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A Publisher’s Note introduces this special issue, commemorating Virology’s 50th birthday, with a look back at its prestigious history, and the scientific progress that has been made in the field since the launch of the journal in 1954. It provides a list of the top 100 most-cited papers published in the journal to date.

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Last month saw the close of 2005, the year in which Virology celebrated 50 years of publishing key research in the field. This important event was signaled by the 50th anniversary logo on the journal cover throughout the year, a beautiful special edition calendar, and an editorial board party during the American Society for Virology meeting at Penn State University last June. To complete our celebrations and to provide a more lasting commemoration, this special issue marks this prestigious occasion by publishing a range of exciting Reviews from Editors of the journal, Editorial Board members, and key figures in the field. The diversity and quality of these Reviews are outstanding, and I would like to thank everyone who participated so enthusiastically, for their contributions.

Looking back, the first issue of Virology was published in May 1954 and contained only 139 pages. In the intervening 50 years, Virology has grown and developed, covering burgeoning scientific areas, and publishing research articles at the cutting edge of the discipline. It has also grown in size, from its initial 6 bimonthly issues per year to 26 biweekly issues (many of which have been over 400 pages). Its pages have chronicled many of the advances that have been made in our collective knowledge and understanding of a field of study that is both fascinating intellectually and of vital importance in its human and economic impact.

When the first issue of Virology was published in 1954, George K. Hirst presided as Editor in Chief, and L.M. Black and S.E. Luria acted as the main Editors. At that time, it was only 9 years since Salvador Luria and Alfred Hershey had demonstrated that bacteriophages mutate. Just 4 years beforehand, in 1950, André Lwoff, Louis Siminovitch, and Niels Kjeldgaard discovered lysogenic bacteriophage in Bacillus megaterium and coined the term prophage. In 1952, Renato Dulbecco demonstrated that animal viruses can form plaques in a similar way to bacteriophages, and in the same year, Alfred Hershey and Martha Chase showed that DNA was the genetic material of a bacteriophage. It was in this scientific environment that Virology was born and became the first general journal in the field. It was a time in which the basic foundations were being laid, and it conjures a reminder that it is “strange how much you’ve got to know before you know how little you know” (Anon).

The 1950s and 1960s were the formative years for virology. In the year that Virology was launched, John Enders, Thomas Weller, and Frederick Robbins won the Nobel Prize for their work in growing poliovirus in vitro using human tissue culture, perhaps one of the most significant single events in the development of diagnostic virology. Many of the important achievements in the field were recognized with Nobel prizes, and virology can certainly claim to be ranked extraordinarily highly among scientific disciplines with the most frequent awards, with over 10 prizes to date directly relating to discoveries in virology, plus 2 relating to prions, awarded to 17 individuals.

Following George K. Hirst as Editor in Chief was Bill Joklik, who honors us with an article in this issue describing...
the founding of the American Society for Virology. The present Editor in Chief, Robert Lamb, took over from Bill in 1994 and is therefore only the third to hold this role since the journal began. Over the years, the journal has been supported by its Editors, strengthened by their work and passionate involvement, and broadened and stimulated by their ideas. There are too many whose involvement we have enjoyed over the years to name, but readers may be interested to learn that for the first issue, apart from George K. Hirst, L.M. Black, and S.E. Luria, the Associate Editors were listed as C.H. Andrews, C.A. Brandly, Seymour S. Cohen, A.H. Doerrmann, John F. Enders, Charles A. Evans, Werner Henle, A.D. Hershey, Francis O. Holmes, Frank L. Horsfall Jr, Hilary Koprowski, André Lwoff, James W. Moulder, Glenn S. Pound, Theodore T. Puck, A.F. Ross, H.K. Schachman, Edward A. Steinhaus, Robley C. Williams, and C.E. Yarwood.

Throughout this last half century, scientists and clinicians have submitted their best work to the journal, and we are proud to have published excellent work from scientists from around the world. Indeed, its achievements have only been possible through the intellectual input, hard work, dedication, and support of key figures in the field, who have devoted their time and energy to ensure that *Virology continues to be one of the best vehicles for the dissemination of quality research. Their involvement as Editors, Editorial Board members, reviewers, and authors is gratefully acknowledged.

