

CURRICULUM VITAE

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EDUCATION

- 1991: Ph.D. "Characterization of Human Astrovirus" Department of Biological Sciences, University of Warwick, Coventry, UK
1984: B.Sc. Microbiology and Virology, Department of Biological Sciences, University of Warwick, Coventry, UK

SCIENTIFIC EXPERIENCE/EMPLOYMENT

- 2012-present:** Chief, Laboratory of Hepatitis Viruses, Division of Viral Products, Center for Biologics Evaluation and Research, Food And Drug Administration (CBER/FDA).
Major focus: Hepatitis C virus, vaccinology, immunology, molecular virology, viral pathogenesis, immunization (genetic, viral vectors and protein/peptide), liver histology.
- 2000-2012:** Senior Investigator, Division of Viral Products, Center for Biologics Evaluation and Research, Food and Drug Administration (CBER/FDA).
- 1996-2000:** NIH Fogarty Fellow, Division of Viral Products, CBER/FDA
- 1993-1996:** Post Doctoral Research Fellow, INSERM U271, Lyon, France
(i) Genetic immunization to study HCV proteins as potential vaccine candidates. (ii) Assessing the effectiveness of antisense oligonucleotides as inhibitors of HCV translation for use as antivirals.
- 1990-1993:** Post Doctoral Research Fellow, Regional Virus Lab. East Birmingham Hospital, Birmingham/ Division of Virology, Department of Pathology, University of Cambridge, Cambridge. UK
Molecular epidemiology of Human T-cell leukaemia virus type 1 (HTLV-1).
- 1984-1986:** Research Assistant, Department of Pure and Applied Biology, Imperial College of Science and Technology, University of London, London, UK.
The recovery of Bacillus subtilis spores after exposure to the sterilant gas, ethylene oxide.

FDA REGULATORY RESPONSIBILITIES

Reviewer of all product applications or amendments for hepatitis virus vaccines.

Product expert. Hepatitis virus vaccines.

Reviewer and committee member for Investigational New Drug (IND) and Pre-IND applications dealing with vaccines against hepatitis viruses.

Primary inspector for Office of Vaccine Research and Review (OVRR) at site visits of production facilities manufacturing hepatitis virus vaccines.

Product expert at site visits of production facilities manufacturing influenza vaccines.

OVRR product expert for the FDA Nanotechnology Working Group since 2010.

Member of OVRR Assay Working Group

PROFESSIONAL ACTIVITIES

2003. Peer review member of NIH Study Section. Hepatitis C: Natural History, Pathogenesis, Therapy, and Prevention R01s.

2006. Chair of the Committee for the Advancement of FDA Science (CAFDAS) within the FDA Commissioner's Office.

2007. Peer review member of NIH/NIDDK Special Emphasis Panel. Ancillary Studies to Major Ongoing NIDDK and NHLBI Clinical Research Studies R01s.

2008. Peer review member NIH/NIAID Special Emphasis Panel. Immune Mechanisms of Virus Control (U01/U19).

2009. Peer review member NIH/NIAID Special Emphasis Panel. Basic HIV Vaccine Discovery Research (R01).

2010. Peer review member NIH/NIAID Special Emphasis Panel. Basic HIV Vaccine Discovery Research (R01).

2005 to present. Member of the CBER Institutional Animal Care and Use Committee.

Ad Hoc reviewer for journals including *Journal of Virology*, *Hepatology*, *Gastroenterology*, *Vaccine*, *Journal of Infectious Diseases*, *Journal of Virological Methods*, *New England Journal of Medicine*, *Proceedings for the National Academy of Sciences, USA*.

2000 to present. Member of American Society for Virology.

1999 to present. Member of American Association for the Advancement of Science.

2006 to present. Member of the American Association for the Study of Liver Disease (AASLD).

2012-2013. Chair of the Norman P. Salzman Virology Symposium organizing committee, NIH.

2013 to present. Adjunct Professor, George Washington University School of Medicine and Health Sciences.

