



UvA-DARE (Digital Academic Repository)

The HIV-1 RNA genome and regulation of reverse transcription and polyadenylation

Klasens, B.I.F.

[Link to publication](#)

Citation for published version (APA):

Klasens, B. I. F. (2000). The HIV-1 RNA genome and regulation of reverse transcription and polyadenylation

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <http://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

CHAPTER 8

REFERENCE LIST

1. Vogt, P.K. (1997) In Coffin, J.M., Hughes, S.H., and Varmus, H.E. (eds.), *Retroviruses*. Cold Spring Harbor Laboratory Press, New York, pp. 1-25.
2. Teich, N. (1984) In Weiss, R., Teich, N., Varmus, H., and Coffin, J. (eds.), *RNA tumor viruses*. Cold Spring Harbor Laboratory Press, New York, pp. 25-207.
3. Coffin, J.M. (1990) In Fields, B.N. and Knipe, D.M. (eds.), *Virology*. Raven Press, New York, N.Y., pp. 1437-1500.
4. Vogt, V.M. (1997) In Coffin, J.M., Hughes, S.H., and Varmus, H.E. (eds.), *Retroviruses*. Cold Spring Harbor Laboratory Press, New York, pp. 27-69.
5. Goff, S.P. (1990) *J.Acquir.Immune.Defic.Syindr.*, **3**, 817-831.
6. Hu, W.-S. and Temin, H.M. (1990) *Proc.Natl.Acad.Sci.USA*, **87**, 1556-1560.
7. Hu, W.-S. and Temin, H.M. (1990) *Science*, **250**, 1277-1233.
8. Katz, R.A. and Skalka, A.M. (1994) *Ann.Rev.Biochem.*, **63**, 133-173.
9. Oude Essink, B.B., Das, A.T., and Berkhout, B. (1995) *J.Biol.Chem.*, **270**, 23867-23874.
10. Trono, D. (1995) *Cell*, **82**, 189-192.
11. Frankel, A.D. and Young J.A.T. (1998) *Annu.Rev.Biochem.*, **67**, 1-25.
12. Frankel, A.D. and Young, J.A. (1998) *Ann.Rev.Biochem.*, **67**, 1-25.
13. Bohan, C.A., Kashanchi, F., Ensoli, B., Buonaguro, L., Boris Lawrie, K.A., and Brady, J.N. (1992) *Gene Expr.*, **2**, 391-407.
14. Jeang, K.T. and Berkhout, B. (1992) *J.Biol.Chem.*, **267**, 17891-17899.

15. Jeang, K.T., Berkhout, B., and Dropulic, B. (1993) *J.Biol.Chem.*, **268**, 24940-24949.
16. Kao, S.-Y., Calman, A.F., Luciw, P.A., and Peterlin, B.M. (1987) *Nature*, **330**, 489-493.
17. Laspia, M.F., Rice, A.P., and Mathews, M.B. (1989) *Cell*, **59**, 283-292.
18. Berkhout, B., Silverman, R.H., and Jeang, K.T. (1989) *Cell*, **59**, 273-282.
19. Dingwall, C., Ernberg, I., Gait, M.J., Green, S.M., Heaphy, S., Karn, J., Lowe, A.D., Singh, M., Skinner, M.A., and Valerio, R. (1989) *Proc.Natl.Acad.Sci.USA*, **86**, 6925-6929.
20. Rabson, A.B. and Graves, B.J. (1997) In Coffin, J.M., Hughes, S.H., and Varmus, H.E. (eds.), *Retroviruses*. Cold Spring Harbor Laboratory Press, New York, pp. 205-262.
21. Olsen, H.S., Cochrane, A.W., Dillon, P.J., Nalin, C.M., and Rosen, C.A. (1990) *Genes Dev.*, **4**, 1357-1364.
22. Malim, M.H. and Cullen, B.R. (1991) *Cell*, **65**, 241-248.
23. Olsen, H.S., Cochrane, A.W., Dillon, P.J., Nalin, C.M., and Rosen, C.A. (1990) *Genes & Development*, **4**, 1357-1364.
24. Meyer, B.E., Meinkoth, J.L., and Malim, M.H. (1996) *J.Virol.*, **70**, 2350-2359.
25. Najera, I., Krieg, M., and Karn, J. (1999) *J.Mol.Biol.*, **285**, 1951-1964.
26. Hewson, T., Lonc, N., Moore, M., and Howle, S. (1999) *Immunology and Cell Biology*, **77**, 289-303.
27. Garzino-Demo, A. and DeVico, A.L.G.R.C. (1998) *Journal of Clinical Immunology*, **18**, 243-255.
28. Klatzmann, D., Champagne, E., and Chamaret, S. (1984) *Nature*, **312**, 767-768.

29. Alkhatib, G., Combadiere, C., Broder, C.C., Feng, Y., Murphy, P.M., and Berger, E.A. (1996) *Science*, **272**, 1955-1958.
30. Choe, H., Farzan, M., Sun, Y., Sullivan, N., Rollins, B., Ponath, P.D., Wu, L., Mackay, C.R., LaRosa, G., Newman, W. *et al.* (1996) *Cell*, **85**, 1135-1148.
31. Deng, H., Liu, R., Ellmeier, W., Choe, S., Unutmaz, D., Burkhart, M., Di Marzio, P., Marmon, S., Sutton, R.E., Hill, C.M. *et al.* (1996) *Nature*, **381**, 661-666.
32. Dragic, T., Litwin, V., Allaway, G.P., Martin, S.R., Huang, Y., Nagashima, K.A., Cayan, C., Maddon, P.J., Koup, R.A., Moore, J.P. *et al.* (1996) *Nature*, **381**, 667-673.
33. Doranz, B.J., Rucker, J., Yi, Y., Smyth, R.J., Samson, M., Peiper, S., Parmentier, M., Collman, R.G., and Doms, R.W. (1996) *Cell*, **85**, 1149-1158.
34. Feng, Y., Broder, C.C., Kennedy, P.E., and Berger, E.A. (1996) *Science*, **272**, 872-877.
35. Ho, D.D., Rota, T.R., and Hirsch, M.S. (1986) *J.Clin.Invest.*, **77**, 1712-1715.
36. Klatzmann, D., Barre-Sinoussi, F., Nugeyre, M.T., Danquet, C., Vilmer, E., Griscelli, C., Brun-Veziret, F., Rouzioux, C., Gluckman, J.C., Chermann, J.C. *et al.* (1984) *Science*, **225**, 59-63.
37. Eiden, L.E. and Lifson, J.D. (1992) *Immunol.Today*, **13**, 201-206.
38. Kido, H., Fukutomi, A., and Katanama, N. (1990) *J Biol Chem.*, **265**, 21979-21985.
39. March, M. and Dalglish, A.G. (1987) *Immunol.Today*, **8**, 369-371.
40. Sattentau, Q.J. and Moore, J.P. (1993) *Philos.Trans.R.Soc.London Ser.B.*, **342**, 59-66.