Since the launch of *Virology* in 1954, many outstanding achievements in the field have been made, and the developments in our knowledge have been rapid, only outpaced perhaps by the ability of viruses to mutate, find new hosts, and otherwise present challenges for humankind. Alan Cann gives a brief overview of some of these historic advances in the new edition of his book (*Cann, 2005*). Looking back, among the important milestones are the demonstration by Sydney Brenner, François Jacob, and Matthew Meselson that bacteriophage T4 uses host-cell ribosomes to direct virus protein synthesis (1961), the discovery of hepatitis B virus in 1963 (Baruch Blumberg), and Mark Ptashne’s isolation and study of the λ repressor protein (1967). Howard Temin and David Baltimore’s independent discovery of reverse transcriptase in retroviruses was made in 1970, followed 2 years later by Paul Berg’s creation of the first recombinant DNA molecules, comprising circular SV40 DNA genomes containing λ phage genes and the galactose operon of *E. coli*, an event that initiated the era of recombinant DNA technology. In 1973, Peter Doherty and Rolf Zinkernagel demonstrated the basis of antigenic recognition of the cellular immune system and the role of the major histocompatibility complex. Bernard Moss and Aaron Shatkin in 1975 showed in reovirus and vaccinia the role of the nucleotide cap at the 5' end of messenger RNA in affecting correct processing during translation, later found to apply to other cellular mRNAs. Also during the 1970s, J. Michael Bishop and Harold Varmus discovered the cellular basis of retroviral oncogenes that in 1989 was rewarded with the Nobel prize. Richard Roberts and, independently, Phillip Sharp discovered introns in adenovirus genes in 1977, and Frederick Sanger and colleagues determined the complete sequence of the bacteriophage φX174 genome also in that year.

In 1980, one of the major achievements of the 20th century was celebrated, with the World Health Organization’s official declaration of the global eradication of smallpox, still the only instance of the eradication of a human infectious disease to the present day. In 1981, Yorio Hinuma isolated human T-cell leukemia virus, the first human cancer virus to be identified. The next year, Stanley Prusiner demonstrated that the infectious proteins he called prions could cause scrapie, the first step in our understanding of transmissible spongiform encephalopathies. In 1983, Luc Montagnier and Robert Gallo announced the discovery of human immunodeficiency virus (HIV), the causative agent of AIDS. In 1985, a virus to vaccinate against swine herpes became the first genetically modified organism to be granted a license by the US Department of Agriculture. The following year, Roger Beachy and Rob Fraley published work that significantly improved the understanding of virus resistance (in this case tobacco mosaic virus) in plants, an important goal of plant breeders. 1989 brought the definitive identification of hepatitis C virus, and in 1993, the sequence of the smallpox virus genome was completed. Yuan Chang and Patrick Moore identified human herpesvirus 8, the causative agent of Kaposi’s sarcoma, and in 2003, the newly discovered Mimivirus became the largest known virus, with a diameter of 400 nm and a genome of 1.2 Mbp, and in the same year, severe acute respiratory syndrome (SARS) broke out in China, subsequently spreading around the world.

Over these 50 years, *Virology* has published many thousands of papers that have chronicled or been instrumental in enabling these major steps forward. In total, there are presently over 21,500 articles available online, all the way back to Volume 1, Issue 1. Each one has been important in some way. Indeed, the articles published in *Virology* trace the intellectual evolution of the field. Compiling a list of the ‘most important’ papers, however, is an invidious task. Friendships can falter on such an undertaking, but perhaps, the most objective measure is the number of times a published paper is cited in other publications. This evaluation can of course be criticized for its bias towards papers describing novel techniques or methods. Arguably, older papers dominate because they have had more time in which to have been cited. On the other hand, the citation rates of these articles are also a measure of their persisting importance. On balance, it does represent a value in some way related to how often that paper has been used. With many caveats, the list of the 100 most-cited papers in *Virology* since records began is presented in Table 1. Many of the papers have helped or influenced both a great many people and a great many subsequent advances in virology.

Among the many ground-breaking and fascinating articles published in *Virology* over the last 50 years are over 150 from 24 Nobel-prize-winning scientists, including Werner Arber, David Baltimore, J. Michael Bishop, Sydney Brenner, Peter C. Doherty, Renato Dulbecco, Gertrude B. Elion, John F. Enders, D. Carleton Gajdusek, Leland H. Hartwell, Alfred D. Hershey, François Jacob, Neils K. Jerne, Arthur Kornberg, André Lwoff,
Table 1
The top 100 most frequently cited articles in Virology to date

