



Robert W. Shafer

Professor (Research) of Medicine (Infectious Diseases) and, by courtesy, of Pathology

Medicine - Infectious Diseases

CLINICAL OFFICE (PRIMARY)

- **Stanford AIDS Clinical Trial Unit**

1000 Welch Rd Ste 202

Palo Alto, CA 94304

Tel (650) 725-2946 Fax (650) 498-7874

Bio

BIO

Dr. Robert Shafer specializes in the treatment of infectious diseases. He has practiced for more than 25 years. Dr. Shafer has a special interest in acute and chronic viral infections.

CLINICAL FOCUS

- Infectious Disease

ACADEMIC APPOINTMENTS

- Professor (Research), Medicine - Infectious Diseases
- Professor (Research) (By courtesy), Pathology
- Member, Bio-X

PROFESSIONAL EDUCATION

- Medical Education: New York University School of Medicine (1983) NY
- Fellowship: Stanford University School of Medicine (1993) CA
- Board Certification: Infectious Disease, American Board of Internal Medicine (1988)
- Fellowship: SUNY at Brooklyn School Of Medicine (1988) NY
- Board Certification: Internal Medicine, American Board of Internal Medicine (1986)
- Residency: Lenox Hill Hospital (1986) NY
- Internship: Lenox Hill Hospital (1984) NY

LINKS

- HIV Drug Resistance Database: <http://hivdb.stanford.edu>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My group's research is on the mechanisms and consequences of virus evolution with a focus on HIV therapy and drug resistance. We maintain a public HIV drug resistance database (<http://hivdb.stanford.edu>) as a resource for HIV drug resistance surveillance, interpreting HIV drug resistance tests, and HIV drug development. These three disciplines – epidemiology, clinical management, and basic science – reflect the interdisciplinary nature of antiviral drug resistance research and represent the range of our group's activities.

HIV drug resistance, once the main challenge to the very concept that antiretroviral therapy would be possible, has been countered in a striking success of modern medicine. However, HIV drug resistance persists as the main threat to the long-term effectiveness of antiretroviral therapy in the under-resourced parts of the world with the highest numbers of HIV-infected people. The paramount goal of our group's work is to inform HIV treatment and prevention policies by identifying the most important factors responsible for the emergence and spread of drug resistance.

Additional interests of our group include sequence analyses that provide insight into viral pathogenesis, open source informatics approaches that facilitate the use of genomic data in clinical practice, and new sequencing technologies.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biomedical Data Science (Phd Program)
- Immunology (Phd Program)

Publications

PUBLICATIONS

- **Combating antimicrobial resistance in malaria, HIV and tuberculosis.** *Nature reviews. Drug discovery*
Duffey, M., Shafer, R. W., Timm, J., Burrows, J. N., Fotouhi, N., Cockett, M., Leroy, D.
2024
- **Prevalence of Emergent Dolutegravir Resistance Mutations in People Living with HIV: A Rapid Scoping Review.** *Viruses*
Chu, C., Tao, K., Kouamou, V., Avalos, A., Scott, J., Grant, P. M., Rhee, S. Y., McCluskey, S. M., Jordan, M. R., Morgan, R. L., Shafer, R. W.
2024; 16 (3)
- **Recommendations on data sharing in HIV drug resistance research.** *PLoS medicine*
Inzaule, S. C., Siedner, M. J., Little, S. J., Avila-Rios, S., Ayitewala, A., Bosch, R. J., Calvez, V., Ceccherini-Silberstein, F., Charpentier, C., Descamps, D., Eshleman, S. H., Fokam, J., Frenkel, et al
2023; 20 (9): e1004293
- **Treatment Emergent Dolutegravir Resistance Mutations in Individuals Naïve to HIV-1 Integrase Inhibitors: A Rapid Scoping Review.** *Viruses*
Tao, K., Rhee, S. Y., Chu, C., Avalos, A., Ahluwalia, A. K., Gupta, R. K., Jordan, M. R., Shafer, R. W.
2023; 15 (9)
- **Genotypic Resistance Testing of HIV-1 DNA in Peripheral Blood Mononuclear Cells.** *Clinical microbiology reviews*
Chu, C., Armenia, D., Walworth, C., Santoro, M. M., Shafer, R. W.
2022: e0005222
- **Susceptibility of SARS-CoV-2 Omicron Variants to Therapeutic Monoclonal Antibodies: Systematic Review and Meta-analysis.** *Microbiology spectrum*
Tao, K., Tzou, P. L., Kosakovsky Pond, S. L., Ioannidis, J. P., Shafer, R. W.
2022: e0092622

- **Public availability of HIV-1 drug resistance sequence and treatment data: a systematic review.** *The Lancet. Microbe*
Rhee, S., Kassaye, S. G., Jordan, M. R., Kouamou, V., Katzenstein, D., Shafer, R. W.
2022; 3 (5): e392-e398
- **Coronavirus Resistance Database (CoV-RDB): SARS-CoV-2 susceptibility to monoclonal antibodies, convalescent plasma, and plasma from vaccinated persons.** *PloS one*
Tzou, P. L., Tao, K., Pond, S. L., Shafer, R. W.
2022; 17 (3): e0261045
- **The biological and clinical significance of emerging SARS-CoV-2 variants.** *Nature reviews. Genetics*
Tao, K., Tzou, P. L., Nouhin, J., Gupta, R. K., de Oliveira, T., Kosakovsky Pond, S. L., Fera, D., Shafer, R. W.
2021
- **SARS-CoV-2 Antiviral Therapy.** *Clinical microbiology reviews*
Tao, K., Tzou, P. L., Nouhin, J., Bonilla, H., Jagannathan, P., Shafer, R. W.
2021: e0010921
- **Virological Failure and Acquired Genotypic Resistance Associated With Contemporary Antiretroviral Treatment Regimens.** *Open forum infectious diseases*
Rhee, S. Y., Clutter, D. n., Hare, C. B., Tchakoute, C. T., Sainani, K. n., Fessel, W. J., Hurley, L. n., Slome, S. n., Pinsky, B. A., Silverberg, M. J., Shafer, R. W.
2020; 7 (9): ofaa316
- **Analysis of unusual and signature APOBEC-mutations in HIV-1 pol next-generation sequences.** *PloS one*
Tzou, P. L., Kosakovsky Pond, S. L., Avila-Rios, S. n., Holmes, S. P., Kantor, R. n., Shafer, R. W.
2020; 15 (2): e0225352
- **Coronavirus Antiviral Research Database (CoV-RDB): An Online Database Designed to Facilitate Comparisons between Candidate Anti-Coronavirus Compounds.** *Viruses*
Tzou, P. L., Tao, K. n., Nouhin, J. n., Rhee, S. Y., Hu, B. D., Pai, S. n., Parkin, N. n., Shafer, R. W.
2020; 12 (9)
- **Multiplex Solid-Phase Melt Curve Analysis for the Point-of-Care Detection of HIV-1 Drug Resistance** *JOURNAL OF MOLECULAR DIAGNOSTICS*
Clutter, D. S., Mazarei, G., Sinha, R., Manasa, J., Nouhin, J., LaPrade, E., Bolouki, S., Tzou, P. L., Hannita-Hui, J., Sahoo, M. K., Kuimelis, P., Kuimelis, R. G., Pinsky, et al
2019; 21 (4): 580–92
- **Trends in the Molecular Epidemiology and Genetic Mechanisms of Transmitted Human Immunodeficiency Virus Type 1 Drug Resistance in a Large US Clinic Population** *CLINICAL INFECTIOUS DISEASES*
Rhee, S., Clutter, D., Fessel, W., Klein, D., Slome, S., Pinsky, B. A., Marcus, J. L., Hurley, L., Silverberg, M. J., Pond, S., Shafer, R. W.
2019; 68 (2): 213–21
- **Trends in the Molecular Epidemiology and Genetic Mechanisms of Transmitted HIV-1 Drug Resistance in a Large U.S. Clinic Population.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Rhee, S., Clutter, D., Fessel, W. J., Klein, D., Slome, S., Pinsky, B. A., Marcus, J. L., Hurley, L., Silverberg, M. J., Kosakovsky Pond, S. L., Shafer, R. W.
2018
- **Mutational Correlates of Virological Failure in Individuals Receiving a WHO-Recommended Tenofovir-Containing First-Line Regimen: An International Collaboration.** *EBioMedicine*
Rhee, S., Varghese, V., Holmes, S. P., van Zyl, G. U., Steegen, K., Boyd, M. A., Cooper, D. A., Nsanzimana, S., Saravanan, S., Charpentier, C., de Oliveira, T., Etiebet, M. A., Garcia, et al
2017; 18: 225-235
- **Evolution of gag and gp41 in Patients Receiving Ritonavir-Boosted Protease Inhibitors.** *Scientific reports*
Manasa, J. n., Varghese, V. n., Pond, S. L., Rhee, S. Y., Tzou, P. L., Fessel, W. J., Jang, K. S., White, E. n., Rögnvaldsson, T. n., Katzenstein, D. A., Shafer, R. W.
2017; 7 (1): 11559
- **HIV-1 drug resistance and resistance testing.** *Infection, genetics and evolution : journal of molecular epidemiology and evolutionary genetics in infectious diseases*

- Clutter, D. S., Jordan, M. R., Bertagnolio, S., Shafer, R. W.
2016
- **HIV-1 Protease, Reverse Transcriptase, and Integrase Variation** *JOURNAL OF VIROLOGY*
Rhee, S., Sankaran, K., Varghese, V., Winters, M. A., Hurt, C. B., Eron, J. J., Parkin, N., Holmes, S. P., Holodniy, M., Shafer, R. W.
2016; 90 (13): 6058-6070
 - **Response to Therapy in Antiretroviral Therapy-Naive Patients With Isolated Nonnucleoside Reverse Transcriptase Inhibitor-Associated Transmitted Drug Resistance** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Clutter, D. S., Fessel, W. J., Rhee, S., Hurley, L. B., Klein, D. B., Ioannidis, J. P., Silverberg, M. J., Shafer, R. W.
2016; 72 (2): 171-176
 - **Global epidemiology of drug resistance after failure of WHO recommended first-line regimens for adult HIV-1 infection: a multicentre retrospective cohort study** *LANCET INFECTIOUS DISEASES*
Gregson, J., Tang, M., Ndembu, N., Hamers, R. L., Rhee, S., Marconi, V. C., Diero, L., Brooks, K., Theys, K., de Wit, T. F., Arruda, M., Garcia, F., Monge, et al
2016; 16 (5): 565-575
 - **More effective drugs lead to harder selective sweeps in the evolution of drug resistance in HIV-1.** *eLife*
Feder, A. F., Rhee, S., Holmes, S. P., Shafer, R. W., Petrov, D. A., Pennings, P. S.
2016; 5
 - **Modifying Antiretroviral Therapy in Virologically Suppressed HIV-1-Infected Patients** *DRUGS*
Collins, S. E., Grant, P. M., Shafer, R. W.
2016; 76 (1): 75-98
 - **Geographic and Temporal Trends in the Molecular Epidemiology and Genetic Mechanisms of Transmitted HIV-1 Drug Resistance: An Individual-Patient- and Sequence-Level Meta-Analysis.** *PLoS medicine*
Rhee, S., Blanco, J. L., Jordan, M. R., Taylor, J., Lemey, P., Varghese, V., Hamers, R. L., Bertagnolio, S., de Wit, T. F., Aghokeng, A. F., Albert, J., Avi, R., Avila-Rios, et al
2015; 12 (4)
 - **HIV-1 Drug Resistance Mutations: Potential Applications for Point-of-Care Genotypic Resistance Testing.** *PLoS one*
Rhee, S., Jordan, M. R., Raizes, E., Chua, A., Parkin, N., Kantor, R., van Zyl, G. U., Mukui, I., Hosseinipour, M. C., Frenkel, L. M., Ndembu, N., Hamers, R. L., Rinke de Wit, et al
2015; 10 (12)
 - **A uniquely prevalent nonnucleoside reverse transcriptase inhibitor resistance mutation in Russian subtype A HIV-1 viruses** *AIDS*
Kolomeets, A. N., Varghese, V., Lemey, P., Bobkova, M. R., Shafer, R. W.
2014; 28 (17): F1-F8
 - **Non-nucleoside reverse transcriptase inhibitor (NNRTI) cross-resistance: implications for preclinical evaluation of novel NNRTIs and clinical genotypic resistance testing** *JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY*
Melikian, G. L., Rhee, S., Varghese, V., Porter, D., White, K., Taylor, J., Towner, W., Troia, P., Burack, J., deJesus, E., Robbins, G. K., Razzeca, K., Kagan, et al
2014; 69 (1): 12-20
 - **Prototypical Recombinant Multi-Protease-Inhibitor-Resistant Infectious Molecular Clones of Human Immunodeficiency Virus Type 1** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Varghese, V., Mitsuya, Y., Fessel, W. J., Liu, T. F., Melikian, G. L., Katzenstein, D. A., Schiffer, C. A., Holmes, S. P., Shafer, R. W.
2013; 57 (9): 4290-4299
 - **Trends in Genotypic HIV-1 Antiretroviral Resistance between 2006 and 2012 in South African Patients Receiving First- and Second-Line Antiretroviral Treatment Regimens** *PLOS ONE*
van Zyl, G. U., Liu, T. F., Claassen, M., Engelbrecht, S., de Oliveira, T., Preiser, W., Wood, N. T., Travers, S., Shafer, R. W.
2013; 8 (6)
 - **Nucleoside reverse transcriptase inhibitor resistance mutations associated with first-line stavudine-containing antiretroviral therapy: programmatic implications for countries phasing out stavudine.** *journal of infectious diseases*
Tang, M. W., Rhee, S., Bertagnolio, S., Ford, N., Holmes, S., Sigaloff, K. C., Hamers, R. L., de Wit, T. F., Fleury, H. J., Kanki, P. J., Ruxrungtham, K., Hawkins, C. A., Wallis, et al

