

**Most Significant Contributions.** (*Note: I am senior/last author on all “et al.” papers listed below.*)

**A. Phage-display technology.** George Smith, inventor of phage display, and I demonstrated use of the first peptide libraries. Since then, I continued to develop and teach this technology, *via* research papers, reviews, lectures for the CSHL *Phage Antibody* course, hosting 2 international meetings on phage-display, hosting visiting scientists, providing phage libraries, and invited presentations and scientific reviews. Two postdocs trained in my lab are now staff scientists, three previous grad students are assistant professors, and another is a staff scientist, with another just beginning a CIHR-funded postdoctoral award. This research is in: Scott, J.K. & Smith, G.P. 1990. Searching for Peptide Ligands with an Epitope Library. *Science* 249: 386-390; Scott, J.K., *et al.* 1992. Discovery of a Family of Concanavalin A-binding Peptides from a Hexapeptide Epitope Library. *Proc. Natl. Acad. Sci., USA*. 89: 5398-5402; Smith & Scott 1993. Libraries of Peptides and Proteins Displayed on Filamentous Phage. *Meth. Enzymol.* 217: 228-257; Bonnycastle *et al.* 1997. Assaying Phage-borne Peptides by Phage Capture on Fibrinogen or Streptavidin. *Biol. Chem.* 378: 509-515; Blancafort, P., Steinberg, S.V., Paquin, B., Klinck, R., Scott, J.K. and Cedergren, R. 1999. The Recognition of a Non-canonical RNA Base Pair by a Zinc Finger Protein. *Chem. & Biol.* 6(8): 585-597; Zwick, M.B. *et al.* 2000. Homodimeric Peptides Displayed by the Major Coat Protein of Filamentous Phage. *J. Mol. Biol.* 300(2): 307-320; Barbas, C.F., III., Burton, D.R., Scott, J.K. and Silverman, G. 2001. *Phage Display: A Laboratory Manual.* Cold Spring Harbor Laboratories Press, Plainview, NY.

**B. Peptides as “epitope mimics” and vaccine leads for carbohydrate and protein antigens.** In 1995, my lab completed a panel of 16 peptide libraries, with the goal of developing idio-type-specific markers for MAbs, and testing the idea that they could be used to follow particular reactivities in the serum, and to serve as vaccine candidates. We also began work to develop phage for prime-boost immunization strategies. This is charted in: Bonnycastle *et al.* 1996. Probing the Basis of Antibody Reactivity with a Panel of Constrained Peptide Libraries Displayed by Filamentous Phage. *J. Mol. Biol.* 258: 747-762; Harris *et al.* 1997. Exploring the Basis of Peptide:carbohydrate Cross-reactivity: Evidence for Discrimination by Peptides between Closely-related, Anti-carbohydrate Antibodies. *Proc. Natl. Acad. Sci., USA.*, 94: 2454-2459; Craig, *et al.* 1998. The Role of Structure in Antibody Cross-reactivity between Peptides and Folded Proteins. *J. Mol. Biol.* 281(1): 183-201; Yu, M.W.N., Scott, J.K., Fournier, A. and Talbot, P.J. 2000. Characterization of Murine Coronavirus Neutralization Epitopes with Phage-displayed Peptides. *Virology* 271: 182-196; van Houten, N.E., Zwick, M.B., Menendez, A., and Scott, J.K. 2006. Filamentous Phage as an Immunogenic Carrier to Elicit Focused Antibody Responses Against a Synthetic Peptide. *Vaccine.* 24 (19): 4188-4200.

**C. Targeting the Antibody Response against Conserved Epitopes on HIV-1.** In the late 1990s, my lab began work to produce specific peptides for the b12 MAb, which neutralizes a broad range of HIV-1 isolates (Zwick *et al.*, 2003). Later, I expanded the work to neutralizing MAbs 2G12, 2F5 and 4E10, and have produced peptide ligands for 2F5 (Menendez *et al.*, 2004), and Fab-peptide x-ray structures for b12 and 2G12 (Saphire *et al.*, and Menendez *et al.*, both submitted). Extensive functional and immunization studies with the peptide-ligand of b12, has shown that while its antibody affinity and immunogenicity are strong, it failed to elicit HIV-binding sera (Saphire *et al.*). Over the same time, we have worked to develop a prime-boost immunization system that uses native antigen to initiate B cell responses, and peptides to boost cross-reactive antibodies (unpublished). A recent award is funding work to develop DNA and virus-like particle vaccines for targeting the gp41 epitopes for 2F5 and 4E10. Our recently-submitted paper, Wang *et al.*, as well as the work proposed in this application, developed because of our concern for the implications for vaccine design of a recent study, which suggests that broadly-neutralizing antibodies against HIV-1 only develop from autoreactive B-cell precursors. The goal of this proposal is to thoroughly test this hypothesis, and in so doing, to understand the origin of, and requirement for, the unusual, long-CDR-H3s that apparently are enriched during HIV-1 infection.