| Authors                      | Year | Title                                                                 | Vol., pp.                                      | Number of citations to date |
|------------------------------|------|----------------------------------------------------------------------|------------------------------------------------|-----------------------------|
| Graham, F.L., Van Der Eb, A.J. | 1973 | A new technique for the assay of infectivity of human adenovirus 5 DNA | *Virology*, 52 (2), Pages 456–467.              | 2170                        |
| Zur Hausen, H.                | 1991 | Human Papillomaviruses in the pathogenesis of anogenital cancer       | *Virology*, 184 (1), Pages 9–13.                | 423                         |
| McGrory, W.J., Bautista, D.S., Graham, F.L. | 1988 | A simple technique for the rescue of early region I mutations into infectious human adenovirus type 5 | *Virology*, 163 (2), Pages 614–617.             | 400                         |
| Markowitz, D., Goff, S., Bank, A. | 1988 | Construction and use of a safe and efficient amphotropic packaging cell line | *Virology*, 167 (2), Pages 400–406.             | 394                         |
| Ayres, M.D., Howard, S.C., Kuzio, J., Lopez-Ferber, M., Possee, R.D. | 1994 | The complete DNA sequence of *Autographa californica* nuclear polyhedrosis virus | *Virology*, 202 (2), Pages 586–605.             | 388                         |
| Connor, R.I., Chen, B.K., Choe, S., Landau, N.R. | 1995 | Vpr is required for efficient replication of human immunodeficiency virus type 1 in mononuclear phagocytes | *Virology*, 206 (2), Pages 935–944.             | 370                         |
| Gale Jr., M.J., Korth, M.J., Tang, N.M., Tan, S.-L., Hopkins, D.A., Dever, T.E., Polvak, S.J., Katze, M.G. | 1997 | Evidence that hepatitis C virus resistance to interferon is mediated through repression of the PKR protein kinase by the nonstructural 5A protein | *Virology*, 230 (2), Pages 217–227.             | 341                         |
| Gompels, U.A., Nicholas, J., Lawrence, G., Jones, M., Thomson, B.J., Martin, M.E.D., Estathious, S., Macaulay, H.A. | 1995 | The DNA sequence of human herpesvirus 6: structure, coding content, and genome evolution | *Virology*, 209 (1), Pages 29–51.               | 296                         |
| Goebel, S.J., Johnson, G.P., Perkins, M.E., Davis, S.W., Winslow, J.P., Paolletti, E. | 1990 | The complete DNA sequence of vaccinia virus | *Virology*, 179 (1), Pages 247–266 + 517.       | 296                         |
| Samuel, C.E. | 1991 | Antiviral actions of interferon interferon-regulated cellular proteins and their surprisingly selective antiviral activities | *Virology*, 183 (1), Pages 1–11.                | 290                         |
| Norder, H., Courouce, A.-M., Magnus, L.O. | 1994 | Complete genomes, phylogenetic relatedness, and structural proteins of six strains of the hepatitis B virus, four of which represent two new genotypes | *Virology*, 198 (1), Pages 489–503.             | 286                         |
| Ogawa, E., Inuzuka, M., Maruyama, M., Satake, M., Naito-Fujimoto, M., Ito, Y., Shigesada, K. | 1993 | Molecular cloning and characterization of PEBP2?: the heterodimeric partner of a novel *Drosophila* runt-related DNA binding protein PEBP2? | *Virology*, 194 (1), Pages 314–331.             | 257                         |
| Telford, E.A.R., Watson, M.S., McBride, K., Davison, A.J. | 1992 | The DNA sequence of equine herpesvirus 1 | *Virology*, 189 (1), Pages 304–316.             | 246                         |
| Doms, R.W., Lamb, R.A., Rose, J.K., Helenius, A. | 1993 | Folding and assembly of viral membrane proteins | *Virology*, 193 (2), Pages 545–562.             | 232                         |
| Weiner, A.J., Brauer, M.J., Rosenblatt, J., Richman, K.H., Tung, J., Crawford, K., Bonino, F., Han, J.H. | 1991 | Variable and hypervariable domains are found in the regions of HCV corresponding to the Flavivirus envelope and NS1 proteins and the Pestivirus envelope glycoproteins | *Virology*, 180 (2), Pages 842–848.             | 231                         |
| Okamoto, H., Kurai, K., Okada, S.-I., Yamamoto, K., Lizuka, H., Tanaka, T., Fukuda, S., Mishiro, S. | 1992 | Full-length sequence of a hepatitis C virus genome having poor homology to reported isolates: comparative study of four distinct genotypes | *Virology*, 188 (1), Pages 331–341.             | 228                         |
| Meulenbergen, J.J.M., Hulst, M.M., De Mejter, E.J., Moonen, P.L.J.M., Den Besten, A., De Kluyver, E.P., Wensvoort, G., Moormann, R.J.M. | 1993 | Lelystad virus, the causative agent of porcine epidemic abortion and respiratory syndrome (PEARS), is related to LDV and EAV | *Virology*, 192 (1), Pages 62–72.               | 223                         |
| Xiang, Z.Q., Spitalnik, S., Tran, M., Wunner, W.H., Cheng, J., Ertl, H.C.J. | 1994 | Vaccination with a plasmid vector carrying the rabies virus glycoprotein gene induces protective immunity against rabies virus | *Virology*, 199 (1), Pages 132–140.             | 218                         |
| Jiang, X., Wang, M., Wang, K., Estes, M.K. | 1993 | Sequence and genomic organization of Norwalk virus | *Virology*, 195 (1), Pages 51–61.               | 217                         |
| Pellerin, C., Van den Hurk, J., Lecomte, J., Tijsken, P. | 1994 | Identification of a new group of bovine viral diarrhea virus strains associated with severe outbreaks and high mortalities | *Virology*, 203 (2), Pages 260–268.             | 216                         |