2013; 207: S70-7

- **Low-Level Persistence of Drug Resistance Mutations in Hepatitis B Virus-Infected Subjects with a Past History of Lamivudine Treatment** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Margeridon-Thermet, S., Svarovskaia, E. S., Babrzadeh, F., Martin, R., Liu, T. F., Pacold, M., Reuman, E. C., Holmes, S. P., Borroto-Esoda, K., Shafer, R. W.
2013; 57 (1): 343-349
- **A Review of the Virological Efficacy of the 4 World Health Organization-Recommended Tenofovir-Containing Regimens for Initial HIV Therapy** *CLINICAL INFECTIOUS DISEASES*
Tang, M. W., Kanki, P. J., Shafer, R. W.
2012; 54 (6): 862-875
- **HIV-1 Antiretroviral Resistance: Scientific Principles and Clinical Applications** *DRUGS*
Tang, M. W., Shafer, R. W.
2012; 72 (9): E1-E25
- **The efficacy of an anti-CD4 monoclonal antibody for HIV-1 treatment** *ANTIVIRAL RESEARCH*
Fessel, W. J., Anderson, B., Follansbee, S. E., Winters, M. A., Lewis, S. T., Weinheimer, S. P., Petropoulos, C. J., Shafer, R. W.
2011; 92 (3): 484-487
- **HIV-1 Integrase Inhibitor Resistance and Its Clinical Implications** *JOURNAL OF INFECTIOUS DISEASES*
Blanco, J., Varghese, V., Rhee, S., Gatell, J. M., Shafer, R. W.
2011; 203 (9): 1204-1214
- **Comparison of the Mechanisms of Drug Resistance among HIV, Hepatitis B, and Hepatitis C** *VIRUSES-BASEL*
Margeridon-Thermet, S., Shafer, R. W.
2010; 2 (12): 2696-2739
- **HIV-1 Protease Mutations and Protease Inhibitor Cross-Resistance** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Rhee, S., Taylor, J., Fessel, W. J., Kaufman, D., Towner, W., Troia, P., Ruane, P., Hellinger, J., Shirvani, V., Zolopa, A., Shafer, R. W.
2010; 54 (10): 4253-4261
- **Minority Variants Associated with Transmitted and Acquired HIV-1 Nonnucleoside Reverse Transcriptase Inhibitor Resistance: Implications for the Use of Second-Generation Nonnucleoside Reverse Transcriptase Inhibitors** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Varghese, V., Shahriar, R., Rhee, S., Liu, T., Simen, B. B., Egholm, M., Hanczaruk, B., Blake, L. A., Gharizadeh, B., Babrzadeh, F., Bachmann, M. H., Fessel, W. J., Shafer, et al
2009; 52 (3): 309-315
- **Predictive Value of HIV-1 Genotypic Resistance Test Interpretation Algorithms** *JOURNAL OF INFECTIOUS DISEASES*
Rhee, S., Fessel, W. J., Liu, T. F., Marlowe, N. M., Rowland, C. M., Rode, R. A., Vandamme, A., Van Laethem, K., Brun-Vezinet, F., Calvez, V., Taylor, J., Hurley, L., Horberg, et al
2009; 200 (3): 453-463
- **Ultra-Deep Pyrosequencing of Hepatitis B Virus Quasispecies from Nucleoside and Nucleotide Reverse-Transcriptase Inhibitor (NRTI)-Treated Patients and NRTI-Naive Patients** *15th Conference on Retroviruses and Opportunistic Infections*
Margeridon-Thermet, S., Shulman, N. S., Ahmed, A., Shahriar, R., Liu, T., Wang, C., Holmes, S. P., Babrzadeh, F., Gharizadeh, B., Hanczaruk, B., Simen, B. B., Egholm, M., Shafer, et al
OXFORD UNIV PRESS INC.2009: 1275-85
- **Drug Resistance Mutations for Surveillance of Transmitted HIV-1 Drug-Resistance: 2009 Update** *PLOS ONE*
Bennett, D. E., Camacho, R. J., Otelea, D., Kuritzkes, D. R., Fleury, H., Kiuchi, M., Heneine, W., Kantor, R., Jordan, M. R., Schapiro, J. M., Vandamme, A., Sandstrom, P., Boucher, et al
2009; 4 (3)
- **Low-Abundance Drug-Resistant HIV-1 Variants: Finding Significance in an Era of Abundant Diagnostic and Therapeutic Options** *JOURNAL OF INFECTIOUS DISEASES*
Shafer, R. W.
2009; 199 (5): 610-612

- **A transitional endogenous lentivirus from the genome of a basal primate and implications for lentivirus evolution** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Gifford, R. J., Katzourakis, A., Tristem, M., Pybus, O. G., Winters, M., Shafer, R. W.
2008; 105 (51): 20362-20367
- **Characterization of mutation spectra with ultra-deep pyrosequencing: Application to HIV-1 drug resistance** *GENOME RESEARCH*
Wang, C., Mitsuya, Y., Gharizadeh, B., Ronaghi, M., Shafer, R. W.
2007; 17 (8): 1195-1201
- **HIV-1 subtype B protease and reverse transcriptase amino acid covariation** *PLOS COMPUTATIONAL BIOLOGY*
Rhee, S., Liu, T. F., Holmes, S. P., Shafer, R. W.
2007; 3 (5): 836-843
- **Genotypic predictors of human immunodeficiency virus type 1 drug resistance** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Rhee, S., Taylor, J., Wadhera, G., Ben-Hur, A., Brutlag, D. L., Shafer, R. W.
2006; 103 (46): 17355-17360
- **Rationale and uses of a public HIV drug-resistance database** *Symposium on Bridging Generations Toward an Understanding of Infectious Disease Pathogenesis*
Shafer, R. W.
UNIV CHICAGO PRESS.2006: S51-S58
- **HIV-1 pol mutation frequency by subtype and treatment experience: extension of the HIVseq program to seven non-B subtypes** *AIDS*
Rhee, S. Y., Kantor, R., Katzenstein, D. A., Camacho, R., Morris, L., Sirivichayakul, S., Jorgensen, L., Brigido, L. F., Schapiro, J. M., Shafer, R. W.
2006; 20 (5): 643-651
- **Panel of prototypical infectious molecular HIV-1 clones containing multiple nucleoside reverse transcriptase inhibitor resistance mutations** *AIDS*
Johnston, E., Dupnik, K. M., Gonzales, M. J., Winters, M. A., Rhee, S. Y., Imamichi, T., Shafer, R. W.
2005; 19 (7): 731-733
- **Impact of HIV-1 subtype and antiretroviral therapy on protease and reverse transcriptase genotype: Results of a global collaboration** *PLOS MEDICINE*
Kantor, R., Katzenstein, D. A., Efron, B., CARVALHO, A. P., Wynhoven, B., Cane, P., Clarke, J., Sirivichayakul, S., Soares, M. A., Snoeck, J., Pillay, C., Rudich, H., Rodrigues, et al
2005; 2 (4): 325-337
- **Comparison of four-drug regimens and pairs of sequential three-drug regimens as initial therapy for HIV-1 infection** *NEW ENGLAND JOURNAL OF MEDICINE*
Shafer, R. W., Smeaton, L. M., Robbins, G. K., De Gruttola, V., Snyder, S. W., D'Aquila, R. T., JOHNSON, V. A., Morse, G. D., Nokta, M. A., Martinez, A. I., Gripshover, B. M., Kaul, P., Haubrich, et al
2003; 349 (24): 2304-2315
- **Colinearity of reverse transcriptase inhibitor resistance mutations detected by population-based sequencing** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Gonzales, M. J., JOHNSON, E., Dupnik, K. M., Imamichi, T., Shafer, R. W.
2003; 34 (4): 398-402
- **Extended spectrum of HIV-1 reverse transcriptase mutations in patients receiving multiple nucleoside analog inhibitors** *AIDS*
Gonzales, M. J., Wu, T. D., Taylor, J., Belitskaya, F., Kantor, R., Israelski, D., Chou, S., Zolopa, A. R., Fessel, W. J., Shafer, R. W.
2003; 17 (6): 791-799
- **Mutation patterns and structural correlates in human immunodeficiency virus type 1 protease following different protease inhibitor treatments** *JOURNAL OF VIROLOGY*
Wu, T. D., Schiffer, C. A., Gonzales, M. J., Taylor, J., Kantor, R., Chou, S. W., Israelski, D., Zolopa, A. R., Fessel, W. J., Shafer, R. W.
2003; 77 (8): 4836-4847
- **Human immunodeficiency virus reverse transcriptase and protease sequence database** *NUCLEIC ACIDS RESEARCH*
Rhee, S. Y., Gonzales, M. J., Kantor, R., Betts, B. J., Ravela, J., Shafer, R. W.
2003; 31 (1): 298-303

- **Human immunodeficiency virus type 1 reverse transcriptase and protease mutation search engine for queries** *NATURE MEDICINE*
Shafer, R. W., Jung, D. R., Betts, B. J.
2000; 6 (11): 1290-1292
- **Multiple concurrent reverse transcriptase and protease mutations and multidrug resistance of HIV-1 isolates from heavily treated patients** *ANNALS OF INTERNAL MEDICINE*
Shafer, R. W., Winters, M. A., Palmer, S., Merigan, T. C.
1998; 128 (11): 906-911
- **Tuberculosis in patients infected with human immunodeficiency virus: Perspective on the past decade** *CLINICAL INFECTIOUS DISEASES*
Shafer, R. W., Edlin, B. R.
1996; 22 (4): 683-704
- **Predictors of survival in HIV-infected tuberculosis patients** *AIDS*
Shafer, R. W., Bloch, A. B., Larkin, C., VASUDAVAN, V., SELIGMAN, S., Dehovitz, J. D., DiFerdinando, G., Stoneburner, R., Cauthen, G.
1996; 10 (3): 269-272
- **TEMPORAL TRENDS AND TRANSMISSION PATTERNS DURING THE EMERGENCE OF MULTIDRUG-RESISTANT TUBERCULOSIS IN NEW-YORK-CITY - A MOLECULAR EPIDEMIOLOGIC ASSESSMENT** *JOURNAL OF INFECTIOUS DISEASES*
Shafer, R. W., Small, P. M., Larkin, C., Singh, S. P., Kelly, P., Sierra, M. F., SCHOOLNIK, G., Chirgwin, K. D.
1995; 171 (1): 170-176
- **COMBINATION THERAPY WITH ZIDOVUDINE AND DIDANOSINE SELECTS FOR DRUG-RESISTANT HUMAN-IMMUNODEFICIENCY-VIRUS TYPE-1 STRAINS WITH UNIQUE PATTERNS OF POL GENE-MUTATIONS** *JOURNAL OF INFECTIOUS DISEASES*
Shafer, R. W., Kozal, M. J., Winters, M. A., Iversen, A. K., Katzenstein, D. A., Ragni, M. V., Meyer, W. A., Gupta, P., Rasheed, S., COOMBS, R., Katzman, M., Fiscus, S., Merigan, et al
1994; 169 (4): 722-729
- **EXOGENOUS REINFECTION WITH MULTIDRUG-RESISTANT MYCOBACTERIUM-TUBERCULOSIS IN PATIENTS WITH ADVANCED HIV-INFECTION** *NEW ENGLAND JOURNAL OF MEDICINE*
Small, P. M., Shafer, R. W., Hopewell, P. C., Singh, S. P., MURPHY, M. J., Desmond, E., Sierra, M. F., SCHOOLNIK, G. K.
1993; 328 (16): 1137-1144
- **EXTRAPULMONARY TUBERCULOSIS IN PATIENTS WITH HUMAN-IMMUNODEFICIENCY-VIRUS INFECTION** *MEDICINE*
Shafer, R. W., Kim, D. S., Weiss, J. P., Quale, J. M.
1991; 70 (6): 384-397
- **Extensive diversity and impact of drug-resistant HIV-1 variants in individuals with prior virologic failure.** *PLoS pathogens*
Pillay, M., Choudhary, M. C., Deo, R., Naumenko, S., Tamura, T. J., Etemad, B., Edelstein, G., Khan, A., Govender, K., Govender, S., Tzou, P., Mick, M., Herbert, et al
2026; 22 (5): e1014118
- **Plasma Extracellular Vesicle Surface Marker Profiling Reveals Immune Cell-Associated Mitochondrial Membrane Potential Alterations in Long COVID and Myalgic Encephalomyelitis/Chronic Fatigue Syndrome.** *Open forum infectious diseases*
Ikeda, G., Koike-Ieki, M., Inoue, H., Dadhania, A. V., El Kamari, V., Jagannathan, P., Geng, L. N., Miglis, M. G., Shafer, R. W., Yang, P. C., Bonilla, H. F.
2026; 13 (5): ofag209
- **Understanding the clinical implications of the barrier against resistance in antiretroviral treatment.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Llibre, J. M., Kuritzkes, D. R., Martin-Iguacel, R., Ripamonti, D., Gupta, R. K., Sax, P. E., Schapiro, J. M., Shafer, R. W., Mesplède, T.
2026
- **2025 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Treatment and Management of COVID-19: Antiviral Treatment for Mild to Moderate COVID-19 in Adults.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Shumaker, A. H., Bhimraj, A., Bedimo, R., Cheng, V. C., Chew, K. W., Daar, E. S., Glidden, D. V., Shafer, R. W., Tien, P. C., Baden, L. R., Cawcutt, K., Chiotos, K., Dzierba, et al
2026
- **HIV-1 subtype diversity trends in a Northern California cohort.** *AIDS (London, England)*

- Tao, K., Tzou, P. L., Sahoo, M. K., Hare, C. B., Pinsky, B. A., Shafer, R. W.
2026; 40 (4): 530-532
- **2025 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Treatment and Management of COVID-19: Baricitinib vs. Tocilizumab.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Nadig, N., Bhimraj, A., Cawcutt, K., Chiotos, K., Dzierba, A. L., Kim, A. Y., Martin, G. S., Pearson, J. C., Shumaker, A. H., Baden, L. R., Bedimo, R., Cheng, V. C., Chew, et al
2026
 - **GenBank2PubMed: bridging viral genomic data and the scientific literature with AI-assisted curation.** *Scientific reports*
Tao, K., Zhou, J., Getaneh, Y., Shafer, R. W.
2025
 - **Can Low Cortisol Predict Long COVID? A Controversial Issue.** *Biomedicines*
Quach, T. C., Wilson, A., Sum-Ping, O., Lomba, S., Geng, L. N., Shafer, R., Miglis, M. G., Yang, P. C., Grossman, L., Ricciardiello, G., Bonilla, H.
2025; 13 (11)
 - **POST-COVID-19 VACCINATION AND LONG COVID: INSIGHTS FROM PATIENT REPORTED DATA**
Quach, T. C., Miglis, M., Tian, L., Bonilla, H., Yang, P. C., Paleru, A., Xin, V., Tiwari, A., Shafer, R. W., Geng, L. N.
SPRINGER.2025: S589
 - **Emergent Human Immunodeficiency Virus Type 1 (HIV-1) Drug Resistance in Randomized Trials of Contemporary Antiretroviral Regimens.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Llibre, J. M., Ripamonti, D., Geretti, A. M., Martin-Iguacel, R., Sax, P. E., Gupta, R. K., Shafer, R. W., Schapiro, J. M., Kuritzkes, D. R., Mesplède, T.
2025
 - **2025 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Treatment and Management of COVID-19: Abatacept.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Nadig, N., Bhimraj, A., Cawcutt, K., Chiotos, K., Dzierba, A. L., Kim, A. Y., Martin, G. S., Pearson, J. C., Shumaker, A. H., Baden, L. R., Bedimo, R., Cheng, V. C., Chew, et al
2025
 - **2025 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Treatment and Management of COVID-19: Infliximab.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Nadig, N., Bhimraj, A., Cawcutt, K., Chiotos, K., Dzierba, A. L., Kim, A. Y., Martin, G. S., Pearson, J. C., Shumaker, A. H., Baden, L. R., Bedimo, R., Cheng, V. C., Chew, et al
2025
 - **Design and evaluation of next-generation HIV genotyping for detection of resistance mutations to 28 antiretroviral drugs across five major classes including lenacapavir.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Park, S. Y., Takayama, C., Ryu, J., Sattah, M., Badii, Z., Kim, J. W., Shafer, R. W., Gorbach, P. M., Lee, H. Y.
2025
 - **2025 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Treatment and Management of COVID-19: Pemivibart for Pre-exposure Prophylaxis, Vilobelimab for Critical Illness, and Abatacept or Infliximab for Severe or Critical Illness.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Bhimraj, A., Falck-Ytter, Y., Baden, L. R., Bedimo, R., Cawcutt, K., Cheng, V. C., Chew, K. W., Chiotos, K., Daar, E. S., Dzierba, A. L., Glidden, D. V., Hardy, E. J., Johnson, et al
2025
 - **Lenacapavir-associated drug resistance: implications for scaling up long-acting HIV pre-exposure prophylaxis.** *The lancet. HIV*
van Zyl, G., Prochazka, M., Schmidt, H. A., Orrell, C., Schapiro, J. M., McCluskey, S. M., Vitoria, M., Kantor, R., Parikh, U. M., Rodolph, M., Jordan, M. R., Shafer, R. W.
2025
 - **2025 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Treatment and Management of COVID-19: Vilobelimab.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Nadig, N., Bhimraj, A., Cawcutt, K., Chiotos, K., Dzierba, A. L., Kim, A. Y., Martin, G. S., Pearson, J. C., Shumaker, A. H., Baden, L. R., Bedimo, R., Cheng, V. C., Chew, et al
2025
 - **2025 update of the drug resistance mutations in HIV-1.** *Topics in antiviral medicine*

