

PROFESSOR PATRICK T. F. KENNEDY

PUBLICATIONS (119 peer reviewed publications)

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- 1) **Kennedy PTF**, Fung S, Buti M, Yilmaz G, Chuang WL, Asselah T, Kurosaki M, Jezorwski J, Klyashtornyy V, Verbinnen T, Kakuda TN, Lenz O, Guinard-Azadian C, Biermer M. Peginterferon alpha-2a add-on to siRNA JNJ-73763989 in untreated patients with HBeAg-positive chronic hepatitis B virus (HBV) infection: the phase 2 REEF-IT study. **Gut.** 2026 Apr 7;75(5):1043-1054. doi: 10.1136/gutjnl-2025-336592.
- 2) Verheijden S, Conceição-Neto N, Bourgeois S, Vandamme C, Troyer E, Kanoulas E, Maeyer D, Crabbe M, Makariadou E, Slaets L, Fevery B, Remoortere PV, Biermer M, **Kennedy PTF**, De Creus A. Safety, immunogenicity, and baseline immune correlates of vaccine JNJ-0535 in participants with or without CHB. **NPJ Vaccines.** 2026 Feb 5;11(1):45. doi: 10.1038/s41541-025-01364-x.
- 3) Preechanukul A, Alrubayyi A, Sun B, Arbe-Barnes E, Kokici J, Gorou F, Prasitdumrong S, da Costa KAS, Fisher-Pearson N, Hussain N, Kucykowicz S, Ghosh I, Burns F, Kinloch S, Simoes P, Bhagani S, **Kennedy PTF**, Maini MK, Bashford-Rogers R, Gill US, Peppia D. Stem-like CD8+ T cells preserve HBV-specific responses in HBV/HIV co-infection. **Gut.** 2025 Dec 4;gutjnl-2025-335461. doi: 10.1136/gutjnl-2025-335461.
- 4) Le Bert N, Koffas A, Kumar R, Facchetti F, Tan AT, Gill US, Mak LY, Stretch SW, Miao T, Hariharaputran S, Hang SK, Guo Y, Chen Q, Degasperi E, Lampertico P, Chow WC, Bertoletti A, **Kennedy PTF**. Rapid whole-blood immune profiling reveals heterogeneous HBV-specific T cell response patterns independent of clinical disease phases. **J Hepatol.** 2025 Dec;83(6):1292-1304. doi: 10.1016/j.jhep.2025.06.012.
- 5) Tarik Asselah, Michael A. Chattergoon, Alina Jucov, Anca Streinu-Cercel, Pietro Lampertico, Heiner Wedemeyer, **Patrick T. Kennedy**, Edward J. Gane, Brianna L. Bullard, Sophia Chow, Desiree Santos, Gregory Camus, Yimeng Lu, Cara Pilowa, Carey Hwang, M.D, Todd Correll, Kosh Agarwal, SOLSTICE Trial Investigators. A Phase 2 Trial of Tobevibart plus Elebsiran in Hepatitis D. **N Engl J Med.** 2025 Nov 9. doi: 10.1056/NEJMoa2508827.
- 6) **Patrick T F Kennedy**, Scott Fung, Maria Buti, Gurdal Yilmaz, Wan-Long Chuang, Tarik Asselah, Masayuki Kurosaki, John Jezorwski, Vladislav Klyashtornyy, Thierry Verbinnen, Thomas Naoki Kakuda, Oliver Lenz, Carine Guinard-Azadian, Michael Biermer. Peginterferon alpha-2a add-on to siRNA JNJ-73763989 in untreated patients with HBeAg-positive chronic hepatitis B virus (HBV) infection: the phase 2 REEF-IT study. **Gut.** 2025 Nov 4; gutjnl-2025-336592. doi: 10.1136/gutjnl-2025-336592.
- 7) **Patrick T Kennedy**, Lena Allweiss, Antonio Bertoletti, Markus Cornberg, Adam J Gehring, Luca G Guidotti, Hélène A Kerth, Maud Lemoine, Massimo Levrero, Seng Gee Lim, John E Tavis, Barbara Testoni, Thomas Tu; International Coalition to Eliminate HBV. Scientific and medical evidence informing expansion of hepatitis B treatment guidelines. **Lancet Gastroenterol Hepatol.** 2025 Oct;10(10): 941-951. doi: 10.1016/S2468-1253(25)00053-6.
- 8) Markus Cornberg, Lisa Sandmann, Jerzy Jaroszewicz, **Patrick Kennedy**, Pietro Lampertico, Maud Lemoine, Sabela Lens, Barbara Testoni, Grace Lai-Hung Wong, Francesco Paolo Russo. EASL Clinical Practice Guidelines on the management of hepatitis B virus infection. **J Hepatol.** 2025 Aug;83(2):502-583. doi: 10.1016/j.jhep.2025.03.018.

