage of pentose phosphate. J. Am Chem Soc 1956; 78:5449.

17. Horecker BL, Hurwitz J, Heppel LA. The synthesis of ribose 5-pyrophosphate and ribose 5-triphosphate. J.A.C.S. 1957; 79:701-702.

18. Heppel LA, Hurwitz J, Horecker BL. Adenine deaminase of azotobacter vinelandii. JACS 1957; 79:630-633.

19. Hurwitz J, Heppel L, Horecker BL. The enzymatic cleavage of adenylic acid to adenine and ribose 5-phosphate. J Biol Chem 1957; 226:525-540.

20. Horecker BL, Heath E, Hurwitz J, Y. Takagi, Burman DP. A new phosphorolytic mechanism for the cleavage of pentose phosphate. Proc of the International Symposium on Enzyme Chemistry, Tokyo and Kyoto, 1957; 93-102.

21. Heath EC, Hurwitz J, Horecker BL, Ginsberg A. Pentose fermentation by *Lactobacillus plantarum*. J Biol Chem 1958; 231:1009-1029.

22. Hurwitz J. Pentose phosphate cleavage by leuconostoc mesanteroides. Biochim Biophysica Acta 1958; 28:599-602.
23. Hurwitz J, Weissbach A. The formation of 2-Keto-3-deoxyheptonic acid in extracts of *E. coli* B.I. identification. J Biol Chem 1959; 234:705-709.

24. Hurwitz J, Weissbach A. The Formation of 2-Keto-3-deoxyheptonic acid in extracts of *E. coli* B.II. enzymatic studies. J Biol Chem 1959; 234:710-712.

25. Hurwitz J. The enzymatic incorporation of ribonucleotides into polydeoxynucleotide material. J Biol Chem 1959; 234:2351-2358.

26. Hurwitz J, Bresler A, Kaye A. Incorporation of ribonucleotides into RNA. Biochem and Biophys Res Commun 1959; 1:3-5.

27. Hurwitz J, Bresler A, Diringer R. The enzymatic incorporation of ribonucleotides into polyribonucleotides and the effect of DNA. Biochem and Biophys Res Commun 1960; 3:15-19.

28. Hurwitz J, Bresler AE. The incorporation of ribonucleotides into ribonucleic acid. J Biol Chem 1961; 236:542-548.

29. Furth JJ, Hurwitz J, Goldmann M. The directing role of DNA in RNA synthesis. Biochem and Biophys Res Commun 1961; 4:362-367.

30. Furth JJ, Hurwitz J, Goldmann M. The directing role of DNA in RNA synthesis. specificity of the deoxyadenylate deoxythymidylate copolymer as a primer. Biochem and Biophys Res Commun 1961; 4:431-435.

31. Alexander M, Heppel LA, Hurwitz J. The purification and properties of micrococcal nuclease. J Biol Chem 1961; 236:3014-3019.

32. Furth JJ, Hurwitz J, Krug R, Alexander M. The incorporation of adenylic and cytidylic acids into ribonucleic acid. J Biol Chem 1961; 236:3317-3322.

33. Hurwitz J, Furth JJ, Anders M, Ortiz PJ, August JT. The enzymatic incorporation of ribonucleotides into RNA and the role of DNA. J de Chimie Physique 1961; 934-944.

34. Hurwitz J, Furth JJ, Anders M, Ortiz PJ, August JT. The enzymatic incorporation of ribonucleotides into RNA and the role of DNA. Cold Spring Harbor Symposia on Quantitative Biology 1961; 26:91-99.

35. Furth JJ, Hurwitz J, Anders M. The role of DNA in RNA synthesis. I. Purification and properties of RNA polymerase. J Biol Chem 1962; 237:2611.

36. Hurwitz J, Furth JJ, Anders M, Evans A. The role of DNA in RNA synthesis. II. The Influence of deoxyribonucleic acid on the reaction. J Biol Chem 1962; 237:3752-3759.

37. Hurwitz J, Furth JJ, Malamy N, Alexander M. The role of DNA in RNA synthesis. III. The inhibition of the enzymatic synthesis of RNA and DNA by actinomycin D and proflavin. Proc Natl Acad Sci USA 1962; 48:1222-1230.

38. Kahan F, Hurwitz J. The role of DNA in RNA Synthesis. IV. The incorporation of pyrimidine and purine analogues into RNA. J Biol Chem 1962; 237:3778-3785.
39. August JT, Ortiz PJ, Hurwitz J. Ribonucleic acid-dependent ribonucleotide incorporation. I. Purification and properties of the enzyme. J Biol Chem 1962; 237:3786-3793.

40. Hurwitz J. Phosphoribulokinase. Methods in Enzymology, Vol. 5, Academic Press, Inc., New

York, 1962:258-261.

41. Hurwitz J. D-xylulose 5-phosphate-3-epimerase. Methods in Enzymology, Vol. 5, Academic Press, Inc., New York, 1962:247-253.

42. Furth JJ, Kahan FM, Hurwitz J. Stimulation by RNA polymerase of amino acid incorporation into proteins by extracts of *Escherichia coli*. Biochem Biophys Res Commun 1962; 9:337-343.

43. Hurwitz J, Furth JJ, Kahan FM. Biosynthesis of ribonucleic acid and the role of deoxyribonucleic acid. Basic problem in neoplastic disease. Columbia University Press 1962:37-62.

44. Gold M, Hurwitz J, Anders M. The enzymatic methylation of RNA and DNA I. Biochem Biophys Res Commun 1963; 11:107-114.

45. Hurwitz J. RNA polymerase. Methods in Enzymology Vol. 6, Academic Press 1963; 23-27

46. Gold M, Hurwitz J, Anders M. The Enzymatic methylation of RNA and DNA II. On the species specificity of the methylation enzymes. Proc Natl Acad Sci USA 1963; 50:164-169.

47. Kahan E, Kahan FM, Hurwitz J. The role of DNA in RNA synthesis. VI. Specificity of action of actinomycin D. J Biol Chem 1963; 238:2491-2497.

48. Hurwitz J, August JT. The role of DNA in RNA synthesis. Progress in Nucleic Acid Research 1963; 1:59-92.

49. Hurwitz J Furth JJ. Messenger RNA. Scientific American 1962; 206:41-492.

50. August JT, Ortiz PJ, Hurwitz J. Ribonucleic acid-dependent ribonucleotide incorporation, I. Purification and properties of the enzyme. J Biol Chem 1962; 237:3786-3793.

51. Hurwitz J, Evans A, Babinet C, Skalka A. On the copying of DNA in the RNA polymerase reaction. Cold Spring Harbor, XXVIII, 1963:59-65.

52. Gold M, Hurwitz J. The Enzymatic methylation of the nucleic acids. Cold Spring Harbor, XXVIII, 1963:149-156.

53. Hurwitz J, Gold M, Anders M. The enzymatic methylation of RNA and DNA. III. Purification of soluble RNA methylating enzymes. J Biol Chem 239:3462-3473 (1964).

54. Hurwitz J, Gold M, Anders M. The enzymatic methylation of RNA and DNA. IV. Properties of the 5-RNA methylating enzymes. J Biol Chem 1964; 239:3474-3482.

55. Gold M, Hurwitz J. The enzymatic methylation of RNA and DNA. V. Purification and properties of the DNA methylating activity of *E. coli*. J Biol Chem 1964; 239:3858-3865.

56. Gold M Hurwitz J. The enzymatic methylation of RNA and DNA. VI. Further studies on the properties of the DNA methylation reaction. J Biol Chem 1964; 239:3866-3874.

5 7. Hurwitz J, Anders M, Gold M, I. Smith. The enzymatic methylation of RNA and DNA. VII. The methylation of ribosomal RNA. J Biol Chem1965; 240:1256-1266.

58. Gold M, Hausmann R, Maitra U, Hurwitz J. Bacteriophage infection on the activity of the methylating enzymes. Proc Natl Acad Sci USA 1964; 52:292-297.

59. Maitra U, Novogrodsky A, Baltimore D, Hurwitz J. The identification of nucleoside triphosphate ends on RNA formed in the RNA polymerase reaction. Biochem Biophys Res Commun 1965; 18:801-811.

60. Ortiz PJ, August JT, Watanabe M, Kaye AM, Hurwitz J. Ribonucleic acid-dependent ribonucleotide incorporation, II. Inhibition of polyriboadenylate polymerase activity following bacteriophage infection. J Biol Chem 1965; 240:423-431.

61. Skalka A, Fowler A, Hurwitz J. The effect of histones on the enzymatic synthesis of RNA. J Biol Chem 1966; 241:588-596.

62. Maitra U, Hurwitz J. The role of DNA in RNA synthesis, IX. Nucleoside triphosphate termini in RNA polymerase products. Proc Natl Acad Sci USA 1965; 54:815-822.

63. Gefter M, Hausmann R, Gold M, Hurwitz J. The enzymatic methylation of RNA and DNA, X. bacteriophage T3-induced S-adenosylmethionine cleavage. J Biol Chem 1966; 241:1995-2005.

64. Novogrodsky A, Hurwitz J. The enzymatic phosphorylation of RNA and DNA, I. phosphorylation at 5′ hydroxyl termini. J Biol Chem 1966; 241:2923-2932.

65. Novogrodsky A, Tal M, Traub A, Hurwitz J. The enzymatic phosphorylation of RNA and DNA, II. Further properties of the 5′- polynucleotide kinase. J Biol Chem 1966; 241:2933-2943.

66. Gold M, Gefter M, Hausmann R, Hurwitz J. Methylation of DNA. J Gen Physiol 1966; 49:5-28.

67. Novogrodsky A, Gefter M, Maitra U, Gold M, Hurwitz J. The role of DNA in RNA synthesis, X. The influence of 6-Methylamino-purine on nucleic acid synthesis *in vitro*. J Biol Chem 1966; 241:1977-1984.

68. Maitra U, Cohen SN, Hurwitz J. Specificity of initiation and synthesis of RNA from DNA templates. Cold Spring Harbor 1966; 31:113-122.

69. Maitra U, Cohen SN, Hurwitz J. Specificity of *in vitro* initiation and synthesis of RNA. Canadian Cancer Conference, Proc. of the 7th Canadian Cancer Res. Conf., Honey Harbour, Ontario 1966; 7:113-132.

70. Cohen SN, Maitra U, Hurwitz J. The role of DNA in RNA synthesis, XI. Selective transcription of DNA segments *in vitro* by RNA polymerase of *E. coli*. J Mol Biol 1967; 23:1938.