- Wensing, A. M., Calvez, V., Ceccherini-Silberstein, F., Charpentier, C., Günthard, H. F., Jacobsen, D. M., Paredes, R., Shafer, R. W., Richman, D. D. 2025; 33 (2): 457-473
- **2025 update of the drug resistance mutations in HIV-1.** *Topics in antiviral medicine*
Wensing, A. M., Calvez, V., Ceccherini-Silberstein, F., Charpentier, C., Günthard, H. F., Jacobsen, D. M., Paredes, R., Shafer, R. W., Richman, D. D. 2025; 33 (2): 457-473
 - **Hepatitis B virus resistance to nucleos(t)ide analogue therapy: WHO consultation on questions, challenges, and a roadmap for the field.** *The Lancet. Microbe*
Lumley, S. F., Mokaya, J., Maponga, T. G., Kramvis, A., Dusheiko, G., Irving, W., Delphin, M., Said Mohammed, K., Downs, L. O., Waddilove, E., Anderson, M., Iwuji, C., Msomi, et al
2025: 101076
 - **Utilizing HIV Proviral DNA to Assess for the Presence of HIV Drug Resistance.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Wensing, A. M., Charpentier, C., Calvez, V., Ceccherini-Silberstein, F., Günthard, H. F., Jacobsen, D. M., Paredes, R., Shafer, R. W., Richman, D. D. 2025
 - **Non-canonical HIV drug resistance mutations: need to close existing gaps.** *AIDS (London, England)*
Inzaule, S., Jordan, M. R., Fokam, J., Hamers, R. L., Paredes, R., Crowell, T. A., Shafer, R. W., Schapiro, J., Wit, T. F., Charurat, M., Kuritzkes, D. R., Ndembu, N.
2025
 - **Can Low Cortisol Predict Long COVID? A Controversial Issue** *Biomedicines*
Quach, T. C., Wilson, A., Sum-Ping, O., Lomba, S., Geng, L. N., Shafer, R., Miglis, M. G., Yang, P. C., Grossman, L., Ricciardiello, G., Bonilla, H. 2025; 13 (11): 2636
 - **Post-COVID-19 Vaccination and Long COVID: Insights from Patient-Reported Data.** *Vaccines*
Quach, T. C., Miglis, M. G., Tian, L., Bonilla, H., Yang, P. C., Grossman, L., Paleru, A., Xin, V., Tiwari, A., Shafer, R. W., Geng, L. N. 2024; 12 (12)
 - **Post-COVID-19 Vaccination and Long COVID: Insights from Patient-Reported Data** *VACCINES*
Quach, T. C., Miglis, M. G., Tian, L., Bonilla, H., Yang, P. C., Grossman, L., Paleru, A., Xin, V., Tiwari, A., Shafer, R. W., Geng, L. N. 2024; 12 (12)
 - **Spectrum of Non-Nucleoside Reverse Transcriptase Inhibitor-Associated Drug Resistance Mutations in Persons Living with HIV-1 Receiving Rilpivirine.** *Viruses*
Nagarajan, P., Zhou, J., Di Teodoro, G., Incardona, F., Seguin-Devaux, C., Kaiser, R., Abecasis, A. B., Gomes, P., Tao, K., Zazzi, M., Shafer, R. W. 2024; 16 (11)
 - **2024 Clinical Practice Guideline Update by the Infectious Diseases Society of America on the Management of COVID-19: Anti-SARS-CoV-2 Neutralizing Antibody Pemivbart for Pre-exposure Prophylaxis.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Bhimraj, A., Falck-Ytter, Y., Kim, A. Y., Li, J. Z., Baden, L. R., Johnson, S., Shafer, R. W., Shoham, S., Tebas, P., Bedimo, R., Cheng, V. C., Chew, K. W., Chiotos, et al
2024
 - **Emerging SARS-CoV-2 Resistance After Antiviral Treatment.** *JAMA network open*
Tamura, T. J., Choudhary, M. C., Deo, R., Yousuf, F., Gomez, A. N., Edelstein, G. E., Boucau, J., Glover, O. T., Barry, M., Gilbert, R. F., Reynolds, Z., Li, Y., Tien, et al
2024; 7 (9): e2435431
 - **Comprehensive Database of HIV Mutations Selected During Antiretroviral In Vitro Passage Experiments.** *Antiviral research*
Tao, K., Zhou, J., Nagarajan, P., Tzou, P. L., Shafer, R. W.
2024: 105988
 - **GPT-4 performance on querying scientific publications: reproducibility, accuracy, and impact of an instruction sheet.** *BMC medical research methodology*
Tao, K., Osman, Z. A., Tzou, P. L., Rhee, S. Y., Ahluwalia, V., Shafer, R. W.
2024; 24 (1): 139

- **Nirmatrelvir-Ritonavir and Symptoms in Adults With Postacute Sequelae of SARS-CoV-2 Infection: The STOP-PASC Randomized Clinical Trial.** *JAMA internal medicine*
Geng, L. N., Bonilla, H., Hedlin, H., Jacobson, K. B., Tian, L., Jagannathan, P., Yang, P. C., Subramanian, A. K., Liang, J. W., Shen, S., Deng, Y., Shaw, B. J., Botzheim, et al
2024
- **Low-dose naltrexone use for the management of post-acute sequelae of COVID-19.** *International immunopharmacology*
Bonilla, H., Tian, L., Marconi, V. C., Shafer, R., McComsey, G. A., Miglis, M., Yang, P., Bonilla, A., Eggert, L., Geng, L. N.
2023; 124 (Pt B): 110966
- **Human immunodeficiency virus 1 5'-leader mutations in plasma viruses before and after the development of reverse transcriptase inhibitor-resistance mutations.** *The Journal of general virology*
Nouhin, J., Tzou, P. L., Rhee, S., Sahoo, M. K., Pinsky, B. A., Krupkin, M., Puglisi, J. D., Puglisi, E. V., Shafer, R. W.
2023; 104 (10)
- **Checklist for studies of HIV drug resistance prevalence or incidence: rationale and recommended use.** *The lancet. HIV*
Mbuagbaw, L., Garcia, C., Brenner, B., Cecchini, D., Chakroun, M., Djadeu, P., Holguin, A., Mor, O., Parkin, N., Santoro, M. M., Ávila-Ríos, S., Fokam, J., Phillips, et al
2023
- **HIV-1 5'-Leader Mutations in Plasma Viruses Before and After the Development of Reverse Transcriptase Inhibitor-Resistance Mutations.** *medRxiv : the preprint server for health sciences*
Nouhin, J., Tzou, P., Rhee, S., Sahoo, M. K., Pinsky, B. A., Krupkin, M. A., Puglisi, J. D., Puglisi, E. V., Shafer, R. W.
2023
- **HIV-1 Group M Capsid Amino Acid Variability: Implications for Sequence Quality Control of Genotypic Resistance Testing.** *Viruses*
Tao, K., Rhee, S. Y., Tzou, P. L., Osman, Z. A., Pond, S. L., Holmes, S. P., Shafer, R. W.
2023; 15 (4)
- **Myalgic Encephalomyelitis/Chronic Fatigue Syndrome is common in post-acute sequelae of SARS-CoV-2 infection (PASC): Results from a post-COVID-19 multidisciplinary clinic.** *Frontiers in neurology*
Bonilla, H., Quach, T. C., Tiwari, A., Bonilla, A. E., Miglis, M., Yang, P. C., Eggert, L. E., Sharifi, H., Horomanski, A., Subramanian, A., Smirnoff, L., Simpson, N., Halawi, et al
2023; 14: 1090747
- **Potential role of doravirine for the treatment of HIV-1-infected persons with transmitted drug resistance.** *AIDS research and therapy*
Rhee, S., Schapiro, J. M., Saladini, F., Zazzi, M., Khoo, S., Shafer, R. W.
2023; 20 (1): 8
- **Predicted effects of the introduction of long-acting injectable cabotegravir pre-exposure prophylaxis in sub-Saharan Africa: a modelling study.** *The lancet. HIV*
Smith, J., Bansi-Matharu, L., Cambiano, V., Dimitrov, D., Bershteyn, A., van de Vijver, D., Kripke, K., Revill, P., Boily, M., Meyer-Rath, G., Taramusi, I., Lundgren, J. D., van Oosterhout, et al
2023
- **Insights into HIV-1 Transmission Dynamics Using Routinely Collected Data in the Mid-Atlantic United States.** *Viruses*
Kassaye, S. G., Grossman, Z., Vengurlekar, P., Chai, W., Wallace, M., Rhee, S. Y., Meyer, W. A., Kaufman, H. W., Castel, A., Jordan, J., Crandall, K. A., Kang, A., Kumar, et al
2022; 15 (1)
- **Highly Ambiguous HIV-1 pol Positions Encoding Multiple Amino Acids Usually Result from Antiviral or Immune Selection Pressure.** *AIDS research and human retroviruses*
Tao, K., Rhee, S., Tzou, P. L., Holmes, S., Shafer, R. W.
2022
- **Sierra SARS-CoV-2 sequence and antiviral resistance analysis program.** *Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology*
Tzou, P. L., Tao, K., Sahoo, M. K., Kosakovsky Pond, S. L., Pinsky, B. A., Shafer, R. W.
2022; 157: 105323
- **2022 update of the drug resistance mutations in HIV-1.** *Topics in antiviral medicine*

Wensing, A. M., Calvez, V., Ceccherini-Silberstein, F., Charpentier, C., Gunthard, H. F., Paredes, R., Shafer, R. W., Richman, D. D.
2022; 30 (4): 559-574

- **Genotypic correlates of resistance to the HIV-1 strand transfer integrase inhibitor cabotegravir.** *Antiviral research*
Rhee, S., Parkin, N., Harrigan, P. R., Holmes, S., Shafer, R. W.
2022: 105427
- **Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Bhimraj, A., Morgan, R. L., Shumaker, A. H., Baden, L., Cheng, V. C., Edwards, K. M., Gallagher, J. C., Gandhi, R. T., Muller, W. J., Nakamura, M. M., O'Horo, J. C., Shafer, R. W., Shoham, et al
2022
- **Spectrum of Atazanavir-Selected Protease Inhibitor-Resistance Mutations.** *Pathogens (Basel, Switzerland)*
Rhee, S., Boehm, M., Tarasova, O., Di Teodoro, G., Abecasis, A. B., Sonnerborg, A., Bailey, A. J., Kireev, D., Zazzi, M., The EuResist Network Study Group, Shafer, R. W.
2022; 11 (5)
- **A Partially Multiplexed HIV Drug Resistance (HIVDR) Assay for Monitoring HIVDR Mutations of the Protease, Reverse-Transcriptase (PRRT), and Integrase (INT).** *Microbiology spectrum*
DeVos, J., McCarthy, K., Sewe, V., Akinyi, G., Junghae, M., Opollo, V., Nouhin, J., Shafer, R., Zeh, C., Ramos, A., Alexander, H., Chang, J.
2022: e0177621
- **Selection analysis identifies clusters of unusual mutational changes in Omicron lineage BA.1 that likely impact Spike function.** *Molecular biology and evolution*
Martin, D. P., Lytras, S., Lucaci, A. G., Maier, W., Grüning, B., Shank, S. D., Weaver, S., MacLean, O. A., Orton, R. J., Lemey, P., Boni, M. F., Tegally, H., Harkins, et al
2022
- **Selection analysis identifies unusual clustered mutational changes in Omicron lineage BA.1 that likely impact Spike function.** *bioRxiv : the preprint server for biology*
Martin, D. P., Lytras, S., Lucaci, A. G., Maier, W., Grüning, B., Shank, S. D., Weaver, S., MacLean, O. A., Orton, R. J., Lemey, P., Boni, M. F., Tegally, H., Harkins, et al
2022
- **Adherence to contemporary antiretroviral treatment regimens and impact on immunological and virologic outcomes in a US healthcare system.** *PLoS one*
T Tchakoute, C., Rhee, S., Hare, C. B., Shafer, R. W., Sainani, K.
2022; 17 (2): e0263742
- **Integrase Strand Transfer Inhibitor Resistance in Integrase Strand Transfer Inhibitor-Naive Persons** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Bailey, A. J., Rhee, S., Shafer, R. W.
2021; 37 (10): 736-743
- **Temporal Trends in HIV-1 Mutations Used for the Surveillance of Transmitted Drug Resistance.** *Viruses*
Rhee, S., Tzou, P. L., Shafer, R. W.
2021; 13 (5)
- **Integrase Strand Transfer Inhibitor Resistance in Integrase Strand Transfer Inhibitor-Naïve Persons.** *AIDS research and human retroviruses*
Bailey, A. J., Rhee, S. Y., Shafer, R. W.
2021
- **SARS-CoV-2 Variants and Their Relevant Mutational Profiles: Update Summer 2021.** *Microbiology spectrum*
Alkhatib, M., Svicher, V., Salpini, R., Ambrosio, F. A., Bellocchi, M. C., Carioti, L., Piermatteo, L., Scutari, R., Costa, G., Artese, A., Alcaro, S., Shafer, R., Ceccherini-Silberstein, et al
2021: e0109621
- **SARS-CoV-2 Neutralization Resistance Mutations in Patient with HIV/AIDS, California, USA.** *Emerging infectious diseases*
Hoffman, S. A., Costales, C., Sahoo, M. K., Palanisamy, S., Yamamoto, F., Huang, C., Verghese, M., Solis, D. C., Sibai, M., Subramanian, A., Tompkins, L. S., Grant, P., Shafer, et al

2021; 27 (10)