- 9) Douglas L Fink, David Etoori, Robert Hill, Orest Idilli, Nikita Kartikapallil, Olivia Payne, Sarah Griffith, Hannah F Bradford, Claudia Mauri, **Patrick T F Kennedy**, Laura E McCoy, Mala K Maini, Upkar S Gill. Corrigendum to "Auto-antibodies against interferons are common in people living with chronic hepatitis B virus infection and associate with PegIFN α non-response. **JHEP Rep.** **2025** Aug 22;7(10): 101520.doi: 10.1016/j.jhepr.2025.101520.
- 10) Valentina Venzin, Cristian G Beccaria, Chiara Perucchini, Pietro Delfino, Elisa B Bono, Leonardo Giustini, Federica Moalli, Marta Grillo, Valeria Fumagalli, Chiara Laura, Pietro Di Lucia, Katharina Reinhard, Jutta Petschenka, Tana Annmarie Omokoko, Anna Celant, Sabrina Ottolini, Keigo Kawashima, Micol Ravà, Marco De Giovanni, Donato Inverso, Mirela Kuka, **Patrick T F Kennedy**, Martin Guilliams, Giulia Casorati, Federica Pedica, Maurilio Ponzoni, Uğur Şahin, Nina Le Bert, Antonio Bertoletti, Fulvia Vascotto, Luca G Guidotti, Matteo Iannacone. CD4⁺ T cells license Kupffer cells to reverse CD8⁺ T cell dysfunction induced by hepatocellular priming. **Nat Immunol.** **2025** Jun 30. doi: 10.1038/s41590-025-02199-3. Epub 2025 Jun 30.
- 11) Nina Le Bert, Apostolos Koffas, Rajneesh Kumar, Floriana Facchetti, Anthony T Tan, Upkar S Gill, Lung-Yi Mak, Sophie W Stretch, Tizong Miao, Smrithi Hariharaputran, Shou Kit Hang, Yifei Guo, Qi Chen, Elisabetta Degaspero, Pietro Lampertico, Wan Cheng Chow, Antonio Bertoletti, **Patrick T F Kennedy**. Rapid whole-blood immune profiling reveals heterogeneous HBV-specific T cell response patterns independent of clinical disease phases. **J Hepatol.** **2025** Jun 21: S0168-8278(25)02280-9. doi: 10.1016/j.jhep.2025.06.01.
- 12) Jay Preechanukul, Aljawharah Alrubayyi, Bo Sun, Edward Arbe-Barnes, Jonida Kokici, Frances Gorou, Sarun Prasitdumrong, Kelly A S da Costa, Natasha Fisher-Pearson, Noshin Hussain, Stephanie Kucykowicz, Indrajit Ghosh, Fiona Burns, Sabine Kinloch, Pedro Simoes, Sanjay Bhagani, **Patrick T F Kennedy**, Mala K Maini, Rachael Bashford-Rogers, Upkar S Gill, Dimitra Peppas. Stem-like CD8⁺ T cells preserve HBV-specific responses in HBV/HIV co-infection. **medRxiv [Preprint].** **2025** Apr 3:2025.03.30.25324898. doi: 10.1101/2025.03.30.25324898.
- 13) **Patrick T. Kennedy**, Lena Allweiss, Antonio Bertoletti, Markus Cornberg, Adam J. Gehring, Luca G. Guidotti, Helene A. Kerth, Maud Lemoine, Massimo Levrero, Seng Gee Lim, John E. Tavis, Barbara Testoni, and Thomas Tu. Scientific and Medical Evidence Informing Expansion of HBV Treatment Guidelines. **Lancet Gastroenterol Hepatol.** **2025** Oct;10(10):941-951 doi: 10.1016/S2468-1253(25)00053-6.
- 14) Wu D, Kao JH, Piratvisuth T, Wang X, **Kennedy PTF**, Otsuka M, Ahn SH, Tanaka Y, Wang G, Yuan Z, Li W, Lim YS, Niu J, Lu F, Zhang W, Gao Z, Kaewdech A, Han M, Yan W, Ren H, Hu P, Shu S, Kwo PY, Wang FS, Yuen MF, Ning Q. Update on the treatment navigation for functional cure of chronic hepatitis B: expert consensus 2.0 **Clin Mol Hepatol.** **2025** Feb;31(Suppl):S134-S164. doi: 10.3350/cmh.2024.0780.
- 15) Douglas L Fink, David Etoori, Robert Hill, Orest Idilli, Nikita Kartikapallil, Olivia Payne, Sarah Griffith, Hannah F Bradford, Claudia Mauri, **Patrick T F Kennedy**, Laura E McCoy, Mala K Maini, Upkar S Gill. Auto-antibodies against interferons are common in people living with chronic hepatitis B virus infection and associate with PegIFN α non-response. **JHEP Rep.** **2025** Feb 28;7(5): 101382.doi: 10.1016/j.jhepr.2025.101382.
- 16) Lei Y, Mohamed A, **Kennedy PT**. Minimising Risk in CHB Management: A Zero-Risk Approach. **J Viral Hepat.** **2024** Dec;31 Suppl 2:56-60. doi: 10.1111/jvh.14034.
- 17) Zoulim F, Chen PJ, Dandri M, **Kennedy PT**, Seeger C. Hepatitis B virus DNA integration: Implications for diagnostics, therapy, and outcome. **J Hepatol.** **2024** Dec;81(6):1087-1099. doi: 10.1016/j.jhep.2024.06.037.

- 18) Efthymiou A, **Kennedy PT**. Preoperative gastric retention in endoscopic retrograde cholangiopancreatography. **World J Gastrointest Surg.** **2024** Nov 27;16(11):3632-3635. doi:10.4240/wjgs.v16.i11.3632.
- 19) Robert G Gish, Robert J Wong, Gian Luca Di Tanna, Ankita Kaushik, Chong Kim, Nathaniel J Smith, **Patrick TF Kennedy**. The causal analysis of missing confounding-factors for the association between HDV with specific liver events. **Hepatology.** **2024** Oct 1;80(4):E50-E52.DOI:10.1097/HEP.0000000000001025.
- 20) Sun B, da Costa KAS, Alrubayyi A, Kokici J, Fisher-Pearson N, Hussain N, D'Anna S, Piermatteo L, Salpini R, Svicher V, Kucykowicz S, Ghosh I, Burns F, Kinloch S, Simoes P, Bhagani S, **Kennedy PTF**, Maini MK, Bashford-Rogers R, Gill US, Peppia D. HIV/HBV coinfection remodels the immune landscape and natural killer cell ADCC functional responses. **Hepatology.** **2024** Sep 1;80(3):649-663. doi: 10.1097/HEP.0000000000000877.
- 21) Amy Cross, James M Harris, Edward Arbe-Barnes, Colin Nixon, Rageshri Dhairyawan, Andrew Hall, Alberto Quaglia, Fadi Issa, **Patrick T F Kennedy**, Jane A McKeating, Upkar S Gill, Dimitra Peppia. Characterisation of HBV and co-infection with HDV and HIV through spatial transcriptomics. **eGastroenterology**2024;2: 2024 Aug;2(3):e100067.doi: 10.1136/egastro-2024-100067.
- 22) Fabien Zoulim, Pei-Jer Chen, Maura Dandri, **Patrick Kennedy**, Christoph Seeger. Hepatitis B Virus DNA integration: Implications for diagnostics, therapy, and outcome. **J Hepatol.** **2024** Jul 4:S0168-8278(24)02343-2. doi: 10.1016/j.jhep.2024.06.037.
- 23) Jane Abbott; Natalie V. J. Aldhouse; Helen Kitchen; Hannah C. Pegram; Fiona Brown; Malcolm Macartney; Angelina Villasis-Keever; Urbano Sbarigia; Tetsuro Ito; Eric K.H. Chan; **Patrick T. Kennedy**. A Conceptual Model for Chronic Hepatitis B and Content Validity of the Hepatitis B Quality of Life (HBQOL) Instrument. **J Patient Rep Outcomes.** **2024** Mar 4;8(1):29.doi: 10.1186/s41687-023-00675-8.
- 24) Mak LY, Koffas A, Dolman GE, Saleh H, Kemos P, Riddell A, Gill U, **Kennedy PTF**. Role of HBsAg levels in guiding hepatitis B virus prophylaxis in pregnancy: Insights from a multi-ethnic cohort. **J Viral Hepat.** **2024** Jan;31(1):3-11. doi: 10.1111/jvh.13893.
- 25) Georgia Zeng, Benjamin R. Holmes, Saleh A. Alqahtani, Upkar S. Gill and **Patrick T. F. Kennedy** *The co-existence of NAFLD and CHB is associated with suboptimal viral and biochemical response to CHB antiviral therapy: a systemic review and meta-analysis. **Font. Gastroenterol.,** **2024 Jan 24** Sec. Hepatology. doi:10.3389/fgstr.2024.1333988
- 26) Romina Salpini, Valentina Svicher, **Patrick T Kennedy**. The Current Challenges Underlying Hepatitis D Virus Infection. **Editorial.** **2024** Jan 8:10:1355027.doi:10.3389/fmed.2023.1355027.
- 27) Gish RG, Wong RJ, Di Tanna GL, Kaushik A, Kim C, Smith NJ, **Kennedy PTF**. Association between hepatitis delta virus with liver morbidity and mortality: A systematic literature review and meta-analysis. **Hepatology.** **2023** Oct 23. doi: 10.1097/HEP.0000000000000642.
- 28) Mak LY, Koffas A, Dolman GE, Saleh H, Kemos P, Riddell A, Gill U, **Kennedy PTF**. Role of HBsAg levels in guiding hepatitis B virus prophylaxis in pregnancy: Insights from a multi-ethnic cohort. **J Viral Hepat.** **2023** Oct 26. doi: 10.1111/jvh.13893.
- 29) Barbara Testoni, Armando Andres Roca Suarez, Arianna Battisti, Marie-Laure Plissonnier, Marantha Heil, Thierry Fontanges, François Villeret, Yasmina Chouik, Massimo Levrero, Upkar Gill, **Kennedy P**, Fabien Zoulim. Evaluation of thr HBV Liver Reservoir with Fine Needle Aspirates. **JHEP Rep.** **2023** Jul 11;5(10):100841. doi: 10.1016/j.jhepr.2023.100841.