41. Telesnitsky, A. and Goff, S.P. (1997) In Coffin, J.M., Hughes, S.H., and Varmus, H.E. (eds.), *Retroviruses*. New York: Cold Spring Harbor Laboratory Press, pp. 121-160.
42. Bebenek, K. and Kunkel, T.A. (1993) In Skalka, A.M. and Goff, S.P. (eds.), *Reverse transcriptase*. CSH Laboratory Press, New York, pp. 85-102.
43. Arts, E.J., Li, X., Gu, Z., Kleiman, L., Parniak, M.A., and Wainberg, M.A. (1994) *J.Biol.Chem.*, **269**, 14672-14680.
44. Cobrinik, D., Aiyar, A., Ge, Z., Katzman, M., Huang, H., and Leis, J. (1991) *J.Virol.*, **65**, 3864-3872.
45. Aiyar, A., Cobrinik, D., Ge, Z., Kung, H.J., and Leis, J. (1992) *J.Virol.*, **66**, 2464-2472.
46. Brown, P.O. (1990) *Curr.Top.Microbiol.Immunol.*, **157**, 19-48.
47. Brown, P.O. (1992) *Annu.Rev.Genet.*, **26**, 527-544.
48. Brown, P.O. (1997) In Coffin, J.M., Hughes, S.H., and Varmus, H.E. (eds.), *Retroviruses*. Cold Spring Harbor Laboratory Press, New York, pp. 161-204.
49. Feinberg, M.B., Baltimore, D., and Frankel, A.D. (1991) *Proc.Natl.Acad.Sci.USA*, **88**, 4045-4049.
50. Rana, T.M. and Jeang, K.-T. (1999) *Arch.Biochem.Biophys.*, **365**, 175-185.
51. Keller, W. (1995) *Cell*, **81**, 829-832.
52. Proudfoot, N.J. (1996) *Cell*, **87**, 779-781.
53. Wahle, E. and Keller, W. (1996) *TIBS*, **21**, 247-250.
54. Barabino, S.M.L. and Keller, W. (1999) *Cell*, **99**, 9-11.
55. Zhao, J., Hyman, L., and Moore, C. (1999) *Microbiol.Mol.Biol.Rev.*, **63**, 405-445.

56. Colgan, D.F. and Manley, J.L. (1997) *Genes Dev.*, **11**, 2755-2766.
57. Lewis, J., Gunderson, S., and Mattaj, I.W. (1995) *J.Cell Sci.(Suppl.)*, **19**, 13-19.
58. Sachs, A.B., Sarnow, P., and Hentze, M.W. (1997) *Cell*, **89**, 831-838.
59. Wickens, M., Anderson, P., and Jackson, R.J. (1997) *Curr.Opin.Genet.Dev.*, **7**, 220-232.
60. Manley, J.L. (1995) *Proc.Natl.Acad.Sci.USA*, **92**, 1800-1801.
61. Manley, J. (1988) *Biochim.Biophys.Acta*, **950**, 1-12.
62. Wickens, M. (1990) *Trends Biochem.Sci.*, **15**, 277-281.
63. Proudfoot, N.J. (1991) *Cell*, **64**, 671-674.
64. McDevitt, M.A., Hart, R.P., Wong, W.W., and Nevins, J.R. (1986) *EMBO J.*, **5**, 2907-2913.
65. McLauchlan, J., Gaffney, D., Whitton, J.L., and Clements, J.B. (1985) *Nucleic Acids Res.*, **13**, 1347-1368.
66. Gilmartin, G.M. and Nevins, J.R. (1989) *Genes Dev.*, **3**, 2180-2189.
67. Gilmartin, G.M. and Nevins, J.R. (1991) *Mol.Cell Biol.*, **11**, 2432-2438.
68. Keller, W., Bienroth, S., Lang, K.M., and Christofori, G. (1991) *EMBO J.*, **10**, 4249.
69. Takagaki, Y., MacDonald, C.C., Shenk, T., and Manley, J.L. (1992) *Proc.Natl.Acad.Sci.USA*, **89**, 1403-1407.
70. Takagaki, Y., Manley, J.L., MacDonald, C.C., Wilusz, J., and Shenk, T. (1990) *Genes Dev.*, **4**, 2112-2120.
71. Chen, F., MacDonald, C.C., and Wilusz, J. (1995) *Nucleic Acids Res.*, **23**, 2614-2620.
72. Wahle, E. and Keller, W. (1992) *Ann.Rev.Biochem.*, **61**, 419-440.