- **A SARS-CoV-2 antiviral therapy score card.** *Global health & medicine*
Shafer, R. W.
2020; 2 (6): 346–49
- **In vitro cross-resistance to doravirine in a panel of HIV-1 clones harbouring multiple NNRTI resistance mutations.** *The Journal of antimicrobial chemotherapy*
Saladini, F., Giammarino, F., Hosseini, B. A., Giannini, A., Boccutto, A., Dragoni, F., Vicenti, I., Shafer, R. W., Zazzi, M.
2020
- **Next-Generation Sequencing for HIV Drug Resistance Testing: Laboratory, Clinical, and Implementation Considerations.** *Viruses*
Avila-Rios, S., Parkin, N., Swanstrom, R., Paredes, R., Shafer, R., Ji, H., Kantor, R.
2020; 12 (6)
- **Cost-effectiveness analysis of pre-ART HIV drug resistance testing in Kenyan women.** *EClinicalMedicine*
Duarte, H. A., Babigumira, J. B., Enns, E. A., Stauffer, D. C., Shafer, R. W., Beck, I. A., Garrison, L. P., Chung, M. H., Frenkel, L. M., Bendavid, E.
2020; 22: 100355
- **Expanded Spectrum of Antiretroviral-Selected Mutations in Human Immunodeficiency Virus Type 2.** *The Journal of infectious diseases*
Tzou, P. L., Descamps, D., Rhee, S., Raugi, D. N., Charpentier, C., Taveira, N., Smith, R. A., Soriano, V., de Mendoza, C., Holmes, S. P., Gottlieb, G. S., Shafer, R. W.
2020
- **Dry Panels Supporting External Quality Assessment Programs for Next Generation Sequencing-Based HIV Drug Resistance Testing.** *Viruses*
Noguera-Julian, M. n., Lee, E. R., Shafer, R. W., Kantor, R. n., Ji, H. n.
2020; 12 (6)
- **HIV-1 transmitted drug resistance surveillance: shifting trends in study design and prevalence estimates.** *Journal of the International AIDS Society*
Rhee, S. Y., Kassaye, S. G., Barrow, G. n., Sundaramurthi, J. C., Jordan, M. R., Shafer, R. W.
2020; 23 (9): e25611
- **Predictors of first-line antiretroviral therapy failure among adults and adolescents living with HIV/AIDS in a large prevention and treatment program in Nigeria.** *AIDS research and therapy*
Ndembi, N. n., Murtala-Ibrahim, F. n., Tola, M. n., Jumare, J. n., Aliyu, A. n., Alabi, P. n., Mensah, C. n., Abimiku, A. n., Quiñones-Mateu, M. E., Crowell, T. A., Rhee, S. Y., Shafer, R. W., Gupta, et al
2020; 17 (1): 64
- **2019 update of the drug resistance mutations in HIV-1.** *Topics in antiviral medicine*
Wensing, A. M., Calvez, V., Ceccherini-Silberstein, F., Charpentier, C., Gunthard, H. F., Paredes, R., Shafer, R. W., Richman, D. D.
2019; 27 (3): 111–21
- **Prospective Evaluation of the Vela Diagnostics Next-Generation Sequencing Platform for HIV-1 Genotypic Resistance Testing.** *The Journal of molecular diagnostics : JMD*
Weber, J., Volkova, I., Sahoo, M. K., Tzou, P. L., Shafer, R. W., Pinsky, B. A.
2019
- **Amino Acid Prevalence of HIV-1 pol Mutations by Direct PCR and Single Genome Sequencing.** *AIDS research and human retroviruses*
Tzou, P. L., Rhee, S., Shafer, R.
2019
- **The Clinical Implications of Pretreatment Drug Resistance-A Moving Target** *CLINICAL INFECTIOUS DISEASES*
Shafer, R. W., Frenkel, L. M.
2019; 69 (2): 215–17
- **DOLUTEGRAVIR ROLLOUT AND EXPECTED PREVALENCE OF PRETREATMENT DRUG RESISTANCE TO ANTIRETROVIRAL THERAPY AMONG KENYAN WOMEN**
Duarte, H., Enns, E., Stauffer, D., Shafer, R., Bendavid, E.
BMJ PUBLISHING GROUP.2019: A137–A138

- **Curbing the rise of HIV drug resistance in low-income and middle-income countries: the role of dolutegravir-containing regimens** *LANCET INFECTIOUS DISEASES*
Inzaule, S. C., Hamers, R. L., Doherty, M., Shafer, R. W., Bertagnolio, S., de Wit, T.
2019; 19 (7): E246–E252
- **Resistance Testing for Integrase Strand Transfer Inhibitors in Naive, Human Immunodeficiency Virus-infected Individuals Reply** *CLINICAL INFECTIOUS DISEASES*
Gunthard, H. F., Calvez, V., Paredes, R., Pillay, D., Shafer, R. W., Wensing, A. M., Jacobsen, D. M., Richman, D. D.
2019; 68 (11): 1977–78
- **National and International Dimensions of Human Immunodeficiency Virus-1 Sequence Clusters in a Northern California Clinical Cohort** *OPEN FORUM INFECTIOUS DISEASES*
Rhee, S., Magalis, B. R., Hurley, L., Silverberg, M. J., Marcus, J. L., Slome, S., Pond, S., Shafer, R. W.
2019; 6 (4)
- **National and International Dimensions of Human Immunodeficiency Virus-1 Sequence Clusters in a Northern California Clinical Cohort.** *Open forum infectious diseases*
Rhee, S., Magalis, B. R., Hurley, L., Silverberg, M. J., Marcus, J. L., Slome, S., Kosakovsky Pond, S. L., Shafer, R. W.
2019; 6 (4): ofz135
- **Curbing the rise of HIV drug resistance in low-income and middle-income countries: the role of dolutegravir-containing regimens.** *The Lancet. Infectious diseases*
Inzaule, S. C., Hamers, R. L., Doherty, M., Shafer, R. W., Bertagnolio, S., Rinke de Wit, T. F.
2019
- **Trends in Pretreatment HIV-1 Drug Resistance in Antiretroviral Therapy-naive Adults in South Africa, 2000-2016: A Pooled Sequence Analysis.** *EClinicalMedicine*
Chimukangara, B., Lessells, R. J., Rhee, S., Giandhari, J., Kharsany, A. B., Naidoo, K., Lewis, L., Cawood, C., Khanyile, D., Ayalew, K. A., Diallo, K., Samuel, R., Hunt, et al
2019; 9: 26–34
- **Moderate-to-High Levels of Pretreatment HIV Drug Resistance in KwaZulu-Natal Province, South Africa** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Chimukangara, B., Kharsany, A. B. M., Lessells, R. J., Naidoo, K., Rhee, S., Manasa, J., Graef, T., Lewis, L., Cawood, C., Khanyile, D., Diallo, K., Ayalew, K. A., Shafer, et al
2019; 35 (2): 129–38
- **Human Immunodeficiency Virus Drug Resistance: 2018 Recommendations of the International Antiviral Society-USA Panel** *CLINICAL INFECTIOUS DISEASES*
Gunthard, H. F., Calvez, V., Paredes, R., Pillay, D., Shafer, R. W., Wensing, A. M., Jacobsen, D. M., Richman, D. D.
2019; 68 (2): 177–87
- **A systematic review of the genetic mechanisms of dolutegravir resistance.** *The Journal of antimicrobial chemotherapy*
Rhee, S. Y., Grant, P. M., Tzou, P. L., Barrow, G. n., Harrigan, P. R., Ioannidis, J. P., Shafer, R. W.
2019
- **Multiplex Solid-Phase Melt Curve Analysis for the Point-of-Care Detection of HIV-1 Drug Resistance.** *The Journal of molecular diagnostics : JMD*
Clutter, D. S., Mazarei, G. n., Sinha, R. n., Manasa, J. n., Nouhin, J. n., LaPrade, E. n., Bolouki, S. n., Tzou, P. L., Hannita-Hui, J. n., Sahoo, M. K., Kuimelis, P. n., Kuimelis, R. G., Pinsky, et al
2019
- **Integrase strand transfer inhibitor (INSTI)-resistance mutations for the surveillance of transmitted HIV-1 drug resistance.** *The Journal of antimicrobial chemotherapy*
Tzou, P. L., Rhee, S. Y., Descamps, D. n., Clutter, D. S., Hare, B. n., Mor, O. n., Grude, M. n., Parkin, N. n., Jordan, M. R., Bertagnolio, S. n., Schapiro, J. M., Harrigan, P. R., Geretti, et al
2019
- **Reply to Ambrosioni et al.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Gunthard, H. F., Calvez, V., Paredes, R., Pillay, D., Shafer, R. W., Wensing, A. M., Jacobsen, D. M., Richman, D. D.
2018

- **Moderate to high levels of pre-treatment HIV drug resistance in KwaZulu-Natal Province, South Africa.** *AIDS research and human retroviruses*
Chimukangara, B., Kharsany, A. B., Lessells, R. J., Naidoo, K., Rhee, S., Manasa, J., Graf, T., Lewis, L., Cawood, C., Khanyile, D., Diallo, K., Ayalew, K. A., Shafer, et al
2018
- **The clinical implications of pretreatment drug resistance -- a moving target.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
Shafer, R. W., Frenkel, L. M.
2018
- **Geographically-stratified HIV-1 group M pol subtype and circulating recombinant form sequences.** *Scientific data*
Rhee, S., Shafer, R. W.
2018; 5: 180148
- **Geographically-stratified HIV-1 group M pol subtype and circulating recombinant form sequences** *SCIENTIFIC DATA*
Rhee, S., Shafer, R. W.
2018; 5
- **Selection analyses of paired HIV-1 gag and gp41 sequences obtained before and after antiretroviral therapy.** *Scientific data*
Tzou, P. L., Rhee, S., Pond, S. L., Manasa, J., Shafer, R. W.
2018; 5: 180147
- **Selection analyses of paired HIV-1 gag and gp41 sequences obtained before and after antiretroviral therapy** *SCIENTIFIC DATA*
Tzou, P. L., Rhee, S., Pond, S., Manasa, J., Shafer, R. W.
2018; 5
- **Comparison of an In Vitro Diagnostic Next-Generation Sequencing Assay with Sanger Sequencing for HIV-1 Genotypic Resistance Testing** *JOURNAL OF CLINICAL MICROBIOLOGY*
Tzou, P. L., Ariyaratne, P., Varghese, V., Lee, C., Rakhmanaliev, E., Villy, C., Yee, M., Tan, K., Michel, G., Pinsky, B. A., Shafer, R. W.
2018; 56 (6)
- **Diff-seq: A high throughput sequencing-based mismatch detection assay for DNA variant enrichment and discovery** *NUCLEIC ACIDS RESEARCH*
Aggeli, D., Karas, V. O., Sinnott-Armstrong, N. A., Varghese, V., Shafer, R. W., Greenleaf, W. J., Sherlock, G.
2018; 46 (7)
- **Baseline dasabuvir resistance in Hepatitis C virus from the genotypes 1, 2 and 3 and modeling of the NS5B-dasabuvir complex by the in silico approach.** *Infection ecology & epidemiology*
Akaberi, D., Bergfors, A., Kjellin, M., Kameli, N., Lidemalm, L., Kolli, B., Shafer, R. W., Palanisamy, N., Lennerstrand, J.
2018; 8 (1): 1528117
- **2017 Update of the Drug Resistance Mutations in HIV-1.** *Topics in antiviral medicine*
Wensing, A. M., Calvez, V., Günthard, H. F., Johnson, V. A., Paredes, R., Pillay, D., Shafer, R. W., Richman, D. D.
2017; 24 (4): 132-133
- **Occult HIV-1 drug resistance to thymidine analogues following failure of first-line tenofovir combined with a cytosine analogue and nevirapine or efavirenz in sub Saharan Africa: a retrospective multi-centre cohort study.** *The Lancet. Infectious diseases*
Gregson, J., Kaleebu, P., Marconi, V. C., van Vuuren, C., Ndembu, N., Hamers, R. L., Kanki, P., Hoffmann, C. J., Lockman, S., Pillay, D., de Oliveira, T., Clumeck, N., Hunt, et al
2017; 17 (3): 296-304
- **NucAmino: a nucleotide to amino acid alignment optimized for virus gene sequences** *BMC BIOINFORMATICS*
Tzou, P. L., Huang, X., Shafer, R. W.
2017; 18
- **Prevalence of Drug-Resistant Minority Variants in Untreated HIV-1-Infected Individuals With and Those Without Transmitted Drug Resistance Detected by Sanger Sequencing.** *The Journal of infectious diseases*
Clutter, D. S., Zhou, S. n., Varghese, V. n., Rhee, S. Y., Pinsky, B. A., Jeffrey Fessel, W. n., Klein, D. B., Spielvogel, E. n., Holmes, S. P., Hurley, L. B., Silverberg, M. J., Swanstrom, R. n., Shafer, et al
2017; 216 (3): 387-91

- **Collaborative update of a rule-based expert system for HIV-1 genotypic resistance test interpretation.** *PloS one*
Paredes, R. n., Tzou, P. L., van Zyl, G. n., Barrow, G. n., Camacho, R. n., Carmona, S. n., Grant, P. M., Gupta, R. K., Hamers, R. L., Harrigan, P. R., Jordan, M. R., Kantor, R. n., Katzenstein, et al
2017; 12 (7): e0181357
- **Human Immunodeficiency Virus Type 1 Drug Resistance Mutations Update.** *The Journal of infectious diseases*
Shafer, R. W.
2017
- **Evaluation of the Aptima HIV-1 Quant Dx Assay Using Plasma and Dried Blood Spots.** *Journal of clinical microbiology*
Sahoo, M. K., Varghese, V., White, E., Winslow, M., Katzenstein, D. A., Shafer, R. W., Pinsky, B. A.
2016; 54 (10): 2597-2601
- **Transmitted HIV Drug Resistance Is High and Longstanding in Metropolitan Washington, DC.** *Clinical infectious diseases*
Kassaye, S. G., Grossman, Z., Balamane, M., Johnston-White, B., Liu, C., Kumar, P., Young, M., Sneller, M. C., Sereti, I., Dewar, R., Rehm, C., Meyer, W., Shafer, et al
2016; 63 (6): 836-843
- **Transmitted HIV Drug Resistance Is High and Longstanding in Metropolitan Washington, DC** *CLINICAL INFECTIOUS DISEASES*
Kassaye, S. G., Grossman, Z., Balamane, M., Johnston-White, B., Liu, C., Kumar, P., Young, M., Sneller, M. C., Sereti, I., Dewar, R., Rehm, C., Meyer, W., Shafer, et al
2016; 65 (6): 836-843
- **Q148N, a Novel Integrase Inhibitor Resistance Mutation Associated with Low-Level Reduction in Elvitegravir Susceptibility** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Varghese, V., Pinsky, B. A., Smith, D. S., Klein, D., Shafer, R. W.
2016; 32 (7): 702-704
- **Surveillance of HIV Transmitted Drug Resistance in Latin America and the Caribbean: A Systematic Review and Meta-Analysis** *PLOS ONE*
Avila-Rios, S., Sued, O., Rhee, S., Shafer, R. W., Reyes-Teran, G., Ravasi, G.
2016; 11 (6)
- **Genetic Variability of HIV-1 for Drug Resistance Assay Development** *VIRUSES-BASEL*
Clutter, D. S., Rojas Sanchez, P., Rhee, S., Shafer, R. W.
2016; 8 (2)
- **Modifying Antiretroviral Therapy in Virologically Suppressed HIV-1-Infected Patients.** *Drugs*
Collins, S. E., Grant, P. M., Shafer, R. W.
2016; 76 (1): 75-98
- **HIV-1 Drug Resistance Mutations: Potential Applications for Point-of-Care Genotypic Resistance Testing** *PLOS ONE*
Rhee, S., Jordan, M. R., Raizes, E., Chua, A., Parkin, N., Kantor, R., van Zyl, G. U., Mukui, I., Hosseinipour, M. C., Frenkel, L. M., Ndemi, N., Hamers, R. L., de Wit, et al
2015; 10 (12)
- **2015 Update of the Drug Resistance Mutations in HIV-1.** *Topics in antiviral medicine*
Wensing, A. M., Calvez, V., Günthard, H. F., Johnson, V. A., Paredes, R., Pillay, D., Shafer, R. W., Richman, D. D.
2015; 23 (4): 132-141
- **Impact of Drug Resistance-Associated Amino Acid Changes in HIV-1 Subtype C on Susceptibility to Newer Nonnucleoside Reverse Transcriptase Inhibitors** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Basson, A. E., Rhee, S., Parry, C. M., El-Khatib, Z., Charalambous, S., de Oliveira, T., Pillay, D., Hoffmann, C., Katzenstein, D., Shafer, R. W., Morris, L.
2015; 59 (2): 960-971
- **Lower prevalence of drug resistance mutations at first-line virological failure to first-line therapy with atripla vs. tenofovir+emtricitabine/lamivudine+efavirenz administered on a multiple tablet therapy.** *AIDS*
Blanco, J. L., Montaner, J. S., Marconi, V. C., Santoro, M. M., Campos-Loza, A. E., Shafer, R. W., Miller, M. D., Paredes, R., Harrigan, R., Nguyen, M. L., Perno, C. F., Gonzalez-Hernandez, L. A., Gatell, et al
2014; 28 (17): 2531-2539

