

CURRICULUM VITAE

April 2010

Name: **Eric Delwart**

Position: Senior Investigator
Blood Systems Research Institute

Professor Adjunct
Dept of Laboratory Medicine
University of California, San Francisco
email: delwarte@medicine.ucsf.edu

EDUCATION:

1977-1980 **University of Newcastle upon Tyne, England.**
Bachelor of Sciences. Joint Honors in Biochemistry and Genetics.

1981-1982 **University of Geneva, Switzerland.**
Certificate of Specialization in Molecular Biology.

1984-1990 **University of Wisconsin-Madison.** McArdle Laboratory for Cancer Research.
Ph.D. in Oncology.

PRINCIPAL POSITIONS HELD:

1990-1994 **Stanford University School of Medicine.**
Post-doctoral fellow. Dept. of Microbiology and Immunology.

1994-1996 **New York University.**
Assistant Professor, School of Medicine. Dept. of Pathology.

1996-1999 **Rockefeller University.**
Assistant Professor.

1999-2008 **University of California, San Francisco.**
Associate Professor adjunct in Dept. of Medicine

2008-now **University of California, San Francisco.**
Professor adjunct in Dept. of Laboratory Medicine

OTHER PROFESSIONAL ACTIVITIES:

1982-1984 **Genentech Inc.**
Research Associate. Dept. of Molecular Biology.

1994-1999 **Aaron Diamond AIDS Research Center.**
Staff Investigator.

1999-2008 **Blood Systems Research Institute. San Francisco, CA.**
Director of Molecular Virology.

PUBLICATIONS

Reviews, book chapters, editorials, letters to editor

1. M.-E. Mirault, **E. L. Delwart**, and R. Southgate. 1982. Heat-shock from bacteria to man. pp35-42. Eds. M. J. Schlesinger, M. Ashburner and A. Tissieres. Cold Spring Harbor Laboratory Press, Plainview, NY.
2. **Delwart EL**, Mosialos G, Gilmore T. Retroviral envelope glycoproteins contain a "leucine zipper"-like repeat. AIDS research and human retroviruses 1990;6(6):703-6.
3. **Delwart, EL**, E. G. Shpaer and J. I. Mullins. 1995. Heteroduplex mobility assays for phylogenetic analysis. PCR Strategies. Eds M. A. Innis, D. H. Gelfand and J. J. Sninsky. Chapter 12. Academic Press, San Diego, CA.
4. **Delwart, EL**, B. Herring, A. G. Rodrigo, and J. I. Mullins. 1995. Genetic subtyping of human immunodeficiency virus using a heteroduplex assay. PCR Primer: A Laboratory Manual. Eds. C. W. Dieffenbach and G. Dveksler. Cold Spring Harbor Laboratory Press, Plainview, NY.
5. **Delwart E**. A new HIV-1 group: abstract and commentary. JAMA 1998;280(22):1960.
6. Doukhan L, **Delwart EL**. Use of tissue culture-amplified human immunodeficiency virus type 1 to study evolutionary changes in vivo. The Journal of infectious diseases 2001;183(1):173-5.
7. **Delwart EL**. Viral metagenomics. Reviews in Medical Virology 2007;17(2):115-31.