(continued on next page)
| Authors                               | Year | Title                                                                 | Vol., pp.          | Number of citations to date |
|---------------------------------------|------|----------------------------------------------------------------------|--------------------|------------------------------|
| Lee, S.B., Esteban, M.                | 1994 | The interferon-induced double-stranded RNA-activated protein kinase induces apoptosis | Virology, 199 (2), Pages 491–496. | 206                          |
| Ridpath, J.F., Bolin, S.R., Dubovi, E.J. | 1994 | Segregation of bovine viral diarrhea virus into genotypes             | Virology, 205 (1), Pages 66–74. | 205                          |
| Tam, A.W., Smith, M.M., Guerra, M.E., Huang, C.-C., Bradley, D.W., Fry, K.E., Reyes, G.R. | 1991 | Hepatitis E virus (HEV): molecular cloning and sequencing of the full-length viral genome | Virology, 185 (1), Pages 120–131. | 204                          |
| Freed, E.O.                          | 1998 | HIV-1 Gag proteins: diverse functions in the virus life cycle         | Virology, 251 (1), Pages 1–15. | 199                          |
| Lamb, R.A.                           | 1993 | Paramyxovirus fusion: a hypothesis for changes                        | Virology, 197 (1), Pages 1–11. | 199                          |
| Okamoto, H., Kojima, M., Okada, S.-I., Yoshizawa, H., Iizuka, H., Tanaka, T., Muchmore, E.E., Mishiro, S. | 1992 | Genetic drift of hepatitis C virus during an 8.2-year infection in a chimpanzee: variability and stability | Virology, 190 (2), Pages 894–899. | 198                          |
| Fisher, K.J., Choi, H., Burda, J., Chen, S.-J., Wilson, J.M. | 1996 | Recombinant adenovirus deleted of all viral genes for gene therapy of cystic fibrosis | Virology, 217 (1), Pages 11–22. | 192                          |
| Seedorf, K., Krammer, G., Durst, M. | 1985 | Human papillomavirus type 16 DNA sequence                             | Virology, 145 (1), Pages 181–185. | 180                          |
| Laurent-Crawford, A.G., Krust, B., Muller, S., Riviere, Y., Rey-Cuillé, M.A., Bechet, J.-M., Montagnier, L., Hovanessian, A.G. | 1991 | The cytopathic effect of HIV is associated with apoptosis             | Virology, 185 (2), Pages 829–839. | 179                          |
| Colett, M.S., Larson, R., Gold, C., Strick, D., Anderson, D.K., Pucherio, A.F. | 1988 | Molecular cloning and nucleotide sequence of the Pestivirus bovine viral diarrhea virus | Virology, 165 (1), Pages 191–199. | 177                          |
| Doms, R.W., Peiper, S.C.              | 1997 | Unwelcomed guests with master keyes: how HIV uses chemokine receptors for cellular entry | Virology, 235 (2), Pages 179–190. | 175                          |
| Lanford, R.E., Sureau, C., Jacob, J.R., White, R., Fuerst, T.R. | 1994 | Demonstration of in vitro infection of chimpanzee hepatocytes with hepatitis C virus using strand-specific RT/PCR | Virology, 202 (2), Pages 606–614. | 174                          |
| Warner, M.S., Geraghty, R.J., Martinez, W.M., Montgomery, R.I., Whitbeck, J.C., Xu, R., Eisenberg, R.J., Spear, P.G. | 1998 | A cell surface protein with herpesvirus entry activity (Hveb) confers susceptibility to infection by mutants of herpes simplex virus type 1, herpes simplex virus type 2, and pseudorabies virus | Virology, 246 (1), Pages 179–189. | 173                          |
| Jacobs, B.L., Landglang, J.O.         | 1996 | When two strands are better than one: the mediators and modulators of the cellular responses to double-stranded RNA | Virology, 219 (2), Pages 339–349. | 166                          |
| Okamoto, H., Takahashi, M., Nishizawa, T., Ukita, M., Fukuda, M., Tsuda, F., Miyakawa, Y., Mayumi, M. | 1999 | Suppression of apoptotic cell death by hepatitis C virus core protein | Virology, 259 (2), Pages 428–436. | 160                          |