- 30) Man-Fung Yuen, Tarik Asselah, Ira M Jacobson, Maurizia Rossana Brunetto, Harry L A Janssen, Tetsuo Takehara, Jin Lin Hou, Thomas N Kakuda, Tom Lambrecht, Maria Beumont, Ronald Kalmeijer, Carine Guinard-Azadian, Cristiana Mayer, John Jezowski, Thierry Verbinnen, Oliver Lenz, Umesh Shukla, Michael Biermer; **REEF-1 Study Group**. Efficacy and Safety of The siRNA JNJ – 73763989 and The Capsid Assembly Modulator JNJ-56136379 (Bersacapavir) with Nucleos(t)ide Analogues for The Treatment of Chronic Hepatitis B Virus Infection (REEF-1): A Multicentre, Double-Blind, Active-Controlled, Randomised, Phase 2b Trial. *Lancet Gastroenterol Hepatol.* **2023** Sep;8(9):790-802. doi: 10.1016/S2468-1253(23)00148-6.
- 31) Young-Suk Lim, W. Ray Kim, Douglas Dieterich, Jia-Horng Kao, John F. Flaherty, Leland J. Yee, Lewis R. Roberts, Homie Razavi, **Patrick T. F. Kennedy**. Evidence for Benefits of Early Treatment Initiation for Chronic Hepatitis B. *Viruses.* **2023** Apr; 15(4): 997. Published online 2023 Apr 18. doi: 10.3390/v15040997
- 32) Georgia Zeng, Apostolos Koffas, Lung-Yi Mak, Upkar S. Gill, **Patrick TF Kennedy**. Utility of novel viral and immune markers in predicting HBV treatment endpoints: A systematic review of treatment discontinuation studies. *JHEP Reports.* **2023.** Jun; 5(6): 100720. Published online 2023 Mar 8. doi: 10.1016/j.jhepr.2023.100720
- 33) Pallett LJ, Swadling L, Diniz M, Maini AA, Schwabenland M, Gasull AD, Davies J, Kucykowicz S, Skelton JK, Thomas N, Schmidt NM, Amin OE, Gill US, Stegmann KA, Burton AR, Stephenson E, Reynolds G, Whelan M, Sanchez J, de Maeyer R, Thakker C, Suveizdyte K, Uddin I, Ortega-Prieto AM, Grant C, Froghi F, Fusai G, Lens S, Pérez-Del-Pulgar S, Al-Akkad W, Mazza G, Noursadeghi M, Akbar A, **Kennedy PTF**, Davidson BR, Prinz M, Chain BM, Haniffa M, Gilroy DW, Dorner M, Bengsch B, Schurich A, Maini MK. Tissue CD14⁺CD8⁺ T cells reprogrammed by myeloid cells and modulated by LPS. *Nature.* **2023** Feb;614(7947):334-342. doi: 10.1038/s41586-022-05645-6.
- 34) Mak LY, Beasley I, **Kennedy PTF**. Chronic viral hepatitis in athletes: an overlooked population? *Br J Sports Med.* **2023** Jan;57(2):72-74. doi: 10.1136/bjsports-2022-105837.
- 35) Khalfi P, **Kennedy PT**, Majzoub K, Asselah T. Hepatitis D virus: Improving virological knowledge to develop new treatments. *Antiviral Res.* **2023** Jan;209:105461. doi: 10.1016/j.antiviral.2022.105461.
- 36) Hardt K, Vandebosch A, Sadoff J, Le Gars M, Truyers C, Lawson D, Van Dromme I, Vingerhoets J, Kamphuis T, Scheper G, Ruiz-Guiñazú J, Faust SN, Spinner CD, Schuitemaker H, Van Hoof J, Douoguih M, Struyf F; **ENSEMBLE2 study group**. Efficacy, safety, and immunogenicity of a booster regimen of Ad26.COV2.S vaccine against COVID-19 (ENSEMBLE2): results of a randomised, double-blind, placebo-controlled, phase 3 trial. *Lancet Infect Dis.* **2022** Dec;22(12):1703-1715. doi: 10.1016/S1473-3099(22)00506-0.
- 37) Koffas A, Mak LY, **Kennedy PTF**. Hepatitis delta virus: Disease assessment and stratification. *J Viral Hepat.* **2022** Dec 2. doi: 10.1111/jvh.13777.
- 38) Mak LY, Beasley I, **Kennedy PTF**. Chronic Viral Hepatitis in Elite Athletes: Approaches to Risk Assessment, Prevention and Management. *Sports Med Open.* **2022** Oct 4;8(1):123. doi: 10.1186/s40798-022-00517-9.
- 39) Salpini R, D'Anna S, Benedetti L, Piermatteo L, Gill U, Svicher V and **Kennedy PTF**. Hepatitis B virus DNA integration as a novel biomarker of hepatitis B virus-mediated pathogenetic properties and a barrier to the current strategies for hepatitis B virus cure. *Front Microbiol.* **2022** Sep 13:972687. doi: 10.3389/fmicb.2022.972687.
- 40) Wiggins BG, Pallett LJ, Li X, Davies SP, Amin OE, Gill US, Kucykowicz S, Patel AM, Aliasis K, Liu YS, Reynolds GM, Davidson BR, Gander A, Luong TV, Hirschfield GM, **Kennedy PTF**,