## Publications

### Published Papers (Past five years)

1. Montero, M. \*, van Houten, N.E. \*, Wang, X. and **Scott, J.K.** The Membrane Proximal External Region of the HIV-1 Envelope: A Dominant Site of Antibody Neutralization and Target for Vaccine Design. *J. Mol. Biol.* **369**:696-709. \*These authors contributed equally to this work.
2. Saphire, E.O. \*, Montero, M. \*, Menendez, A., van Houten, E., Pantophlet, R., Zwick, M.B., Parren, P.W.H.I., Burton, D.R., **Scott, J.K.** and Wilson, I.A. Crystal Structure of a Broadly Neutralizing Anti-HIV-1 Antibody in Complex with a Peptide: Mechanism of gp120 Cross-reactivity. *J Mol Biol.* **369**:696-709. \*These authors contributed equally to this work.
3. van Houten, N.E., Zwick, M.B., Menendez, A., and **Scott, J.K.** 2006. Filamentous Phage as an Immunogenic Carrier to Elicit Focused Antibody Responses Against a Synthetic Peptide. *Vaccine.* **24 (19)**: 4188-4200.
4. Menendez, A. and Scott, J.K. 2005. The Nature of Target-Unrelated Peptides Recovered in the Screening of Phage-Displayed Random Peptide Libraries with Antibodies. *Anal. Biochem.* **336(2)**: 145-157.
5. van Houten, N.E. and Scott, J.K. 2005. Chapter 5: Phage Libraries for Developing Antibody-targeted Diagnostics and Vaccines. In Phage Display in Biotechnology and Drug Discovery. (Ed. S. Siddhu) Marcel Dekker, Inc., New York. pp. 165-254.
6. Menendez, A., Chow, K., Pan, O. and Scott, J.K. 2004. HIV Type-1-Neutralizing Monoclonal Antibody 2F5 is Multispecific for Sequences Flanking the DKW Core Epitope. *J. Mol. Biol.* **338(2)**: 311-327.
7. Visvanathan, S., Scott, J.K., Hwang, K.-K., Banares, M., Grossman, J.M., Merrill, J.T., FitzGerald, J., Chukwuocha, R.U., Tsao, B.P., Hahn, B.H. and Chen, P.P. 2003. Identification and Characterization of a Peptide Mimic that May Detect a Species of Disease-Associated Anticardiolipin Antibodies in Patients with the Antiphospholipid Syndrome. *Arth. Rheum.* **48(3)**: 737-745.
8. Zwick, M.B., Parren P.W.H.I., Saphire, E.O., Wang, M., Scott, J.K., Dawson, P.E., Wilson, I.A. and Burton, D.R. 2003. Molecular Features of the Broadly Neutralizing Antibody b12 Required for Recognition of HIV-1 gp120. *J. Virol.* **77 (10)**: 5863-5876.

### Submitted Manuscripts

- Menendez, A., Calarese, D., Scanlon, C., Burton, D.R., Wilson, I.A. and **Scott, J.K.** Crystal Structure of a Peptide in Complex with the Broadly-neutralizing Antibody 2G12. Submitted to *FASEB Journal*. MS# FASEBJ/2007/089839.

### Manuscripts in Preparation

- Wang, C., Wang, X., Menendez, A., Zwick, M.B., Pantophlet, R., VanCott, T.C., Kingsley, L., Little, S.J., Rinaldo, C., Burton, D.R., Richman, D.D. and **Scott, J.K.** Evolution of the Antibody Response against Envelope Proteins during HIV-1 Infection. To be submitted to *AIDS*.

### Published Papers (Prior to 2002)

1. Zwick, M.B., Bonnycastle, L.L., Menendez, A., Irving, M.B., Barbas, C.F., III, Parren, P.W.H.I., Burton, D.R. and Scott, J.K. 2001. Identification and Characterization of a Peptide that Specifically Binds the Human Broadly Neutralizing Anti-Human Immunodeficiency Virus Type 1 Antibody b12. *J. Virol.* **75(14)**: 6692-6699.