Research articles

1. Mirault ME, Southgate R, **Delwart E**. Regulation of heat-shock genes: a DNA sequence upstream of Drosophila hsp70 genes is essential for their induction in monkey cells. The EMBO journal 1982;1(10):1279-85.
2. Wood WI, Capon DJ, Simenson CC, Eaton DL, Gitschier J, Keyt B, Seeburg PH, Smith DH, Hollingshead P, Wion KL, **Delwart E**, Tuddenham E, Vehar GA, and Lawn RM. Expression of active human factor VIII from recombinant DNA clones. Nature 1984;312 (5992):330-337.
3. Lowe DG, Capon DJ, **Delwart E**, Sakaguchi AY, Naylor SL, Goeddel DV. Structure of the human and murine R-ras genes, novel genes closely related to ras proto-oncogenes. Cell 1987;48(1):137-46.
4. **Delwart EL**, Panganiban AT. Role of reticuloendotheliosis virus envelope glycoprotein in superinfection interference. Journal of Virology 1989;63(1):273-80.
5. **Delwart EL**, Panganiban AT. N-linked glycosylation and reticuloendotheliosis retrovirus envelope glycoprotein function. Virology 1990;179(2):648-57.
6. Freed EO, **Delwart EL**, Buchschacher GL, Jr., Panganiban AT. A mutation in the human immunodeficiency virus type 1 transmembrane glycoprotein gp41 dominantly interferes with fusion and infectivity. Proceedings of the National Academy of Sciences of the United States of America 1992;89(1):70-4.
7. **Delwart EL**, Buchschacher GL, Jr., Freed EO, Panganiban AT. Analysis of HIV-1 envelope mutants and pseudotyping of replication-defective HIV-1 vectors by genetic complementation. AIDS research and human retroviruses 1992;8(9):1669-77.
8. **Delwart EL**, Shpaer EG, Louwagie J, et al. Genetic relationships determined by a DNA heteroduplex mobility assay: analysis of HIV-1 env genes. Science (New York, NY) 1993;262(5137):1257-61.
9. **Delwart EL**, Sheppard HW, Walker BD, Goudsmit J, Mullins JI. Human immunodeficiency virus type 1 evolution in vivo tracked by DNA heteroduplex mobility assays. Journal of Virology 1994;68(10):6672-83.

10. Sabino EC, **Delwart E**, Lee TH, Mayer A, Mullins JI, Busch MP. Identification of low-level contamination of blood as basis for detection of human immunodeficiency virus (HIV) DNA in anti-HIV-negative specimens. Journal of acquired immune deficiency syndromes 1994;7(8):853-9.
11. Louwagie J, **Delwart EL**, Mullins JI, McCutchan FE, Eddy G, Burke DS. Genetic analysis of HIV-1 isolates from Brazil reveals presence of two distinct genetic subtypes. AIDS research and human retroviruses 1994;10(5):561-7.
12. Grez, M., U. Dietrich, P. Balfe, H. von Briesen, G. Mahambre, J. K. Maniar, G. Mahambre, **E. Delwart**, J. I. Mullins, and H. Rubsamen-Waigmann Genetic analysis of human immunodeficiency virus type 1 and 2 (HIV-1 and HIV-2) mixed infections in India reveals a recent spread of HIV-1 and HIV-2 from a single ancestor for each of these viruses. Journal of Virology 1994;68(4):2161-8.