Huang Y, Maini MK, Stamataki Z. The human liver microenvironment shapes the homing and function of CD4+ T-cell populations. *Gut.* **2022** Jul;71(7):1399-1411. doi: 10.1136/gutjnl-2020-323771.

- 41) Koffas A, Mak LY, Gill US, **Kennedy PTF.** Early Treatment Consideration in Patients with Hepatitis B 'e' Antigen-Positive Chronic Infection: Is It Time for a Paradigm Shift? *Viruses.* **2022** Apr 26;14(5):900. doi: 10.3390/v14050900.
- 42) Usai C, Gill US, Riddell AC, Asselah T, **Kennedy PT.** Emerging insights into the immunopathology, clinical and therapeutic aspects of hepatitis delta virus. *Aliment Pharmacol Ther.* **2022** Apr;55(8):978-993. doi: 10.1111/apt.16807.
- 43) Khoo NKH, Lim JME, Gill US, de Alwis R, Tan N, Toh JZN, Abbott JE, Usai C, Ooi EE, Low JGH, Le Bert N, **Kennedy PTF,** Bertoletti A. Differential immunogenicity of homologous versus heterologous boost in Ad26.COVS vaccine recipients. *Med (N Y).* **2022** Feb 11;3(2):104-118.e4. doi: 10.1016/j.medj.2021.12.004.
- 44) Usai C, Gibbons JM, Pade C, Li W, Jacobs SRM, McKnight Á, **Kennedy PTF,** Gill US. The β -NGF/TrkA Signalling Pathway Is Associated With the Production of Anti-Nucleoprotein IgG in Convalescent COVID-19. *Front Immunol.* **2022** Jan 14;12:813300. doi: 10.3389/fimmu.2021.813300.
- 45) Piermatteo L, Alkhatib M, D'Anna S, Malagnino V, Bertoli A, Andreassi E, Basile E, Iuvara A, De Cristofaro M, Cappiello G, Cerva C, Minichini C, Pisaturo M, Starace M, Coppola N, Fontana C, Grelli S, Ceccherini-Silberstein F, Andreoni M, Gill US, **Kennedy PTF,** Sarmati L, Salpini R, Svicher V. HBeAg Levels Vary across the Different Stages of HBV Infection According to the Extent of Immunological Pressure and Are Associated with Therapeutic Outcome in the Setting of Immunosuppression-Driven HBV Reactivation. *Biomedicines.* **2021** Sep 29;9(10):1352.
- 46) Wiggins BG, Pallett LJ, Li X, Davies SP, Amin OE, Gill US, Kucykowicz S, Patel AM, Aliazis K, Liu YS, Reynolds GM, Davidson BR, Gander A, Luong TV, Hirschfield GM, **Kennedy PTF,** Huang Y, Maini MK, Stamataki Z. The human liver microenvironment shapes the homing and function of CD4+ T-cell populations. *Gut.* **2021** Sep 21:gutjnl-2020-323771.
- 47) Dolman GE, Koffas A, Phipps E, **Kennedy PTF.** Clinical and occupational health management of healthcare workers living with chronic hepatitis B: UK policy and international comparisons. *J Viral Hepat.* **2021** Jul;28(7):976-981.
- 48) Choudhry N, Drysdale K, Usai C, Leighton D, Sonagara V, Buchanan R, Nijjar M, Thomas S, Hopkins M, Cutino-Moguel T, Gill US, Foster GR, **Kennedy PT.** Disparities of SARS-CoV-2 Nucleoprotein-Specific IgG in Healthcare Workers in East London, UK. *Front Med (Lausanne).* **2021** Apr 27;8:642723.
- 49) Koffas A, Kumar M, Gill US, Jindal A, **Kennedy PTF***, Sarin SK*. Chronic hepatitis B: the demise of the 'inactive carrier' phase. *Hepatol Int.* **2021** Feb 27.
- 50) Svicher V*, Salpini R*, Piermatteo L, Carioti L, Battisti A, Colagrossi L, Scutari R, Surdo M, Cacciafesta V, Nuccitelli A, Hansi N, Ceccherini Silberstein F, Perno CF, Gill US, **Kennedy PTF.** Whole exome HBV DNA integration is independent of the intrahepatic HBV reservoir in HBeAg-negative chronic hepatitis B. *Gut.* **2020** Dec 21:gutjnl-2020-323300.
- 51) Zeng G, Gill US, **Kennedy PTF.** Prioritisation and the initiation of HCC surveillance in CHB patients: lessons to learn from the COVID-19 crisis. *Gut.* **2020** Nov;69(11):1907-1912
- 52) Le Bert N*, Gill US*, Hong M*, Kunasegaran K, Tan DZM, Ahmad R, Cheng Y, Dutertre CA, Heinecke A, Rivino L, Tan A, Hansi NK, Zhang M, Xi S, Chong Y, Pflanz S, Newell EW, **Kennedy PTF***, Bertoletti A*. Effects of Hepatitis B Surface Antigen on Virus-specific and Global T Cells in Patients With Chronic HBV infection. *Gastroenterology.* **2020** Aug;159(2):652-664.