73. Wahle, E., Martin, G., Schiltz, E., and Keller, W. (1991) *EMBO J.*, **10**, 4251-4257.
74. Murthy, K.G. and Manley, J.L. (1995) *Genes & Development*, **9**, 2672-2683.
75. Wahle, E. (1991) *Cell*, **66**, 759-768.
76. Bienroth, S., Keller, W., and Wahle, E. (1993) *EMBO J.*, **12**, 585-594.
77. Guntaka, R.V. (1993) *Microbiol.Rev.*, **57**, 511-521.
78. Brown, P.H., Tiley, L.S., and Cullen, B.R. (1991) *J.Virol.*, **65**, 3340-3343.
79. DeZazzo, J.D., Scott, J.M., and Imperiale, M.J. (1992) *Mol.Cell.Biol.*, **12**, 5555-5562.
80. Valsamakis, A., Zeichner, S., Carswell, S., and Alwine, J.C. (1991) *Proc.Natl.Acad.Sci.USA*, **88**, 2108-2112.
81. Valsamakis, A., Schek, N., and Alwine, J.C. (1992) *Mol.Cell Biol.*, **12**, 3699-3705.
82. Gilmartin, G.M., Fleming, E.S., Oetjen, J., and Graveley, B.R. (1995) *Genes Dev.*, **9**, 72-83.
83. Cherrington, J. and Ganem, D. (1992) *EMBO J.*, **11**, 1513-1524.
84. Iwasaki, K. and Temin, H.M. (1990) *Genes & Development*, **4**, 2299-2307.
85. Gilmartin, G.M., Fleming, E.S., and Oetjen, J. (1992) *EMBO J.*, **11**, 4419-4428.
86. Ashe, M.P., Griffin, P., James, W., and Proudfoot, N.J. (1995) *Genes Dev.*, **9**, 3008-3025.
87. Ashe, M.P., Pearson, L.H., and Proudfoot, N.J. (1997) *EMBO J.*, **16**, 5752-5763.
88. Ashe, M.P., Furger, A., and Proudfoot, N.J. (2000) *RNA*, **6**, 170-177.
89. Arts, E.J. and Le Grice, S.F.J. (1998) *Progr.Nucl.Acid.Res.Mol.Biol.*, **58**, 339-393.

90. Gotte, M., Li, X., and Wainberg, M.A. (1999) *Arch.Biochem.Biophys.*, **365**, 199-210.
91. Telesnitsky, A. and Goff, S.P. (1993) In Skalka, A.M. and Goff, S.P. (eds.), *Reverse transcriptase*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, pp. 49-83.
92. Davis, N.L. and Rueckert, R.R. (1972) *J.Virol.*, **10**, 1010-1020.
93. Gilboa, E., Mitra, S.W., Goff, S., and Baltimore, D. (1979) *Cell*, **18**, 93-100.
94. Benz, E.W., Jr. and Dina, D. (1979) *Proc Natl Acad Sci U S A*, **76**, 3294-3298.
95. Chen, M., Garon, C.F., and Papas, T.S. (2000) *Proc Natl Acad Sci U S A*, **77**, 1296-1300.
96. Boone, L.R. and Skalka, A. (1980) *Proc.Natl.Acad.Sci.USA*, **77**, 847-851.
97. Boone, L.R. and Skalka, A.M. (1981) *J.Virol.*, **37**, 109-116.
98. Boone, L.R. and Skalka, A.M. (1981) *J.Virol.*, **37**, 117-126.
99. Barat, C., Lullien, V., Schatz, O., Keith, G., Mugeyre, M.T., Grüniger-Lcitch, F., Barré-Sinoussi, F., LeGrice, S.F.J., and Darlix, J.L. (1989) *EMBO J.*, **11**, 3279-3285.
100. Khan, R. and Giedroc, D.P. (1992) *J.Biol.Chem.*, **267**, 6689-6695.
101. De Rocquigny, H., Gabus, C., Vincent, A., Fournie-Zaluski, M.-C., Roques, B., and Darlix, J.-L. (1992) *Proc.Natl.Acad.Sci.USA*, **89**, 6472-6476.
102. Li, X., Quan, Y., Arts, E.J., Li, Z., Preston, B.D., De Rocquigny, H., Roques, B.P., Darlix, J.-L., Kleiman, L., Parniak, M.A. *et al.* (1996) *J.Virol.*, **70**, 4996-5004.
103. Remy, E., De Rocquigny, H., Petitjean, P., Muriaux, D., Theilleux, V., Paoletti, J., and Roques, B.P. (1998) *J.Biol.Chem.*, **273**, 4819-4822.

104. Rong, L., Liang, C., Hsu, M., Kleiman, L., Petitjean, P., De Rocquigny, H., Roques, B.P., and Wainberg, M.A. (1998) *J. Virol.*, **72**, 9353-9358.
105. Guo, J., Henderson, L.E., Bess, J., Kane, B., and Levin, J.G. (1997) *J. Virol.*, **71**, 5178-5188.
106. Allain, B., Lapadat-Tapolsky, M., Berlioz, C., and Darlix, J.-L. (1994) *EMBO J.*, **13**, 973-981.
107. Ji, X., Klarmann, G.J., and Preston, B.D. (1996) *Biochem.*, **35**, 132-143.
108. Zhang, J. and Temin, H.M. (1993) *Science*, **259**, 234-238.
109. Tan, R., Brodsky, A., Williamson, J.R., and Frankel, A.D. (1997) *Semin. Virol.*, **8**, 186-193.
110. Roy, S., Parkin, N.T., Rosen, C., Itovitch, J., and Sonenberg, N. (1990) *J. Virol.*, **64**, 1402-1406.
111. Berkhout, B. and Jeang, K.T. (1989) *J. Virol.*, **63**, 5501-5504.
112. Berkhout, B. (1992) *Nucleic Acids Res.*, **20**, 27-31.
113. Feng, S. and Holland, E.C. (1988) *Nature*, **334**, 165-167.
114. Verhoef, K., Tijms, M., and Berkhout, B. (1997) *Nucleic Acids Res.*, **25**, 496-502.
115. Harrich, D., Ulich, C., and Gaynor, R.B. (1996) *J. Virol.*, **70**, 4017-4027.
116. Clever, J.L., Eckstein, D.A., and Parslow, T.G. (1999) *J. Virol.*, **73**, 101-109.
117. Berkhout, B., Klaver, B., and Das, A.T. (1995) *Virol.*, **207**, 276-281.
118. Berkhout, B., Klaver, B., and Das, A.T. (1997) *Nucleic Acids Res.*, **25**, 940-947.
119. Das, A.T., Klaver, B., and Berkhout, B. (1999) *J. Virol.*, **73**, 81-91.
120. McLaren, R.S., Newbury, S.F., Dance, G.S., Causton, H.C., and Higgins, C.F. (1991) *J. Mol. Biol.*, **221**, 81-95.