- **A uniquely prevalent nonnucleoside reverse transcriptase inhibitor resistance mutation in Russian subtype A HIV-1 viruses.** *AIDS*
Kolomeets, A. N., Varghese, V., Lemey, P., Bobkova, M. R., Shafer, R. W.
2014; 28 (17): F1-8
- **Lower prevalence of drug resistance mutations at first-line virological failure to first-line therapy with atripla vs. tenofovir plus emtricitabine/lamivudine plus efavirenz administered on a multiple tablet therapy** *AIDS*
Blanco, J. L., Montaner, J. S., Marconi, V. C., Santoro, M. M., Campos-Loza, A. E., Shafer, R. W., Miller, M. D., Paredes, R., Harrigan, R., Nguyen, M. L., Perno, C. F., Gonzalez-Hernandez, L. A., Gatell, et al
2014; 28 (17): 2531-2539
- **Similar Prevalence of Low-Abundance Drug-Resistant Variants in Treatment-Naive Patients with Genotype 1a and 1b Hepatitis C Virus Infections as Determined by Ultra-deep Pyrosequencing** *PLOS ONE*
Margeridon-Thermet, S., Le Pogam, S., Li, L., Liu, T. F., Shulman, N., Shafer, R. W., Najera, I.
2014; 9 (8)
- **Genome-wide association study of peripheral neuropathy with D-drug-containing regimens in AIDS Clinical Trials Group protocol 384** *JOURNAL OF NEUROVIROLOGY*
Leger, P. D., Johnson, D. H., Robbins, G. K., Shafer, R. W., Clifford, D. B., Li, J., McLaren, P. J., Haas, D. W.
2014; 20 (3): 304-308
- **2014 update of the drug resistance mutations in HIV-1.** *Topics in antiviral medicine*
Wensing, A. M., Calvez, V., Günthard, H. F., Johnson, V. A., Paredes, R., Pillay, D., Shafer, R. W., Richman, D. D.
2014; 22 (3): 642-650
- **HIV-1 transmission networks in a small world.** *journal of infectious diseases*
Pennings, P. S., Holmes, S. P., Shafer, R. W.
2014; 209 (2): 180-182
- **HIV-1 fitness landscape models for indinavir treatment pressure using observed evolution in longitudinal sequence data are predictive for treatment failure.** *Infection, genetics and evolution : journal of molecular epidemiology and evolutionary genetics in infectious diseases*
Sangeda, R. Z., Theys, K., Beheydt, G., Rhee, S., Deforche, K., Vercauteren, J., Libin, P., Imbrechts, S., Grossman, Z., Camacho, R. J., Van Laethem, K., Pironti, A., Zazzi, et al
2013; 19: 349-360
- **Cooperative Effects of Drug-Resistance Mutations in the Flap Region of HIV-1 Protease** *ACS CHEMICAL BIOLOGY*
Foulkes-Murzycki, J. E., Rosi, C., Yilmaz, N. K., Shafer, R. W., Schiffer, C. A.
2013; 8 (3): 513-518
- **Update of the drug resistance mutations in HIV-1: March 2013.** *Topics in antiviral medicine*
Johnson, V. A., Calvez, V., Günthard, H. F., Paredes, R., Pillay, D., Shafer, R. W., Wensing, A. M., Richman, D. D.
2013; 21 (1): 6-14
- **Collinearity of protease mutations in HIV-1 samples with high-level protease inhibitor class resistance** *JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY*
Babrzadeh, F., Varghese, V., Pacold, M., Liu, T. F., Nyren, P., Schiffer, C., Fessel, W. J., Shafer, R. W.
2013; 68 (2): 414-418
- **In vitro HIV-1 evolution in response to triple reverse transcriptase inhibitors & in silico phenotypic analysis.** *PloS one*
Rath, B. A., Yousef, K. P., Katzenstein, D. K., Shafer, R. W., Schütte, C., von Kleist, M., Merigan, T. C.
2013; 8 (4)
- **In Vitro HIV-1 Evolution in Response to Triple Reverse Transcriptase Inhibitors & In Silico Phenotypic Analysis.** *PloS one*
Rath, B. A., Yousef, K. P., Katzenstein, D. K., Shafer, R. W., Schütte, C., von Kleist, M., Merigan, T. C.
2013; 8 (4)
- **T Cell Activation Markers and African Mitochondrial DNA Haplogroups among Non-Hispanic Black Participants in AIDS Clinical Trials Group Study 384** *PLOS ONE*
Hulgan, T., Robbins, G. K., Kalams, S. A., Samuels, D. C., Grady, B., Shafer, R., Murdock, D. G., Selph, D., Haas, D. W., Pollard, R. B.
2012; 7 (8)

- **Panel of Prototypical Recombinant Infectious Molecular Clones Resistant to Nevirapine, Efavirenz, Etravirine, and Rilpivirine** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Balamane, M., Varghese, V., Melikian, G. L., Fessel, W. J., Katzenstein, D. A., Shafer, R. W.
2012; 56 (8): 4522-4524
- **Development of Elvitegravir Resistance and Linkage of Integrase Inhibitor Mutations with Protease and Reverse Transcriptase Resistance Mutations** *PLOS ONE*
Winters, M. A., Lloyd, R. M., Shafer, R. W., Kozal, M. J., Miller, M. D., Holodniy, M.
2012; 7 (7)
- **Whole-genome sequencing of the efficient industrial fuel-ethanol fermentative *Saccharomyces cerevisiae* strain CAT-1** *MOLECULAR GENETICS AND GENOMICS*
Babrzadeh, F., Jalili, R., Wang, C., Shokralla, S., Pierce, S., Robinson-Mosher, A., Nyren, P., Shafer, R. W., Basso, L. C., de Amorim, H. V., de Oliveira, A. J., Davis, R. W., Ronaghi, et al
2012; 287 (6): 485-494
- **Automating HIV Drug Resistance Genotyping with RECall, a Freely Accessible Sequence Analysis Tool** *JOURNAL OF CLINICAL MICROBIOLOGY*
Woods, C. K., Brumme, C. J., Liu, T. F., Chui, C. K., Chu, A. L., Wynhoven, B., Hall, T. A., Trevino, C., Shafer, R. W., Harrigan, P. R.
2012; 50 (6): 1936-1942
- **Standardized representation, visualization and searchable repository of antiretroviral treatment-change episodes** *AIDS RESEARCH AND THERAPY*
Rhee, S., Luis Blanco, J., Liu, T. F., Pere, I., Kaiser, R., Zazzi, M., Incardona, F., Towner, W., Maria Gatell, J., De Luca, A., Fessel, W. J., Shafer, R. W.
2012; 9
- **Standardized Comparison of the Relative Impacts of HIV-1 Reverse Transcriptase (RT) Mutations on Nucleoside RT Inhibitor Susceptibility** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Melikian, G. L., Rhee, S., Taylor, J., Fessel, W. J., Kaufman, D., Towner, W., Troia-Cancio, P. V., Zolopa, A., Robbins, G. K., Kagan, R., Israelski, D., Shafer, R. W.
2012; 56 (5): 2305-2313
- **The HIVdb System for HIV-1 Genotypic Resistance Interpretation** *INTERVIROLOGY*
Tang, M. W., Liu, T. F., Shafer, R. W.
2012; 55 (2): 98-101
- **A multifaceted analysis of HIV-1 protease multidrug resistance phenotypes** *BMC BIOINFORMATICS*
Doherty, K. M., Nakka, P., King, B. M., Rhee, S., Holmes, S. P., Shafer, R. W., Radhakrishnan, M. L.
2011; 12
- **2011 update of the drug resistance mutations in HIV-1.** *Topics in antiviral medicine*
Johnson, V. A., Calvez, V., Günthard, H. F., Paredes, R., Pillay, D., Shafer, R., Wensing, A. M., Richman, D. D.
2011; 19 (4): 156-164
- **Loss of Protease Dimerization Inhibition Activity of Darunavir Is Associated with the Acquisition of Resistance to Darunavir by HIV-1** *JOURNAL OF VIROLOGY*
Koh, Y., Aoki, M., Danish, M. L., Aoki-Ogata, H., Amano, M., Das, D., Shafer, R. W., Ghosh, A. K., Mitsuya, H.
2011; 85 (19): 10079-10089
- **NO DETECTION OF VARIANTS BEARING NS5B S282T MERICITABINE (MCB) RESISTANCE MUTATION IN DAA TREATMENT-NAIVE HCV GENOTYPE 1 (G1)-INFECTED PATIENTS USING ULTRA-DEEP PYROSEQUENCING (UDPS)**
Margeridon, S., Le Pogam, S., Liu, T. F., Hanczaruk, B., Simen, B. B., Shulman, N., Shafer, R. W., Najera, I.
WILEY-BLACKWELL.2011: 532A
- **Prediction of response to antiretroviral therapy by human experts and by the EuResist data-driven expert system (the EVE study)** *HIV MEDICINE*
Zazzi, M., Kaiser, R., Sonnerborg, A., Struck, D., Altmann, A., Prosperi, M., Rosen-Zvi, M., Petroczi, A., Peres, Y., Schuelter, E., Boucher, C. A., Brun-Vezinet, F., Harrigan, et al
2011; 12 (4): 211-218

- **The Major Genetic Determinants of HIV-1 Control Affect HLA Class I Peptide Presentation** *SCIENCE*
Pereyra, F., Jia, X., McLaren, P. J., Telenti, A., de Bakker, P. I., Walker, B. D., Ripke, S., Brumme, C. J., Pulit, S. L., Carrington, M., Kadie, C. M., Carlson, J. M., Heckerman, et al
2010; 330 (6010): 1551-1557
- **Hepatitis B virus reverse transcriptase sequence variant database for sequence analysis and mutation discovery** *ANTIVIRAL RESEARCH*
Rhee, S., Margeridon-Thermet, S., Nguyen, M. H., Liu, T. F., Kagan, R. M., Beggel, B., Verheyen, J., Kaiser, R., Shafer, R. W.
2010; 88 (3): 269-275
- **A classification model for G-to-A hypermutation in hepatitis B virus ultra-deep pyrosequencing reads** *BIOINFORMATICS*
Reuman, E. C., Margeridon-Thermet, S., Caudill, H. B., Liu, T., Borroto-Esoda, K., Svarovskaia, E. S., Holmes, S. P., Shafer, R. W.
2010; 26 (23): 2929-2932
- **HIV-1 Integrase Sequence Variability in Antiretroviral Naive Patients and in Triple-Class Experienced Patients Subsequently Treated with Raltegravir** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Varghese, V., Liu, T. F., Rhee, S., Libiran, P., Trevino, C., Fessel, W. J., Shafer, R. W.
2010; 26 (12): 1323-1326
- **ULTRA-DEEP SEQUENCING OF THE NS3 AND NS5B REGIONS DETECTS PRE-EXISTING RESISTANT VARIANTS TO DIRECT ACTING ANTIVIRALS (DAA) IN HCV GENOTYPE 1 INFECTED PATIENTS NAIVE**
Margeridon, S., Le Pogam, S., Liu, T. F., Hanczaruk, B., Arnold, T. E., Simen, B. B., Shulman, N., Shafer, R. W., Najera, I.
WILEY-BLACKWELL.2010: 714A
- **LOW-LEVEL PERSISTENCE OF HBV DRUG RESISTANCE MUTATIONS IN PATIENTS WITH A PAST HISTORY OF LAMIVUDINE (LAM) TREATMENT**
Margeridon, S., Svarovskaia, E. S., Martin, S. R., Liu, T. F., Borroto-Esoda, K., Shafer, R. W.
WILEY-BLACKWELL.2010: 505A-506A
- **Estimating the individualized HIV-1 genetic barrier to resistance using a nelfinavir fitness landscape** *BMC BIOINFORMATICS*
Theys, K., Deforche, K., Beheydt, G., Moreau, Y., Van Laethem, K., Lemey, P., Camacho, R. J., Rhee, S., Shafer, R. W., Van Wijngaerden, E., Vandamme, A.
2010; 11
- **Long-term increase in CD4(+) T-cell counts during combination antiretroviral therapy for HIV-1 infection** *AIDS*
Lok, J. J., Bosch, R. J., Benson, C. A., Collier, A. C., Robbins, G. K., Shafer, R. W., Hughes, M. D.
2010; 24 (12): 1867-1876
- **Constrained patterns of covariation and clustering of HIV-1 non-nucleoside reverse transcriptase inhibitor resistance mutations** *JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY*
Reuman, E. C., Rhee, S., Holmes, S. P., Shafer, R. W.
2010; 65 (7): 1477-1485
- **Nucleic Acid Template and the Risk of a PCR-Induced HIV-1 Drug Resistance Mutation** *PLOS ONE*
Varghese, V., Wang, E., Babrzadeh, F., Bachmann, M. H., Shahriar, R., Liu, T., Mappala, S. J., Gharizadeh, B., Fessel, W. J., Katzenstein, D., Kassaye, S., Shafer, R. W.
2010; 5 (6)
- **African Mitochondrial DNA Subhaplogroups and Peripheral Neuropathy during Antiretroviral Therapy** *JOURNAL OF INFECTIOUS DISEASES*
Canter, J. A., Robbins, G. K., Selph, D., Clifford, D. B., Kallianpur, A. R., Shafer, R., Levy, S., Murdock, D. G., Ritchie, M. D., Haas, D. W., Hulgán, T.
2010; 201 (11): 1703-1707
- **Predicting Tipranavir and Darunavir Resistance Using Genotypic, Phenotypic, and Virtual Phenotypic Resistance Patterns: an Independent Cohort Analysis of Clinical Isolates Highly Resistant to All Other Protease Inhibitors** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Talbot, A., Grant, P., Taylor, J., Baril, J., Liu, T. F., Charest, H., Brenner, B., Roger, M., Shafer, R., Cantin, R., Zolopa, A.
2010; 54 (6): 2473-2479
- **Public database for HIV drug resistance in southern Africa** *NATURE*
de Oliveira, T., Shafer, R. W., Seebregts, C.
2010; 464 (7289): 673-673