71. Maitra U, Hurwitz J. The role of DNA in RNA synthesis, XIII. Modified purification procedure and additional properties of RNA polymerase from *E. coli*. J Biol Chem 1967; 242:4897-4907.

72. Maitra U, Nakata Y, Hurwitz J. The role of DNA in RNA synthesis, XIV. A study of the initiation of RNA synthesis. J Biol Chem 1967; 242:4908-4918.

73. Becker A, Hurwitz J. Polynucleotides. J Biol Chem 1967; 241:936-950.

74. Cohen SN, Maitra U, Hurwitz J. Selectivity of *in vitro* RNA synthesis on lambda DNA templates. In: The Molecular Biology of Viruses, Academic Press Inc., New York, 1967:159-172.

75. Gefter M, Becker A, Hurwitz J. Enzymatic repair of DNA, I. Formation of circular DNA. Proc Natl Acad Sci USA 1967; 58:240-247.

76. Becker A, Lyn G, Gefter M, Hurwitz J. Enzymatic repair of DNA, II. Characterization of phage-induced sealase. Proc Natl Acad Sci USA 1967; 58:1996-2003.

77. Cohen SN, Hurwitz J. Transcription of Complementary Strands of phage DNA *in vivo* and *in vitro*. Proc Natl Acad Sci USA 1967; 57:1759-1766.

78. Hurwitz J, Becker A, Gefter M, Gold M. Enzymatic reactions at termini of DNA. J Cell Physiol, Supl. 1. 1967; 70:181-200.

79. Hurwitz J, Novogrodsky A. Polynucleotide 5′-hydroxyl kinase. Methods in Enzymology Vol. XII, Academic Press, L. Grossman K. Moldave, eds. 1968:207-212.

80. Hurwitz J, Gold M. s-RNA methylases from *Escherichia coli*. In: Grossman L, Moldave K, eds.

Methods in Enzymology. Vol. XII, Academic Press, 1968:480-491.

81. Cohen SN, Hurwitz J. Genetic transcription in bacteriophage: Studies of mRNA Synthesis *In vivo*. J Mol Biol 1968; 37:387406.

82. Ginsberg B, Yudelevich A, Sadowski P, Feiner L, Hurwitz J. Biochemical mechanisms involved in breakage and repair of DNA. Twenty-Second Annual Symposium on Fundamental Cancer Research at University of Texas M.D. Anderson Hospital Tumor Institute at Houston, Exploitable Molecular Mechanisms and Neoplasia 1968:373-393.

83. Yudelevich A, Ginsberg B, Hurwitz J. Discontinuous synthesis of DNA during replication. Proc Natl Acad Sci USA 1968; 61:1129-1136.

84. Sadowski P, Ginsberg B, Yudelevich A, Feiner L, Hurwitz J. Enzymatic mechanisms of the repair and breakage of DNA. Cold Spring Harbor Symp. Quant. Biol. 1968; 33:165-177.

85. Frederick EW, Maitra U, Hurwitz J. Role of DNA in RNA synthesis, XVI. The purification and properties of RNA polymerase from yeast: Preferential utilization of denatured DNA as template. J Biol Chem 1963; 244:413-424.

86. Sadowski P, Hurwitz J. Enzymatic breakage of DNA. I. Purification and properties of endonuclease II from T4 phage-infected *E. coli*. J Biol Chem 1969; 244:6182-6191.

87. Sadowski P, Hurwitz J. Enzymatic breakage of DNA. II. Purification and properties of endonuclease IV from phage-infected *E. coli*. J Biol Chem 1069; 244:6182-6191.

88. Hirota Y, Wakil S, Shapiro B, Ryter A, Hurwitz J, Jacob F. Sur un mutant thermosensible d'*Escherichia coli* presentant des anomalies de la membrane. Compt. Rend. (Paris) 1969; 269:1346-1348.

89. Ishihama A, Hurwitz J. The role of DNA in RNA synthesis. XVII. Multiple Active sites of *E. coli* polymerase. J Biol Chem 1969; 244:6680-6889.

90. Hurwitz J. Studies on the DNA-dependent synthesis of RNA with RNA polymerase. *Harvey Lectures*, delivered in January, 1969, Academic Press, 1970:157-178.

91. Ginsberg B, Hurwitz J. Unbiased synthesis of pulse-labeled DNA fragments of bacteriophage and T4. J Mol Biol 1970; 2:265-280.

92. Cohen SN, Hurwitz J. Further studies on the synthesis of RNA *in vitro* by enzyme-template complexes isolated from induced lysogens. J Mol Biol 1971; 58:635-639.

93. Goldberg AR, Hurwitz J. The catalytic role of Rho in termination during *in vitro* DNA dependent RNA synthesis. Stadler Symposia 1971; 3:37-50.

94. Hurwitz J, Leis JP. RNA-dependent DNA polymerase activity of RNA tumor viruses I. Directing influence of DNA in the reaction. J of Virology 1972; 9:116-129.

95. Goldberg AR, Hurwitz J. Studies on termination during *In vitro* DNA-dependent RNA synthesis. Miami Winter Symposia, Vol. 2, 1971:70-86.

96. Wright M, Buttin G, Hurwitz J. The isolation and characterization from *Escherichia coli* of an adenosine triphosphate-dependent deoxyribonuclease directed by rec B, C genes. J Biol Chem 1971; 246:6543-6555.

97. Becker A, Hurwitz J. Current thoughts on the replication of DNA. Prog Nucleic Acid Res 1971; 11:423-454.

98. Leis J, Silver R, Malathi VG, Hurwitz J. Studies on transcription and ligation of RNA. Advances in Biosciences Pergamon Press, Vieweg, 1971; 8:117-144.

99. Leis JP, Hurwitz J. RNA-dependent DNA polymerase activity of RNA tumor viruses II. directing influence of RNA in the reaction. J of Virology 1972; 9:130-142.

100. Wickner RW, Ginsberg B, Berkower I, Hurwitz J. DNA polymerase II of *Escherichia coli*, I. The purification and characterization of the enzyme. J Biol Chem 1972; 247:489-497.

101. Wickner RW, Ginsburg B, Hurwitz J. DNA polymerase II of *Escherichia coli*, II. Studies of the template requirements and the structure of the deoxyribonucleic acid product. J Biol Chem 1972; 247:498-504.

102. Goldberg AR, Hurwitz J. Studies on termination of *in vitro* ribonucleic Acid Synthesis by Rho Factor. J Biol Chem 1972; 247:5637-5645.

103. Wickner RB, Hurwitz J. DNA replication in *Escherichia coli* made permeable by treatment with high sucrose. Biochem Biophys Res Comm 1972; 47:202-211.

104. Wickner S, Hurwitz J, Nath K, Yarbrough L. DNA-dependent RNA polymerase catalyzed synthesis of polyribo-nucleotide chains covalently linked to DNA. Biochem Biophys Res Comm 1972; 48:619-627.

105. Hurwitz J, Yarbrough L, Wickner S. Utilization of deoxynucleoside triphosphates by DNA-dependent RNA polymerase of *E. coli*. Biochem Biophys Res Comm 1972; 48:628-635.

106. Leis JP Hurwitz J. Isolation and characterization of a protein that stimulates DNA synthesis from avian myeloblastosis virus. Proc Natl Acad Sci USA 1972; 69**:**2331-2335.

107. Silber R, Malathi VG, Hurwitz J. Purification and properties of bacteriophage T4-induced RNA ligase. Proc Natl Acad Sci USA 1972; 65:3009-3013.

108. Pisetsky D, Berkower I, Wickner RB, Hurwitz J. Role of ATP in DNA synthesis in *Escherichia coli*. J Mol Biol 1972; 71:557-571.

109. Wickner RB, Wright M, Wickner S, Hurwitz J. Conversion of ϕX174 and fd-single-stranded DNA to replicative forms in extracts of *Escherichia coli*. Proc Natl Acad Sci USA 1972; 69:3233-3237.

110. Wickner RB, Wright M, Wickner S, and Hurwitz J. Role of DNA ts genes in DNA synthesis. In: Wells, R, and Inman R, eds. The Second Annual Harry Steenbock Symposium, Maryland DNA Synthesis *In vitro*. University Park Press, 1973:137.

111. Leis J, Berkower I, Hurwitz J. RNA dependent DNA polymerase of RNA tumor viruses IV. Characterization of AMV stimulatory protein and RNase H-associated activity. In: Wells RD, Inman RB, eds, DNA Synthesis *In vitro*, University Park Press, Baltimore 1973:287-308.

112. Kemper B, Hurwitz J. Studies on T4-induced nucleases. Isolation and characterization of a manganese-activated T4-induced endonuclease. J Biol Chem 1973; 248:91-99.

113. Maitra U, Hurwitz J. The enzymatic cleavage of 5′-triphosphate termini from RNA polymerase products. J Biol Chem 1973; 248:3893-3903.

114. Leis J, Berkower I, Hurwitz J. Mechanism of action of RNase H isolated from avian myeloblastosis virus and *Escherichia coli*. Proc Natl Acad Sci USA 1973; 70:466-470.

115. Wickner S, Wickner RB, Wright M, Berkower I, Hurwitz J. Conversion of ϕX174 and fd DNA to their replicative forms by two enzyme systems in *E. coli*. India meeting 1973.

116. Leis J, Hurwitz J, Schincariol AL, Joklik W. The avian myeloblastosis virus RNA-dependent DNA polymerase. In: The Biology of Tumor Viruses, Proceedings of the Thirty-Fourth Annual Biology

Colloqium 1973.

117. Hurwitz J, Wickner S, Wright, M. Studies on *in vitro* DNA synthesis II. Isolation of a protein which stimulates deoxynucleotide incorporation catalyzed by DNA polymerases of *E. coli*. Biochim Biophys Res Comm 1973; 51:257-267.

118. Silber R, Malathi VG, Schulman LH, Hurwitz J. In: Duesberg PH, Studies of the Rouse Sarcoma Virus RNA: Characterization of the 5′ terminus.. Bioch Biophys Res Comm 1973; 50:467-472.

119. Wickner S, Wright M, Hurwitz J. Studies on *in vitro* DNA synthesis. Purification of the *dna* G gene product from *Escherichia coli*. Proc Natl Acad Sci USA 1973; 70:1613-1618.

120. Wickner S, Berkower L, Wright M, Hurwitz J. Studies on *in vitro* DNA synthesis. Purification of *dna* C gene product containing *dna* D activity from *Escherichia coli*. Proc Natl Acad Sci USA 1973; 70:2369-2373.

121. Wickner RB, Wright M, Wickner S, Hurwitz J. Involvement of *dna* gene products in the conversion of ϕX174 and fd DNA to replicative forms by extracts of *Escherichia coli*. In: Wells RD, and Inman RB, eds. DNA Synthesis *In vitro*. University Park Press, Baltimore 1973:137-142.