121. Berkhout, B. (1996) *Progr.Nucl.Acid.Res.Mol.Biol.*, **54**, 1-34.
122. Harrison, G.P. and Lever, A.M.L. (1992) *J.Virol.*, **66**, 4144-4153.
123. Muesing, M.A., Smith, D.H., and Capon, D.J. (1987) *Cell*, **48**, 691-701.
124. Baudin, F., Marquet, R., Isel, C., Darlix, J.L., Ehresmann, B., and Ehresmann, C. (1993) *J.Mol.Biol.*, **229**, 382-397.
125. Berkhout, B. and Schoneveld, I. (1993) *Nucleic Acids Res.*, **21**, 1171-1178.
126. Sakaguchi, K., Zambrano, N., Baldwin, E.T., Shapiro, B.A., Erickson, J.W., Omichinski, J.G., Clore, G.M., Gronenborn, A.M., and Appella, E. (1993) *Proc.Natl.Acad.Sci.USA*, **90**, 5219-5223.
127. Skripkin, E., Paillart, J.C., Marquet, R., Ehresmann, B., and Ehresmann, C. (1994) *Proc.Natl.Acad.Sci.USA*, **91**, 4945-4949.
128. McBride, M.S. and Panganiban, A.T. (1996) *J.Virol.*, **70**, 2963-2973.
129. Hayashi, T., Ueno, Y., and Okamoto, T. (1993) *FEBS Lett.*, **327**, 213-218.
130. Sakuragi, J.-I., Fukasawa, M., Shibata, R., Sakai, H., Kawamura, M., Akari, H., Kiyomasu, T., Ishimoto, A., Hayami, M., and Adachi, A. (1991) *Virol.*, **185**, 455-459.
131. Jones, K.A. and Peterlin, B.M. (1994) *Annu.Rev.Biochem.*, **63**, 717-743.
132. Garcia, J.A. and Gaynor, R.B. (1994) *Prog.Nucleic Acid.Res.Mol.Biol.*, **49**, 157-196.
133. Klaver, B. and Berkhout, B. (1994) *EMBO J.*, **13**, 2650-2659.
134. Weichs an der Glon, C., Ashe, M., Eggermont, J., and Proudfoot, N.J. (1993) *EMBO J.*, **12**, 2119-2128.
135. Weichs an der Glon, C., Monks, J., and Proudfoot, N.J. (1991) *Genes Dev.*, **5**, 244-253.

136. DeZazzo, J.D., Kilpatrick, J.E., and Imperiale, M.J. (1991) *Mol. Cell Biol.*, **11**, 1624-1630.
137. Berkhout, B., van Wamel, J., and Klaver, B. (1995) *J. Mol. Biol.*, **252**, 59-69.
138. Auersperg, N. (1964) *J. Nat. Cancer Inst.*, **32**, 135-163.
139. Peden, K., Emerman, M., and Montagnier, L. (1991) *Virology*, **185**, 661-672.
140. Berkhout, B. and Klaver, B. (1993) *Nucleic Acids Res.*, **21**, 5020-5024.
141. Kunkel, T.A., Roberts, J.D., and Zakour, R.A. (1987) In Wu, R. and Grossman, L. (eds.), *Methods in Enzymology*. Academic Press, San Diego, Vol. 154, pp. 367-382.
142. Das, A.T., Salvadó, J., Boon, L., Biharie, G., Moorman, A.F.M., and Lamers, W.H. (1996) *Eur. J. Biochem.*, **235**, 677-682.
143. Willey, R.L., Smith, D.H., Lasky, L.A., Theodore, T.S., Earl, P.L., Moss, B., Capon, D.J., and Martin, M.A. (1988) *J. Virol.*, **62**, 139-147.
144. Klaver, B. and Berkhout, B. (1994) *Nucleic Acids Res.*, **22**, 137-144.
145. Isel, C., Ehresmann, C., Keith, G., Ehresmann, B., and Marquet, R. (1995) *J. Mol. Biol.*, **247**, 236-250.
146. Wakefield, J.K., Kang, S.-M., and Morrow, C.D. (1996) *J. Virol.*, **70**, 966-975.
147. Pathak, V.K. and Temin, H.M. (1992) *J. Virol.*, **66**, 3093-3100.
148. Rounseville, M.P., Lin, H.C., Agbottah, E., Shukla, R.R., Rabson, A.B., and Kumar, A. (1996) *Virology*, **216**, 411-417.
149. Harrich, D., Mavankal, G., Mette-Snyder, A., and Gaynor, R.B. (1995) *J. Virol.*, **69**, 4906-4913.
150. Bohnlein, S., Hauber, J., and Cullen, B.R. (1989) *J. Virol.*, **63**, 421-424.