- **Panel of Prototypical Raltegravir-Resistant Infectious Molecular Clones in a Novel Integrase-Deleted Cloning Vector** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Reuman, E. C., Bachmann, M. H., Varghese, V., Fessel, W. J., Shafer, R. W.
2010; 54 (2): 934-936
- **Nonpolymorphic Human Immunodeficiency Virus Type 1 Protease and Reverse Transcriptase Treatment-Selected Mutations** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Shahriar, R., Rhee, S., Liu, T. F., Fessel, W. J., Scarsella, A., Towner, W., Holmes, S. P., Zolopa, A. R., Shafer, R. W.
2009; 53 (11): 4869-4878
- **The calibrated population resistance tool: standardized genotypic estimation of transmitted HIV-1 drug resistance** *BIOINFORMATICS*
Gifford, R. J., Liu, T. F., Rhee, S., Kiuchi, M., Hue, S., Pillay, D., Shafer, R. W.
2009; 25 (9): 1197-1198
- **Human Immunodeficiency Virus Type 1 Isolates with the Reverse Transcriptase (RT) Mutation Q145M Retain Nucleoside and Nonnucleoside RT Inhibitor Susceptibility** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Varghese, V., Mitsuya, Y., Shahriar, R., Bachmann, M. H., Fessel, W. J., Kagan, R. M., Shafer, R. W.
2009; 53 (5): 2196-2198
- **Predicting the Response to Combination Antiretroviral Therapy: Retrospective Validation of geno2pheno-THEO on a Large Clinical Database** *5th European HIV Drug Resistance Workshop*
Altmann, A., Daeumer, M., Beerenwinkel, N., Peres, Y., Schuelter, E., Buech, J., Rhee, S., Soennerborg, A., Fessel, W. J., Shafer, R. W., Zazzi, M., Kaiser, R., Lengauer, et al
UNIV CHICAGO PRESS.2009: 999-1006
- **The challenge of antiretroviral drug resistance in HIV-1-infected children** *JORNAL DE PEDIATRIA*
Shafer, R. W.
2009; 85 (2): 91-94
- **Incomplete Reconstitution of T Cell Subsets on Combination Antiretroviral Therapy in the AIDS Clinical Trials Group Protocol 384** *CLINICAL INFECTIOUS DISEASES*
Robbins, G. K., Spritzler, J. G., Chan, E. S., Asmuth, D. M., Gandhi, R. T., Rodriguez, B. A., Skowron, G., Skolnik, P. R., Shafer, R. W., Pollard, R. B.
2009; 48 (3): 350-361
- **Biomarker discovery using targeted maximum-likelihood estimation: Application to the treatment of antiretroviral-resistant HIV infection** *STATISTICS IN MEDICINE*
Bembom, O., Petersen, M. L., Rhee, S., Fessel, W. J., Sinisi, S. E., Shafer, R. W., Van der Laan, M. J.
2009; 28 (1): 152-172
- **Advantages of predicted phenotypes and statistical learning models in inferring virological response to antiretroviral therapy from HIV genotype** *ANTIVIRAL THERAPY*
Altmann, A., Sing, T., Vermeiren, H., Winters, B., Van Craenenbroeck, E., Van der Borgh, K., Rhee, S., Shafer, R. W., Schuelter, E., Kaiser, R., Peres, Y., Sonnerborg, A., Fessel, et al
2009; 14 (2): 273-283
- **A highly prevalent and genetically diversified Picornaviridae genus in South Asian children** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Kapoor, A., Victoria, J., Simmonds, P., Slikas, E., Chieochansin, T., Naeem, A., Shaukat, S., Sharif, S., Alam, M. M., Angez, M., Wang, C., Shafer, R. W., Zaidi, et al
2008; 105 (51): 20482-20487
- **Virologic Response to Lopinavir-Ritonavir-Based Antiretroviral Regimens in a Multicenter International Clinical Cohort: Comparison of Genotypic Interpretation Scores** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Grant, P., Wong, E. C., Rode, R., Shafer, R., De Luca, A., Nadler, J., Hawkins, T., Cohen, C., Harrington, R., Kempf, D., Zolopa, A.
2008; 52 (11): 4050-4056
- **Minority Human Immunodeficiency Virus Type 1 Variants in Antiretroviral-Naive Persons with Reverse Transcriptase Codon 215 Revertant Mutations** *JOURNAL OF VIROLOGY*
Mitsuya, Y., Varghese, V., Wang, C., Liu, T. F., Holmes, S. P., Jayakumar, P., Gharizadeh, B., Ronaghi, M., Klein, D., Fessel, W. J., Shafer, R. W.
2008; 82 (21): 10747-10755

- **Bayesian network analyses of resistance pathways against efavirenz and nevirapine** *AIDS*
Deforche, K., Camacho, R. J., Grossman, Z., Soares, M. A., Van Laethem, K., Katzenstein, D. A., Harrigan, P. R., Kantor, R., Shafer, R., Vandamme, A.
2008; 22 (16): 2107-2115
- **Rational use of antiretroviral therapy in low-income and middle-income countries: optimizing regimen sequencing and switching** *AIDS*
Elliott, J. H., Lynen, L., Calmy, A., De Luca, A., Shafer, R. W., Zolfo, M., Clotet, B., Huffam, S., Boucher, C. A., Cooper, D. A., Schapiro, J. M.
2008; 22 (16): 2053-2067
- **Natural variation of HIV-1 group M integrase: Implications for a new class of antiretroviral inhibitors** *RETROVIROLOGY*
Rhee, S., Liu, T. F., Kiuchi, M., Zioni, R., Gifford, R. J., Holmes, S. P., Shafer, R. W.
2008; 5
- **Viral population estimation using pyrosequencing** *PLOS COMPUTATIONAL BIOLOGY*
Eriksson, N., Pachter, L., Mitsuya, Y., Rhee, S., Wang, C., Gharizadeh, B., Ronaghi, M., Shafer, R. W., Beerenwinkel, N.
2008; 4 (5)
- **Viral population estimation using pyrosequencing.** *PLoS computational biology*
Eriksson, N., Pachter, L., Mitsuya, Y., Rhee, S., Wang, C., Gharizadeh, B., Ronaghi, M., Shafer, R. W., Beerenwinkel, N.
2008; 4 (4)
- **HIV-1 drug resistance mutations: an updated framework for the second decade of HAART** *AIDS REVIEWS*
Shafer, R. W., Schapiro, J. M.
2008; 10 (2): 67-84
- **Sequence editing by Apolipoprotein B RNA-editing catalytic component-B and epidemiological surveillance of transmitted HIV-1 drug resistance** *AIDS*
Gifford, R. J., Rhee, S., Eriksson, N., Liu, T. F., Kiuchi, M., Das, A. K., Shafer, R. W.
2008; 22 (6): 717-725
- **Hemochromatosis gene polymorphisms, mitochondrial haplogroups, and peripheral lipotrophy during antiretroviral therapy** *14th Conference on Retroviruses and Opportunistic Infections*
Hulgan, T., Tebas, P., Canter, J. A., Mulligan, K., Haas, D. W., Dube, M., Grinspoon, S., Robbins, G. K., Moutsinger, A. A., Kallianpur, A. R.
UNIV CHICAGO PRESS.2008: 858-66
- **The mitochondrial pharmacogenomics of haplogroup T: MTND2*LHON4917G and antiretroviral therapy-associated peripheral neuropathy** *PHARMACOGENOMICS JOURNAL*
Canter, J. A., Haas, D. W., Kallianpur, A. R., Ritchie, M. D., Robbins, G. K., Shafer, R. W., Clifford, D. B., Murdock, D. G., Hulgan, T.
2008; 8 (1): 71-77
- **Dynamics of total, linear nonintegrated, and integrated HIV-1 DNA in vivo and in vitro** *15th International AIDS Conference*
Koelsch, K. K., Liu, L., Haubrich, R., May, S., Havlir, D., Guenthard, H. F., Ignacio, C. C., Campos-Soto, P., Little, S. J., Shafer, R., Robbins, G. K., D'Aquila, R. T., Kawano, et al
OXFORD UNIV PRESS INC.2008: 411-19
- **Multiple independent origins of a protease inhibitor resistance mutation in salvage therapy patients** *RETROVIROLOGY*
Kapoor, A., Shapiro, B., Shafer, R. W., Shulman, N., Rhee, S., Delwart, E. L.
2008; 5
- **Consensus drug resistance mutations for epidemiological surveillance: basic principles and potential controversies** *ANTIVIRAL THERAPY*
Shafer, R. W., Rhee, S., Bennett, D. E.
2008; 13: 59-68
- **A highly divergent picornavirus in a marine mammal** *JOURNAL OF VIROLOGY*
Kapoor, A., Victoria, J., Simmonds, P., Wang, C., Shafer, R. W., Nims, R., Nielsen, O., Delwart, E.
2008; 82 (1): 311-320
- **Prevalence of darunavir resistance-associated mutations: Patterns of occurrence and association with past treatment** *JOURNAL OF INFECTIOUS DISEASES*
Mitsuya, Y., Liu, T. F., Rhee, S., Fessel, W. J., Shafer, R. W.

2007; 196 (8): 1177-1179

- **World antimalarial resistance network (WARN) III: Molecular markers for drug resistant malaria** *MALARIA JOURNAL*
Plowe, C. V., Roper, C., Barnwell, J. W., Happi, C. T., Joshi, H. H., Mbacham, W., Meshnick, S. R., Mugittu, K., Naidoo, I., Price, R. N., Shafer, R. W., Sibley, C. H., Sutherland, et al
2007; 6
- **Educational attainment and response to HAART during initial therapy for HIV-1 infection** *JOURNAL OF PSYCHOSOMATIC RESEARCH*
Marc, L. G., Testa, M. A., Walker, A. M., Robbins, G. K., Shafer, R. W., Anderson, N. B., Berkman, L. F.
2007; 63 (2): 207-216
- **Virologic efficacy of boosted double versus boosted single protease inhibitor therapy** *AIDS*
Petersen, M. L., Wang, Y., Van der Laan, M. J., Rhee, S., Shafer, R. W., Fessel, W. J.
2007; 21 (12): 1547-1554
- **Simple PCR Assays Improve the Sensitivity of HIV-1 Subtype B Drug Resistance Testing and Allow Linking of Resistance Mutations** *PLOS ONE*
Johnson, J. A., Li, J., Wei, X., Lipscomb, J., Bennett, D., Brant, A., Cong, M., Spira, T., Shafer, R. W., Heneine, W.
2007; 2 (7)
- **HIV-1 protease and reverse transcriptase mutations for drug resistance surveillance** *AIDS*
Shafer, R. W., Rhee, S., Pillay, D., Miller, V., Sandstrom, P., Schapiro, J. M., Kuritzkes, D. R., Bennett, D.
2007; 21 (2): 215-223
- **Improved prediction of response to antiretroviral combination therapy using the genetic barrier to drug resistance** *ANTIVIRAL THERAPY*
Altmann, A., Beerenwinkel, N., Sing, T., Savenkov, I., Daeumer, M., Kaiser, R., Rhee, S., Fessel, W. J., Shafer, R. W., Lengauer, T.
2007; 12 (2): 169-178
- **Mechanisms of Resistance to Antiviral Agents** *MANUAL OF CLINICAL MICROBIOLOGY, 9TH ED*
Shafer, R. W., Einav, S., Chou, S.
edited by Baron, E. J., Jorgensen, J. H., Landry, M. L., Pfaller, M. A.
2007: 1689–1704
- **Knowledge integration of software for HIV drug resistance research.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*
Hernandez, G., Rhee, S., Shafer, R. W., Das, A. K.
2007: 973-?
- **Case files from Stanford University Medical Center: ten years of HAART: a long wait for full HIV suppression.** *MedGenMed : Medscape general medicine*
Shulman, N., Shafer, R. W.
2007; 9 (1): 10-?
- **N88D facilitates the co-occurrence of D30N and L90M and the development of multidrug resistance in HIV type 1 protease following nelfinavir treatment failure** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Mitsuya, Y., Winters, M. A., Fessel, W. J., Rhee, S., Hurley, L., Horberg, M., Schiffer, C. A., Zolopa, A. R., Shafer, R. W.
2006; 22 (12): 1300-1305
- **Multilocus genetic interactions and response to efavirenz-containing regimens: an Adult AIDS Clinical Trials Group study** *13th Conference on Retroviruses and Opportunistic Infections*
Motsinger, A. A., Ritchie, M. D., Shafer, R. W., Robbins, G. K., Morse, G. D., Labbe, L., Wilkinson, G. R., Clifford, D. B., D'Aquila, R. T., Johnson, V. A., Pollard, R. B., Merigan, T. C., Hirsch, et al
LIPPINCOTT WILLIAMS & WILKINS.2006: 837–45
- **Rationale and uses of a public HIV drug-resistance database.** *The Journal of infectious diseases*
Shafer, R. W.
2006; 194 Suppl 1: S51-8
- **HIV-1 drug resistance genotype results in patients with plasma samples with HIV-1 RNA levels less than 75 copies/mL** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Mitsuya, Y., Winters, M. A., Fessel, W. J., Rhee, S., Slome, S., Flamm, J., Horberg, M., Hurley, L., Klein, D., Shafer, R. W.

2006; 43 (1): 56-59

- **Effect of baseline- and treatment-related factors on immunologic recovery after initiation of antiretroviral therapy in HIV-1-positive subjects: Results from ACTG 384** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Gandhi, R. T., Spritzler, J., Chan, E., Asmuth, D. M., Rodriguez, B., Merigan, T. C., Hirsch, M. S., Shafer, R. W., Robbins, G. K., Pollard, R. B.
2006; 42 (4): 426-434
- **Oxidant stress and peripheral neuropathy during antiretroviral therapy: An AIDS Clinical Trials Group Study** *12th Conference on Retroviruses and Opportunistic Infections*
Hulgan, T., Hughes, M., Xin Sun, S., Smeaton, L. M., Terry, E., Robbins, G. K., Shafer, R. W., Clifford, D. B., McComsey, G. A., Canter, J. A., Morrow, J. D., Haas, D. W.
LIPPINCOTT WILLIAMS & WILKINS.2006: 450-54
- **Hemochromatosis (HFE) gene mutations and peripheral neuropathy during antiretroviral therapy** *AIDS*
Kallianpur, A. R., Hulgan, T., Canter, J. A., Ritchie, M. D., Haines, J. L., Robbins, G. K., Shafer, R. W., Clifford, D. B., Haas, D. W.
2006; 20 (11): 1503-1513
- **Assessment of automated genotyping protocols as tools for surveillance of HIV-1 genetic diversity** *AIDS*
Gifford, R., de Oliveira, T., Rambaut, A., Myers, R. E., Gale, C. V., Dunn, D., Shafer, R., Vandamme, A., Kellam, P., Pillay, D.
2006; 20 (11): 1521-1529
- **Web resources for HIV type 1 genotypic-resistance test interpretation** *CLINICAL INFECTIOUS DISEASES*
Liu, T. F., Shafer, R. W.
2006; 42 (11): 1608-1618
- **Discordances between interpretation algorithms for genotypic resistance to protease and reverse transcriptase inhibitors of human immunodeficiency virus are subtype dependent** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Snoeck, J., Kantor, R., Shafer, R. W., Van Laethem, K., Deforche, K., CARVALHO, A. P., Wynhoven, B., Soares, M. A., Cane, P., Clarke, J., Pillay, C., Sirivichayakul, S., Ariyoshi, et al
2006; 50 (2): 694-701
- **Case files from Stanford University Medical Center: Drug resistance testing in previously untreated patients with HIV--knowing what to look for and choosing appropriate therapy.** *MedGenMed : Medscape general medicine*
Shafer, R. W., Nguyen, D. P., Fessel, W. J.
2006; 8 (3): 32-?
- **A combined data mining approach for infrequent events: analyzing HIV mutation changes based on treatment history.** *Computational systems bioinformatics / Life Sciences Society. Computational Systems Bioinformatics Conference*
Lin, R. S., Rhee, S., Shafer, R. W., Das, A. K.
2006: 385-388
- **Case files from Stanford University Medical Center: the initial presentation of HIV-1 infection--where public and personal health meet.** *MedGenMed : Medscape general medicine*
Liu, M., Holodniy, M., Zolopa, A. R., Shafer, R. W.
2006; 8 (1): 24-?
- **Prediction of HIV mutation changes based on treatment history.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*
Lin, R. S., Rhee, S., Shafer, R. W., Das, A. K.
2006: 1011-?
- **Pharmacogenetics of long-term responses to antiretroviral regimens containing efavirenz and/or nelfinavir: An adult AIDS clinical trials group study** *12th Conference on Retroviruses and Opportunistic Infections*
Haas, D. W., Smeaton, L. M., Shafer, R. W., Robbins, G. K., Morse, G. D., Labbe, L., Wilkinson, G. R., Clifford, D. B., D'Aquila, R. T., De Gruttola, V., Pollard, R. B., Merigan, T. C., Hirsch, et al
UNIV CHICAGO PRESS.2005: 1931-42
- **Glucose metabolism, lipid, and body fat changes in antiretroviral-naive subjects randomized to nelfinavir or efavirenz plus dual nucleosides** *11th Conference on Retroviruses and Opportunistic Infections*
Dube, M. P., Parker, R. A., Tebas, P., Grinspoon, S. K., Zackin, R. A., Robbins, G. K., Roubenoff, R., Shafer, R. W., Wininger, D. A., Meyer, W. A., Snyder, S. W., Mulligan, K.
LIPPINCOTT WILLIAMS & WILKINS.2005: 1807-18