13. Bachmann MH, **Delwart EL**, Shpaer EG, Lingenfelter P, Singal R, Mullins JI. Rapid genetic characterization of HIV type 1 strains from four World Health Organization-sponsored vaccine evaluation sites using a heteroduplex mobility assay. WHO Network for HIV Isolation and Characterization. AIDS research and human retroviruses 1994;10(11):1345-53.
14. Shpaer EG, **Delwart EL**, Kuiken CL, Goudsmit J, Bachmann MH, Mullins JI. Conserved V3 loop sequences and transmission of human immunodeficiency virus type 1. AIDS research and human retroviruses 1994;10(12):1679-84.
15. Wasi C, Herring B, Raktham S, Vanichseni S, Mastro TD, Young NL, Rubsamen-Waigmann H, von Briesen H, Kalish ML, Luo CC, Chou-Pong P, Baldwin A, Mullins JI, **Delwart EL**, Esparza J, Heyward WL, Osmanov S 1995. Determination of HIV-1 subtypes in injecting drug users in Bangkok, Thailand, using peptide-binding enzyme immunoassay and heteroduplex mobility assay: evidence of increasing infection with HIV-1 subtype E. 1995 AIDS;9(8):843-849.
16. **Delwart EL**, Herring B, Rodrigo AG, Mullins JI. Genetic subtyping of human immunodeficiency virus using a heteroduplex mobility assay. PCR methods and applications 1995;4(5):S202-16.
17. **Delwart EL**, Busch MP, Kalish ML, Mosley JW, Mullins JI. Rapid molecular epidemiology of human immunodeficiency virus transmission. AIDS research and human retroviruses 1995;11(9):1081-93.
18. **Delwart EL**, Gordon CJ. Tracking changes in HIV-1 envelope quasispecies using DNA heteroduplex analysis. Methods (San Diego, Calif) 1997;12(4):348-54.
19. **Delwart EL**, Pan H, Sheppard HW, Wolpert D, Neumann AU, Korber B, Mullins JI. Slower evolution of human immunodeficiency virus type 1 quasispecies during progression to AIDS. Journal of Virology 1997;71(10):7498-508.
20. **Delwart EL**, Mullins JI, Gupta P, Learn Jr. GH, Holodniy M, Katzenstein D, Walker BD, Singh MK. Human immunodeficiency virus type 1 populations in blood and semen. Journal of Virology 1998;72(1):617-23.
21. **Delwart EL**, Pan H, Neumann A, Markowitz M. Rapid, transient changes at the env locus of plasma human immunodeficiency virus type 1 populations during the emergence of protease inhibitor resistance. Journal of Virology 1998;72(3):2416-21.
22. Shen DF, Doukhan L, Kalams S, **Delwart E**. High-resolution analysis of T-cell receptor beta-chain repertoires using DNA heteroduplex tracking: generally stable, clonal CD8+ expansions in all healthy young adults. Journal of immunological methods 1998;215(1-2):113-21.
23. Rodrigo AG, Shpaer EG, **Delwart EL**, Iversen AK, Gallo MV, Brojatsch J, Hirsch MS, Walker BD, Mullins JI. Coalescent estimates of HIV-1 generation time in vivo. Proceedings of the National Academy of Sciences of the United States of America 1999;96(5):2187-91.
24. Tien PC, Chiu T, Latif A, Ray S, Batra M, Contag CH, Zejena L, Mbizvo M, **Delwart EL**, Mullins JI, Katzenstein DA. Primary subtype C HIV-1 infection in Harare, Zimbabwe. J Acquir Immune Defic Syndr Hum Retrovirol 1999;20(2):147-53.
25. Gordon CJ, **Delwart EL**. Genetic diversity of primary HIV-1 isolates and their sensitivity to antibody-mediated neutralization. Virology 2000;272(2):326-30.