151. Vicenzi, E., Dimitrov, D.S., Engelman, A., Migone, T.-S., Purcell, D.F.J., Leonard, J., Englund, G., and Martin, M.A. (1994) *J. Virol.*, **68**, 7879-7890.
152. Berkhout, B. and van Wamel, J.L.B. (1996) *J. Virol.*, **70**, 6723-6732.
153. Kim, H.-J., Lee, K., and O'Rear, J.J. (1994) *Virol.*, **198**, 336-340.
154. Hayashi, T., Shioda, T., Iwakura, Y., and Shibuta, H. (1992) *Virol.*, **188**, 590-599.
155. Aldovini, A. and Young, R.A. (1990) *J. Virol.*, **64**, 1920-1926.
156. Lever, A., Gottlinger, H., Haseltine, W., and Sodroski, J. (1989) *J. Virol.*, **63**, 4085-4087.
157. Clavel, F. and Orenstein, J.M. (1990) *J. Virol.*, **64**, 5230-5234.
158. Buchschacher, G.L. and Panganiban, A.T. (1992) *J. Virol.*, **66**, 2731-2739.
159. Luban, J. and Goff, S.P. (1994) *J. Virol.*, **68**, 3784-3793.
160. Parolin, C., Dorfman, T., Palu, G., Gottlinger, H., and Sodroski, J. (1994) *J. Virol.*, **68**, 3888-3895.
161. Konings, D.A., Nash, M.A., Maizel, J.V., and Arlinghaus, R.B. (1992) *J. Virol.*, **66**, 632-640.
162. Yang, S. and Temin, H.M. (1994) *EMBO J.*, **13**, 713-726.
163. Fu, W. and Rein, A. (1993) *J. Virol.*, **67**, 5443-5449.
164. Fu, W., Gorelick, R.J., and Rein, A. (1994) *J. Virol.*, **68**, 5013-5018.
165. Swain, A. and Coffin, J.M. (1993) *J. Virol.*, **67**, 6265-6269.
166. Myers, G., Wain-Hobson, S., Henderson, L.E., Korber, B., Jeang, K.T., and Pavlakis, G.N. (1994) *Human Retroviruses and AIDS 1994. A compilation and analysis of nucleic acid and amino acid sequences*. Theoretical Biology and Biophysics, Los Alamos National Laboratory, Los Alamos, New Mexico.

167. Zuker, M. (1989) *Science*, **244**, 48-52.
168. Berkhout, B. and Klaver, B. (1995) *J.Gen.Virol.*, **76**, 845-853.
169. Peterson, M.L. (1994) *Mol.Cell.Biol.*, **14**, 7891-7898.
170. Edwalds-Gilbert, G. and Milcarek, C. (1995) *Mol.Cell.Biol.*, **15**, 6420-6429.
171. Das, A.T., Klaver, B., Klasens, B.I.F., van Wamel, J.L.B., and Berkhout, B. (1997) *J.Virol.*, **71**, 2346-2356.
172. Gorman, C., Moffat, L., and Howard, B. (1982) *Mol.Cell Biol.*, **2**, 1044-1051.
173. Berkhout, B., Gatignol, A., Silver, J., and Jeang, K.T. (1990) *Nucleic Acids Res.*, **18**, 1839-1846.
174. Okayama, H. and Berg, P. (1983) *Mol.Cell Biol.*, **3**, 280-289.
175. Gimmi, E.R., Reff, M.E., and Deckman, I.C. (1989) *Nucleic Acids Res.*, **17**, 6983-6998.
176. Graveley, B.R., Fleming, E.S., and Gilmartin, G.M. (1996) *Mol.Cell Biol.*, **16**, 4942-4951.
177. Graveley, B.R., Fleming, E.S., and Gilmartin, G.M. (1996) *J.Biol.Chem.*, **271**, 33654-33663.
178. Seiki, M., Hattori, S., Hirayama, Y., and Yoshida, M. (1983) *Proc.Natl.Acad.Sci.USA*, **80**, 3618-3622.
179. Ahmed, Y.F., Gilmartin, G.M., Hanly, S.M., Nevins, J.R., and Greene, W.C. (1991) *Cell*, **64**, 727-737.
180. Bar-Shira, A., Panet, A., and Honigman, A. (1991) *J.Virol.*, **65**, 5165-5173.
181. Tiley, L.S. and Cullen, B.R. (1991) *Genes Dev.*, **5**, 1277-1284.
182. Goguel, V., Yang, Y., and Rosbash, M. (1993) *Mol.Cell Biol.*, **13**, 6841-6848.
183. Eng, F.J. and Warner, J.R. (1991) *Cell*, **65**, 797-804.

184. Alvarez, C.J., Romfo, C.M., Vanhoy, R.W., Porter, G.L., and Wise, J.A. (1996) *RNA*, **2**, 404-418.
185. de Smit, M.H. and van Duin, J. (1990) *Proc.Natl.Acad.Sci.USA*, **87**, 7668-7672.
186. Honda, M., Brown, E.A., and Lemon, S.M. (1996) *RNA*, **2**, 955-968.
187. Bernstein, P. and Ross, J. (1989) *TIBS*, **14**, 373-377.
188. Edwalds-Gilbert, G., Veraldi, K.L., and Milcarek, C. (1997) *Nucleic Acids Res.*, **25**, 2547-2561.
189. Jackson, R.J. and Standart, N. (1990) *Cell*, **62**, 15-24.
190. Preiss, T. and Hentze, M.W. (1998) *Nature*, **392**, 516-520.
191. Craig, A.W.B., Haghighat, A., Yu, A.T.K., and Sonenberg, N. (1998) *Nature*, **392**, 520-523.
192. Gilmartin, G.M., McDevitt, M.A., and Nevins, J.R. (1988) *Genes Dev.*, **2**, 578-587.
193. Hart, R.P., McDevitt, M.A., and Nevins, J.R. (1985) *Cell*, **43**, 677-683.
194. Gil, A. and Proudfoot, N.J. (1987) *Cell*, **49**, 399-406.
195. Hart, R.P., McDevitt, M.A., Ali, H., and Nevins, J.R. (1985) *Mol.Cell.Biol.*, **5**, 2975-2983.
196. Kessler, M.M., Beckendorf, R.C., Westhafer, M.A., and Nordstrom, J.L. (1986) *Nucleic Acids Res.*, **14**, 4939-4952.
197. Graveley, B.R. and Gilmartin, G.M. (1996) *J.Virol.*, **70**, 1612-1617.
198. Carswell, S. and Alwine, J.C. (1989) *Mol.Cell Biol.*, **Oct, 1989**, 4248-4258.
199. Moreira, A., Wollerton, M., Monks, J., and Proudfoot, N.J. (1995) *EMBO J.*, **14**, 3809-3819.
200. Weiss, E.A., Gilmartin, G.M., and Nevins, J.R. (1991) *EMBO J.*, **10**, 215-219.