PATENTS

Modified HCV peptide vaccines: United States Patent #6,685,944, February 3, 2004. Berzofsky; Jay A.; Pendleton; C. David; Feinstone; Stephen M.; Major; Marian E.; Sarobe; Pablo

Modified HCV peptide vaccines: United States Patent #7,074,410, July 11, 2006. Berzofsky; Jay A., Feinstone; Stephen M.; Major; Marian E.; Sarobe; Pablo

Modified HCV peptide immunogens: United States Patent #7,341,726, March 11, 2008. Berzofsky; Jay A., Sarobe; Pablo, Feinstone; Stephen M.; Major; Marian E.

Neutralization of Hepatitis C virus: United States Patent #8,603,468, December 10, 2013. Pei Zhang, Marian Major, Stephen Feinstone

Hepatitis C Virus Neutralizing Antibody: U.S. Patent Application No. 14/401648 filed November 17, 2014. Hongying Duan, Stephen Feinstone, Marian Major, Pei Zhang

Hepatitis C Virus Neutralizing Epitopes, Antibodies and Methods: PCT International Application No. PCT/US2012/62197 filed October 26, 2012. Alla Kachko, Galina Kochneva, Marian Major

PEER-REVIEWED PUBLICATIONS

1. Zubkova I., Duan H., Wells F., Mostowski H., Chang E., Pirollo K., Krawczynski K., Lanford R., and **Major M.E.** Hepatitis C virus clearance correlates with HLA-DR expression on proliferating CD8+ T-cells in immune-primed chimpanzees (2014) *Hepatology*, 59:803-813.
2. Kachko, A., Loesgen, S., Shahzad-ul-Hussan, S., Tan, W., Zubkova, I., Takeda, K., Wells, F., Rubin, S., Bewley, C.A., and **Major, M.E.** Inhibition of Hepatitis C Virus by the Cyanobacterial Protein MVL: mechanistic differences between the high-mannose specific lectins MVL, CV-N, and GNA (2013) *Molecular Pharmaceutics*. 10:4590-4602.
3. Shin, E.C., Park, S.H., Nascimbeni, M., **Major, M.E.**, Caggiari, L., de Re, V., Feinstone, S.M., Rice, C.R. and Rehermann, B. The frequency of CD127+ HCV-specific T cells but not the Expression of Exhaustion Markers Predict the Outcome of Acute Hepatitis C Virus Infection. (2013) *Journal of Virology*. 87:4772-4777.
4. Duan, H., Kachko, A., Zhong, L., Struble, E., Pandey, S., Yan, H., Harman, C., Virata-Theimer, M.L., Deng, L., Zhao, Z., **Major, M.E.**, Feinstone, S.M. and Zhang, P. Amino Acid Residues-Specific neutralization and Non-neutralization of Hepatitis C Virus by Monoclonal Antibodies to the E2 Protein. (2012) *Journal of Virology*. 86:12686-12694.
5. Kachko' A., Kochneva, G., Sivolobova' G., Grazhdantseva' A., Lupan' T., Zubkova' I., Wells' F., Merchlinsky, M., Williams, O., Watanabe' H., Ivanova' A., Shvalov' A., Loktev, V., Netesov, S. and **Major, M.E.** New Neutralizing Antibody Epitopes in Hepatitis C Virus Envelope Glycoproteins are Revealed by Dissecting Peptide Recognition Profiles (2011) *Vaccine* 30:69-77.
6. Shin, E.C., Park, S.H., Demino, M., Nascimbeni, M., Mihalik, K., **Major, M.E.**, Veerapu, N.S., Heller, T., Feinstone, S.M., Rice, C.R. and Rehermann, B. Delayed Induction, Not Impaired Recruitment of Specific CD8(+) T Cells, Causes the Late Onset of Acute Hepatitis C (2011) *Gastroenterology* 141 (2):686-695.