| Ray, R.B., Meyer, K., Ray, R.         | 1996 | Suppression of apoptotic cell death by hepatitis C virus core protein | Virology, 226 (2), Pages 176–182. | 159                          |
| Graham, F.L., Van Der Eb, A.J.       | 1973 | Suppression of apoptotic cell death by hepatitis C virus core protein | Virology, 54 (2), Pages 536–539. | 159                          |
| Ahrens, C.H., Russell, R.L.Q., Funk, C.J., Evans, J.T., Harwood, S.H., Rohrmann, G.F. | 1997 | Suppression of apoptotic cell death by hepatitis C virus core protein | Virology, 229 (2), Pages 381–399. | 157                          |
| White, R.F.                          | 1979 | Suppression of apoptotic cell death by hepatitis C virus core protein | Virology, 99 (2), Pages 410–412. | 155                          |
| Ahrens, C.H., Russell, R.L.Q., Funk, C.J., Evans, J.T., Harwood, S.H., Rohrmann, G.F. | 1997 | Suppression of apoptotic cell death by hepatitis C virus core protein | Virology, 229 (2), Pages 381–399. | 157                          |
| White, R.F.                          | 1979 | Acetylsalicylic acid (aspirin) induces resistance to tobacco mosaic virus in tobacco | Virology, 99 (2), Pages 410–412. | 155                          |
| Barker, D.D., Berk, A.J.             | 1987 | Adenovirus proteins from both E1B reading frames are required for transformation of rodent cells by viral infection and DNA transfection | Virology, 156 (4), Pages 107–121. | 155                          |
| Zibert, A., Schreier, E., Roggendorf, M. | 1995 | Antibodies in human sera specific to hypervariable region 1 of hepatitis C virus can block viral attachment | Virology, 208 (2), Pages 653–661. | 154                          |
| Gelderblom, H.R., Hausmann, E.H.S., Ozel, M. | 1987 | Fine structure of human immunodeficiency virus (HIV) and immunolocalization of structural proteins | Virology, 156 (1), Pages 171–176. | 153                          |
| Spear, P.G., Eisenberg, R.J., Cohen, G.H. | 2000 | Three classes of cell surface receptors for alphaherpesvirus entry | Virology, 275 (1), Pages 1–8. | 152                          |
| Authors                                      | Year | Title                                                                                   | Vol., pp.                          | Number of citations to date |
|----------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------|-----------------------------|
| Ruggieri, A., Harada, T., Matsuura, Y., Miyamura, T. | 1997 | Sensitization to Fas-mediated apoptosis by hepatitis C virus core protein                 | Virology, 229 (1), Pages 68–76.    | 151                         |
| Palese, P., Tobita, K., Ueda, M., Compans, R.W. | 1974 | Characterization of temperature sensitive influenza virus mutants defective in neuraminidase | Virology, 61 (2), Pages 397–410.   | 147                         |
| Tartaglia, J., Perkus, M.E., Taylor, J., Norton, E.K., Audonnet, J.-C., Cox, W.I., Davis, S.W., Paolotti, E. | 1992 | NYVAC: A highly attenuated strain of vaccinia virus                                       | Virology, 188 (1), Pages 217–232.  | 146                         |
| Meyers, G., Rumenapf, T., Thiel, H.-J.        | 1989 | Molecular cloning and nucleotide sequence of the genome of hog cholera virus               | Virology, 171 (2), Pages 555–567.  | 142                         |
| Rico-Hesse, R., Harrison, L.M., Salas, R.A., Tovar, D., Nisalak, A., Ramos, C., Bosshel, J., Rosa, A.T.D. | 1997 | Origins of dengue type 2 viruses associated with increased pathogenicity in the Americas | Virology, 230 (2), Pages 244–251.  | 141                         |