26. Foley B, Pan H, Buchbinder S, **Delwart EL**. Apparent founder effect during the early years of the San Francisco HIV type 1 epidemic (1978-1979). AIDS research and human retroviruses 2000;16(15):1463-9.
27. Doukhan L, **Delwart E**. Population genetic analysis of the protease locus of human immunodeficiency virus type 1 quasispecies undergoing drug selection, using a denaturing gradient-heteroduplex tracking assay. Journal of Virology 2001;75(14):6729-36.
28. Foley B, Donegan E, Silitonga N, Wignall FS, Busch MP, **Delwart EL**. Importation of multiple HIV type 1 strains into West Papua, Indonesia (Irian Jaya). AIDS research and human retroviruses 2001;17(17):1655-9.
29. Machado DM, **Delwart EL**, Diaz RS, de Oliveira CF, Alves K, Rawal BD, Sullivan M, Gwinn M, Clark KA, Busch MP. Use of the sensitive/less-sensitive (detuned) EIA strategy for targeting genetic analysis of HIV-1 to recently infected blood donors. AIDS (London, England) 2002;16(1):113-9.
30. Alves K, Canzian M, **Delwart EL**. HIV type 1 envelope quasispecies in the thymus and lymph Nodes of AIDS patients. AIDS research and human retroviruses 2002;18(2):161-5.
31. **Delwart E**, Magierowska M, Royz M, et al. Homogeneous quasispecies in 16 out of 17 individuals during very early HIV-1 primary infection. AIDS (London, England) 2002;16(2):189-95.
32. Bernardin F, Doukhan L, Longone-Miller A, Champagne P, Sekaly R, **Delwart E**. Estimate of the total number of CD8+ clonal expansions in healthy adults using a new DNA heteroduplex-tracking assay for CDR3 repertoire analysis. Journal of immunological methods 2003;274(1-2):159-75.
33. Gonzales MJ, **Delwart E**, Rhee SY, Tsui R, Zolopa AR, Taylor J, Shafer RW. Lack of detectable human immunodeficiency virus type 1 superinfection during 1072 person-years of observation. The Journal of infectious diseases 2003;188(3):397-405.
34. **Delwart EL**, Orton S, Parekh B, Dobbs T, Clark K, Busch MP. Two percent of HIV-positive U.S. blood donors are infected with non-subtype B strains. AIDS research and human retroviruses 2003;19(12):1065-70.
35. Bernardin F, Herring BL, Peddada L, **Delwart EL**. Primary infection of a male plasma donor with divergent HIV variants from the same source followed by rapid fluctuations in their relative frequency and viral recombination. AIDS research and human retroviruses 2003;19(11):1009-15.
36. Tsui R, Herring BL, Barbour JD, Grant RM, Bacchetti P, Kral A, Edlin BR, **Delwart EL**. Human immunodeficiency virus type 1 superinfection was not detected following 215 years of injection drug user exposure. Journal of Virology 2004;78(1):94-103.
37. Magierowska M, Bernardin F, Garg S, Staprans S, Miller MD, Van Rompay KK, **Delwart EL**. Highly uneven distribution of tenofovir-selected simian immunodeficiency virus in different anatomical sites of rhesus macaques. Journal of Virology 2004;78(5):2434-44.
38. Angel JB, Hu YW, Kravcik S, Tsui R, Lee KH, Barbour J, Balaskas E, Branson BM, **Delwart EL**, Grant RM. Virological evaluation of the 'Ottawa case' indicates no evidence for HIV-1 superinfection. AIDS (London, England) 2004;18(2):331-4.
39. **Delwart EL**, Kalmin ND, Jones TS, Ladd DJ, Foley B, Tobler LH, Tsui RC, Busch MP. First report of human immunodeficiency virus transmission via an RNA-screened blood donation. Vox sanguinis 2004;86(3):171-7.
40. Bernardin F, Magierowska M, Dandekar S, Van Rompay KK, **Delwart EL**. Number of CD4+ and CD8+ T-cell CDR3 clonotypes expanding during acute infection of macaques with simian immunodeficiency virus. Virology 2004;322(1):105-17.
41. Herring BL, Page-Shafer K, Tobler LH, **Delwart EL**. Frequent hepatitis C virus superinfection in injection drug users. The Journal of infectious diseases 2004;190(8):1396-403.
42. Kapoor A, Jones M, Shafer RW, Rhee SY, Kazanjian P, **Delwart EL**. Sequencing-based detection of low-frequency human immunodeficiency virus type 1 drug-resistant mutants by an RNA/DNA heteroduplex generator-tracking assay. Journal of Virology 2004;78(13):7112-23.