122. Berkower I, Leis J, Hurwitz J. Isolation and characterization of an endonuclease from *Escherichia coli* specific for RNA in RNA•DNA Hybrid structures. J Biol Chem 1973; 248:5914-5921.

123. Wright M, Wickner S, Hurwitz J. Studies of *in vitro* DNA synthesis. Isolation of *dna* B gene product from *E. coli*. Proc Natl Acad Sci USA 1973; 70:3120-3124.

124. Wickner RB, Wickner S, Wright M, Berkower I, Hurwitz J. Isolation of *dna* gene products of *Escherichia coli*. Methods in Molec Biol, Ed., M. Dekker Inc., N.Y. 1972:195-219.

125. Nath K, Hurwitz J. Covalent attachment of polyribonucleotides to polydeoxynucleotides catalyzed by deoxyribonucleic acid ligase. J Biol Chem 1974; 249:3680-3688.

126. Yarbrough LR, Hurwitz J. The isolation of subunits of DNA-dependent DNA polymerase of *E. coli*. J Biol Chem 1974; 249:5400-5404.

127. Yarbrough LR, Hurwitz J. The reversible denaturation of DNA-dependent RNA polymerase of *E. coli*. J Biol Chem 1974; 249:5394-5399.

128. Jacquet M, Groner Y, Monroy G, Hurwitz J. The *in vitro* synthesis of avian myeloblastosis viral RNA sequences. Proc Natl Acad Sci USA 1974; 71:3045-3049.

129. Cranston JW, Silber R, Malathi JC, Hurwitz J. Studies on RNA ligase; characterization of an ATP-PPi exchange reaction and demonstration of an enzyme-adenylate complex with T4 bacteriophage induced enzyme. J Biol Chem 1974; 249**:**7447-7456.

130. Hurwitz J Wickner S. Involvement of two protein factors and ATP in *in vitro* DNA synthesis catalyzed by DNA polymerase III of *E. coli*. Proc Natl Acad Sci USA 1974; 71:6.

131. Leis JP, Hurwitz J. Purification of RNA dependent DNA polymerase from avian myeloblastosis virus. In: Colowick S, and Kaplan eds. Methods in Enzymology, Academic Press, N.Y. 1974.

132. Wickner S, Wright M, Hurwitz J. Association of DNA-dependent and independent ribonucleoside triphosphatase activities with *dna* B gene product of *E. coli*. Proc Natl Acad Sci USA 1974; 71:783-787.

133. Nath K, Hurwitz J. Covalent Attachment of ribonucleotides at 3′-hydroxyl ends of deoxyribonucleic acid catalyzed by DNA-dependent RNA polymerase of *E. coli*. J Biol Chem

1974; 249:2605-2215.

134. Wickner S, Hurwitz J. Conversion of ϕX174 viral DNA to double stranded form by purified *E. coli* proteins. Proc Natl Acad Sci USA 1974; 71:4120-4124.

135. Groner Y, Monroy G, Jacquet M, Hurwitz J. Chromatin as a template for RNA synthesis *in vitro*. Proc Natl Acad Sci USA 1975; 72:194-199.

136. Wickner S, Hurwitz J. Interaction of *E. coli dna* B and *dna* C(D) gene products *in vitro*. Proc Natl Acad Sci USA 1975; 72:921-925.

137. Jacquet M, Groner Y, Monroy G, Hurwitz J. *In vitro* transcription studies with RNA tumor viruses. In "Fundamental Aspects of Neoplasia" p 281-291 ed. by Gottlieb AA, Plescia OJ, and Bishop DHL.; by Springer-Verlag New York Inc, 1975.

138. Leis J, Schincariol A, Ishizaki R, Hurwitz J. RNA-dependent DNA polymerase activity of RNA tumor viruses V. RSV single-stranded RNA-DNA covalent Hybrids in infected chick embryo fibroblast cells. J of Virology 1975; 15:484-489.

139. Groner Y, Hurwitz J. Synthesis of RNA containing a methylated blocked 5′ terminus by HeLa nuclear homogenates. Proc Natl Acad Sci USA 1975; 72:2930.

140. Monroy G, Jacquet M, Groner Y, Hurwitz J. AMV RNA transcription in cell-free systems and properties of *in vitro* chromatin-directed RNA synthesis. Cold Spring Harbor Symposium on Quantitative Biology Vol. XXXIX, 1975; 1033-1041.

141. Wickner S, Hurwitz J. Association of ϕX174 DNA-dependent ATPase activity with an *E. coli* protein, replication factor Y, required for *in vitro* synthesis of ϕX174 DNA. Proc Natl Acad Sci USA 1975; 72:3342-3346.

142. Goulian M, and Hanawalt P. *In vitro* synthesis of DNA. Wickner S, Hurwitz J. ICN-UCLA Winter Conference, DNA synthesis and its regulation., 1975:227-238.

143. Wickner S, Hurwitz J. Involvement of *E. coli dna*Z gene product in DNA elongation *in vitro*. Proc Natl Acad Sci USA 1976; 73:1053-1057.

144. Sumida-Yasumoto C, Yudelevich A, Hurwitz J. DNA synthesis *in vitro* dependent upon ϕX174 replicative form I DNA. Proc Natl Acad Sci USA 1976; 73:1887-1891.

145. Ikeda J-E, Yudelevich A, Hurwitz J. Isolation and characterization of the protein coded by gene A of bacteriophage ϕX174 DNA. Proc Natl Acad Sci USA 1976; 73:2669-2673.

146. Monroy G, Groner Y, Jacquet M, Hurwitz J. Characteristics of an *in vitro* system which transcribes viral RNA from chromatin. In: Molecular Mechanisms in the Control of Gene Expression, Academic Press, 1976:l95.

147. Ohtsuki K, Groner Y, Hurwitz J. Isolation and purification of Double-stranded ribonuclease from calf thymus. J Biol Chem 1977; 252:483.

148. Vicuna R, Hurwitz J, Wallace S, Girard M. Selective inhibition of *in vitro* DNA synthesis dependent on ϕX174 compared with fd DNA. I. Protein requirements for selective inhibition. J Biol Chem 1977; 252:2524-2533.

149. Vicuna R, Ikeda J-E, Hurwitz J. Selective inhibition of X RfII compared with fd RFII DNA synthesis *in vitro*. II. Resolution of the discrimination reaction into multiple steps. J Biol Chem l977; 252:2534-2544.

150. Marians KJ, Ikeda JE, Schlagman S, Hurwitz J. Role of DNA gyrase in X RF replication *in vitro*.

Proc Natl Acad Sci USA 1977; 74:1965-1968.

151. Sumida-Yasumoto C, Hurwitz J. Synthesis of ϕX174 viral DNA *In vitro* depends on X replicative form DNA. Proc Natl Acad Sci USA 1977; 74:4195-4199.

152. Reha-Krantz LJ, Hurwitz J. The *dna*B gene product of *Escherichia coli* I. Purification, Homogeneity, physical properties. J Biol Chem 78; 253:4043.

153. Reha-Krantz LJ, Hurwitz J. The *dna*B gene product of *Escherichia coli* II. Single-stranded DNA-dependent ribonucleoside triphosphatase activity. J Biol Chem 1978; 253:4051-4057.

154. Monroy G, Spencer E, Hurwitz J. Characteristics of reactions catalyzed by purified guanylyltransferase from vaccinia virus. J Biol Chem 1978; 253**:**4490-4498.

155. Monroy G, Spencer E, Hurwitz J. Purification of mRNA guanylyl transferase from vaccinia virions. J Biol Chem 1978; 253:4481-4489.

156. Spencer E, Loring D, Hurwitz J, Monroy G. Enzymatic conversion of 5′-phosphoryl terminated RNA to 5′-di- and triphosphate terminated RNA. Proc Natl Acad Sci USA 1978; 75:4793-4797.

157. Sumida-Yasumoto C, Ikeda J-E, Yudelevich A, Marians KJ, Schlagman S, Hurwitz J. Studies on the *in vitro* synthesis of ϕX174 RFI DNA and circular single-stranded DNA. Cold Spring Harbor "Single-Stranded-DNA Phages" 1978:303-324.

158. Sumida-Yasumoto C, Ikeda J-E, Vicuna R, Marians K, Sugrue S, Hurwitz J, Benz E. Analysis of *in vitro* replication of different DNAs. CRC Critical Reviews in Biochemistry 1979; 7:45-74.

159. Sumida-Yasumoto C, Ikeda J-E, Benz E, Marians KJ, Vicuna R, Sugrue S, Zipursky SL, Hurwitz J. Replication of ϕX174 DNA *in vitro* synthesis of ϕX174 RFI DNA and circular single-stranded DNA. Cold Spring Harbor Symposium on Quantitative Biology 1979; 43:311-.

160. Ikeda J-E, Yudelevich A, Shimamato N, Hurwitz J. Role of polymeric forms of the bacteriophage ϕX174 coded gene A protein in X RFI DNA cleavage. J Biol Chem 1979; 254, 9416-.

161. Shuman S, Hurwitz J. 5′-Hydroxyl polyribonucleotide Kinase from HeLa cell nuclei purification and properties. J Biol Chem 1979; 254:10396-10404.

162. Kaplan LM, Ariga H, Hurwitz J, Horwitz MS. Complementation of the temperature-sensitive defect in H5ts 125 adenovirus DNA replication *in vitro*. Proc Natl Acad Sci USA 1979; 76:5534-5538.

163. Benz EW, Reinberg D, Vicuna R, Hurwitz J. The initiation of DNA replication by the *dna*G protein. J Biol Chem 1980; 255:1096-1106.

164. Spencer E, Shuman S, Hurwitz J. Purification and properties of vaccinia virus DNA-dependent RNA polymerase. J Biol Chem 1980; 255:5388-.

165. Shuman S, Spencer E, Furneaux H, Hurwitz J. The role of ATP in *in vitro* vaccinia virus RNA synthesis: effects of AMP-PNP and ATPγS. J Biol Chem 1980; 255:5396-.

166. Shuman S, Surks M, Furneaux H, Hurwitz J. 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 1980; 255:11588-11598.

167. Zipursky SL, Reinberg D, Hurwitz J. *In vitro* DNA replication of recombinant plasmid DNAs containing the origin of progeny RF DNA synthesis of phage ϕX174. Proc Natl Acad Sci USA l980; 77:5182-5186.

168. Ikeda J-E, Longiaru M, Horwitz MS, Hurwitz J. Elongation of primed DNA templates by eukaryotic DNA polymerases. Proc Natl Acad Sci USA 1980; 77:5827-5831.