| Sugrue, R.J., Hay, A.J.                       | 1991 | Structural characteristics of the M2 protein of influenza A viruses: evidence that it forms a tetrameric channel | Virology, 180 (2), Pages 617–624.  | 141                         |
| Lai, M.M.C.                                  | 1998 | Cellular factors in the transcription and replication of viral RNA genomes: A parallel to DNA-dependent RNA transcription | Virology, 244 (1), Pages 1–12.      | 140                         |
| Kuzio, J., Pearson, M.N., Harwood, S.H., Funk, C.J., Evans, J.T., Slavicek, J.M., Rohrmann, G.F. | 1999 | Sequence and analysis of the genome of a baculovirus pathogenic for Lymantria dispar     | Virology, 253 (1), Pages 17–34.     | 139                         |
| Clapham, P.R., Bianc, D., Weiss, R.A.         | 1991 | Specific cell surface requirements for the infection of CD4-positive cells by human immunodeficiency virus types 1 and 2 and by simian immunodeficiency virus | Virology, 181 (2), Pages 703–715.  | 137                         |
| Garcia-Sastre, A., Egorov, A., Matassov, D., Brandt, S., Levy, D.E., Durbin, J.E., Palese, P., Muster, T. | 1998 | Influenza A virus lacking the NS1 gene replicates in interferon-deficient systems        | Virology, 252 (2), Pages 324–330.  | 135                         |
| Novick, R.                                   | 1967 | Properties of a cryptic high-frequency transducing phage in Staphylococcus aureus         | Virology, 33 (1), Pages 155–166.    | 134                         |
| Wyatt, L.S., Moss, B., Rozenblatt, S.         | 1995 | Replication-deficient vaccinia virus encoding bacteriophage T7 RNA polymerase for transient gene expression in mammalian cells | Virology, 210 (1), Pages 202–205.  | 132                         |
| Boyer, J.-C., Haenni, A.-L.                  | 1994 | Infectious transcripts and cDNA clones of RNA viruses                                      | Virology, 198 (1), Pages 415–426.   | 131                         |
| Geiss, G.K., Bumgarner, R.E., An, M.C., Agy, M.B., Van ’T Wout, A.B., Hammersmark, E., Carter, V.S., Katze, M.G. | 2000 | Large-scale monitoring of host cell gene expression during HIV-1 infection using cDNA microarrays | Virology, 266 (1), Pages 8–16.     | 130                         |
| Kinbauer, R., Chandrachud, L.M., O’Neil, B.W., Wagner, E.R., Grindlay, G.J., Armstrong, A., McGarvie, G.M., Campo, M.S. | 1996 | Virus-like particles of bovine papillomavirus type 4 in prophylactic and therapeutic immunization | Virology, 219 (1), Pages 37–44.     | 128                         |
| Jurriaans, S., Van Gemen, B., Weverling, G.J., Van Strijp, D., Nara, P., Coutinho, R., Koot, M., Goudsmit, J. | 1994 | The natural history of HIV-1 infection: virus load and virus phenotype independent determinants of clinical course? | Virology, 204 (1), Pages 223–233.  | 128                         |
| Rico-Hesse, R.                               | 1990 | Molecular evolution and distribution of dengue viruses type 1 and 2 in nature             | Virology, 174 (2), Pages 479–491.   | 127                         |
| Lednicky, J.A., Garcea, R.L., Bergsagel, D.J., Butel, J.S. | 1995 | Natural Simian virus 40 strains are present in human choroid plexus and ependymoma tumors | Virology, 212 (2), Pages 710–717.   | 126                         |
| Compton, T., Nowlin, D.M., Cooper, N.R.       | 1993 | Initiation of human cytomegalovirus infection requires initial interaction with cell surface heparan sulfate Changes in growth properties on passage in tissue culture of viruses derived from infectious molecular clones of HIV-1(LAI), HIV-1(MAL), and HIV-1(ELI) | Virology, 193 (2), Pages 834–841.   | 126                         |
| Pedersen, M., Emerman, M., Montagnier, L.     | 1991 |                                                                              | Virology, 185 (2), Pages 661–672.   | 126                         |