- 53) Avellon A, Ala A, Diaz A, Domingo D, Gonzalez R, Hidalgo L, Kooner P, Loganathan S, Martin D, McPherson S, Munoz-Chimeno M, Ryder S, Slapak G, Ryan P, Valbuena M, **Kennedy PT**. Clinical Performance of Determine™ HBsAg 2 rapid test for hepatitis B detection. *J Med Virol.* **2020** Apr 9.
- 54) Koffas A, Petersen J, **Kennedy PT**. Reasons to consider early treatment in chronic hepatitis B patients. *Antiviral Res.* **2020** May;177:104783.
- 55) Bertoletti A, Gill US, **Kennedy PTF**. Early treatment in chronic hepatitis B in children: Everything to play for? *J Hepatol.* **2020** Apr;72(4):802-803.
- 56) Bigogno CM, Falahieh RR, Ho KMA, Jeffrey-Smith A, Jones M, Usai C, Battisti A, Gill U, **Kennedy P**. The genetic landscape of hepatitis delta virus infection. *Clin Med (Lond).* **2020** Mar;20(Suppl 2):s101.
- 57) Dolman GE, **Kennedy PTF**. Hepatitis B reactivation: reducing the risk in patients with inflammatory bowel disease. *Gut.* **2020** Jan 30. pii: gutjnl-2019-319480.
- 58) Gill US, Battisti A, Kennedy PTF. Emerging tools in the changing landscape of chronic hepatitis B management. *Expert Rev Anti Infect Ther.* **2019** Dec;17(12):943-955.
- 59) Cornberg M, Lok AS, Terrault NA, Zoulim F; 2019 **EASL-AASLD HBV Treatment Endpoints Conference Faculty**. Guidance for design and endpoints of clinical trials in chronic hepatitis B - Report from the 2019 EASL-AASLD HBV Treatment Endpoints Conference. *J Hepatol.* **2020** Mar;72(3):539-557.
- 60) Cornberg M, Lok AS, Terrault NA, Zoulim F; 2019 **EASL-AASLD HBV Treatment Endpoints Conference Faculty**. Guidance for design and endpoints of clinical trials in chronic hepatitis B - Report from the 2019 EASL-AASLD HBV Treatment Endpoints Conference. *Hepatology.* **2019** Nov 12.
- 61) Bénéchet AP, De Simone G, Di Lucia P, Cilenti F, Barbiera G, Le Bert N, Fumagalli V, Lusito E, Moalli F, Bianchessi V, Andreatta F, Zordan P, Bono E, Giustini L, Bonilla WV, Bleriot C, Kunasegaran K, Gonzalez-Asequinolaza G, Pinschewer DD, **Kennedy PTF**, Naldini L, Kuka M, Ginhoux F, Cantore A, Bertoletti A, Ostuni R, Guidotti LG, Iannacone M. Dynamics and genomic landscape of CD8+ T cells undergoing hepatic priming. *Nature.* **2019** Oct;574(7777):200-205.
- 62) Le Bert N, Salimzadeh L, Gill US, Dutertre CA, Facchetti F, Tan A, Hung M, Novikov N, Lampertico P, Fletcher SP, **Kennedy PTF**, Bertoletti A. Comparative characterization of B cells specific for HBV nucleocapsid and envelope proteins in patients with chronic hepatitis B. *J Hepatol.* **2020** Jan;72(1):34-44.
- 63) Bertoletti A, **Kennedy PT**. HBV antiviral immunity: not all CD8 T cells are born equal. *Gut.* **2019** Jan 30. pii: gutjnl-2018-317959. doi: 10.1136/gutjnl-2018-317959.
- 64) Khakpoor A, Ni Y, Chen A, Ho ZZ, Oei V, Yang N, Giri R, Chow JX, Tan AT, **Kennedy PT**, Maini M, Urban S, Bertoletti A. Spatiotemporal Differences in Presentation of CD8 T Cell Epitopes during Hepatitis B Virus Infection. *J Virol.* **2019** Feb 5;93(4). pii: e01457-18. doi: 10.1128/JVI.01457-18.
- 65) Gill US*, Pallett LJ*, Thomas N, Burton AR, Patel AA, Yona S, **Kennedy PT*** & Maini MK*. Fine needle aspirates comprehensively sample intrahepatic immunity. *Gut* **2018** Nov 28. pii: gutjnl-2018-317071. doi: 10.1136/gutjnl-2018-317071.