43. Herring BL, Tsui R, Peddada L, Busch M, **Delwart EL**. Wide range of quasispecies diversity during primary hepatitis C virus infection. Journal of Virology 2005;79(7):4340-6.
44. Fiebig EW, Heldebrant CM, Smith RI, Conrad AJ, **Delwart EL**, Busch MP. Intermittent low-level viremia in very early primary HIV-1 infection. Journal of acquired immune deficiency syndromes 2005;39(2):133-7.
45. Jones MS, Kapoor A, Lukashov VV, Simmonds P, Hecht F, **Delwart E**. New DNA viruses identified in patients with acute viral infection syndrome. Journal of Virology 2005;79(13):8230-6.
46. Bernardin F, Kong D, Peddada L, Baxter-Lowe LA, **Delwart E**. Human immunodeficiency virus mutations during the first month of infection are preferentially found in known cytotoxic T-lymphocyte epitopes. Journal of Virology 2005;79(17):11523-8.
47. Fryer JF, Kapoor A, Minor PD, **Delwart E**, Baylis SA. Novel parvovirus and related variant in human plasma. Emerging infectious diseases 2006;12(1):151-4.
48. **Delwart E**, Kuhns MC, Busch MP. Surveillance of the genetic variation in incident HIV, HCV, and HBV infections in blood and plasma donors: implications for blood safety, diagnostics, treatment, and molecular epidemiology. Journal of medical virology 2006;78 Suppl 1:S30-5.
49. Bernardin F, Herring B, Page-Shafer K, Kuiken C, **Delwart E**. Absence of HCV viral recombination following superinfection. Journal of viral hepatitis 2006;13(8):532-7.
50. Trautmann L, Janbazian L, Chomont N, Said EA, Gimmig S, Bessette B, Boulassel MR, **Delwart E**, Sepulveda H, Balderas RS, Routy JP, Haddad EK, Sekaly RP. Upregulation of PD-1 expression on HIV-specific CD8+ T cells leads to reversible immune dysfunction. Nature medicine 2006;12(10):1198-202.
51. Johnson JA, Rompay KK, **Delwart E**, Heneine W. A rapid and sensitive real-time PCR assay for the K65R drug resistance mutation in SIV reverse transcriptase. AIDS research and human retroviruses 2006;22(9):912-6.
52. Herring BL, Bernardin F, Caglioti S, Stramer S, Tobler L, Andrews W, Cheng L, Rampersad S, Cameron C, Saldanha J, Busch MP, **Delwart E**. Phylogenetic analysis of WNV in North American blood donors during the 2003-2004 epidemic seasons. Virology 2007;363(1):220-8.
53. Jones MS 2nd, Harrach B, Ganac RD, Gozum MM, Dela Cruz WP, Riedel B, Pan C, **Delwart EL**, Schnurr DP. New adenovirus species found in a patient presenting with gastroenteritis. Journal of Virology 2007;81(11):5978-84.
54. Bernardin F, Stramer SL, Rehmann B, Page-Shafer K, Cooper S, Bangsberg DR, Hahn J, Tobler L, Busch M, **Delwart E**. High levels of subgenomic HCV plasma RNA in immunosilent infections. Virology 2007;365(2):446-56.
55. Fryer JF, **Delwart E**, Hecht FM, Bernardin F, Jones MS, Shah N, Baylis SA. Frequent detection of the parvoviruses, PARV4 and PARV5, in plasma from blood donors and symptomatic individuals. Transfusion 2007;47(6):1054-61.
56. Fryer JF, **Delwart E**, Bernardin F, Tuke PW, Lukashov VV, Baylis SA. Analysis of two human parvovirus PARV4 genotypes identified in human plasma for fractionation. The Journal of General Virology 2007;88(Pt 8):2162-7.
57. Kapoor A., Victoria J., Simmonds P., Wang C., Shafer R.W., Nims R., Nielsen O., E. **Delwart**. A highly divergent picornavirus in a marine mammal. Journal of Virology 2008. 82:311-320.
58. D Vallerini, P Barozzi, C Quadrelli, R Bosco, L Potenza, G Riva, G Gregorini, S Sandrini, A Tironi, G Montagnani, M-D Palma, G Torelli, **E Delwart**, and M Luppi. Parvoviruses in blood donors and transplant patients, Italy. Emerging infection diseases. 2008. 14(1):185-186
59. F Bernardin, L Tobler, I Walsh, J Dunn Williams, MP Busch, and **E Delwart**. Clearance of Hepatitis C Virus RNA from the peripheral blood mononuclear cells of blood donors who spontaneously or therapeutically control their plasma viremia. Hepatology. 2007 ;47:1446-1452
60. A Kapoor, B Shapiro, RW Shafer, N Shulman, S-Y Rhee and **E. Delwart**. Multiple independent origins of a protease inhibitor resistance mutation in salvage therapy patients. Retrovirology. 2008.