169. Benz EW, Jr, Sims J, Dressler D, Hurwitz J. Tertiary structure is involved in the initiation of DNA synthesis by the *dna*G protein. I.C.N. Winter Symposium on Mechanistic Studies of DNA Replication and Genetic Recombination; Bruce Alberts, ed., 1980.

170. Shuman S, Hurwitz J. Mechanism of mRNA capping by vaccinia virus guanylyltransferase: Characterization of an enzyme-guanylate intermediate. Proc Natl Acad Sci USA 1981; 78:187-191.

171. Ikeda J-E, Enomoto T, Hurwitz J. Replication of the adenovirus DNA-protein complex with purified proteins. Proc Natl Acad Sci USA 1981; 78:884-888.

172. Lichy J, Horwitz MS, Hurwitz J. Formation of a covalent complex between the 80,000 dalton adenovirus terminal protein and 5′-dCMPO *in vitro*. Proc Natl Acad Sci USA 1981; 78:2678-2682.

173. Reinberg D, Zipursky SL, Hurwitz J. Separate requirements for leading and lagging strand DNA synthesis during ϕX174 gene A protein-dependent RF-RF DNA replication *in vitro*. J Biol Chem. 1981; 256:13143-13151.

174. Enomoto T, Lichy JH, Ikeda J-E, Hurwitz J. Adenovirus DNA replication *in vitro*: Purification of the terminal protein in a functional form. Proc Natl Acad Sci USA 1981; 78:6779-6783.

175. Benz E, Reinberg D, Hurwitz J. Priming enzymes. In: Paul D. Boyer, ed. The Enzymes. Academic Press, NY, Vol. XV, 1982:155-182,

176. Shuman S, Hurwitz J. Capping enzymes. In: Paul D. Boyer, ed. The Enzymes. Vol. Academic Press, NY, Vol. XV, 1982 245265.

177. Ikeda J-E, Enomoto T, and Hurwitz J. Adenoviral protein-primed initiation of DNA chains *in vitro*. Proc Natl Acad Sci USA 1982; 79:2442-2446.

178. Brown D, Hurwitz J, Reinberg D, Zipursky SL. Nuclease activities involved in DNA replication. Cold Spring Harbor Symposium on Nucleases. 1982:187-209.

179. Lichy JH, Field J, Horwitz MS, Hurwitz J. Separation of the adenovirus terminal protein precursor from its associated DNA polymerase; role of both proteins in the initiation of adenovirus DNA replication. Proc Natl Acad Sci USA 1982; 79:5225-5229.

180. Nagata K, Guggenheimer RA, Enomoto T, Lichy JH, Hurwitz J. Adenovirus DNA replication *in vitro*: identification of a host factor that stimulates synthesis of the preterminal protein-dCMP complex. Proc Natl Acad Sci USA 1982; 79:6438-6442.

181. Reinberg D, Zipursky SL, Weisbeek P, Brown D, Hurwitz J. Studies on the ϕX174 gene A protein-mediated termination of leading strand DNA synthesis. J Biol Chem. 1983; 258:529-537.

182. Lichy JH, Nagata K, Friefeld BR, Enomoto T, Field J, Guggenheimer RA, Ikeda J-E, Horwitz MS, Hurwitz J. Isolation of proteins involved in the replication of adenovirus DNA *in vitro*. Cold Spring Harbor Symposia on Quantitative Biology, Vol. XLVII Structures of DNA. 1983:731-740.

183. Brown DR, Reinberg D, Schmidt-Glenewinkel T, Roth M, Zipursky SL, Hurwitz J. DNA Structures required for ϕX174 gene A protein-directed initiation and termination of DNA replication. Cold Spring Harbor Symposia on Quantitative Biology, Vol. XLVII Structures of DNA. 1983:701-715.

184. Brown DR, Schmidt-Glenewinkel T, Reinberg D, Hurwitz J. DNA sequences which support activities of the bacteriophage ϕX174 gene A protein. J Biol Chem. 1983; 258:8402-8412.

185. Friefeld BR, Lichy JH, Hurwitz J, Horwitz MS. Evidence for an altered adenovirus DNA polymerase in cells infected with the mutant H5tsl49 (DNA synthesis/temperature sensitive mutation). Proc Natl Acad Sci USA 1983; 80:1583-1593.

186. Nagata K, Guggenheimer RA, Hurwitz J. Adenovirus DNA replication *in vitro*: synthesis of full length DNA with purified proteins. Proc Natl Acad Sci USA 1983; 80:4266-4270.

187. Furneaux H, Pick L, Hurwitz J. Isolation and characterization of RNA ligase from wheat germ. Proc Natl Acad Sci USA 1933; 80:3933-3937.

188. Guggenheimer R, Nagata K, Field J, Lindenbaum J, Gronostajski R, Horwitz H, Hurwitz J. *In vitro* synthesis of full length adenoviral DNA. UCLA Symposium on Molecular and Cellular Biology "Mechanisms of DNA Replication and Recombination" 1983.395-421.

189. Brown DR, Reinberg D, Schmidt-Glenewinkel T, Zipursky SL, Hurwitz J. Analysis of the ϕX174 gene A protein using *in vitro* DNA replication systems. Methods in Enzymology 1983; 100:217-239.

190. Nagata K, Guggenheimer R, Hurwitz J. Specific binding of a cellular DNA replication protein to the origin of replication of adenovirus DNA. Proc Natl Acad Sci USA 1983; 80:6177-6181.

191. Guggenheimer RA, Nagata K, Lindenbaum J, Hurwitz J. Protein-primed replication of plasmids containing the terminus of the adenovirus genome. I. Characterization of an *in vitro* DNA replication system dependent on adenoviral DNA sequences. J Biol Chem 1984; 259:(12):7807-7814.

192. Guggenheimer RA, Nagata K, Kenny M, Hurwitz J. Protein-primed replication of plasmids containing the terminus of the adenoviral genome: II. Purification and characterization of a Host protein required for the replication of DNA templates devoid of the terminal protein". J Biol Chem 1984; 259:(12):7815-7825.

193. Gronostajski R, Field J, Hurwitz J. Purification of a primase activity associated with DNA polymerase from HeLa cells. J Biol Chem 1984; 259:9479-9486.

194. Field J, Gronostajski R, Hurwitz J. Properties of the adenovirus DNA polymerase. J Biol Chem 1984; 253**:**9487-9495.

195. Guggenheimer RA, Stillman BW, Nagata K, Tamanoi F, Hurwitz J. DNA sequences required for the *in vitro* replication of adenovirus DNA. Proc Natl Acad Sci USA 1984; 81:3069-3073.

196. Friefeld B, Lichy J, Field J, Gronostajski R, Guggenheimer R, Krevolin MD, Nagata K, Hurwitz J, Horwitz MS. The *in vitro* replication of adenovirus DNA. In: W. Doerfler, ed. The Molecular Biology of adenovirus. Springer Verlag Current Topics in Microbiology and Immunology 1984:110:221-255.

197. Gronostajski RM, Nagata K, Hurwitz J. Isolation of human DNA sequences that bind to nuclear factor I, a host protein involved in adenovirus DNA replication. Proc Natl Acad Sci USA 1984; 81:4013-4017.

198. Brown DR, Roth MJ, Reinberg D, Hurwitz J. Analysis of bacteriophage ϕX174 gene A protein-mediated termination and reinitiation of ϕX DNA synthesis. I. Characterization of the termination and reinitiation reactions. J Biol Chem 1984; 259:10545-10555.

199. Roth MJ, Brown DR, Hurwitz J. Analysis of bacteriophage ϕX174 gene A protein-mediated termination and reinitiation of ϕX DNA synthesis. II. Structural characterization of the covalent ϕX174 gene A protein-DNA complex. J Biol Chem 1984; 259:10556-10568.

200. Roth MJ, Hurwitz J. RNA capping by the vaccinia virus guanylyltransferase: Structure of enzyme-guanylate intermediate. J Biol Chem 1984; 259:13488-13494.

201. Gronostajski RM, Adhya S, Nagata K, Guggenheimer RA, Hurwitz J. Site specific DNA binding of nuclear factor I: Analyses of cellular binding site. Molecular and Cellular Biology 1985; 5:964-971.

202. Perkins KK, Furneaux H, Hurwitz J. Isolation and characterization of an RNA ligase from HeLa cells. Proc Natl Acad Sci USA 82:684-638.

203. Reinberg D, Arenas J, Hurwitz J. The enzymatic conversion of 3'-phosphate terminated RNA chains to 2′, 3′ cyclic phosphate derivatives. J Biol Chem. 1985; 260:6088-6097.

204. Hurwitz J, Adhya S, Field J, Gronostajski R, Guggenheimer R, Nagata K. Synthesis of adenoviral DNA with purified proteins. In: Marks PA, ed. Bristol-Myers Cancer Symposia, Vol. 7 Academic Press, New York, 1985:15-24.

205. Lakritz N, Foglesong PD, Reddy M, Baum S, Hurwitz J, Bauer W. A vaccinia virus DNase preparation which cross-links superhelical DNA. J. Virol 1985; 53:935-943.

206. D. Rekosh, Lindenbaum J, Brewster J, Mertz LM, Hurwitz J, Prestine L. Expression in *Escherichia coli* of a fusion protein product containing a region encoding the adenovirus DNA polymerase Proc Natl Acad Sci USA 1985; 82:2354-2353.

207. Wobbe CR, Dean F, Weissbach L, Hurwitz J. *In vitro* replication of duplex circular DNA containing the simian virus 40 DNA Origin site. Proc Natl Acad Sci USA 1985; 82:5710-5714.

208. Adhya S, Shneidman PS, Hurwitz J. Reconstruction of adenovirus replication origins with a human nuclear factor I binding site. J Biol Chem. 1986; 261:3339-3346.

209. Furneaux HM, Perkins KK, Freyer GA, Arenas J, Hurwitz J. Isolation and characterization of two fractions from HeLa cells required for *in vitro* RNA splicing. Proc Natl Acad Sci USA 1985; 82:4351-4355.

210. Dean F, Wobbe CR, Weissbach L, Murakami Y, Hurwitz J. *In vitro* replication of DNA containing the SV40 origin sequence. In: Howley PM, Broker TM, eds. Papilloma Viruses, Molecular and Clinical Aspects. Alan R. Liss, Inc. 1986:397-406.

211. Perkins KK, Furneaux H, Freyer G, Arenas J, Pick L, Hurwitz J. Analysis of mRNA splicing using fractions isolated from HeLa cells and mutant adenovirus pre-mRNA. Cold Spring Harbor Symposia, Cancer Cells. 1986; 4:249-258.