7. Dahari' H.; Feinstone, S.M. and **Major, M.E.** Meta-Analysis of Hepatitis C Virus Vaccine Efficacy in Chimpanzees Indicates an Importance for Structural Proteins (2010) *Gastroenterology*. 139 (3): 965-974.
8. Duan, H., Struble, E., Zhong, L., Mihalik, K., **Major, M.E.**, Zhang, P., Feinstone, S.M., and Feigelstock, D. Hepatitis C virus with a naturally occurring single amino-acid substitution in the E2 envelope protein escapes neutralization by naturally-induced and vaccine-induced antibodies. (2010) *Vaccine*. 28:4138-4144.
9. Watanabe, H., Wells, F. and **Major, M.E.** Clearance of hepatitis C in chimpanzees is associated with intrahepatic T-cell perforin expression during the late acute phase (2010). *Journal of Viral Hepatitis*. 17:245-253.
10. Zhang, P., Zhong, L., Struble, E., Watanabe, H., Kachko, A., Mihalik, K., Virata-Theimer, M.L., Alter, H., Feinstone, S.M., and **Major, M.E.** (2009). Depletion of Interfering Antibodies in Chronic Hepatitis C Patients and Vaccinated Chimpanzees Reveals Broad Cross-genotype Neutralizing Activity. *Proc. Nat. Acad. Sci U.S.A.* 106 (18) 7537-7541.
11. Zubkova, I, Choi, Y.H., Chang, E., Pirollo, K., Uren, T., Watanabe, H., Wells, F., Krawczynski, K. and **Major, M.E.** T-cell Vaccines that Elicit Effective Immune Responses Against HCV in Chimpanzees Create Greater Immune Pressure for Viral Mutation (2009) *Vaccine*. 27:2594-2602.
12. Jeonghoon Heo, Valentina M. Factor, Tania Uren, Yasushi Takahama, Ju-Seog Lee, **Marian Major**, Stephen M. Feinstone, and Snorri S. Thorgeirsson (2006). Hepatic Precursors Derived From Murine Embryonic Stem Cells Contribute to Regeneration of Injured Liver. *Hepatology* 44:1478-1486.
13. Puig, M., Mihalik, K., Tilton, J.C., Williams, O., Merchlinsky, M., Connors, M., Feinstone, S.M., and **Major, M.E.** (2006). CD4+ immune escape and subsequent T-cell failure following chimpanzee immunization against hepatitis C virus. *Hepatology*. 44(3):736-745
14. Lindenbach, BD, Meuleman, P, Ploss, A, Vanwolleghem, T, Syder, AJ, McKeating, JA, Lanford, R, Feinstone, SM, **Major, ME**, Leroux-Roels, G, M. Rice, CM. (2006) Cell culture-grown hepatitis C virus is infectious in vivo and can be re-cultured in vitro. *Proc. Nat. Acad. Sci U.S.A.* 103 (10) 3805-9.
15. Dahari, H., **Major, M.E.**, Zhang, X., Mihalik, K., Rice, C.R., Perelson, A.S., Feinstone, S.M., and Neumann, A.V. (2005) Non-cytolytic HCV clearance and early blockade of viral production indicated by mathematical modeling of primary HCV infection in chimpanzees. *Gastroenterology*. 128 (4) 1056-1066.
16. Prikhod'ko, E.A. Prikhod'ko, G.G., Siegel, R.M., Thompson, P., **Major, M.E.** and Cohen, J.I (2004) The NS3 Protein of Hepatitis C Virus Induces Caspase-8 Mediated Apoptosis Independent of its Protease or Helicase Activities. *Virology*. 329 (1) 53-67.
17. Logvinoff, C., **Major, M.E.**, Oldach, D., Heyward, S., Talal, A., P.Balfe., Feinstone, S., Alter, H., Rice, C.M., and McKeating, J.A. (2004) Neutralizing antibody response during acute and chronic hepatitis C virus infection. *Proc. Nat. Acad. Sci U.S.A.* 101 (27) 10149-10154.