- 66) Gill US, **Kennedy PTF**. The impact of currently licensed therapies on viral and immune responses in Chronic Hepatitis B: considerations for future novel therapeutics. *J Viral Hepat.* **2019** Jan;26(1):4-15. doi: 10.1111/jvh.13040.
- 67) Lampertico P, Messinger D, Cornberg M, Brunetto M, Petersen J, **Kennedy PT**, Asselah T, Rothe V, Caputo A, Bakalos G, Pavlovic V, Papatheodoridis GV. A genotype-specific baseline score predicts post-treatment response to peginterferon alfa-2a in hepatitis B e antigen-negative chronic hepatitis B. *Ann Gastroenterol.* **2018** Nov-Dec;31(6):712-721. doi: 10.20524/aog.2018.0300. Epub 2018 Jul 26.
- 68) Otano I, Escors D, Schurich A, Singh H, Robertson F, Davidson BR, Fusai G, Vargas FA, Tan ZMD, Aw JYJ, Hansi N, **Kennedy PT**, Xue SA, Stauss HJ, Bertoletti A, Pavesi A, Maini MK. Molecular Recalibration of PD-1+ Antigen-Specific T Cells from Blood and Liver. *Mol Ther.* **2018** Nov 7;26(11):2553-2566. doi: 10.1016/j.ymthe.2018.08.013.
- 69) Burton AR, Pallett LJ, McCoy LE, Suveizdyte K, Amin OE, Swadling L, Alberts E, Davidson BR, **Kennedy PT**, Gill US, Mauri C, Blair PA, Pelletier N, Maini MK. Circulating and intrahepatic antiviral B cells are defective in hepatitis B. *J Clin Invest.* **2018** Oct 1;128(10):4588-4603. doi: 10.1172/JCI121960.
- 70) Salimzadeh L, Le Bert N, Dutertre CA, Gill US, Newell EW, Frey C, Hung M, Novikov N, Fletcher S, **Kennedy PT**, Bertoletti A. PD-1 blockade partially recovers dysfunctional virus-specific B cells in chronic hepatitis B infection. *J Clin Invest.* **2018** Oct 1;128(10):4573-4587. doi: 10.1172/JCI121957.
- 71) Koffas A, Dolman GE, **Kennedy PT**. Hepatitis B virus reactivation in patients treated with immunosuppressive drugs: a practical guide for clinicians. *Clin Med (Lond).* **2018** Jun;18(3):212-218. doi: 10.7861/clinmedicine.18-3-212.
- 72) Dolman GE, Koffas A, Mason WS, **Kennedy PT**. Why, who and when to start treatment for chronic hepatitis B infection. *Curr Opin Virol.* **2018** Jun;30:39-47. doi: 10.1016/j.coviro.2018.03.006.
- 73) Gill US, Pallett LJ, **Kennedy PT**, Maini MK. Liver sampling: a vital window into HBV pathogenesis on the path to functional cure. *Gut* **2018** Apr;67(4):767-775. doi: 10.1136/gutjnl-2017-314873.
- 74) Rivino L*, Le Bert N*, Gill US, Kunasegaran K, Cheng Y, Tan DZ, Becht E, Hansi NK, Foster GR, Su TH, Tseng TC, Lim SG, Kao JH, Newell EW, **Kennedy PT***, Bertoletti A*. Hepatitis B virus-specific T cells associate with viral control upon nucleos(t)ide-analogue therapy discontinuation. *J Clin Invest.* **2018** Feb 1;128(2):668-681. doi: 10.1172/JCI92812.
- 75) Bertoletti A, **Kennedy PTF**, Durantel D. HBV infection and HCC: the 'dangerous liaisons'. *Gut* **2018** May;67(5):787-788. doi: 10.1136/gutjnl-2017-315528.
- 76) Singh HD, Otano I, Rombouts K, Singh KP, Peppia D, Gill US, Böttcher K, **Kennedy PTF**, Oben J, Pinzani M, Walczak H, Fusai G, Rosenberg WMC, Maini MK. TRAIL regulatory receptors constrain human hepatic stellate cell apoptosis. *Sci Rep.* **2017** Jul 17;7(1):5514. doi: 10.1038/s41598-017-05845-5.
- 77) Gill US, **Kennedy PTF**. Current therapeutic approaches for HBV infected patients. *J Hepatol.* **2017** Aug;67(2):412-414. doi: 10.1016/j.jhep.2017.04.015.
- 78) Duriez M, Mandouri Y, Lekbaby B, Wang H, Schnuriger A, Redelsperger F, Guerrero CI, Lefevre M, Fauveau V, Ahodantin J, Quetier I, Chhuon C, Gourari S, Boissonnas A, Gill U, **Kennedy PT**, Debzi N, Sitterlin D, Maini MK, Kremsdorf D, Soussan P. Alternative splicing of hepatitis B

virus: A novel virus/host interaction altering liver immunity. *J Hepatol.* **2017** Oct;67(4):687-699. doi: 10.1016/j.jhep.2017.05.025.

- 79) Pallett LJ, Davies J, Colbeck EJ, Robertson F, Hansi N, Easom NJW, Burton AR, Stegmann KA, Schurich A, Swadling L, Gill US, Male V, Luong T, Gander A, Davidson BR, **Kennedy PTF**, Maini MK. IL-2^{high} tissue-resident T cells in the human liver: Sentinels for hepatotropic infection. *J Exp Med.* **2017** Jun 5;214(6):1567-1580. doi: 10.1084/jem.20162115. doi: 10.1084/jem.20162115.
- 80) **Kennedy PTF**, Litwin S, Dolman GE, Bertoletti A, Mason WS. Immune Tolerant Chronic Hepatitis B: The Unrecognized Risks. *Viruses.* **2017** Apr 29;9(5). pii: E96. doi: 10.3390/v9050096.
- 81) Salpini R, Piermatteo L, Gill US, Battisti A, Stazi F, Guenci T, Giannella S, Serafini V, **Kennedy PTF**, Perno CF, Svicher V, Ciotti M. Quantification of intrahepatic total HBV DNA in liver biopsies of HBV-infected patients by a modified version of COBAS® Ampliprep/COBAS® TaqMan HBV test v2.0. *Med Microbiol Immunol.* **2017** Aug;206(4):295-299. doi: 10.1007/s00430-017-0504-3.
- 82) **Kennedy PTF**, Bertoletti A, Mason WS. Reply. *Gastroenterology.* **2017** Apr;152(5):1246-1247. doi: 10.1053/j.gastro.2017.03.002.
- 83) Huang WC, Easom NJ, Tang XZ, Gill US, Singh H, Robertson F, Chang C, Trowsdale J, Davidson BR, Rosenberg WM, Fusai G, Toubert A, **Kennedy PT**, Peppia D, Maini MK. T Cells Infiltrating Diseased Liver Express Ligands for the NKG2D Stress Surveillance System. *J Immunol.* **2016** Dec 28. pii: 1601313. doi: 10.4049/jimmunol.1601313. doi: 10.4049/jimmunol.1601313.
- 84) Gill US, Peppia D, Micco L, Singh HD, Carey I, Foster GR, Maini MK*, **Kennedy PT***. Interferon Alpha Induces Sustained Changes in NK Cell Responsiveness to Hepatitis B Viral Load Suppression In Vivo. *PLoS Pathog.* **2016** Aug 3;12(8):e1005788. doi: 10.1371/journal.ppat.1005788. eCollection 2016 Aug.
- 85) Mason WS, Gill US, Litwin S, Zhou Y, Peri S, Pop O, Hong ML, Naik S, Quaglia A, Bertoletti A, **Kennedy PT**. HBV DNA Integration and Clonal Hepatocyte Expansion in Chronic Hepatitis B Patients Considered Immune Tolerant. *Gastroenterology.* **2016** Nov;151(5):986-998. doi: 10.1053/j.gastro.2016.07.012.
- 86) Schurich A, Pallett LJ, Jajbhay D, Wijngaarden J, Otano I, Gill US, Hansi N, **Kennedy PT**, Nastouli E, Gilson R, Frezza C, Henson SM, Maini MK. Distinct Metabolic Requirements of Exhausted and Functional Virus-Specific CD8 T Cells in the Same Host. *Cell Rep.* **2016** Aug 2;16(5):1243-52. doi: 10.1016/j.celrep.2016.06.078.
- 87) Stegmann KA, Robertson F, Hansi N, Gill U, Pallant C, Christophides T, Pallett LJ, Peppia D, Dunn C, Fusai G, Male V, Davidson BR, **Kennedy PT**, Maini MK. CXCR6 marks a novel subset of T-bet(lo)Eomes(hi) natural killer cells residing in human liver. *Sci Rep.* **2016** May 23;6:26157. doi: 10.1038/srep26157.
- 88) Bermingham SL, Hughes R, Fenu E, Sawyer LM, Boxall E, **Kennedy PT**, Dusheiko G, Hill-Cawthorne G, Thomas H. Cost-Effectiveness Analysis of Alternative Antiviral Strategies for the Treatment of HBeAg-Positive and HBeAg-Negative Chronic Hepatitis B in the United Kingdom. *Value Health.* **2015** Sep;18(6):800-9. doi: 10.1016/j.jval.2015.05.007.
- 89) Pallett LJ, Gill US, Quaglia A, Sinclair LV, Jover-Cobos M, Schurich A, Singh KP, Thomas N, Das A, Chen A, Fusai G, Bertoletti A, Cantrell DA, **Kennedy PT**, Davies NA, Haniffa M, Maini MK. Metabolic regulation of hepatitis B immunopathology by myeloid-derived suppressor cells. *Nat Med.* **2015** Jun;21(6):591-600. doi: 10.1038/nm.3856.