212. Murakami Y, Wobbe CR, Dean F, Weissbach L, Hurwitz J. *In vitro* replication of DNA containing the simian virus 40 Origin. In: Botchan M, Grodzicker T, and Sharp P, eds. DNA Tumor Viruses: Control of Gene expression and replication, Cancer Cells. Cold Spring Harbor, N.Y. 1986; 4:465-470.

213. Pick L, Hurwitz J. Purification of wheat germ RNA ligase I. Isolation and properties of enzyme activities. J Biol Chem 1986; 261:6684-6693.

214. Pick L, Furneaux H, Hurwitz J. Purification of wheat germ RNA ligase II. Mechanism of action of wheat germ RNA ligase. J Biol Chem 1986; 261:6694-6704.

215. Murakami Y, Wobbe CR, Weissbach L, Dean FB, Hurwitz J. Role of DNA polymerase α and DNA primase in simian virus 40 DNA replication *in vitro*. Proc Natl Acad Sci USA 1986; 83:2869-2873.

216. Perkins KK, Furneaux H, Hurwitz J. RNA splicing product, formed with isolated fractions from HeLa cells are associated with fast sedimenting complexes. Proc Natl Acad Sci USA 1986; 83:887-891.

217. Murakami Y, Eki T, Yamada M-A, C. Prives, Hurwitz J. Species specific *in vitro* synthesis, of DNA containing the origin of polyoma virus. Proc Natl Acad Sci USA 1986; 83:6347-6351.

218. Wobbe CR, Murakami Y, Dean F, Weissbach L, Hurwitz J. *In vitro* replication of SV40 and polyoma virus DNA. In: DNA replication and recombination. Alan R. Liss Inc. 1987:303-313.

219. Wobbe CR, Dean FB, Murakami Y, Weissbach L, Hurwitz J. Simian virus 40 DNA replication *in vitro*: Study of events preceding elongation of chains. Proc Natl Acad Sci USA 1986; 83:4612-4616.

220. Lindenbaum JO, Field JS, Hurwitz J. The adenovirus DNA binding protein and adenovirus DNA polymerase interact to catalyze elongation of primed DNA templates. J Biol Chem 1986; 261:10218-10227.

221. Arenas J, Hurwitz J. Purification of a RNA debranching activity from HeLa cells. J Biol Chem 1987; 262:4274-4279.

222. Freyer GA, Arenas J, Perkins KK, Furneaux HM, Pick L, Young B, Roberts RJ, Hurwitz J. *In vitro* formation of a lariat structure containing a $G^{2'}$-$5'$G linkage. J Biol Chem 1987; 262:4267-4273.

223. Dean FB, Bullock P, Murakami Y, Wobbe CR, Weissbach L, Hurwitz J. Simian virus 40 (SV40) DNA replication: SV40 large T antigen unwinds DNA containing the SV40 origin of replication. Proc Natl Acad Sci USA 1987; 84:16-20.

224. Wobbe CR, Weissbach L, Borowiec JA, Dean FB, Murakami Y, Bullock P, Hurwitz J. Replication, of SV40 origin-containing DNA *in vitro* with purified proteins. Proc Natl Acad Sci USA 1987; 84:1834-1838.

225. Prives C, Murakami Y, Kern FG, Folk W, Basilico C, Hurwitz J. DNA sequence requirements for replication of polyomavirus DNA *in vitro* and *in vivo*. Molecular and Cell. Biol. 1987; 7:3694-3704.

226. Dean FB, Dodson M, Echols H, Hurwitz J. ATP-dependent formation of a specialized nucleoprotein structure by simian virus 40 (SV40) large tumor antigen at the SV40 replication origin. Proc Natl Acad Sci USA, 1987; 84:8981-8985.

227. Dodson M, Dean FB, Bullock P, Echols H, Hurwitz J. Unwinding of duplex DNA from the SV40 origin of replication by T antigen. Science 1987; 238:964-967.

228. Goetz GS, Dean FB, Hurwitz J, Matson SW. The unwinding of duplex regions in DNA by the simian virus 40 large tumor antigen associated DNA helicase activity. J Biol Chem 1988; 263:383-392.

229. Borowiec JA, Hurwitz J. ATP stimulates the binding of simian virus 40 (SV40) large tumor antigen to the SV40 Origin of Replication. Proc Natl Acad Sci USA 1988; 85:64-68.

230. Dean FB, Borowiec JA, Ishimi Y, Deb S, Tegtmeyer P, Hurwitz J. Simian virus 40 large tumor antigen requires three core replication origin domains for DNA unwinding and replication *in vitro*. Proc Natl Acad Sci USA 1987; 84**:**8267-8271.

231. Wobbe CR, Dean FB, Murakami Y, Borowiec JA, Bullock P, Hurwitz J. *In vitro* replication of DNA containing either the SV40 or the polyoma origin. In: Philosophical Transaction of the Royal Society, 1987; B 317:439-453.

232. Kenny M, Balogh LA, Hurwitz J. Initiation of adenovirus DNA replication: I. Mechanism of action of a host protein required for replication of adenovirus DNA templates devoid of the terminal protein. J Biol Chem 1988; 263:9801-9808.

233. Kenny M, Hurwitz J. Initiation of adenovirus DNA replication: II. Structural requirements using

synthetic oligonucleotide adenovirus templates. J Biol Chem 1988; 263:9809-9817.

234. Dean FB, Dodson M, Borowiec JA, Ishimi Y, Goetz GS, Bullock P, Matson SM, Echols H, Hurwitz J. SV40 origin-dependent DNA unwinding and nucleoprotein complex formation by SV40 T antigen. Cancer Cells 11988; 6:113-122.

235. Tegtmeyer P, Deb S, DeLucia AL, Deb SP, Koff A, Tsui S, Parsons R, Partin K, Baur CP, Dean FB, Hurwitz J. The SV40 origin of replication. Cancer Cells 1988; 6:123-132.

236. Goetz GS, S. Englard, Schmidt-Glenewinkel T, Aoyama A, Hayashi M, Hurwitz J. effect of ϕX C protein on leading strand DNA synthesis in the ϕX174 replication pathway. J Biol Chem 1988; 263:16452-16460.

237. Goetz GS, Hurwitz J. Studies on the role of the ϕX174 gene A protein in ϕX viral strand synthesis: I. Replication of DNA containing an alteration in position I of the 30 bp icosahedral bacteriophage origin. J Biol Chem 1988; 263**:**16421-16432

238. Goetz GS, Schmidt-Glenewinkel T, Hu M, Belgado N, Hurwitz J. Studies on the role of the ϕX174 gene A protein in ϕX viral strand synthesis: II. Effects on DNA replication of mutations in the 30 bp icosahedral bacteriophage origin. J Biol Chem. 1988; 263:16433-16442.

239. Goetz GS, Hurwitz J. Studies on the role of tile ϕX174 gene A protein in ϕX viral strand synthesis: III. Replication of DNA containing two viral replication origins. J Biol Chem 1988; 263:16443-16451.

240. Pick L, Furneaux HM, Hurwitz J. Purification and characterization of wheat germ RNA ligase and associated activities. In: Dahlberg JE, Abelson JN, eds. Methods in Enzymology, Academic Press, Inc., Orlando, Florida, 1988; 181, 480-499.

241. Ishimi Y, Claude A, Bullock P, Hurwitz J. Complete enzymatic synthesis of DNA containing the SV40 origin of replication. J Biol Chem 1988; 263:19723-19733.

242. Boroweic J, Hurwitz J. Localized melting and structural changes in the SV40 origin of replication induced by T antigen. EMBO 1988; 7:3149-3158.

243. Lee S-H, Ishimi Y, Kenny MK, Bullock P, Dean FB, Hurwitz J. An inhibitor of the *in vitro* elongation reaction of simian virus 40 DNA replication is overcome by proliferating-cell nuclear antigen. Proc Natl Acad Sci USA 1988; 85:9469-9473.

244. Borowiec J, Bullock P, Dean F, Hurwitz J, Ishimi Y, Kenny M, Lee S-H Seo YS. Studies on the *in vitro* replication of SV40 DNA. Proc Mol Biol and Genet 1988; 3:311-322.

245. Bullock PA, Seo YS, Hurwitz J. Initiation of SV40 DNA replication *in vitro*: Pulse-chase experiments identify the first labeled species as topologically unwound. Proc Natl Acad Sci USA, 1989; 86:3944-3948.

246. Lee S-H, Eki T, Hurwitz J. Synthesis of DNA containing the SV40 origin of replication by the combined action of DNA polymerases α and δ. Proc Natl Acad Sci USA, 1989; 86:7361-7365.

247. Mastrangelo IA, Hough PVC, Wall JS, Dodson M, Dean F Hurwitz J. ATP-dependent assembly of double hexamers of the SV40 T antigen at the origin of DNA replication. Nature 1989; 338:658-662.

248. Lee S-H, Kwong AD, Ishimi Y, Hurwitz J. Studies on the DNA elongation inhibitor and its PCNA-dependent control in SV40 DNA replication *in vitro*. Proc Natl Acad Sci USA 1989; 86:4877-4881.

249. Freyer GA, O'Brien JP, Hurwitz J. Alterations in the polypyrimidine sequence affect the *in vitro* splicing reactions catalyzed by HeLa cell free preparations. J Biol Chem 1989; 264:14631-14637.

250. Kenny MK, Kwong AD, Lee S-H, Matsumoto T, Seo YS, Borowiec JA, Bullock P, Dean FB, Eki T, Ishimi Y, Hurwitz J. SV40 DNA replication *in vitro*. In: Vectors as Tools for the Study of Normal and Abnormal Growth and Differentiation, Springer Verlag, 1989:437-448.

251. Kenny MK, Lee S-H, Hurwitz J. Multiple functions of human single-stranded DNA binding protein in simian virus 40 DNA replication: Single strand stabilization and stimulation of DNA polymerase α and δ. Proc Natl Acad Sci USA 1989; 86:9757-9761.

252. Dean FB, Lee S-H, Kwong A, Bullock P, Borowiec JA, Kenny MK, Seo YS, Eki T, Matsumoto T, Hodgins G, Hurwitz J. SV40 DNA replication *in vitro*. molecular mechanism in DNA replication and recombination. In: Richardson C, Lehman R, eds. UCLA Symposia on Molecular and Cell Biology, New Series Vol. 127, Alan R. Liss, Inc. NY, 1990:315-326.