18. Fernandez, J., Taylor, D., Morhardt, D., Mihalik, K., Puig, M., Rice, C.M., Feinstone, S.M., and **Major, M.E.** (2004) Long Term Persistence of Infection in Chimpanzees Inoculated with an HCV Infectious Clone is Associated with a Decrease in Viral Mutation Rate and Low Levels of Heterogeneity. *Journal of Virology*. 78 (18) 9782-9789.
19. **Major, M.E.**, Dahari, H., Mihalik, K., Puig, M. Rice, C.M., Neumann, A.U., and Feinstone, S.M. (2004) Hepatitis C Virus Kinetics and Host Responses Associated with Disease and Outcome Of Infection. *Hepatology*. 39 (6) 1709-1720.
20. Puig, M., **Major, M.E.**, Mihalik, K., and Feinstone, S.M. (2004). Vaccination of Naïve and HCV-recovered Chimpanzees with Recombinant HCV E1E2 Proteins. *Vaccine*. 22 (8) 991-1000.
21. Lou, H., LaVoy, J., Choi, Y.H., **Major, M.E.**, and Hagedorn, C.H. (2003). Analysis of mutant NS5B proteins encoded by isolates from chimpanzees chronically infected following clonal HCV RNA inoculation. *Virology*. 317 (1) 65-72.
22. Nussbaum, J.M., **Major, M.E.**, and Gunnery, S. (2003). Transcriptional upregulation of interferon-induced protein kinase, PKR, in breast cancer cells. *Cancer Letters*. 196 (2) 207-16.
23. Nascimbeni, M.; Mizukoshi, E., Bosmann, M., **Major, M.E.**, Mihalik, K.; Rice, C.M.; Feinstone, S.M., Rehermann, B. (2003). Protective Immunity against hepatitis C virus exerted by CD4+ and CD8+ memory T cells. *Journal of Virology*. 77 (8) 4781-4793.
24. Thomson, M., Nascimbeni, M., Havert, M.B., **Major, M.E.**, Gonzales, S., Alter, H., Feinstone, S.M., Murthy, K.K., Rehermann, B. and Liang, T.J (2003). The Clearance of Hepatitis C Virus Infection in Chimpanzees May Not Necessarily Correlate with the Appearance of Acquired Immunity. *Journal of Virology*. 77 (2) 862-870.
25. Puig, M., Mihalik, K., Yu, M-Y., Feinstone, S.M., and **Major, M.E.** (2002). Sensitivity and Reproducibility of HCV quantification in chimpanzee sera using TaqMan Real Time PCR assay. *J. of Virological Methods*. 105: 253-263.
26. Feinstone, S.M., **Major, M.E.**, Mihalik, K.; and Yu, M-Y. (2002) Hepatitis C vaccines: problems and prospects. Proceedings of the 10th International Symposium on Viral Hepatitis and Liver Disease. Editors: Harold S. Margolis, Miriam J. Alter, T. Jake Liang and Jules L. Dienstag. International Medical Press.
27. **Major, M.E.**, Mihalik, K.; Puig, M.; Rehermann, B.; Nascimbeni, M.; Rice, C.M.; Feinstone, S.M. (2002). Previously infected and recovered chimpanzees exhibit rapid responses that control HCV replication upon rechallenge. *Journal of Virology*. 76 (13) 6586-6595.
28. **Major, M.E.**, Mihalik, K., Fernandez, J., Seidman, J., Kleiner, D., Kolykhalov, A.A., Rice, C.M. and Feinstone, S.M. Long term follow-up of chimpanzees inoculated with the first HCV infectious clone. (1999). *Journal of Virology*. 73 (4) 3317-3325.
29. Shirai, M., Arichi, T., Chen, M., Nishioka, M., Ikeda, K., Takahashi, H., Enomoto, N., Saito, T., **Major, M.E.**, Nakazawa, T., Akatsuka, T., Feinstone, S.M., Berzofsky, J.A. T cell recognition of hypervariable region 1 from hepatitis C virus envelope protein with multiple class II MHC molecules in mice and humans: Preferential help for induction of antibodies to the hypervariable region. (1999) *Journal of Immunology*. 162 568-576.
30. Inchauspé, G., **Major, M.E.**, Nakano, I., Vitvitski, L., Maisonnas, M. and Trépo, C. Immune responses against hepatitis C virus structural proteins following genetic immunization. (1998). *Dev. Biol. Stand.* 92:163-8.
31. Nakano, I., Maertens, G., **Major, M.E.**, Vitvitski, L., Dubuisson, J., Fournillier, A., De Martynoff, G., Trépo, C. and Inchauspé, G. Immunization with plasmid DNA encoding hepatitis C virus envelope E2 antigenic domains induces antibodies whose immune reactivity is linked to injection mode. (1997). *Journal of Virology*. 71 (9):7101-7109.
32. Inchauspé, G., **Major, M.E.**, Nakano, I., Vitvitski, L. and Trépo, C. DNA vaccination for the induction of immune responses against hepatitis C virus proteins. (1997). *Vaccine* 15 (8):853-856.
33. Inchauspé, G., Vitvitski, L., **Major, M.E.**, Jung, G., Spengler, U., Maisonnas, M. and Trépo, C. (1997). Plasmid DNA expressing a secreted or a non-secreted form of Hepatitis C virus nucleocapsid: Comparative studies of antibody and T-helper responses following genetic immunization. *DNA and Cell Biology*. 16 (2):185-195.
34. Vidalin, O., **Major, M.E.**, Rayner, B., Imbach, J-L., Trépo, C. and Inchauspé, G. (1996). *In-vitro* inhibition of Hepatitis C virus gene expression using chemically modified antisense oligodeoxynucleotides. *Antimicrobial Agents and Chemotherapy*. 40 (10):2337-2344.
35. Lerat, H., Berby, F., Trabaud, M-A., Vidalin, O., **Major, M.E.**, Trépo, C. and Inchauspé, G. (1996). Specific detection of Hepatitis C Virus minus strand RNA in hematopoietic cells. *Journal of Clinical Investigation* 97 (3):845-851.
36. **Major, M.E.**, Vitvitski, L., Mink, M., Schleef, M., Whalen, R.G., Trépo, C., Inchauspé, G. (1995). DNA immunization using chimeric vectors for the induction of immune responses against the Hepatitis C virus (HCV) nucleocapsid. *Journal of Virology*. 69:5798-5805.
37. **Major, M.E.**, S.Daenke., S.Nightingale and U.Desselberger. (1995). Differential Tax expression in HTLV-1 infected asymptomatic carriers. *AIDS Research and Human Retroviruses*. 11:415-421.
38. **Major, M.E.**, S.Nightingale and U.Desselberger (1993). Complete sequence conservation of the HTLV-1 tax gene in a family cluster showing different pathologies. *Journal of General Virology*. 74:2531-2537.