- 90) El Bouzidi K, Elamin W, Kranzer K, Irish DN, Ferns B, **Kennedy PT**, Rosenberg W, Dusheiko G, Sabin CA, Smith BC, Nastouli E. Hepatitis delta virus testing, epidemiology and management: a multicentre cross-sectional study of patients in London. *J Clin Virol.* 2015 May;66:33-7. doi: 10.1016/j.jcv.2015.02.011.
- 91) Gill US, **Kennedy PT**. New insights in the management of chronic hepatitis B. *Clin Med (Lond).* 2015 Apr;15(2):191-6. doi: 10.7861/clinmedicine.15-2-191.
- 92) Bertoletti A, **Kennedy PT**. The immune tolerant phase of chronic HBV infection: new perspectives on an old concept. *Cell Mol Immunol.* 2015 May;12(3):258-63. doi: 10.1038/cmi.2014.79.
- 93) Gill US, Zissimopoulos A, Al-Shamma S, Burke K, McPhail MJ, Barr DA, Kallis YN, Marley RT, Kooner P, Foster GR, **Kennedy PT**. Assessment of Bone Mineral Density in Tenofovir treated Chronic Hepatitis B patients: Can FRAX identify those at greatest risk? *J Infect Dis.* 2015 Feb;211(3):374-82. doi: 10.1093/infdis/jiu471.
- 94) Gill US, **Kennedy PT**. Chronic hepatitis B virus in young adults: the need for new approaches to management. *Expert Rev Anti Infect Ther.* 2014 Sep;12(9):1045-53. doi: 10.1586/14787210.2014.940899.
- 95) Jo J, Tan AT, Ussher JE, Sandalova E, Tang XZ, Tan-Garcia A, To N, Hong M, Chia A, Gill US, **Kennedy PT**, Tan KC, Lee KH, De Libero G, Gehring AJ, Willberg CB, Klenerman P, Bertoletti A. Toll-like receptor 8 agonist and bacteria trigger potent activation of innate immune cells in human liver. *PLoS Pathog.* 2014 Jun 26;10(6):e1004210. doi: 10.1371/journal.ppat.1004210. eCollection 2014 Jun.
- 96) Gehring AJ, Haniffa M, **Kennedy PT**, Ho ZZ, Boni C, Shin A, Banu N, Chia A, Lim SG, Ferrari C, Ginhoux F, Bertoletti A. Mobilizing monocytes to cross-present circulating viral antigen in chronic infection. *J Clin Invest.* 2013 Sep 3;123(9):3766-76. doi: 10.1172/JCI66043.
- 97) Sarri G, Westby M, Bermingham S, Hill-Cawthorne G, Thomas H; **Guideline Development Group**. Diagnosis and management of chronic hepatitis B in children, young people, and adults: summary of NICE guidance. *BMJ.* 2013 Jun 26;346:f3893. doi: 10.1136/bmj.f3893.
- 98) Schurich A, Pallett LJ, Lubowiecki M, Singh HD, Gill US, **Kennedy PT**, Nastouli E, Tanwar S, Rosenberg W, Maini MK. The third signal cytokine IL-12 rescues the anti-viral function of exhausted HBV-specific CD8 T cells. *PLoS Pathog.* 2013 Mar;9(3):e1003208. doi: 10.1371/journal.ppat.1003208.
- 99) Peppas D, Gill US, Reynolds G, Easom NJ, Pallett LJ, Schurich A, Micco L, Nebbia G, Singh HD, Adams DH, **Kennedy PT**, Maini MK. Up-regulation of a death receptor renders antiviral T cells susceptible to NK cell mediated deletion. *J Exp Med.* 2013 Jan 14;210(1):99-114. doi: 10.1084/jem.20121172.
- 100) Nebbia G, Peppas D, Schurich A, Khanna P, Singh HD, Cheng Y, Rosenberg W, Dusheiko G, Gilson R, ChinAleong J, **Kennedy PT**, Maini MK. Upregulation of the Tim-3/galectin-9 pathway of T cell exhaustion in chronic hepatitis B virus infection. *PLoS One.* 2012;7(10):e47648. doi: 10.1371/journal.pone.0047648.
- 101) Das A, Ellis G, Pallant C, Lopes AR, Khanna P, Peppas D, Chen A, Blair P, Dusheiko G, Gill US, **Kennedy PT**, Brunetto M, Lampertico P, Mauri C, Maini MK. IL-10-producing regulatory B cells in the pathogenesis of chronic hepatitis B virus infection. *J Immunol.* 2012 Oct 15;189(8):3925-35. doi: 10.4049/jimmunol.1103139.