253. Pruzan R, Furneaux H, Lassota P, Hong G-Y, Hurwitz J. Assemblage of the pre-spliceosome complex with separated fractions isolated from HeLa cells. J Biol Chem 1990; 265:2804-2813.

254. Borowiec JA, Dean FB, Bullock PA, Hurwitz J. Binding and unwinding- How T antigen engages the SV40 origin of DNA replication. Cell 1990; 60:181-184.

255. Kenny MK, Schlegel U, Furneaux H, Hurwitz J. The Role of human single-stranded DNA binding protein and its individual subunits in simian virus 40 DNA replication. J Biol Chem 1990; 265:7693-7700.

256. Hurwitz J, Dean FB, Kwong A, Lee S-H. The *in vitro* replication of DNA containing the SV40 origin. J Biol Chem 1990; 265:18043-18046.

257. Lee S-H, Hurwitz J. Mechanism of elongation of primed DNA by DNA polymerase δ, proliferating cell nuclear antigen, and activator 1. Proc Natl Acad Sci USA 1990; 87:5672-5676.

258. Matsumoto T, Eki T, Hurwitz J. Studies on the initiation and elongation reaction in the SV40 DNA replication system. Proc Natl Acad Sci USA 1990; 85:9712-9716.

259. Lee S-H, Kwong A, Pan Z-Q, Hurwitz J. Studies on the activator 1 protein complex, an accessory factor for PCNA-dependent DNA polymerase δ. J Biol Chem 1991; 266:594-602.

260. Dean FB, Hurwitz J. SV40 large T antigen untwists, DNA at the origin of DNA replication. J Biol Chem 1991; 266:5062-5071.

261. Borowiec J, Dean FB, Hurwitz J. Differential induction of structural changes in the simian virus 40 origin of replication by T antigen. J Virol 1991; 65:1228-1235.

262. Bullock PA, Seo YS, Hurwitz J. Initiation of simian virus 40 DNA synthesis *in vitro*. Mol. Cell. Biol 1991; 11:2350-2361.

263. Eki T, Hurwitz J. Influence of poly(ADP-ribose)polymerase on the enzymatic synthesis of SV40 DNA. J Biol Chem 1991; 266:3087-3100.

264. Seo YS, S.H. Lee, Hurwitz J. Isolation of a DNA helicase from HeLa cells requiring the multisubunit human single-stranded DNA binding protein. J Biol Chem 1991; 266:13161-13170.

265. Claude A, Arenas J, Hurwitz J. The isolation and characterization of an RNA helicase from nuclear extracts of HeLa cells. J Biol Chem 1991; 266:10353-10367.

266. Lee S-H, Pan Z-Q, Kwong AD, Burgers PMJ, Hurwitz J. Synthesis of DNA by DNA polymerase ε *in vitro*. J Biol Chem 1991; 266:22707-22717.

267. Eki T, Matsumoto T, Murakami Y, Hurwitz J. The replication of DNA containing the SV40 origin by the monopolymerase and the dipolymerase systems. J Biol Chem 1992; 267:7284-7294.

268. Murakami Y, Eki T, Hurwitz J. Studies on the initiation of simian virus 40 replication *in vitro*: RNA primer synthesis and its elongation. Proc Natl Acad Sci USA 1992; 89:952-956.

269. Sugasawa K, Ishimi Y, Eki T, Hurwitz J, Kikuchi A, Hanaoka F. Nonconservative segregation of parental nucleosomes during simian virus 40 chromosome replication *in vitro*. Proc Natl Acad Sci USA 1992; 89:1055-1059.

270. Chen M, Pan Z-Q, Hurwitz J. The sequence and expression in *Escherichia coli* of the 40 kDa subunit of activator 1 (replication factor C) of HeLa cells. Proc Natl Acad Sci USA 1992; 89**:**2516-2520.

271. Dean FB, Borowiec JA, Eki T, Hurwitz J. The simian virus 40 T antigen double hexamer assembles around the DNA at the replication origin. J Biol Chem 1992; 267:14129-14137.

272. Lee CG, Hurwitz J. A new RNA helicase isolated from HeLa cells that catalytically translocates in the 3′ to 5′ Direction. J Biol Chem 1992; 267:4398-4407.

273. Chen M, Pan Z-Q, Hurwitz J. Studies of the cloned 37 kDa subunit of activator 1 (replication factor C) of HeLa cells. Proc Natl Acad Sci USA 1992; 89:5211-5215.

274. Ishimi Y, Sugasawa K, Hanaoka F, Eki T, Hurwitz J. Topoisomerase II plays an essential role as a swivelase in the late stage of SV40 chromosome replication *in vivo*. J Biol Chem 1992; 267:462-466.

275. Amin AA Hurwitz J. Polar arrest of the simian virus 40 tumor antigen-mediated replication fork movement *in vitro* by tus protein-terB complex of *Escherichia coli*. J Biol Chem 1992; 267:18612-18622.

* * Kim SH, Smith J, Claude A, Link R-J. The purified yeast pre-mRNA splicing factor PRP2 is an RNA-dependent NTPase. EMBO J 1992; 11:2319-2326 (with support from my grant).

276. Seo YS, Hurwitz J. Isolation of helicase α, a DNA helicase from HeLa cells stimulated by a fork structure and single-stranded DNA binding protein. J Biol Chem 1993; 268:10282-10295.

277. Flores-Rozas H, Hurwitz J. Characterization of a new RNA helicase from nuclear extracts of HeLa cells that translocates in the 5′ to 3′ direction. J Biol Chem 1993; 268:21372-21383.

278 Seo YS, Muller F, Lusky M, Hurwitz J. Bovine papilloma viral (BPV)-encoded E1 protein contains multiple activities required for BPV DNA replication. Proc Natl Acad Sci USA 1993; 90:702-706.

279. Murakami Y, Hurwitz J. Functional interactions between SV40 T antigen and other replication proteins at the replication fork. J Biol Chem 1993; 268:11008-11017.

280. Murakami Y Hurwitz J. DNA polymerase α stimulates the ATP-dependent binding of simian virus tumor T antigen to the SV40 origin of replication. J Biol Chem 1993; 268:11018-11027.

281. Pan Z-Q, Chen M Hurwitz J. The subunits of activator I (replication factor C) carry out multiple functions essential for proliferating-cell nuclear antigen-dependent DNA synthesis. Proc Natl Acad Sci USA1993; 90:6-10.

282. Lee CG, Zamore PD, Green MR, Hurwitz J. RNA annealing activity is intrinsically associated with U2AF. J Biol Chem 1993; 268:13472-13478.

283. Lee C-G, Hurwitz J. Human RNA helicase A is homologous to the maleless protein of *Drosophila*. J Biol Chem 1993; 268:16822-16830.

284. Lusky M, Hurwitz J, Seo YS. Cooperative assembly of the bovine papilloma virus E1 and E2 proteins on the replication origin Requires an intact E2 binding site. J Biol Chem 1993; 268:15795-15803.

285. Seo YS, Muller F, Lusky M, Gibbs E, Kim HY, Phillips B, Hurwitz J. Bovine papilloma viral (BPV)-encoded E2 protein enhances binding of E1 protein to the BPV replication origin. Proc Natl Acad Sci USA 1993; 90:2865-2869.

286. Onrust R, O'Donnell M, Dean FB, Chen M, Hurwitz J. Homology in accessory proteins of replicative polymerases—*E. coli* to humans. Nuc Acid Res 1993; 21:1-3.

287. Pan Z-Q, Hurwitz J. Reconstitution of cyclin-dependent *cdc2* and *cdk2* Kinase activities *in vitro*. J Biol Chem 1993; 268:20433-20442.

288. Pan Z-Q, Amin A, Hurwitz J. Characterization of the *in vitro* reconstituted *cyclin A* or *B1*-dependent *cdk2* and *cdc2* kinase activities. J Biol Chem 1993; 268:20443-20451.

289. ** Burbelo PD, Utani A, Pan Z.-Q, Yamada Y. Cloning of the large subunit of activator 1 (replication factor C) reveals homology with bacterial DNA ligases. Proc Natl Acad Sci USA 1993; 90:11543-11547 (with support from my grant).

290. Amin AA, Murakami Y, Hurwitz J. The initiation of DNA replication by SV40 T antigen is inhibited by the p107 protein. J Biol Chem 1994; 269:7735-7743.

291. Ozawa K, Dean FB, Chen M, Lee S-H, Shiratori A, Murakami Y, Sakakura T, Hurwitz J. Mapping of the 70 kDa, and 11 kDa subunit genes of the human multimeric single-stranded DNA binding protein (hSSB/RPA) to chromosome bands 17p13, 1 p35-p36.1, and 7p21-p22. Cell Structure and Function 1993; 10:215-224.

292. Stigger E, Dean FB, Hurwitz J, Lee S-H. Reconstitution of functional human single-stranded DNA binding protein complex from individual subunits expressed by recombinant baculoviruses. Proc Natl Acad Sci USA 1994; 91:579-583.

293. Müller F, Seo YS, Hurwitz J. Replication of bovine papillomavirus Type 1 origin-containing DNA in crude extracts and with purified proteins. J Biol Chem 1994; 209:17086-17094.

294. Pan Z-Q, Amin AA, Gibbs E, Niu H, Hurwitz J. Phosphorylation of the p34 subunit of human single-stranded DNA binding protein in cyclin A -activated G_1 extracts is catalyzed by cdk-cyclin A and DNA-dependent protein kinase. Proc Natl Acad Sci USA 1994; 91:8343-8347.

295. Flores-Rozas H, Kelman Z, Dean FB, Pan Z-Q, Harper JW, Elledge SJ, O'Donnell M, Hurwitz J. Cdk-interacting protein-1 (Cip1, WAF1) directly binds with proliferating cell nuclear antigen and inhibits DNA replication catalyzed by the DNA polymerase δ holoenzyme. Proc Natl Acad Sci USA 1994; 91:8655-8659.

296. Lusky M, Hurwitz J, Seo YS. The bovine papillomavirus E2 protein modulates the assembly of but is not stably maintained in a replication-competent multimeric E1-replication origin complex. Proc Natl Acad Sci USA 1994; 91:8895-8899.

297. Okumura K, Nogami M, Taguchi H, Dean FB, Chen M, Pan Z-Q, Hurwitz J, Shiratori A, Murakami Y, Ozawa K, Eki T. Assignment of the 36.5-kDa (RFC5), 37-kDa (RFC4), 38-kDa (RFC3), and 40-kDa (RFC2) subunit genes of human replication factor C to chromosome bands 12q24.2-q24.3, 3q27, 13q12.3-q13, and 7q11.23. Genomics 1995; 34:274-278.