5:7.

61. Kapoor, A., J. Victoria, P. Simmonds, E. Slikas, T. Chieochansin, A. Naeem, S. Shaukat, S. Sharif, M. M. Alam, M. Angez, C. Wang, R. W. Shafer, S. Zaidi, and **E. Delwart**. 2008. A highly prevalent and genetically diversified Picornaviridae genus in South Asian children. Proc Natl Acad Sci U S A 105:20482-7.
62. J. Victoria, A. Kapoor, K. Dupuis, D. Schnurr, **E. Delwart**. 2008. Rapid identification of known and new viruses from animal tissues. PLOS Pathogen; 4(9): e1000163.
63. A. Kapoor, E. Slikas, P. Simmonds, T. Chieochansin, A. Naeem, S. Shaukat, M. Alam, S. Sharif, M. Angez, S. Zaidi, **E. Delwart**. 2009. A Newly Identified Bocavirus Species in Human Stool. Journal of Infectious Diseases 199:196-200.
64. Hatano, H., **E. L. Delwart**, P. J. Norris, T. H. Lee, J. Dunn-Williams, P. W. Hunt, R. Hoh, S. L. Stramer, J. M. Linnen, J. M. McCune, J. N. Martin, M. P. Busch, and S. G. Deeks. 2009. Evidence for persistent low-level viremia in individuals who control human immunodeficiency virus in the absence of antiretroviral therapy. J Virol 83:329-35.
65. Li L, Victoria J, Kapoor A, Naeem A, Shaukat S, Sharif S, Alam MM, Angez M, Zaidi SZ, Delwart E. Genomic characterization of novel human parechovirus type. Emerg Infect Dis. 2009 Feb;15(2):288-91. <http://www.cdc.gov/eid/content/15/2/288.htm>
66. Blinkova O, Kapoor A, Victoria J, Jones M, Wolfe N, Naeem A, Shaukat S, Sharif S, Alam MM, Angez M, Zaidi S, **Delwart EL**. Cardioviruses are genetically diverse and cause common enteric infections in South Asian children. J Virol. 2009 May;83(9):4631-41. Epub 2009 Feb 4.
67. Nugent CT, Dockter J, Bernardin F, Hecht R, Smith D, **Delwart E**, Pilcher C, Richman D, Busch M, Giachetti C. Detection of HIV-1 in alternative specimen types using the APTIMA HIV-1 RNA Qualitative Assay. J Virol Methods. 2009 Jul;159(1):10-4. Epub 2009 Feb 24.
68. Victoria JG, Kapoor A, Li L, Blinkova O, Slikas B, Wang C, Naeem A, Zaidi S, **Delwart E**. Metagenomic analyses of viruses in stool samples from children with acute flaccid paralysis. J Virol. 2009 May;83(9):4642-51. Epub 2009 Feb 11.
69. Li L, Barry P, Yeh E, Glaser C, Schnurr D, **Delwart E**. 2009. Identification of a novel human gamma-papillomavirus species. J Gen Virol. 90:2413-19
70. Keele BF, Giorgi EE, Salazar-Gonzalez JF, Decker JM, Pham KT, Salazar MG, Sun C, Grayson T, Wang S, Li H, Wei X, Jiang C, Kirchherr JL, Gao F, Anderson JA, Ping LH, Swanstrom R, Tomaras GD, Blattner WA, Goepfert PA, Kilby JM, Saag MS, **Delwart EL**, Busch MP, Cohen MS, Montefiori DC, Haynes BF, Gaschen B, Athreya GS, Lee HY, Wood N, Seoighe C, Perelson AS, Bhattacharya T, Korber BT, Hahn BH, Shaw GM. Identification and characterization of transmitted and early founder virus envelopes in primary HIV-1 infection. Proc Natl Acad Sci U S A. 2008 May 27;105(21):7552-7. Epub 2008 May 19.
71. Li L, Victoria J, Kapoor A, Blinkova O, Wang C, Babrzadeh F, Mason CJ, Pandey P, Triki H, Bahri O, Oderinde BS, Baba MM, Bukbuk DN, Besser JM, Bartkus JM, **Delwart EL**. A novel picornavirus associated with gastroenteritis. J Virol. 2009 Nov;83(22):12002-6. Epub 2009 Sep 16. PubMed PMID: 19759142.
72. Blinkova O, Rosario K, Li L, Kapoor A, Slikas B, Bernardin F, Breitbart M, **Delwart E**. 2009. Frequent detection of highly diverse Cardioviruses, Cosaviruses, Bocaviruses and Circoviruses in sewage samples collected in the United States. J Clin Microbiol. 47:3509-13
73. Blinkova O, Victoria J, Li Y, Keele B, Sanz C, Ndjango JB, Peeters M, Travis D, Lonsdorf E, Wilson M, Pusey A, Hahn B, **Delwart E**. 2010. Novel circular DNA viruses in stool samples of wild-living chimpanzees. J Gen Virol. 91:74-86
74. Kapoor A, Li L, Victoria J, Oderinde B, Mason C, Pandey P, Zaidi SZ, **Delwart E**. Multiple novel astrovirus species in human stool. J Gen Virol. 2009 Dec;90(Pt 12):2965-72. Epub 2009 Aug 19.
75. Sharp CP, Lail A, Donfield S, Simmons R, Leen C, Klenerman P, **Delwart E**, Gomperts ED, Simmonds P. High frequencies of exposure to the novel human parvovirus PARV4 in hemophiliacs