- 102) **Kennedy PT**, Sandalova E, Jo J, Gill US, Ushiro-Lumb I, Tan AT, Naik S, Foster GR, Bertoletti A. Preserved T cell function in children and young adults with immune tolerant chronic hepatitis B. *Gastroenterology*. 2012 Sep;143(3):637-45. doi: 10.1053/j.gastro.2012.06.009.
- 103) Ji C, Sastry KS, Tiefenthaler G, Cano J, Tang T, Ho ZZ, Teoh D, Bohini S, Chen A, Sankuratri S, Macary PA, **Kennedy PT**, Ma H, Ries S, Klumpp K, Kopetzki E, Bertoletti A. Targeted delivery of interferon- α to hepatitis B virus-infected cells using T-cell receptor-like antibodies. *Hepatology*. 2012 Dec;56(6):2027-38. doi: 10.1002/hep.25875.
- 104) Liu M, Miao T, Zhu H, Symonds AL, Li L, Schurich A, Maini MK, Zhang J, **Kennedy PT**, Li S, Wang P. IL-2-engineered nano-APC effectively activates viral antigen-mediated T cell responses from chronic hepatitis B virus-infected patients. *J Immunol*. 2012 Feb;188(3):1534-43. doi: 10.4049/jimmunol.1102709.
- 105) Malik R, **Kennedy PT**, Suri D, Brown A, Goldin R, Main J, Thomas H, Thursz M. The role of liver fibrosis assessment in the management of patients with chronic hepatitis B infection: lessons learned from a single centre experience. *Hepat Res Treat*. 2011;2011:524027. doi: 10.1155/2011/524027.
- 106) Schurich A, Khanna P, Lopes AR, Han KJ, Peppia D, Micco L, Nebbia G, **Kennedy PT**, Geretti AM, Dusheiko G, Maini MK. Role of the coinhibitory receptor cytotoxic T lymphocyte antigen-4 on apoptosis-prone CD8 T cells in persistent hepatitis B virus infection. *Hepatology*. 2011 May;53(5):1494-503. doi: 10.1002/hep.24249.
- 107) Sastry KS, Too CT, Kaur K, Gehring AJ, Low L, Javaid A, Pollicino T, Li L, **Kennedy PT**, Lopatin U, Macary PA, Bertoletti A. Targeting hepatitis B virus-infected cells with a T-cell receptor-like antibody. *J Virol*. 2011 Mar;85(5):1935-42. doi: 10.1128/JVI.01990-10.
- 108) Peppia D, Micco L, Javaid A, **Kennedy PT**, Schurich A, Dunn C, Pallant C, Ellis G, Khanna P, Dusheiko G, Gilson RJ, Maini MK. Blockade of immunosuppressive cytokines restores NK cell antiviral function in chronic hepatitis B virus infection. *PLoS Pathog*. 2010 Dec 16;6(12):e1001227. doi: 10.1371/journal.ppat.1001227.
- 109) **Kennedy PT**, Russo E, Kumar N, Powell N, Bansi D, Thillainayagam A, Vlavianos P, Westaby D. The safety and utility of prophylactic pancreatic duct stents in the prevention of post-ERCP pancreatitis: an analysis of practice in a single UK tertiary referral center. *Surg Endosc*. 2010 Aug;24(8):1923-8. doi: 10.1007/s00464-009-0875-7.
- 110) Pasha Y, Blunt D, **Kennedy PT**. The pea, the yeast and the prostate. *QJM*. 2010 Apr;103(4):265-6. doi: 10.1093/qjmed/hcp160.
- 111) **Kennedy PT**, Gehring AJ, Nowbath A, Selden C, Quaglia A, Dhillon A, Dusheiko G, Bertoletti A. The expression and function of NKG2D molecule on intrahepatic CD8+ T cells in chronic viral hepatitis. *J Viral Hepat*. 2008 Dec;15(12):901-9. doi: 10.1111/j.1365-2893.2008.01049.
- 112) **Kennedy PT**, Lee HC, Jeyalingam L, Malik R, Karayiannis P, Muir D, Main J, Thursz M, Goldin R, Smith B, Brown A, Thomas HC. NICE guidelines and a treatment algorithm for the management of chronic hepatitis B: a review of 12 years experience in west London. *Antivir Ther*. 2008;13(8):1067-76.
- 113) Das A, Hoare M, Davies N, Lopes AR, Dunn C, **Kennedy PT**, Alexander G, Finney H, Lawson A, Plunkett FJ, Bertoletti A, Akbar AN, Maini MK. Functional skewing of the global CD8 T cell population in chronic hepatitis B virus infection. *J Exp Med*. 2008 Sep 1;205(9):2111-24. doi: 10.1084/jem.20072076.

- 114) **Kennedy PT**, Phillips N, Chandrasekhar J, Jacobs R, Jacobs M, Dusheiko G. Potential and limitations of lamivudine monotherapy in chronic hepatitis B: evidence from genotyping. *Liver Int.* 2008 May;28(5):699-704. doi: 10.1111/j.1478-3231.
- 115) Dunn C, Brunetto M, Reynolds G, Christophides T, **Kennedy PT**, Lampertico P, Das A, Lopes AR, Borrow P, Williams K, Humphreys E, Afford S, Adams DH, Bertolotti A, Maini MK. Cytokines induced during chronic hepatitis B virus infection promote a pathway for NK cell-mediated liver damage. *J Exp Med.* 2007 Mar 19;204(3):667-80.
- 116) Gehring AJ, Sun D, **Kennedy PT**, Nolte-'t Hoen E, Lim SG, Wasser S, Selden C, Maini MK, Davis DM, Nassal M, Bertolotti A. The level of viral antigen presented by hepatocytes influences CD8 T-cell function. *J Virol.* 2007 Mar;81(6):2940-9.
- 117) **Kennedy PT**, Zakaria N, Modawi SB, Papadopoulou AM, Murray-Lyon I, du Bois RM, Jervoise N, Andreyev H, Devlin J. Natural history of hepatic sarcoidosis and its response to treatment. *Eur J Gastroenterol Hepatol.* 2006 Jul;18(7):721-6.
- 118) **Kennedy PT**, Urbani S, Moses RA, Amadei B, Fisicaro P, Lloyd J, Maini MK, Dusheiko G, Ferrari C, Bertolotti A. The influence of T cell cross-reactivity on HCV-peptide specific human T cell response. *Hepatology.* 2006 Mar;43(3):602-11.
- 119) Franzese O, **Kennedy PT**, Gehring AJ, Gotto J, Williams R, Maini MK, Bertolotti A. Modulation of the CD8+-T-cell response by CD4+ CD25+ regulatory T cells in patients with hepatitis B virus infection. *J Virol.* 2005 Mar;79(6):3322-8.