201. Bienroth, S., Wahle, E., Suter-Crazzolara, C., and Keller, W. (1991) *J.Biol.Chem.*, **266**, 19768-19776.
202. MacDonald, C., Wilusz, J., and Shenk, T. (1994) *Mol.Cell Biol.*, **14**, 6647-6654.
203. Takagaki, Y., Seipelt, R.L., Peterson, M.L., and Manley, J.L. (1997) *Cell*, **87**, 941-952.
204. McCracken, S., Fong, N., Yankulov, K., Ballantyne, S., Pan, G., Greenblatt, J., Patterson, S.D., Wickens, M., and Bentley, D.L. (1997) *Nature*, **385**, 357-361.
205. McBride, M.S., Schwartz, M.D., and Panganiban, A.T. (1997) *J.Virol.*, **71**, 4544-4554.
206. Klasens, B.I.F., Das, A.T., and Berkhout, B. (1998) *Nucleic Acids Res.*, **26**, 1870-1876.
207. Klaver, B. and Berkhout, B. (1994) *J.Virol.*, **68**, 3830-3840.
208. Skolnik-David, H., Moore, C.L., and Sharp, P.A. (1987) *Genes Dev.*, **1**, 672-682.
209. Bradford, M.M. (1976) *Anal.Biochem.*, **72**, 248-254.
210. Astrom, A., Astrom, J., and Virtanen, A. (1991) *Eur.J.Biochem.*, **202**, 765-773.
211. Ruegsegger, U., Beyer, K., and Keller, W. (1996) *J.Biol.Chem.*, **271**, 6107-6113.
212. Scavi, B., Sullivan, M., Chance, M.R., Brenowitz, M., and Woodson, S.A. (1998) *Science*, **279**, 1940-1943.
213. Cullen, B.R. (1994) *Infect.Agents Dis.*, **3**, 68-76.
214. Cullen, B.R. and Garrett, E.D. (1992) *AIDS Res.Hum.Retroviruses*, **8**, 387-393.
215. Isel, C., Lanchy, J.-M., Le Grice, S.F.J., Ehresmann, C., Ehresmann, B., and Marquet, R. (1996) *EMBO J.*, **15**, 917-924.

216. Klasens, B.I.F., Thiesen, M., Virtanen, A., and Berkhout, B. (1999) *Nucleic Acids Res.*, **27**, 446-454.
217. Wu, W., Henderson, L.E., Copeland, T.D., Gorelick, R.J., Bosche, W.J., Rein, A., and Levin, J.G. (1996) *J.Virol.*, **70**, 7132-7142.
218. Suo, Z. and Johnson, K.A. (1997) *Biochem.*, **36**, 12468-12476.
219. Suo, Z. and Johnson, K.A. (1998) *Biochem.*, **36**, 14778-14785.
220. Suo, Z. and Johnson, K.A. (1997) *Biochem.*, **36**, 12459-12467.
221. Tsuchihashi, Z. and Brown, P.O. (1994) *J.Virol.*, **68**, 5863-5870.
222. Herschlag, D. (1995) *J.Biol.Chem.*, **270**, 20871-20874.
223. Darlix, J.-L., Lapadat-Tapolsky, M., De Rocquigny, H., and Roques, B.P. (1995) *J.Mol.Biol.*, **254**, 523-537.
224. Oude Essink, B.B., Das, A.T., and Berkhout, B. (1996) *J.Mol.Biol.*, **264**, 243-254.
225. Das, A.T., Klaver, B., and Berkhout, B. (1995) *J.Virol.*, **69**, 3090-3097.
226. You, J.C. and McHenry, C.S. (1994) *J.Biol.Chem.*, **269**, 31491-31495.
227. Jeeninga, R.E., Huthoff, H.T., Gultyaev, A.P., and Berkhout, B. (1998) *Nucleic Acids Res.*, **26**, 5472-5479.
228. Keulen, W., Back, N.K.T., van Wijk, A., Boucher, C.A.B., and Berkhout, B. (1997) *J.Virol.*, **71**, 3346-3350.
229. Back, N.K.T., Nijhuis, M., Keulen, W., Boucher, C.A.B., Oude Essink, B.B., van Kuilenburg, A.B.P., Van Gennip, A.H., and Berkhout, B. (1996) *EMBO J.*, **15**, 4040-4049.
230. Draper, D.E. (1996) *Trends in Biochem.Sci.*, **21**, 145-149.

231. Kohlstaedt, L.A., Wang, J., Friedman, J.M., Rice, P.A., and Steitz, T.A. (1992) *Science*, **256**, 1783-1790.
232. Oude Essink, B.B. and Berkhout, B. (1999) *J.Biomed.Sci.*, **6**, 121-132.
233. Ippolito, J.A. and Steitz, T.A. (1998) *Proc.Natl.Acad.Sci.USA*, **95**, 9819-9824.
234. Peliska, J.A., Balasubramanian, S., Giedroc, D.P., and Benkovic, S.J. (1994) *Biochem.*, **33**, 13817-13823.
235. Cameron, C.E., Ghosh, M., LeGrice, S.F.J., and Benkovic, S.J. (1997) *Proc.Natl.Acad.Sci.USA*, **94**, 6700-6705.
236. Peliska, J.A. and Benkovic, S.J. (1992) *Science*, **258**, 1112-1118.
237. Wöhrl, B.M., Georgiadis, M.M., Telesnitzky, A., Hendrickson, W.A., and Le Grice, S.F.J. (1995) *Science*, **267**, 96-99.
238. Hartz, D., McPheeters, D.S., Traut, R., and Gold, L. (1988) *Methods Enzymol.*, **164**, 419-425.
239. Klarmann, G.J., Schaubert, C.A., and Preston, B.D. (1993) *J.Biol.Chem.*, **268**, 9793-9802.
240. Abbotts, J., Bebenek, K., Kunkel, T.A., and Wilson, S.H. (1993) *J.Biol.Chem.*, **268**, 10312-10323.
241. Ji, J., Hoffmann, J.S., and Loeb, L. (1994) *Nucleic Acids Res.*, **22**, 47-52.
242. Banks, J.D., Yeo, A., Green, K., Cepeda, F., and Linial, M.L. (1998) *J.Virol.*, **72**, 6190-6194.
243. Allain, B., Rasclé, J.-B., De Rocquigny, H., Roques, B., and Darlix, J.-L. (1998) *J.Virol.*, **72**, 225-235.
244. Berkhout, B., Das, A.T., and van Wamel, J.L.B. (1998) *Virol.*, **249**, 211-218.
245. van Wamel, J.L.B. and Berkhout, B. (1998) *Virol.*, **244**, 245-251.