(continued on next page)
| Authors | Year | Title | Vol., pp. | Number of citations to date |
|---------|------|-------|-----------|----------------------------|
| Jacobsen, H., Yasargil, K., Winslow, D.L., Craig, J.C., Krohn, A., Duncan, I.B., Mous, J. | 1995 | Characterization of human immunodeficiency virus type 1 mutants with decreased sensitivity to proteinase inhibitor Ro 31-8959 | Virology, 206 (1), Pages 527–534 | 125 |
| Carr, J.K., Salminen, M.O., Albert, J., Sanders-Buell, E., Gottle, D., Bixr, D.L., McCutchan, F.E. | 1998 | Full genome sequences of human immunodeficiency virus type 1 subtypes G and A/G intersubtype recombinants | Virology, 247 (1), Pages 22–31 | 124 |
| Ding, B., Li, Q., Nguyen, L., Palukaitis, P., Lucas, W.J. | 1995 | Cucumber mosaic virus 3a protein potentiates cell-to-cell trafficking of CMV RNA in tobacco plants | Virology, 207 (2), Pages 345–353 | 124 |
| Massung, R.F., Liu, L.-I., Qi, J., Knight, J.C., Yuran, T.E., Kerlavage, A.R., Parsons, J.M., Esposito, J.J. | 1994 | Analysis of the complete genome of smallpox variola major virus strain Bangladesh–1975 | Virology, 201 (2), Pages 215–240 | 122 |
| Huang, C.-C., Nguyen, D., Fernandez, J., Yun, K.Y., Fry, K.E., Bradley, D.W., Tan, A.W., Reyes, G.R. | 1992 | Molecular cloning and sequencing of the Mexico isolate of hepatitis E virus (HEV) | Virology, 191 (2), Pages 550–558 | 122 |
| Mazel Jr., J.V., White, D.O., Scharff, M.D. | 1968 | The polypeptides of adenovirus. I. Evidence for multiple protein components in the virion and a comparison of types 2, 7A, and 12 | Virology, 36 (1), Pages 115–125 | 122 |
| Lukae, D.M., Renné, R., Kirshner, J.R., Ganem, D. | 1998 | The complete genomic sequence of the modified vaccinia Ankara strain: comparison with other orthopoxviruses | Virology, 252 (2), Pages 304–312 | 121 |
| Antoine, G., Scheiflinger, F., Dorner, F., Falkner, F.G. | 1998 | The complete nucleotide sequence of African swine fever virus | Virology, 244 (2), Pages 365–396 | 120 |
| Yanez, R.J., Rodriguez, J.M., Nogal, M.L., Yuste, L., Enriquez, C., Rodriguez, J.F., Vinuela, E. | 1995 | Analysis of the complete nucleotide sequence of African swine fever virus | Virology, 208 (1), Pages 249–278 | 120 |
| Conzelmann, K.-K., Visser, N., Van Woensel, P., Thiel, H.-J. | 1993 | Molecular characterization of porcine reproductive and respiratory syndrome virus, a member of the arterivirus group | Virology, 193 (1), Pages 329–339 | 120 |
| Layne, S.P., Merger, M.J., Dembo, M., Spouge, J.L., Conley, S.R., Moore, J.P., Raina, J.L., Nara, P.L. | 1992 | Factors underlying spontaneous inactivation and susceptibility to neutralization of human immunodeficiency virus | Virology, 189 (2), Pages 695–714 | 119 |
| Upton, C., Macen, J.L., Schreiber, M., McFadden, G. | 1991 | Myxoma virus expresses a secreted protein with homology to the tumor necrosis factor receptor gene family that contributes to viral virulence | Virology, 184 (1), Pages 370–382 | 118 |
| Zhou, J., Sun, X.Y., Stenzel, D.J., Frazer, I.H. | 1991 | Expression of vaccinia recombinant HPV 16 L1 and L2 ORF proteins in epithelial cells is sufficient for assembly of HPV virion-like particles | Virology, 185 (1), Pages 251–257 | 118 |
| Rowe, W.P., Pugh, W.E., Hartley, J.W. | 1970 | Plaque assay techniques for murine leukemia viruses | Virology, 42 (4), Pages 1136–1139 | 117 |
| Nagy, P.D., Simon, A.E. | 1997 | New insights into the mechanisms of RNA recombination | Virology, 235 (1), Pages 1–9 | 115 |
| Sattentau, Q.J., Zolla-Pazner, S., Poignard, P. | 1995 | Epitope exposure on functional, oligomeric HIV-1 gp41 molecules | Virology, 206 (1), Pages 713–717 | 115 |
| Schneemann, A., Schneider, P.A., Lamb, R.A., Linkin, W.I. | 1995 | The remarkable coding strategy of Borna disease virus: a new member of the nonsegmented negative strand RNA viruses | Virology, 210 (1), Pages 1–8 | 115 |
| Graham, K.A., Lalani, A.S., Macen, J.L., Ness, T.L., Barry, M., Liu, L.-Y., Lucas, A., McFadden, G. | 1997 | The T1/35kDa family of poxvirus-secreted proteins bind chemokines and modulate leukocyte influx into virus-infected tissues | Virology, 229 (1), Pages 12–24 | 114 |
| Authors                                      | Year | Title                                                                 | Vol., pp.         | Number of citations to date |
|----------------------------------------------|------|-----------------------------------------------------------------------|-------------------|------------------------------|
| Meulenberg, J.J.M., Petersen-Den Besten, A., De Kluyver, E.P., Moormann, R.J.M., Schaaper, W.M.M., Wensvoort, G. | 1995 | Characterization of proteins encoded by ORFs 2 to 7 of Lelystad virus | Virology, 206 (1), Pages 155–163. | 114                           |