39. **Major, M.E.**, Eglin, R.P. and Easton, A.J. (1992) 3' Terminal nucleotide sequence of human astrovirus type 1 and routine detection of astrovirus nucleic acid and antigens. *Journal of Virological Methods*. **39**:217-225.

INVITED (PEER-REVIEWED) ARTICLES

1. Feinstone, S.M, Hu, D.J. and **Major, M.E.** Prospects for Prophylactic and Therapeutic Vaccines against Hepatitis C Virus 2012 In: Clinical Infectious Diseases Supplement. Guest Editor: Scott Holmberg. Clinical Infectious Diseases 2012 55: S25-S32.
2. **Major, M.E.** Prophylactic and Therapeutic Vaccination against Hepatitis C virus (HCV): Developments and Future Perspectives. 2009 In: *Viruses* **1**:144-165. "Hepatitis Viruses" special edition. Guest Editor: Birke Bartosch.
3. **Major, M.E.**, Rehermann, B. and Feinstone, S.M. Hepatitis C Viruses. In: Viral Hepatitis. 2002 Blaine Hollinger, Editor
4. **Major, M.E.**, Rehermann, B. and Feinstone, S.M. Hepatitis C Viruses. In: Fields Virology 4th Edition. 2001 Peter M. Howley and David Knipe, Editors.
5. **Major, M.E.** and Feinstone, S.M. Characterization of Hepatitis C Virus infectious clones in chimpanzees: Long term studies (1999). In Hepatitis C Virus. Current Topics in Microbiology and Immunology Vol. 242 Chapter 13 pp279-298. C. Hagedorn and C.M. Rice, Editors.
6. **Major, M.E.** and Feinstone, S.M. Molecular Virology of Hepatitis C. (1997) *Hepatology*. **25** (6):1527-1538.