- **Mitochondrial haplogroups and peripheral neuropathy during antiretroviral therapy: an adult AIDS clinical trials group study** *12th Conference on Retroviruses and Opportunistic Infections*
Hulgan, T., Haas, D. W., Haines, J. L., Ritchie, M. D., Robbins, G. K., Shafer, R. W., Clifford, D., Kallianpur, A. R., Summar, M., Canter, J. A. LIPPINCOTT WILLIAMS & WILKINS.2005: 1341-49
- **HIV-1 protease and reverse-transcriptase mutations: Correlations with antiretroviral therapy in subtype B isolates and implications for drug-resistance surveillance** *13th International AIDS Conference*
Rhee, S. Y., Fessel, W. J., Zolopa, A. R., Hurley, L., Liu, T., Taylor, J., Nguyen, D. P., Slome, S., Klein, D., Horberg, M., Flamm, J., Follansbee, S., Schapiro, et al
UNIV CHICAGO PRESS.2005: 456-65
- **Pharmacokinetics of nelfinavir and efavirenz in antiretroviral-naive, human immunodeficiency virus-infected subjects when administered alone or in combination with nucleoside analog reverse transcriptase inhibitors** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Smith, P. F., Robbins, G. K., Shafer, R. W., Wu, H. L., Yu, S., Hirsch, M. S., Merigan, T. C., Park, J. G., Forrest, A., Fischl, M. A., Morse, G. D. 2005; 49 (8): 3558-3561
- **Accuracy, precision, and consistency of expert HIV type 1 genotype interpretation: An international comparison (The GUESS Study)** *CLINICAL INFECTIOUS DISEASES*
Zolopa, A. R., Lazzeroni, L. C., Rinehart, A., Vezinet, F. B., Clavel, F., Collier, A., Conway, B., Gulick, R. M., Holodniy, M., Perno, C. F., Shafer, R. W., Richman, D. D., Wainberg, et al
2005; 41 (1): 92-99
- **Drug resistance and antiretroviral drug development** *JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY*
Shafer, R. W., Schapiro, J. M.
2005; 55 (6): 817-820
- **Nonnucleoside reverse transcriptase inhibitor phenotypic hypersusceptibility can be demonstrated in different assays** *12th International HIV Drug Resistance Workshop*
Shulman, N. S., Delgado, D., Bosch, R. J., Winters, M. A., Johnston, E., Shafer, R. W., Katzenstein, D. A., Merigan, T. C.
LIPPINCOTT WILLIAMS & WILKINS.2005: 78-81
- **Comparison of the precision and sensitivity of the antivirogram and PhenoSense HIV drug susceptibility assays** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Zhang, J., Rhee, S. Y., Taylor, J., Shafer, R. W.
2005; 38 (4): 439-444
- **Detection of minority populations of HIV-1 expressing the K103N resistance mutation in patients failing nevirapine** *12th International HIV Drug Resistance Workshop*
Lecossier, D., Shulman, N. S., Morand-Joubert, L., Shafer, R. W., Joly, V., Zolopa, A. R., Clavel, F., Hance, A. J.
LIPPINCOTT WILLIAMS & WILKINS.2005: 37-42
- **The HIV-1 Non-subtype B Workgroup: an international collaboration for the collection and analysis of HIV-1 non-subtype B data.** *MedGenMed : Medscape general medicine*
Kantor, R., Shafer, R. W., Katzenstein, D.
2005; 7 (1): 71-?
- **Association of a novel human immunodeficiency virus type 1 protease substrate cleft mutation, L23I, with protease inhibitor therapy and in vitro drug resistance** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Johnston, E., Winters, M. A., Rhee, S. Y., Merigan, T. C., Schiffer, C. A., Shafer, R. W.
2004; 48 (12): 4864-4868
- **Clinically validated genotype analysis: guiding principles and statistical concerns** *ANTIVIRAL THERAPY*
Brun-Vezinet, F., Costagliolo, D., Khaled, M. A., Calvez, V., Clavel, F., Clotet, B., Haubrich, R., Kemp, D., King, M., Kuritzkes, D., Lanier, R., Miller, M., Miller, et al
2004; 9 (4): 465-478
- **Distribution of human immunodeficiency virus type 1 protease and reverse transcriptase mutation patterns in 4,183 persons undergoing genotypic resistance testing** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Rhee, S. Y., Liu, T., Ravela, J., Gonzales, M. J., Shafer, R. W.
2004; 48 (8): 3122-3126

- **Evolution of resistance to drugs in HIV-1-infected patients failing antiretroviral therapy** *AIDS*
Kantor, R., Shafer, R. W., Follansbee, S., Taylor, J., Shilane, D., Hurley, L., Nguyen, D. P., KATZENSTEIN, D., Fessel, W. J.
2004; 18 (11): 1503-1511
- **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*
Kapoor, A., Jones, M., Shafer, R. W., Rhee, S. Y., Kazanjian, P., Delwart, E. L.
2004; 78 (13): 7112-7123
- **Comparative evaluation of three computerized algorithms for prediction of antiretroviral susceptibility from HIV type 1 genotype** *JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY*
Zazzi, M., Romano, L., Venturi, G., Shafer, R. W., Reid, C., Dal Bello, F., Parolin, C., Palu, G., Valensin, P. E.
2004; 53 (2): 356-360
- **Comparison of sequential three-drug regimens as initial therapy for HIV-1 infection** *NEW ENGLAND JOURNAL OF MEDICINE*
Robbins, G. K., De Gruttola, V., Shafer, R. W., Smeaton, L. M., Snyder, S. W., Pettinelli, C., Dube, M. P., Fischl, M. A., Pollard, R. B., Delapenha, R., Gedeon, L., van der Horst, C., Murphy, et al
2003; 349 (24): 2293-2303
- **Protease and reverse transcriptase mutation patterns in HIV type 1 isolates from heavily treated persons: Comparison of isolates from Northern California with isolates from other regions** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Gonzales, M. J., Belitskaya, I., Dupnik, K. M., Rhee, S. Y., Shafer, R. W.
2003; 19 (10): 909-915
- **Lack of detectable human immunodeficiency virus type 1 superinfection during 1072 person-years of observation** *11th International Workshop on HIV Drug Resistance and Treatment Strategies*
Gonzales, M. J., Delwart, E., Rhee, S. Y., Tsui, R., Zolopa, A. R., Taylor, J., Shafer, R. W.
UNIV CHICAGO PRESS.2003: 397-405
- **Algorithm specification interface for human immunodeficiency virus type 1 genotypic interpretation** *JOURNAL OF CLINICAL MICROBIOLOGY*
Betts, B. J., Shafer, R. W.
2003; 41 (6): 2792-2794
- **HIV-1 protease and reverse transcriptase mutation patterns responsible for discordances between genotypic drug resistance interpretation algorithms** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Ravela, J., Betts, B. J., Brun-Vezinet, F., Vandamme, A. M., Descamps, T., Van Laethem, K., Smith, K., Schapiro, J. M., Winslow, D. L., Reid, C., Shafer, R. W.
2003; 33 (1): 8-14
- **Drug resistance mutations in HIV-1.** *Topics in HIV medicine : a publication of the International AIDS Society, USA*
D'Aquila, R. T., Schapiro, J. M., Brun-Vézinet, F., Clotet, B., Conway, B., Demeter, L. M., Grant, R. M., Johnson, V. A., Kuritzkes, D. R., Loveday, C., Shafer, R. W., Richman, D. D.
2003; 11 (3): 92-96
- **HIV sequence databases.** *AIDS reviews*
Kuiken, C., Korber, B., Shafer, R. W.
2003; 5 (1): 52-61
- **HIV-1 subtype C reverse transcriptase and protease genotypes in Zimbabwean patients failing antiretroviral therapy** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Kantor, R., Zijenah, L. S., Shafer, R. W., Mutetwa, S., Johnston, E., Lloyd, R., Von Lieven, A., Israelski, D., Katzenstein, D. A.
2002; 18 (18): 1407-1413
- **Reverse transcriptase and protease sequence evolution in two HIV-1-infected couples** *JAIDS-JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Palmer, S., Vuitton, D., Gonzales, M. J., Bassignot, A., Shafer, R. W.
2002; 31 (3): 285-290
- **Drug Resistance Mutations in HIV-1.** *Topics in HIV medicine : a publication of the International AIDS Society, USA*

- D'Aquila, R. T., Schapiro, J. M., Brun-Vézinet, F., Clotet, B., Conway, B., Demeter, L. M., Grant, R. M., Johnson, V. A., Kuritzkes, D. R., Loveday, C., Shafer, R. W., Richman, D. D.
2002; 10 (5): 21-25
- **Subtle decreases in stavudine phenotypic susceptibility predict poor virologic response to stavudine monotherapy in zidovudine-experienced patients** *1st IAS Conference on HIV Pathogenesis and Treatment*
Shulman, N. S., Hughes, M. D., Winters, M. A., Shafer, R. W., Zolopa, A. R., Hellmann, N. S., Bates, M., Whitcomb, J. M., Katzenstein, D. A. LIPPINCOTT WILLIAMS & WILKINS.2002: 121–27
 - **Synonymous-non-synonymous mutation rates between sequences containing ambiguous nucleotides (Syn-SCAN)** *BIOINFORMATICS*
Gonzales, M. J., Dugan, J. M., Shafer, R. W.
2002; 18 (6): 886-887
 - **Identification of Ugandan HIV type 1 variants with unique patterns of recombination in pol involving subtypes A and D** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Eshleman, S. H., Gonzales, M. J., Becker-Pergola, G., Cunningham, S. C., Guay, L. A., Jackson, J. B., Shafer, R. W.
2002; 18 (7): 507-511
 - **Evolution of primary protease inhibitor resistance mutations during protease inhibitor salvage therapy** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Kantor, R., Fessel, W. J., Zolopa, A. R., Israelski, D., Shulman, N., Montoya, J. G., Harbour, M., Schapiro, J. M., Shafer, R. W.
2002; 46 (4): 1086-1092
 - **Genotypic testing for human immunodeficiency virus type 1 drug resistance** *CLINICAL MICROBIOLOGY REVIEWS*
Shafer, R. W.
2002; 15 (2): 247-?
 - **Spectrum of HIV-1 reverse transcriptase mutations selected by nucleoside reverse transcriptase inhibitor treatment is greater than previously reported**
Gonzales, M. J., Wu, T., Taylor, J., Belitskaya, I., Kantor, R., Israelski, D., Chou, S., Zolopa, A. R., Fessel, J., Shafer, R. W.
INT MEDICAL PRESS LTD.2002: S38–S38
 - **Human immunodeficiency virus type 1 reverse-transcriptase and protease subtypes: Classification, amino acid mutation patterns, and prevalence in a northern California clinic-based population** *JOURNAL OF INFECTIOUS DISEASES*
Gonzales, M. J., Machezano, R. N., Shafer, R. W.
2001; 184 (8): 998-1006
 - **Genotypic correlates of a virologic response to stavudine after zidovudine monotherapy** *JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Shulman, N. S., Machezano, R. A., Shafer, R. W., Winters, M. A., Zolopa, A. R., Liou, S. H., Hughes, M., Katzenstein, D. A.
2001; 27 (4): 377-380
 - **Phenotypic hypersusceptibility to non-nucleoside reverse transcriptase inhibitors in treatment-experienced HIV-infected patients: impact on virological response to efavirenz-based therapy** *AIDS*
Shulman, N., Zolopa, A. R., Passaro, D., Shafer, R. W., Huang, W., KATZENSTEIN, D., Israelski, D. M., Hellmann, N., Petropoulos, C., Whitcomb, J.
2001; 15 (9): 1125-1132
 - **High degree of interlaboratory reproducibility of human immunodeficiency virus type 1 protease and reverse transcriptase sequencing of plasma samples from heavily treated patients** *JOURNAL OF CLINICAL MICROBIOLOGY*
Shafer, R. W., Hertogs, K., Zolopa, A. R., Warford, A., Bloor, S., Betts, B. J., Merigan, T. C., Harrigan, R., Larder, B. A.
2001; 39 (4): 1522-1529
 - **ACTG (AIDS Clinical Trials Group) 384: A strategy trial comparing consecutive treatments for HIV-1** *CONTROLLED CLINICAL TRIALS*
Smeaton, L. M., DeGruttola, V., Robbins, G. K., Shafer, R. W.
2001; 22 (2): 142-159
 - **Human Immunodeficiency Virus Reverse Transcriptase and Protease Sequence Database: an expanded data model integrating natural language text and sequence analysis programs** *NUCLEIC ACIDS RESEARCH*
Kantor, R., Machezano, R., Gonzales, M. J., Dupnik, K., Schapiro, J. M., Shafer, R. W.
2001; 29 (1): 296-299