246. Berkhout, B. (1997) *Nucleic Acids Res.*, **25**, 4013-4017.
247. Lanchy, J.-M., Ehresmann, C., Le Grice, S.F.J., Ehresmann, B., and Marquet, R. (1997) *EMBO J.*, **15**, 7178-7187.
248. Huang, Y., Wang, J., Shalom, A., Li, Z., Khorchid, A., Wainberg, M.A., and Kleiman, L. (1997) *J.Virol.*, **71**, 726-728.
249. Drummond, J.E., Mounts, P., Gorelick, R.J., CasasFinet, J.R., Bosche, W.J., Henderson, L.E., Waters, D.J., and Arthur, L.O. (1997) *AIDS Res.Hum.Retroviruses*, **13**, 533-543.
250. Dannull, J., Surovov, A., Jung, G., and Moelling, K. (1994) *EMBO J.*, **13**, 1525-1533.
251. Berkowitz, R.D., Luban, J., and Goff, S.P. (1993) *J.Virol.*, **67**, 7190-7200.
252. Zhang, Y. and Barklis, E. (1995) *J.Virol.*, **69**, 5716-5722.
253. Darlix, J.-L., Gabus, C., Nugeyre, M.T., Clavel, F., and Barre-Sinoussi, F. (1990) *J.Mol.Biol.*, **216**, 689-699.
254. Lapadat-Tapolsky, M., Pernelle, C., Borie, C., and Darlix, J.-L. (1995) *Nucleic Acids Res.*, **23**, 2434-2441.
255. Barat, C., Schatz, O., Le Grice, S., and Darlix, J.L. (1993) *J.Mol.Biol.*, **231**, 185-190.
256. Weiss, S., Konig, B., Morikawa, Y., and Jones, I. (1992) *Gene*, **121**, 203-212.
257. Das, A.T. and Berkhout, B. (1995) *Nucleic Acids Res.*, **23**, 1319-1326.
258. Lapadat-Tapolsky, M., Gabus, C., Rau, M., and Darlix, J.-L. (1997) *J.Mol.Biol.*, **269**, 1-11.
259. Chan, B. and Musier-Forsyth, K. (1997) *Proc.Natl.Acad.Sci.USA*, **94**, 13530-13535.
260. Luo, G. and Taylor, J. (1990) *J.Virol.*, **64**, 4321-4328.

261. Darlix, J.-L., Vincent, A., Gabus, C., De Rocquigny, H., and Roques, B. (1993) *Genetics*, **316**, 763-771.
262. Rodriguez-Rodriguez, L., Tsuchihashi, Z., Fuentes, G.M., Bambara, R.A., and Fay, P.J. (1995) *J.Biol.Chem.*, **270**, 15005-15011.
263. Zhang, Y. and Barklis, E. (1997) *J.Virol.*, **71**, 6765-6776.
264. Huang, Y., Khorchid, A., Wang, J., Parniak, M.A., Darlix, J.-L., Wainberg, M.A., and Kleiman, L. (1997) *J.Virol.*, **71**, 4378-4384.
265. Berthoux, L., Pechoux, C., Ottmann, M., Morel, G., and Darlix, J.-L. (1997) *J.Virol.*, **71**, 6973-6981.
266. DeStefano, J.J. (1994) *J.Mol.Biol.*, **243**, 558-567.
267. Wu, W., Blumberg, B.M., Fay, P.J., and Bambara, R.A. (1995) *J.Biol.Chem.*, **270**, 325-332.
268. Kim, J.K., Palaniappan, C., Wu, W., Fay, P., and Bambara, R.A. (1997) *J.Biol.Chem.*, **272**, 16769-16777.
269. Marquet, R., Isel, C., Ehresmann, C., and Ehresmann, B. (1995) *Biochimie*, **77**, 113-124.
270. Mak, J. and Kleiman, L. (1997) *J.Virol.*, **71**, 8087-8095.
271. Panganiban, A.T. and Fiore, D. (1988) *Science*, **241**, 1064-1069.
272. Darlix, J.-L., Bromley, P.A., and Spahr, P.-F. (1977) *J.Virol.*, **22**, 118-129.
273. Lori, F., Veronese, F.D.M., De Vico, A.L., Lusso, P., Reitz Jr., M.S., and Gallo, R.C. (1992) *J.Virol.*, **66**, 5067-5074.
274. Trono, D. (1992) *J.Virol.*, **66**, 4893-4900.
275. Coffin, J.M. (1979) *J.Gen.Virol.*, **42**, 1-26.
276. Blain, S.W. and Goff, S.P. (1996) *J.Virol.*, **69**, 4440-4452.