| Bourhy, H., Kissi, B., Tordo, N.              | 1993 | Molecular diversity of the Lyssavirus genus                           | Virology, 194 (1), Pages 70–81. | 114                           |
| Deng, R., Brock, K.V.                        | 1992 | Molecular cloning and nucleotide sequence of Pestivirus genome, noncytopathic bovine viral diarrhea virus strain SD-1 | Virology, 191 (2), Pages 867–879. | 114                           |
| Smith, I.L., Hardwicke, M.A., Sandri-Goldin, R.M. | 1992 | Evidence that the herpes simplex virus immediate early protein ICP27 acts post-transcriptionally during infection to regulate gene expression | Virology, 186 (1), Pages 74–86. | 114                           |
| Navot, N., Pichersky, E., Zeidan, M., Zamir, D., Czosnek, H. | 1991 | Tomato yellow leaf curl virus: a whitefly-transmitted geminivirus with a single genomic component | Virology, 185 (1), Pages 151–161. | 113                           |
| Lee, H.-J., Shieh, C.-K., Gorbalenya, A.E., Koonin, E.V., La Monica, N., Tuler, J., Baghdzadhyan, A., Lai, M.M.C. | 1991 | The complete sequence (22 kb) of murine coronavirus gene 1 encoding the putative proteases and RNA polymerase | Virology, 180 (2), Pages 567–582. | 112                           |
| Pushko, P., Parker, M., Ludwig, G.V., Davis, N.L., Johnston, R.E., Smith, J.F. | 1997 | Replicon-helper systems from attenuated Venezuelan equine encephalitis virus: expression of heterologous genes in vitro and immunization against heterologous pathogens in vivo | Virology, 239 (2), Pages 389–401. | 111                           |
| Poole, T.L., Wang, C., Popp, R.A., Potgieter, L.N.D., Siddiqui, A., Collett, M.S. | 1995 | Pestivirus translation initiation occurs by internal ribosome entry | Virology, 206 (1), Pages 750–754. | 111                           |
| Cho, M.W., Teterina, N., Egger, D., Bientz, K., Ehrenfeld, E. | 1994 | Membrane rearrangement and vesicle induction by recombinant poliovirus 2C and 2BC in human cells | Virology, 202 (1), Pages 129–145. | 111                           |
| Reeves, J.D., McKnight, A., Potempa, S., Simmons, G., Gray, P.W., Power, C.A., Wells, T., Talbot, S.J. | 1997 | CD4-independent infection by HIV-2 (ROD/B): use of the 7-transmembrane receptors CXCR-4, CCR-3, and V28 for entry | Virology, 231 (1), Pages 130–134. | 110                           |
| Lu, Y., Wambach, M., Katze, M.G., Krug, R.M. | 1995 | Binding of the influenza virus NS1 protein to double-stranded RNA inhibits the activation of the protein kinase that phosphorylates the eIF-2 translation initiation factor | Virology, 214 (1), Pages 222–228. | 110                           |
| Alkhattib, G., Locati, M., Kennedy, P.E., Murphy, P.M., Berger, E.A. | 1997 | HIV-1 coreceptor activity of CCR5 and its inhibition by chemokines: Independence from G protein signaling and importance of coreceptor downmodulation | Virology, 234 (2), Pages 340–348. | 109                           |
| Honda, M., Ping, L.-H., Rijnbrand, R.C.A., Amphlett, E., Clarke, B., Rowlands, D., Lemon, S.M. | 1996 | Structural requirements for initiation of translation by internal ribosome entry within genome-length hepatitis C virus RNA | Virology, 222 (1), Pages 31–42. | 108                           |
| Wold, W.S.M., Gooding, L.R. | 1991 | Region E3 of adenovirus: a cassette of genes involved in host immunosurveillance and virus–cell interactions | Virology, 184 (1), Pages 1–8. | 108                           |
| Alfiieri, C., Birkenbach, M., Kieff, E. | 1991 | Early events in Epstein–Barr virus infection of human B lymphocytes | Virology, 181 (2), Pages 595–608. | 107                           |
| Zhou, A., Paranjape, J.M., Der, S.D., Williams, B.R.G., Silberman, R.H. | 1999 | Interferon action in triply deficient mice reveals the existence of alternative antiviral pathways | Virology, 258 (2), Pages 435–440. | 106                           |
| Maul, G.G., Ishov, A.M., Everett, R.D. | 1996 | Nuclear domain 10 as preexisting potential replication start sites of herpes simplex virus type 1 | Virology, 217 (1), Pages 67–75. | 106                           |
| Ballet, J.W., Kolson, D.L., Eiger, G., Kim, F.M., McGann, K.A., Srinivasan, A., Collman, R. | 1994 | Distinct effects in primary macrophages and lymphocytes of the human immunodeficiency virus type 1 accessory genes vpr, vpu, and nef: Mutational analysis of a primary HIV-1 isolate | Virology, 200 (2), Pages 623–631. | 106                           |
Daniel Nathans, Stanley B. Prusiner, George E. Palade, Frederick C. Robbins, Phillip A. Sharp, Hamilton O. Smith, Howard M. Temin, Harold E. Varmus, and Thomas H. Weller. Time will tell how many will be added in the coming decades.

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**Reference**

Cann, A.J., 2005. Principles of Molecular Virology, 4th ed. Elsevier, London.