298.** Podust VN, Podust LA, Müller F, Hübscher U. DNA polymerase δ holoenzyme: action on single-stranded DNA and on double-stranded DNA in the presence of replicative DNA helicases. Biochem 1995; 34:5003-5009 (with support from my grant).

299. Pan Z-Q, Ge H, Hurwitz J. Transcription of positive cofactor 4 forms complexes with HSSB

(RPA) on single-stranded DNA and influences HSSB-dependent enzymatic synthesis of simian virus 40 DNA. J Biol Chem 1996; 271:22111-22116.

300. Gibbs E, Pan Z-Q, Niu H-W, Hurwitz J. Studies on *in vitro* phosphorylation of HSSB p34 and p107 by cyclin-dependent kinases: cycling-substrate interactions direct phosphorylation efficiencies. J Biol Chem 1996; 271:22847-22854.

301. Pan Z-Q, Park C-H, Amin AA, Hurwitz J, Sancar A. Phosphorylated and unphosphorylated forms of HSSB are equally active in SV40 DNA replication and in nucleotide excision repair. Proc Natl Acad Sci USA 1995; 92:4636-4640.

302. Luo Y, Hurwitz J, Massagué J. Cell cycle inhibition by independent CDK and PCNA binding domains in $p21^{Cip1}$. Nature 1996; 375:159-161.

303. Pan Z-Q, Reardon JT, Lei L, Flores-Rozas H, Legerski R, Sancar A, Hurwitz J. Inhibition of nucleic excision Repair by the cyclin-dependent Kinase inhibitor p21. J. Biological Chemistry 1995; 270:22008-22016.

304. Reardon J, Ge H, Gibbs E, Sancar A, Hurwitz J, Pan Z-Q. Isolation and characterization of two human transcription factor IIH-related complexes: ERCC2/CAK and TFIIH*. Proc Natl Acad Sci USA 1996; 93:6482-6487.

305. Murakami Y, Huberman JA, Hurwitz J. Identification, purification, and molecular cloning of autonomously replicating sequence-binding protein 1 from fission yeast *Schizosaccharomyces pombe*. Proc Natl Acad Sci USA 1996; 92:502-507.

306. Yao N, Turner J, Kelman Z, Stukenberg PT, Dean F, Shechter D, Pan Z-Q, Hurwitz J. O'Donnell M. Clamp loading, unloading and intrinsic stability of the PCNA, β and gp45 sliding clamps of human, *E. coli* and T4 replicases. Genes to Cells 1:101-113 (1996).

307. Jeffrey PD, Russo AA, Polyak K, Gibbs E, Hurwitz J, Massague, J, Pavletich NP. Mechanism of CDK activation revealed by the structure of a cyclin A-CDK2 complex. Nature 1995; 367:313-319.

308. Ishiai M, Sanchez JP, Amin AA, Murakami Y, Hurwitz J. Purification, gene cloning and reconstitution of the heterotrimeric single-stranded DNA binding protein from *Schizosaccharomyces pombe*. J Biol Chem 1996; 271:20868-20878.

309. Valdez BC, Henning D, Busch RK, Woods K, Flores-Rozas H, Hurwitz J, Perlaby L, Busch H. A nucleolar RNA helicase recognized by autoimmune antibodies from a patient with watermelon stomach disease. Nuc Acid Res 1996; 24:1220-1224.

310. Eki T, Okumura K, Amin A, Ishiai M, Abe M, Nogami M, Taguchi H, Hurwitz J, Murakami Y, Hanaoka, F. Mapping of the human homologue (ORC1L) of the yeast origin recognition complex subunit 1 gene to chromosome band 1p32.2-p32.3. Genomics 1996; 35:559-561.

311. Uhlmann F, Cai J, Flores-Rozas H, Dean FB, Finkelstein J, O'Donnell M, Hurwitz J. *In vitro* reconstitution of human replication factor (RFC) from its five subunits. Proc Natl Acad Sci USA 1996; 93:6521-6526.

312. Gibbs E, Kelman Z, Gulbis JM, O'Donnell M, Kuriyan J, Burgers PMJ, Hurwitz J. The influence of the PCNA-interacting domain of p21Cip1 on DNA synthesis catalyzed by the human and *Saccharomyces cerevisiae* polymerase δ holoenzymes. J Biol Chem 1996; 272:2373-2381.

313. Cai J, Uhlmann F, Gibbs E, Lee C-G, Phillips B, Finkelstein J, Yao N, O'Donnell M and Hurwitz J. Reconstitution of human replication factor C (RFC) from its five subunits in baculovirus-infected insect cells. Proc Natl Acad Sci USA 1996; 93:12896-12901.

314. Gulbis JM, Kelman Z, Hurwitz J, O'Donnell M, Kuriyan J. Structure of the C-terminal region of

$^{p21WAF1/CIP1}$ complexed with human PCNA. Cell 1996; 87:297-306.

315. Cai J, Gibbs E, Uhlmann F, Phillips B, Yao N, O'Donnell M, and Hurwitz J. A Complex Consisting of Human Replication Factor C p40, p37, and p36 subunits Is a DNA-dependent ATPase and an Intermediate in the Assembly of the Holoenzyme. J Biol Chem 1997; 272:18974-18981.

316. Uhlmann F, Cai J, Gibbs E, O'Donnell M and Hurwitz J. Deletion analysis of the large sub unit p140 in human replication factor C reveals regionas required for complex formation and replication activities. J. Biol. Chem. 1997; 272:10058-10064

317. Uhlmann F, Gibbs E, Cai J, O'Donnell M and Hurwitz J. Identification of regions within the four small subunits of human replication factor C required for complex formation and DNA replication. J. Biol. Chem. 1997; 272:10065-10071.

318. Lee C-G, Chang KA, Kuroda M and Hurwitz J. NTPase/Helicase activities of *Drosophila* maleless, an essential factor in dosage compensation. EMBO J. 1997; 16:2671-2681.

319. Niu H, Bromage HE, Pan Z-Q, Lee S-H and Hurwitz J. Mapping of amino acid residues in the p34 subunit of HSSB phosphorylated by DNA PK and CDK kinases *in vitro*. J. Biol. Chem. 1997; 272:12634-12641.

320. Lee J-K, Huberman JA, and Hurwitz J. Purification and characterization of a CENP-B homologue protein that binds to the centromeric K-type repeat DNA of *Schizosaccharomyces pombe*. Proc Natl Acad Sci USA 1997; 94:8427-8432.

321. Sanchez JP, Murakami Y, Huberman JA, Hurwtiz J. Isolation, characterization and molecular cloning of a protein (Abp2) that binds to a *Schizosaccharomyces pombe* origin of replication (*ars3002*). Molec. and Cell. Biol. 1998; 18:1670-1681.

322. Zhang D, Frappier L, Gibbs E, Hurwitz J and O'Donnell M. Human RPA (hSSB) interacts with EBNA 1, latent origin binding protein of Epstein-Barr Virus. Nucleic Acid Res., 1998, 26:631-637.

323. Rheamme E, Cohen LY, Uhlmann F, Lazure C, Alam C, Hurwitz J, Sekaly RP and Denis F. The large subunit of replication factor C is a substrate for caspase-3 *in vitro* and is cleaved by a caspase-3 like process during Fas-mediated apoptosis. EMBO J. 1997; 16:6346-6354.

324. Allen BL, Uhlmann F, Gaur L, Muder BA, Posey KL, Jones BL and Hardin SH. DNA recognition properties of N-terminal domain DNA binding domain within the large subunit of replication factor C. . Nucleic Acid Res., 1998, 26:3877-3882 (with support from my grant).

325. Zuo S, Gibbs E, Kelman Z, Wang TS-F, O'Donnell M, MacNeill SA, and Hurwitz J. DNA polymerase δ isolated from *S. pombe* contains five subunits. Proc Natl Acad Sci USA 1997; 94, 11244-11249.

326. Nakajima T, Uchida C, Anderson SF, Lee CG, Hurwitz J, Parvin JD and Montminy M. RNA helicase A mediates association of CBP with RNA polymerase II. Cell 1997; 90, 1107-1112.

327. Ishiai M, Dean FB, Okumura K, Abe M, Moon K.-Y, Amin AA, Kagotani K, Taguchi H, Murakami Y, Hanaoka F, O'Donnell M, Hurwitz J, and Eki T. Isolation of human and fission yeast homologues of the budding yeast origin recognition complex subunit ORC5: Human homologue (ORC5L) maps to 7q22. Genomics 1997, 46:294-298.

328. Kelman Z, Hurwitz J, and O'Donnell M. Processivity of DNA polymerases: two mechanisms, one goal. Structure 1998, 6:121-125.

329. Lee C-G, Eki T, Okumura K, da Costa Soares V, Hurwitz J. Molecular analysis of the cDNA and genomic DNA encoding mouse RNA helicase A. Genomics 1998, 47:365-371.

330 Watanabe J, Pan Z-Q, Schreiber-Agus N, DePinho R, Hurwitz J, and Xiong Y. Suppression of cell transformation by the cyclin-dependent kinase inhibitor $p57^{KIP2}$ requires binding to proliferating cell nuclear antigen. Proc Natl Acad Sci USA 1998; 95, 1392-1397.

331. Kelman Z and Hurwitz J. Protein-PCNA interactions a DNA-scanning mechanism? TIBS 1998, 23:236-238.

332. Eki T, Dean FB, Kohda A, Okumura K, Abe M, Murakami Y, Ishiai M, Satomoto K, Hurwitz J, O'Donnell M and Hanaoka F. Assignment of the homologue of the yeast origin recognition complex subunit ORC4 (ORC4L) to human chromosome band 2q22 to q23 by in situ hybridization and somatic cell hybrid analysis. Cytogenet Cell Genet 1998, 81:89-90

333. Cai J, Yao N, Gibbs E, Finkelstein J, Phillips B, O'Donnell M and Hurwitz J. ATP hydrolysis catalyzed by human replication factor C requires participation of multiple subunits. Proc Natl Acad Sci USA 1998; 95:11607-11612.

334. Lee C-G, da Costa Soares V, Newberger C, Manova K, Lacy E, and Hurwitz J. RNA helicase A is essential for normal gastrulation. Proc Natl Acad Sci USA 1998; 95:13709-13713.

335. Zhang G, Gibbs E, Kelman Z, O'Donnell M, Hurwitz J. Studies on the interaction between human RFC and human PCNA. Proc Natl Acad Sci USA 1999; 96:1869-1874.

336. Kelman Z, Zuo, S, Arroyo, MP, Wang TSF and Hurwitz J. The C-terminal region of *Schizosaccharomyces pombe* proliferating cell nuclear antigen is essential for DNA polymerase activity. Proc Natl Acad Sci USA 1999; 96:9515-9520.