- **A Guide to HIV-1 Reverse Transcriptase and Protease Sequencing for Drug Resistance Studies.** *HIV sequence compendium*
Shafer, R. W., Dupnik, K., Winters, M. A., Eshleman, S. H.
2001; 2001: 1-51
- **Human immunodeficiency virus on the Web: A guided tour** *CLINICAL INFECTIOUS DISEASES*
Shafer, R. W., Deresinski, S. C.
2000; 31 (2): 568-577
- **HIV type 1 envelope subtype C sequences from recent seroconverters in Zimbabwe** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Batra, M., Tien, P. C., Shafer, R. W., Contag, C. H., Katzenstein, D. A.
2000; 16 (10): 973-979
- **Reproducibility of human immunodeficiency virus type 1 (HIV-1) protease and reverse transcriptase sequencing of plasma samples from heavily treated HIV-1-infected individuals** *JOURNAL OF VIROLOGICAL METHODS*
Shafer, R. W., Warford, A., Winters, M. A., Gonzales, M. J.
2000; 86 (2): 143-153
- **Efavirenz- and adefovir dipivoxil-based salvage therapy in highly treatment-experienced patients: Clinical and genotypic predictors of virologic response** *JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Shulman, N. S., Zolopa, A. R., Passaro, D. J., Murlidharan, U., Israelski, D. M., Brosgart, C. L., Miller, M. D., Van Doren, S., Shafer, R. W., Katzenstein, D. A.
2000; 23 (3): 221-226
- **Delavirdine susceptibilities and associated reverse transcriptase mutations in human immunodeficiency virus type 1 isolates from patients in a phase I/II trial of delavirdine monotherapy (ACTG 260)** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Demeter, L. M., Shafer, R. W., Meehan, P. M., Holden-Wiltse, J., Fischl, M. A., Freimuth, W. W., Para, M. F., Reichman, R. C.
2000; 44 (3): 794-797
- **The Genetic Basis of HIV-1 Resistance to Reverse Transcriptase and Protease Inhibitors.** *AIDS reviews*
Shafer, R. W., Kantor, R., Gonzales, M. J.
2000; 2 (4): 211-228
- **Human immunodeficiency virus reverse transcriptase and protease sequence database** *NUCLEIC ACIDS RESEARCH*
Shafer, R. W., Jung, D. R., Betts, B. J., Xi, Y. O., Gonzales, M. J.
2000; 28 (1): 346-348
- **HIV-1 genotypic resistance patterns predict response to saquinavir-ritonavir therapy in patients in whom previous protease inhibitor therapy had failed** *ANNALS OF INTERNAL MEDICINE*
Zolopa, A. R., Shafer, R. W., Warford, A., Montoya, J. G., Hsu, P., KATZENSTEIN, D., Merigan, T. C., Efron, B.
1999; 131 (11): 813-?
- **Hydroxyurea enhances the activities of didanosine, 9-[2(phosphonylmethoxy)ethyl] adenine, and 9-[2(phosphonylmethoxy)propyl]adenine against drug-susceptible and drug-resistant human immunodeficiency virus isolates** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Palmer, S., Shafer, R. W., Merigan, T. C.
1999; 43 (8): 2046-2050
- **Identification of biased amino acid substitution patterns in human immunodeficiency virus type 1 isolates from patients treated with protease inhibitors** *JOURNAL OF VIROLOGY*
Shafer, R. W., Hsu, P., Patick, A. K., Craig, C., Brendel, V.
1999; 73 (7): 6197-6202
- **ACTG 260: a randomized, phase I-II, dose-ranging trial of the anti-human immunodeficiency virus activity of delavirdine monotherapy** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Para, M. F., Meehan, P., Holden-Wiltse, J., Fischl, M., Morse, G., Shafer, R., Demeter, L. M., Wood, K., Nevin, T., Virani-Ketter, N., Freimuth, W. W.
1999; 43 (6): 1373-1378
- **Highly drug-resistant HIV-1 clinical isolates are cross-resistant to many antiretroviral compounds in current clinical development** *AIDS*
Palmer, S., Shafer, R. W., Merigan, T. C.
1999; 13 (6): 661-667

- **Highly active antiretroviral therapy (HAART) for the treatment of infection with human immunodeficiency virus type 1** *BIOMEDICINE & PHARMACOTHERAPY*
Shafer, R. W., Vuitton, D. A.
1999; 53 (2): 73-86
- **Human immunodeficiency virus reverse transcriptase and protease sequence database** *NUCLEIC ACIDS RESEARCH*
Shafer, R. W., Stevenson, D., Chan, B.
1999; 27 (1): 348-352
- **Sequence and drug susceptibility of subtype C protease from human immunodeficiency virus type 1 seroconverters in Zimbabwe** *AIDS RESEARCH AND HUMAN RETROVIRUSES*
Shafer, R. W., Chuang, T. K., Hsu, P., White, C. B., Katzenstein, D. A.
1999; 15 (1): 65-69
- **A 6-basepair insert in the reverse transcriptase gene of human immunodeficiency virus type 1 confers resistance to multiple nucleoside inhibitors** *2nd International Workshop on HIV Drug Resistance and Treatment Strategies*
Winters, M. A., Coolley, K. L., Girard, Y. A., Levee, D. J., Hamdan, H., Shafer, R. W., Katzenstein, D. A., Merigan, T. C.
AMER SOC CLINICAL INVESTIGATION INC.1998: 1769-75
- **Interlaboratory concordance of DNA sequence analysis to detect reverse transcriptase mutations in HIV-1 proviral DNA** *JOURNAL OF VIROLOGICAL METHODS*
Demeter, L. M., D'Aquila, R., WEISLOW, O., Lorenzo, E., ERICE, A., Fitzgibbon, J., Shafer, R., Richman, D., Howard, T. M., Zhao, Y. Q., Fisher, E., Huang, D., Mayers, et al
1998; 75 (1): 93-104
- **An update on the diagnosis and treatment of HIV, 1998** *DRUGS OF TODAY*
Shafer, R. W., Kroodsma, K.
1998; 34 (8): 663-672
- **Sequence and drug susceptibility of subtype C reverse transcriptase from human immunodeficiency virus type 1 seroconverters in Zimbabwe** *JOURNAL OF VIROLOGY*
Shafer, R. W., Eisen, J. A., Merigan, T. C., Katzenstein, D. A.
1997; 71 (7): 5441-5448
- **Human immunodeficiency virus type 1 reverse transcriptase genotype and drug susceptibility changes in infected individuals receiving dideoxyinosine monotherapy for 1 to 2 years** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Winters, M. A., Shafer, R. W., Jellinger, R. A., Mamtora, G., Gingeras, T., Merigan, T. C.
1997; 41 (4): 757-762
- **A novel approach to assessing the drug susceptibility and replication of human immunodeficiency virus type 1 isolates** *JOURNAL OF INFECTIOUS DISEASES*
Jellinger, R. M., Shafer, R. W., Merigan, T. C.
1997; 175 (3): 561-566
- **Comparison of QIAamp HCV kit spin columns, silica beads, and phenol-chloroform for recovering human immunodeficiency virus type 1 RNA from plasma** *JOURNAL OF CLINICAL MICROBIOLOGY*
Shafer, R. W., Levee, D. J., Winters, M. A., Richmond, K. L., Huang, D., Merigan, T. C.
1997; 35 (2): 520-522
- **Genotypic and phenotypic changes during culture of a multinucleoside-resistant human immunodeficiency virus type 1 strain in the presence and absence of additional reverse transcriptase inhibitors** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*
Shafer, R. W., Winters, M. A., Iversen, A. K., Merigan, T. C.
1996; 40 (12): 2887-2890
- **Zidovudine resistance reverse transcriptase mutations during didanosine monotherapy** *JOURNAL OF INFECTIOUS DISEASES*
Shafer, R. W., Winters, M. A., Jellinger, R. M., Merigan, T. C.
1996; 174 (2): 448-449
- **Interlaboratory comparison of sequence-specific PCR and ligase detection reaction to detect a human immunodeficiency virus type 1 drug resistance mutation** *JOURNAL OF CLINICAL MICROBIOLOGY*

- Shafer, R. W., Winters, M. A., MAYERS, D. L., JAPOUR, A. J., Kuritzkes, D. R., Weislow, O. S., White, F., ERICE, A., SANNERUD, K. J., Iversen, A., Pena, F., Dimitrov, D., Frenkel, et al
1996; 34 (7): 1849-1853
- **Multidrug-resistant human immunodeficiency virus type 1 strains resulting from combination antiretroviral therapy** *JOURNAL OF VIROLOGY*
Iversen, A. K., Shafer, R. W., Wehrly, K., Winters, M. A., Mullins, J. I., Chesebro, B., Merigan, T. C.
1996; 70 (2): 1086-1090
 - **Exogenous reinfection with multidrug-resistant Mycobacterium tuberculosis in an immunocompetent patient** *TUBERCLE AND LUNG DISEASE*
Shafer, R. W., Singh, S. P., Larkin, C., Small, P. M.
1995; 76 (6): 575-577
 - **DRUG-RESISTANCE AND HETEROGENEOUS LONG-TERM VIROLOGICAL RESPONSES OF HUMAN-IMMUNODEFICIENCY-VIRUS TYPE 1-INFECTED SUBJECTS TO ZIDOVUDINE AND DIDANOSINE COMBINATION THERAPY** *JOURNAL OF INFECTIOUS DISEASES*
Shafer, R. W., Iversen, A. K., Winters, M. A., Aguiniga, E., Katzenstein, D. A., Merigan, T. C.
1995; 172 (1): 70-78
 - **NEW VIROLOGICAL TOOLS FOR THE DESIGN AND ANALYSIS OF CLINICAL-TRIALS** *JOURNAL OF INFECTIOUS DISEASES*
Shafer, R. W., Merigan, T. C.
1995; 171 (5): 1325-1328
 - **RANDOMIZED STUDY OF DIDANOSINE MONOTHERAPY AND COMBINATION THERAPY WITH ZIDOVUDINE IN HEMOPHILIC AND NONHEMOPHILIC SUBJECTS WITH ASYMPTOMATIC HUMAN IMMUNODEFICIENCY VIRUS-1 INFECTION** *BLOOD*
Ragni, M. V., LOFARO, M. L., DeGruttola, V., VANDERHORST, C., Eyster, M. E., Kessler, C. M., GJERSET, G. F., Ho, M., Parenti, D. M., Dafni, U., Rasheed, S., Korvick, J. A., Merigan, et al
1995; 85 (9): 2337-2346
 - **CLARIFICATION OF A METHOD TO REVERSE TRANSCRIBE HUMAN-IMMUNODEFICIENCY-VIRUS RNA** *JOURNAL OF INFECTIOUS DISEASES*
Kozal, M. J., Shafer, R. W., Winters, M. A., Katzenstein, D. A., Merigan, T. C.
1995; 171 (4): 1072-1072
 - **HIV virology for clinical trials.** *AIDS*
Shafer, R. W., Merigan, T. C.
1995; 9: S193-202
 - **QUANTITATIVE-ANALYSIS OF SYNCYTIUM-INDUCING AND NON-SYNCYTIUM-INDUCING VIRUS IN PATIENTS INFECTED WITH HUMAN-IMMUNODEFICIENCY-VIRUS TYPE-1** *JOURNAL OF CLINICAL MICROBIOLOGY*
Shafer, R. W., Aguiniga, E., Merigan, T. C.
1995; 33 (1): 212-214
 - **DIDANOSINE RESISTANCE IN HIV-INFECTED PATIENTS SWITCHED FROM ZIDOVUDINE TO DIDANOSINE MONOTHERAPY** *ANNALS OF INTERNAL MEDICINE*
Kozal, M. J., Kroodsma, K., Winters, M. A., Shafer, R. W., Efron, B., Katzenstein, D. A., Merigan, T. C.
1994; 121 (4): 263-268
 - **HIV-1 SYNCYTIUM-INDUCING PHENOTYPE, VIRUS BURDEN CODON-215 REVERSE-TRANSCRIPTASE MUTATION AND CD4 CELL DECLINE IN ZIDOVUDINE-TREATED PATIENTS** *JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES AND HUMAN RETROVIROLOGY*
Kozal, M. J., Shafer, R. W., Winters, M. A., Katzenstein, D. A., Aguiniga, E., Halpern, J., Merigan, T. C.
1994; 7 (8): 832-838
 - **PREVALENCE OF HIV-1 SYNCYTIUM-INDUCING PHENOTYPE** *ANNALS OF INTERNAL MEDICINE*
Kozal, M. J., Ramachandran, R. V., Shafer, W.
1994; 120 (9): 811-811
 - **MEASUREMENT OF HIV VIRUS LOAD AND GENOTYPIC RESISTANCE BY GENE AMPLIFICATION IN ASYMPTOMATIC SUBJECTS TREATED WITH COMBINATION THERAPY** *JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES*
Holodniy, M., KATZENSTEIN, D., Winters, M., Montoya, J., Shafer, R., Kozal, M., Ragni, M., Merigan, T. C.

1993; 6 (4): 366-369

- **ZIDOVUDINE SUSCEPTIBILITY TESTING OF HUMAN-IMMUNODEFICIENCY-VIRUS TYPE-1 (HIV) CLINICAL ISOLATES** *JOURNAL OF VIROLOGICAL METHODS*
Shafer, R. W., Kozal, M. J., Katzenstein, D. A., LIPIL, W. H., JOHNSTONE, I. F., Merigan, T. C.
1993; 41 (3): 297-310
- **A MUTATION IN HUMAN-IMMUNODEFICIENCY-VIRUS REVERSE-TRANSCRIPTASE AND DECLINE IN LYMPHOCYTE-CD4 NUMBERS IN LONG-TERM ZIDOVUDINE RECIPIENTS** *JOURNAL OF INFECTIOUS DISEASES*
Kozal, M. J., Shafer, R. W., Winters, M. A., Katzenstein, D. A., Merigan, T. C.
1993; 167 (3): 526-532
- **MYCOBACTERIUM-XENOPI, MYCOBACTERIUM-FORTUITUM, MYCOBACTERIUM-KANSASII, AND OTHER NONTUBERCULOUS MYCOBACTERIA IN AN AREA OF ENDEMICITY FOR AIDS** *CLINICAL INFECTIOUS DISEASES*
Shafer, R. W., Sierra, M. F.
1992; 15 (1): 161-162
- **BLASTOMYCOSIS IN PATIENTS WITH THE ACQUIRED-IMMUNODEFICIENCY-SYNDROME** *ANNALS OF INTERNAL MEDICINE*
Pappas, P. G., Pottage, J. C., Powderly, W. G., Fraser, V. J., Stratton, C. W., McKenzie, S., Tapper, M. L., CHMEL, H., BONEBRAKE, F. C., Blum, R., Shafer, R. W., King, C., Dismukes, et al
1992; 116 (10): 847-853
- **RELAPSE OF TUBERCULOSIS IN A PATIENT WITH THE ACQUIRED-IMMUNODEFICIENCY-SYNDROME DESPITE 12 MONTHS OF ANTITUBERCULOUS THERAPY AND CONTINUATION OF ISONIAZID** *TUBERCLE*
Shafer, R. W., Jones, W. D.
1991; 72 (2): 149-151
- **HIV PREVALENCE, IMMUNOSUPPRESSION, AND DRUG-RESISTANCE IN PATIENTS WITH TUBERCULOSIS IN AN AREA ENDEMIC FOR AIDS** *AIDS*
Shafer, R. W., Chirgwin, K. D., Glatt, A. E., DAHDOUH, M. A., Landesman, S. H., Suster, B.
1991; 5 (4): 399-405
- **FREQUENCY OF MYCOBACTERIUM-TUBERCULOSIS BACTEREMIA IN PATIENTS WITH TUBERCULOSIS IN AN AREA ENDEMIC FOR AIDS** *AMERICAN REVIEW OF RESPIRATORY DISEASE*
Shafer, R. W., Goldberg, R., Sierra, M., Glatt, A. E.
1989; 140 (6): 1611-1613
- **Q-FEVER ENDOCARDITIS - DELAY IN DIAGNOSIS DUE TO AN APPARENT CLINICAL-RESPONSE TO CORTICOSTEROIDS** *AMERICAN JOURNAL OF MEDICINE*
Shafer, R. W., Braverman, E. R.
1989; 86 (6): 729-729
- **A LIFE-THREATENING GONOCOCCAL-INFECTION** *HOSPITAL PRACTICE*
Shafer, R. W., RAZAVI, M. H., Zenilman, J. M.
1989; 24 (5): 26-?
- **SUCCESSFUL PROPHYLAXIS OF PNEUMOCYSTIS-CARINII PNEUMONIA WITH TRIMETHOPRIM SULFAMETHOXAZOLE IN AIDS PATIENTS WITH PREVIOUS ALLERGIC REACTIONS** *JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES AND HUMAN RETROVIROLOGY*
Shafer, R. W., SEITZMAN, P. A., Tapper, M. L.
1989; 2 (4): 389-393