INVITED TALKS

1. **Major, M.E.** HCV Therapeutic Vaccines: Progress and Challenges HCV Animal Models and Vaccine Development. Tallinn, Estonia. May 16-17, 2013
2. **Major, M.E.** Hepatitis C Vaccines: Challenges and Future Perspectives. World Vaccine Congress. April 10-13 2012, Washington DC.
3. **Major M.E** HCV Vaccine Development and Global Control. Postgraduate Course. Viral Hepatitis: Five Decades of Progress and Promises for the Future. American Association for the Study of Liver Disease (AASLD) Annual Meeting October 29 - November 2, 2010.
4. **Major M.E.** The use of ligand-modified immunoliposomes to efficiently deliver plasmid DNA in prime/boost vaccine strategies against hepatitis C virus 2009 American Society for Nanomedicine Conference. October 22-25, 2009 Potomac, MD.
5. **Major, M.E.** Progress and Future Challenges of HCV Vaccine Development. US Japan Joint AIDS-Hepatitis Meeting: September 19-22, 2009. Portland, OR.
6. **Major, M.E.** HCV Vaccines. The 13th International Symposium on Viral Hepatitis and Liver Disease. March 20-24th, 2009.
7. **Major, M.E.** Pathogenesis and Evolution in the Chimpanzee Model. Johns Hopkins-Australia Liver Diseases Conference, William H. Natcher Conference Center, NIH. September 15th, 2005.
8. **Major, M.E.** T cell Protection Against HCV Infection in Chimpanzees. Dept. of Molecular Genetics, University of Illinois College of Medicine, Chicago, IL, USA. May 2003.
9. **Major, M.E.** Factors Influencing HCV Persistence During Acute Phase Infection in Chimpanzees. Laboratory of Clinical Investigation, NIAID, NIH, Bethesda, Maryland. April 2003.
10. **Major, M.E.** Hepatitis C Virus. Invited speaker, NIDDK Workshop on Hepatitis C and Renal Disease. October 21-22, 2002. NIH, Bethesda, MD USA.
11. **Major, M.E.** Studies of HCV Persistence and Protection through the Use of a Clonal Virus. Center for the Study of Hepatitis C, Rockefeller University, NY, NY, USA May 2001.

ORAL COMMUNICATIONS AT SCIENTIFIC MEETINGS (Selected)