- and injection drug users, as detected by a serological assay for PARV4 antibodies. *J Infect Dis*. 2009 Oct 1;200(7):1119-25.
76. Lee HY, Giorgi EE, Keele BF, Gaschen B, Athreya GS, Salazar-Gonzalez JF, Pham KT, Goepfert PA, Kilby JM, Saag MS, **Delwart EL**, Busch MP, Hahn BH, Shaw GM, Korber BT, Bhattacharya T, Perelson AS. Modeling sequence evolution in acute HIV-1 infection. *J Theor Biol*. 2009 Nov 21;261(2):341-60. Epub 2009 Aug 4.
77. Page K, Hahn JA, Evans J, Shiboski S, Lum P, Delwart E, Tobler L, Andrews W, Avanesyan L, Cooper S, **Busch MP**. Acute hepatitis C virus infection in young adult injection drug users: a prospective study of incident infection, resolution, and reinfection. *J Infect Dis*. 2009 Oct 15;200(8):1216-26.
78. Chieochansin T, Kapoor A, **Delwart E**, Poovorawan Y, Simmonds P. Absence of detectable replication of human bocavirus species 2 in respiratory tract. *Emerg Infect Dis*. 2009 Sep;15(9):1503-5.
79. Li L, Kapoor A, Slikas B, Bamidele OS, Wang C, Shaukat S, Masroor MA, Wilson ML, Ndjango JB, Peeters M, Gross-Camp ND, Muller MN, Hahn BH, Wolfe ND, Triki H, Bartkus J, Zaidi SZ, **Delwart E**. Multiple diverse circoviruses infect farm animals and are commonly found in human and chimpanzee feces. *J Virol*. 2010 Feb;84(4):1674-82. Epub 2009 Dec 9.
80. Chiu CY, Greninger AL, Chen EC, Haggerty TD, Parsonnet J, **Delwart E**, Derisi JL, Ganem D. Cultivation and serological characterization of a human Theiler's-like cardiovirus associated with diarrheal disease. *J Virol*. 2010 May;84(9):4407-14. Epub 2010 Feb 17.
81. Victoria JG, Wang C, Jones MS, Jaing C, McLoughlin K, Gardner S, **Delwart EL**. Viral nucleic acids in live-attenuated vaccines: detection of minority variants and an adventitious virus. *J Virol*. 2010 Apr 7. [Epub ahead of print].
82. Kapoor A, Simmonds P, Slikas E, Li L, Bodhidatta L, Sethabutr O, Triki H, Bahri O, Oderinde BS, Baba MM, Bukbuk DN, Besser J, Bartkus J, **Delwart E**. Human Bocaviruses Are Highly Diverse, Dispersed, Recombination Prone, and Prevalent in Enteric Infections. *J Infect Dis*. 2010 Apr 23. [Epub ahead of print].