277. Prats, A.C., Sarih, L., Gabus, C., Litvak, S., Keith, G., and Darlix, J.L. (1988) *EMBO J.*, **7**, 1777-1783.
278. Klasens, B.I.F., Huthoff, H.T., Das, A.T., Jeeninga, R.E., and Berkhout, B. (1999) *Biochim.Biophys.Acta*, **1444**, 355-370.
279. Tanese, N., Telesnitsky, A., and Goff, S.P. (1991) *J.Virol.*, **65**, 4387-4397.
280. Kulpa, D., Topping, R., and Telesnitsky, A. (1997) *EMBO J.*, **16**, 856-865.
281. Topping, R., Demoitie, M.A., Shin, N.H., and Telesnitsky, A. (1998) *J.Mol.Biol.*, **281**, 1-15.
282. Coffin, J.M. (1996) In Fields, B.N., Knipe, D.M., Howley, P.M., Chanock, R.M., Melnick, J.L., Monath, T.P., and Roizman, B. (eds.), *Fields Virology*. Lippincott-Raven, Philadelphia, pp. 1767-1848.
283. Wei, P., Garber, M.E., Fang, S.-M., Fisher, W.H., and Jones, K.A. (1998) *Cell*, **92**, 451-462.
284. SantaLucia, J.Jr. (1998) *Proc.Natl.Acad.Sci.USA*, **95**, 1460-1465.
285. SantaLucia, J.Jr. and Allawi, H.T. (1997) *Biochem.*, **36**, 10581-10594.
286. Guo, J., Wu, T., Bess, J., Henderson, L.E., and Levin, J.G. (1998) *J.Virol.*, **72**, 6716-6724.
287. Gopalakrishnan, V., Peliska, J.A., and Benkovic, S.J. (1992) *Proc.Natl.Acad.Sci.USA*, **89**, 10763-10767.
288. Telesnitsky, A. and Goff, S.P. (1993) *Proc.Natl.Acad.Sci.USA*, **90**, 1276-1280.
289. DeStefano, J.J., Buiser, R.G., Mallaber, L.M., Myers, T.W., Bambara, R.A., and Fay, P.J. (1991) *J.Biol.Chem.*, **266**, 7423-7431.
290. Fu, T.B. and Taylor, J. (1992) *J.Virol.*, **66**, 4271-4278.
291. Pullen, K.A., Ishimoto, L.K., and Champoux, J.J. (1992) *J.Virol.*, **66**, 367-373.

292. Champoux, J.J. (1993) In Skalka, A.M. and Goff, S.P. (eds.), *Reverse Transcriptase*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, pp. 103-117.
293. Harrison, G.P., Mayo, M.S., Hunter, E., and Lever, A.M.L. (1998) *Nucleic Acids Res.*, **26**, 3433-3442.
294. de Smit, M.H. and van Duin, J. (1994) *J.Mol.Biol.*, **244**, 144-150.
295. Beekwilder, M.J., Nieuwenhuizen, R., and van Duin, J. (1995) *J.Mol.Biol.*, **247**, 903-917.
296. Mizokami, M., Orito, E., Gibo, Y., Suzuki, K., Ohba, K., and Lau, J.Y. (1996) *Liver*, **16**, 23-27.
297. Tonizawa, J.I. (1993) In Gesteland, R.F. and Atkins, J.F. (eds.), *The RNA world*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 419-445.
298. Girard, F., Barbault, F., Gouyette, C., Huynh-Dinh, T., Paoletti, J., and Lancelot, G. (1999) *J.Biomol.Struct.Dyn.*, **16**, 1145-1157.
299. Rein, A., Henderson, L.E., and Levin, J.G. (1998) *Trends Biochem.Sci.*, **23**, 297-301.
300. DeStefano, J.J. (1996) *J.Biol.Chem.*, **271**, 16350-16356.
301. Brown, P.H., Tiley, L.S., and Cullen, B.R. (1991) *Genes & Development*, **5**, 1277-1284.
302. Lobel, L.I. and Goff, S.P. (1985) *J.Virol.*, **53**, 447-455.
303. Berkhout, B. and vanWamel, J.L.B. (1999) *RNA*, **6**, 282-295.
304. Cupelli, L.A., Okenquist, S.A., Trubetsky, A., and Lenz, J. (1998) *J.Virol.*, **72**, 7807-7814.
305. Chen, H., Wilcox, G., Kertayadnya, G., and Wood, C. (1999) *J.Virol.*, **73**, 658-666.

306. Ilyinskii, P.O. and Desrosiers, R.C. (1998) *EMBO J.*, **17**, 3766-3774.
307. Mang, R., Goudsmit, J., and van der Kuyl, C.A. (1999) *J.Virol.*, **73**, 7021-7026.
308. Trubetskoy, A.M., Okenquist, S.A., and Lenz, J. (1999) *J.Virol.*, **73**, 3477-3483.
309. Yin, P.D., Pathak, V.K., Rowan, A.E., Teufel II, R.J., and Hu, W.-S. (1997) *J.Virol.*, **71**, 2487-2494.
310. Nagy, P.D., Zhang, C., and Simon, A.E. (1998) *EMBO J.*, **17**, 2392-2403.
311. Paillart, J.-C., Berthoux, L., Ottmann, M., Darlix, J.-L., Marquet, R., Ehresmann, B., and Ehresmann, C. (1996) *J.Virol.*, **70**, 8348-8354.
312. DeStefano, J.J., Buiser, R.G., Mallaber, L.M., Fay, P.J., and Bambara, R.A. (1992) *Biochim.Biophys.Acta*, **113**, 270-280.
313. Parkin, N.T., Cohen, E.A., Darveau, A., Rosen, C., Haseltine, W., and Sonenberg, N. (1988) *EMBO J.*, **7**, 2831-2837.
314. SenGupta, D.N., Berkhout, B., Gatignol, A., Zhou, A.M., and Silverman, R.H. (1990) *Proc.Natl.Acad.Sci.USA*, **87**, 7492-7496.
315. Roy, S., Agy, M., Hovanessian, A.G., Sonenberg, N., and Katze, M.G. (1991) *J.Virol.*, **65**, 632-640.
316. McCormack, S.J. and Samuel, C.E. (1995) *Viol.*, **206**, 511-519.
317. Das, A.T., Klaver, B., and Berkhout, B. (1998) *J.Virol.*, **72**, 9217-9223.
318. Edery, I.R., Petryshyn, R., and Sonenberg, N. (1989) *Cell*, **56**, 303-312.
319. Berkhout, B., Oude Essink, B.B., and Schoneveld, I. (1993) *FASEB J.*, **7**, 181-187.
320. Hoglund, S., Ohagen, A., Goncalves, J., Panganiban, A.T., and Gabuzda, D. (1997) *Viol.*, **233**, 271-279.