1. A. Kachko; S. E. Frey; F. Wells; I. Zubkova; P. Zhang; S. M. Feinstone; M. Houghton; **M. E. Major**. Antibodies to the interfering epitope EP-II (aa434-446) of HCV E2 can mask neutralizing activity induced in patients vaccinated with rE1E2 protein. 18th International Symposium on HCV and Related Viruses, Seattle Washington. September 8-12, 2011
2. A. Kachko; G. Kochneva; G. Sivolobova; A. Grazhdantseva; T. a Lupan; I. Zubkova; F. Wells; M. Merchlinsky; O. Williams; H. Watanabe, A. Ivanova; A. Shvalov; V. Loktev; S. Netesov and **M. Major**. New Neutralizing Antibody Epitopes in Hepatitis C Virus Envelope Glycoproteins are Revealed by Dissecting Peptide Recognition Profiles. American Association for the Study of Liver Disease (AASLD) Annual Meeting October 29 - November 2, 2010.
3. Zubkova, I, Choi, Y.H., Chang, E., Pirollo, K., Uren, T., Watanabe, H., Wells, F., Krawczynski, K. and **Major, M.E.** T-cell Vaccines that Elicit Effective Immune Responses Against HCV in Chimpanzees Create Greater Immune Pressure for Viral Mutation. The 13th International Symposium on Viral Hepatitis and Liver Disease. March 20-24th, 2009.
4. Pei Zhang, Lilin Zhong, Evi Budo Struble, Hisayoshi Watanabe, Alla Kachko, Kathleen Mihalik, Maria Luisa Virata-Theimer, Harvey Alter, Stephen Feinstone, **Marian Major**. Depletion of Interfering Antibodies in Chronic Hepatitis C Patients and Vaccinated Chimpanzees Reveals Broad Cross-genotype Neutralizing Activity. The 13th International Symposium on Viral Hepatitis and Liver Disease. March 20-24th, 2009.
5. Hongying Duan, Evi Stuble, Lilin Zhong, Kathleen Mihalik, Harvey Alter, **Marian Major**, Pei Zhang, Stephen Feinstone, Dino Feigelstock. Immune Escape of Hepatitis C Virus by Modification of a Neutralization Epitope. The 13th International Symposium on Viral Hepatitis and Liver Disease. March 20-24th, 2009.
6. Watanabe, H. and **Major, M.E.** Persistence of hepatitis C virus (HCV) in chimpanzees is associated with a loss of intrahepatic T-cell function during the late acute phase. 14th International Meeting on HCV and Related Viruses September 9-13, 2007.
7. Zubkova, I., Choi, Y.H., Chang, E., Pirollo, K., Uren, T., Watanabe, H., Wells, F., Feinstone, S.M., Krawczynski, K. and **Major, M.E.** A targeted, systemically delivered T-cell vaccine elicits effective immune responses against HCV in chimpanzees. 14th International Meeting on HCV and Related Viruses September 9-13, 2007.
8. Puig, M. Mihalik, K., Feinstone, S.M., and **Major, M.E.** Effect of Vaccine-Elicited T-cell Immunity on HCV Infection. 10th International Meeting on HCV and Related Viruses. December 1-6 2003. Kyoto, Japan.
9. **Major, M.E.**, Shone, D., Morhardt, D., Lou, H., Hwang Choi, Y., and Hagedorn, C. Analysis of replication complex mutations encoded by isolates from chimpanzees chronically infected following clonal RNA inoculation. 10th International Meeting on HCV and Related Viruses. December 1-6 2003. Kyoto, Japan.
10. **Major, M.E.**, Dahari, H., Zhang, X., Mihalik, K., Puig, M. Rice, C.M., Neumann, A.U., and Feinstone, S.M. Hepatitis C Virus Kinetics and Host Responses Associated with Disease and Outcome of Infection. 10th International Meeting on HCV and Related Viruses. December 1-6 2003. Kyoto, Japan.
11. Puig, M., Mihalik, K., Feinstone, S.M. and **Major, M.E.** HCV T-Cell Vaccines In Chimpanzees Generate Immune Responses That Immediately Control Infection Upon Challenge. 11th International Symposium on Viral Hepatitis and Liver Disease. April 6-10, 2003. Sydney, Australia.
12. **Major, M.E.**, Dahari, H., Zhang, X., Mihalik, K., Puig, M. Rice, C.M., Neumann, A.U., and Feinstone, S.M. Modeling Immune Effects on Viral Dynamics and Outcome of Primary Hepatitis C Infection in Chimpanzees. 11th International Symposium on Viral Hepatitis and Liver Disease. April 6-10, 2003. Sydney, Australia.
13. **Major, M.E.**, Mihalik, K., Puig, M., Rehmann, B., Nascimbeni, M., Rice, C.M., and Feinstone S.M. Previously infected chimpanzees exhibit memory immune responses that rapidly control HCV replication upon rechallenge. 8th International Meeting on HCV and Related Viruses. September 2-6 2001. Paris, France.