337. Ling X, Boytim ML, Kamanger S, Kelman Z, Lyu S-C, Hurwitz J, Clayberger C and Krensky AM. PCNA as the cell sensor for an HLA-derived peptide blocking T cell proliferation. Submitted.

338. Yuzhakov A, Kelman Z, Hurwitz J. and O'Donnell M. Multiple competition reactions for RPA order the assembly of the DNA polymerase δ holoenzyme. EMBO J. 1999, 18:6189-6199

339. Kelman Z, Pietrokovski S, Hurwitz J. Isolation and characterization of a split B-type DNA polymerase from the archaeon *Methanobacterium thermoautotrophicum* ΔH. J. Biol. Chem. 1999; 274:28751-28761

340. Matsumoto Y, Kim K, Hurwitz J, Gary R, Levin D, Tomlinson AF, and Park MS. Reconstitution of proliferating cell nuclear antigen-dependent repair of apurinic/apyrimidinic sites with purified proteins. J. Biol. Chem. 1999; 274:33703-33708.

341. Moon K-Y, Kong D, Lee J-K, Raychaudhuri S, and Hurwitz J. Identification and reconstitution of the origin recognition complex from *Schizosaccharomyces pombe*. Proc Natl Acad Sci USA 1999; 96:12367-12372.

342. Kelman Z. Lee JK. Hurwitz J. The single minichromosome maintenance protein of *Methanobacterium thermoautotrophicum* ΔH contains DNA helicase activity. Proc. of the Nat. Acad. Sci. USA, 1999; 96:14783-14788.

343. Yao N. Hurwitz J. O'Donnell M. Dynamics of β and proliferating cell nuclear antigen sliding clamps in traversing DNA secondary structure. J. Biol Chem., 2000; 275:1421-1432.

344. Zuo S, Bermudez V, Zhang G, Kelman Z, and Hurwitz J. Structure and activity associated with multiple forms of *Schizosaccharomyces pombe* DNA polymerase δ. J. Biol. Chem. 1999; 275:5531-5162

345. Kelman Z. Hurwitz J. A unique organization of the protein subunits ofthe DNA polymerase clamp loader in the archaeon *Methanobacterium thermoautotrophicum* ΔH. J. Biol. Chem., 2000; 275:7327-7336.

346. Alleva JL, Zuo S, Hurwitz J, and Doetsch, PW. *In vitro* reconstitution of the *Schizosaccharomyces pombe* alternative excision repair pathway. Biochemistry 2000; 39:2659-2666.

347 Chen X, Zuo S, Kelman Z, O'Donnell M, Hurwitz J, and Goodman MF. Fidelity of eucaryotic DNA polymerase δ holoenzyme from *Schizosaccharomyces pombe*. J. Biol. Chem. 2000; 275:17677-17682.

348. Ling X. Kamangar S. Boytim ML. Kelman Z. Huie P. Lyu SC. Sibley RK.Hurwitz J. Clayberger C. Krensky AM. Proliferating cell nuclear antigen as the cell cycle sensor for an HLA-derived peptide blocking T cell proliferation. J. Immunology., 2000; **164**:6188-6192.

349. Sriskanda V. Kelman Z. Hurwitz J. Shuman S. Characterization of an ATP-dependent DNA ligase from the thermophilic *archaeon Methanobacterium thermoautotrophicum.* Nuc. Acids Res., 2000; **28**:2221-2228.

350. Lee J-K, Hurwitz J. Isolation and characterization of various complexes of the minichromosome maintenance proteins of *Schizosaccharomyces pombe*. J. Biol. Chem. 2000; **275**:18871-18878.

351. Lee CG. Eki T. Okumura K. Nogami M. Soares V da C. Murakami Y. HanaokaF. Hurwitz J. The human RNA helicase A (DDX9) gene maps to the prostate cancer susceptibility locus at chromosome band 1q25 and its pseudogene (DDX9P) to 13q22, respectively. Somatic Cell & Molecular Genetics, 2000 **25**:33-9.

352. Lee J-K, and Hurwitz J. Processive DNA helicase activity of the minichromosome maintenanceproteins 4, 6, and 7 complex requires forked DNA structures. Proc Natl Acad Sci USA 2001; **98**:54-59.

353. Izumi M, Yanagi K, Mizuno T, Yokoi M, Kawasaki Y, Moon K-Y, Hurwitz, J, Yatagai F, and Hanaoka. The human homolog of *Saccharomyces cereviciae* Mcm10 interacts with replication factors and dissociates from nuclease-resistant nuclear structures in G2 phase. Nucleic Acids Research. 2000; 28:4769-77.

354. Wang M, Park J-S, Ishiai M, Hurwitz J, and Lee S-H. Species specificity of human RPA in simian virus 40 DNA replication lies in T-antigen-dependent RNA primer synthesis. Nucleic Acids Res. 2000; 28:4742-4749.

355. Lindsey-Boltz LA, Bermudez VP, Hurwitz J, and Sancar A. Purification and characterization of human DNA damage checkpoint Rad complexes. Proc Natl Acad Sci USA 2001; 98:11236-11241.

356. Haracska L, Unk I, Johnson RE, Phillips BB, Hurwitz J, Prakash L, and Prakash S. Stimulation of DNA synthesis activity of human DNA polymerase κ by PCNA. Molec and Cell Biology 2002; 22:784-791.

357. Lee J-K, Moon K-Y, Jiang Y, and Hurwitz J. The *Schizosaccharomyces pombe* origin recognition complex interacts with multiple AT-rich regions of the replication origin DNA by means fothe AT-hook domains of the spOrc4 protein. Proc Natl Acad Sci USA 2001; **98**:13589-13594.

358. Haracska L, Johnson RE, Unk I, Phillips B, Hurwitz J, Prakash L, and Prakash S. Physical and functional interactions of human DNA polymerase η with PCNA. Molec and Cell Biology 2002; 21:7199-7206.

359. Haracska L, Johnson RE, Unk I, Phillips B, Hurwitz J, Prakash L, and Prakash S. Targeting of human DNA polymerase ι to the replication machinery via interaction with PCNA. Molec and Cell Biology 2001; **21**:7199-7206.

360. Kelman Z and Hurwitz J. PCNA (proliferating cell nuclear antigen). Wiley Encyclopedia of Molecular Medicine, 5 Vol. Set ISBN 0-471-37494-6 Copyright 2002 by John Wiley & sons, Inc.

361. Nakagawa H, Lee JK, Hurwitz J, Allshire RC, Nakayama J, Grewal SI, Tanaka K, Murakami Y. Fission yeast CENP-B homologs nucleate centromeric heterochromatin by promoting heterochromatin-specific histone tail modifications. Genes Dev 2002; **16**:1766-78

362. Maruyama T, Farina A, Dey A, Cheong J, Bermudez VP, Tamura T, Sciortino S, Shuman J, Hurwitz J, Ozato K. A Mammalian bromodomain protein, brd4, interacts with replication factor C and inhibits progression to S phase. Mol Cell Biol 2002; **22**:6509-20

363. Bermudez VP, MacNeill S, Tappin I, Hurwitz J. The influence of the Cdc27 subunit on the properties of the Schizosaccharomyces pombe DNA polymerase delta. J Biol Chem 2002; **277**:36853-36862.

364. Lee J-K, Seo YS and Hurwitz J. The Cdc23 (Mcm10) protein is required for the phosphorylation of Minichromosome maintenance complex by the Dfp1-Hsk1 kinase. Proc Natl Acad Sci USA 2003; **100**:2334-2339.

365. Bermudez VP, Lindsey-Boltz LA, Cesare AJ, Maniwa Y, Griffith JD, Hurwitz J, Sancar A. Loading of the human 9-1-1- checkpoint complex onto DNA by the checkpoint clamp loader hRad17-RFC complex *in vitro*. Proc Natl Acad Sci USA 2003;**100**:1633-1638.

366. Kelman Z, Hurwitz, J. Structural lesson in DNA replication from the third domain of life. Nature Structural Biology 2003; **10**:148-150.

367. BermudezVP, Maniwa Y, Tappin I, Ozato K, Yokomori K and Hurwitz J. The alternative Ctf18-Dcc1-Ctf8-RFC complex required for sister chromatid cohesion loads PCNA onto DNA. Proc Natl Acad Sci USA 2003; **18**:10237-10242.

368. Shin J-H, Jiang Y, Grabowski B, Hurwitz J, and Kelman Z. Substrate requirements for duplex DNA translocation by the eukaryal and archaeal MCM helicases. J Biol Chem 2003; **278**:49053-49062.

369. Fien K, Cho Y-S, Lee J-K, Raychaudhuri S, Tappin I, and Hurwitz J. Primer Utilization by DNA Polymerase α-Primase is Influenced by Its Intraction withMcm10p*. J Biol Chem 2004; **279**: 16144-16153.

370. Maniwa, Y., Yoshimura, M, Bermudez, VP, Yuki, T, Okada, K, Kanomata, N, Ohbayashi, C, Hayashi, Y, Hurwitz ,J. and Okita Y. Accumulation of hRad9 protein in the nuclei of nonsmall cell, lung carcinoma cells. Cancer, 2004, Nov22 (Epub ahead of print).

371. Levin DS, Vijayakumar S, Liu X, Bermudez VP, Hurwitz J, Tomkinson AE. A conserved interaction between the replicative clamp loader and DNA ligase in eukaryotes; implications for okazaki fragment joining. J Biol Chem. 2004 Oct 23; Epub ahead of print).

372. Haracska L, Acharya N, Unk I, Johnson RE, Hurwitz,J, Prakash L, and Prakash S. A single domain in human DNA polymerase iota mediates interaction with PCNA:implication for translesion DNA synthesis. Mol. Cell. Biol. 2004 (in press).

373. Giordano-Coltart J, Ying CY, Gautier J and Hurwitz J. Studies of the properties of human origin recognition complex and its Walker A motif mutants. Proc Natl Acad Sci USA 2004; **102**:69-74

374. Gaczynska M, Osmulski PA, Jiang Y, Lee JK, Bermudez V and Hurwitz J. Atomic force microscopic analysis of the binding of the *Schizosaccharomyces pombe* origin recognition complex and the spOrc4 protein with origin DNA. Proc Natl Acad Sci USA 2004; **101**:17952-7.

375. Kelman LM, Hurwitz J, and Kelman Z. DNA Replication Fork, Eukaryotic. Encyclopedia of Biological Chemistry, Vol. 1, 2004, Elsevier Inc. pp 745-748.