2. Scott, J.K., Huang, S.-F., Gangadhar, B.P., Samorisky, G.M., Clapp, P., Gross, R.A., Taussig, R. and Smrcka, A.V. 2001. Evidence that a Protein-protein Interaction “Hot-spot” is Used for Multiple Effector Recognition on Heterotrimeric G Protein by Subunits. *EMBO J.* **20(4)**: 767-776.
3. Irving, M.B., Pan, O., and Scott, J.K. 2001. Random-peptide Libraries and Anti-fragment Libraries for Epitope Mapping and the Development of Vaccines and Diagnostics. *Curr. Opin. in Chem. Biol.* **5**: 314-324.
4. Barbas, C.F., III., Scott, J.K., Silverman, G. and Burton, D.R. 2001. Phage Display: A Laboratory Manual. Cold Spring Harbor Laboratory Press. Plainview, NY. (I contributed Chapters 2, 4, 14-19 and much of the appendices; I edited Chapters 1 and 20; I conceived the cover art and designed it with D. Marvin.)
5. Smrcka, A.V. and Scott, J.K. 2001. Discovery of Ligands for Beta/Gamma Subunits from Phage-displayed Peptide Libraries. *Meth. in Enzymol.* **344**: 557-576. Zwick, M.B., Shen, J. and Scott, J.K. 2000. Homodimeric Peptide Libraries Displayed by the Major Coat Protein of Filamentous Phage. *J. Mol. Biol.* **300(2)**: 307-320.
6. Yu, M.W.N., Scott, J.K., Fournier, A. and Talbot, P.J. 2000. Characterization of Murine Coronavirus Neutralization Epitopes with Phage-displayed Peptides. *Virology* **271**: 182-196.
7. Blancafort, P., Steinberg, S.V., Paquin, B., Klinck, R., Scott, J.K. and Cedergren, R. 1999. The recognition of non-canonical RNA base pair by a zinc finger protein. *Chem. & Biol.* **6(8)**: 585-597.
8. Craig, L., Sanschagrin, P.C., Rozek, A., Lackie, S., Kuhn, L.A. and Scott, J.K. 1998. The Role of Structure in Antibody Cross-reactivity between Peptides and Folded Proteins. *J. Mol. Biol.* **281(1)**: 183-201.
9. Ryan, S.T., Chi-Rosso, G., Bonnycastle, L.L.C., Scott, J.K., Koteliensky, V., Pollard, S. and Gotwals, P.J. 1998. Epitope Mapping of a Function-blocking Beta-1 Integrin Antibody by Phage display. *Cell Adhes. Commun.* **5(1)**: 75-82.
10. Bonnycastle, L.L.C. 1998. PCR Sequencing of Phage-encoded Peptide Sequences. *Anal. Biochem.* **256**:140-142. [This work was funded by my grants.]
11. Zwick, M.B., Bonnycastle, L.L.C., Noren, K.A., Venturini, S., Leong, E., Barbas, C.F., III, Noren, C.J. and Scott, J.K. 1998. The Maltose Binding Protein as a Scaffold for Monovalent Display of Peptides Derived from Phage Libraries. *Anal. Biochem.* **264(1)**: 87-97.
12. Zwick, M.B., Shen, J. and Scott, J.K. 1998. Phage-displayed Peptide Libraries. *Curr. Opin. Biotechnol.* **9(4)**: 427-436.
13. Bonnycastle, L.L.C., Brown, K., Tang, J. and Scott, J.K. 1997. Assaying Phage-borne Peptides by Phage Capture on Fibrinogen or Streptavidin. *Biol. Chem.* **378**: 509-515.
14. Harris, S.L., Mehroke, Craig, L., Mehroke, J.S., Rashed, M., Zwick, M.B., Kenar, K., Toone, E.J., Auzanneau, F.-I., Marino-Albernas, J.-R., Pinto, B.M. and Scott, J.K. 1997. Exploring the Basis of Peptide:carbohydrate Cross-reactivity: Evidence for Discrimination by Peptides between Closely-related, Anti-carbohydrate Antibodies. *Proc. Natl. Acad. Sci., USA*, **94**: 2454-2459.
15. Bonnycastle, L.L.C., Mehroke, J.S., Rashed, M., Gong, X. and Scott, J.K. 1996. Probing the Basis of Antibody Reactivity with a Panel of Constrained Peptide Libraries Displayed by Filamentous Phage. *J. Mol. Biol.* **258**:747-762.
16. Scott, J.K. & Craig, L. 1994. Random Peptide Libraries. *Curr. Opin. Biotechnol.* **5**:40-48.
17. Scott, J.K. 1994. Identifying Lead Peptides from Epitope Libraries. In Biological Approaches to Rational Drug Design. (Eds. D.B. Weiner & W.V. Williams), CRC Press, Boca Raton, pp. 1-27.

18. Smith, G.P. and J.K. Scott. 1993. Libraries of Peptides and Proteins Displayed on Filamentous Phage. *Meth. Enzymol.* **217**: 228-257.
19. Olivera, B.M., Cruz, L.J., Myers, R.A., Hillyard, D.R., River, J. and Scott, J.K. Conus Peptides and Biotechnology. (1992) In The Molecular Basis of Drug and Pesticide Action. (Ed., I. Duce), Elsevier Press.
20. Scott, J.K. 1992. Designing Epitope Libraries for the Discovery of Ligand-Peptides. *Trends Biochem. Sci.* **17**:241-245.
21. Scott, J.K., Duraikkannu, L., Easley, R.B., Gong, X. and I.A. Goldstein. 1992. "Discovery of a Family of Concanavalin A-binding Peptides from a Hexapeptide Epitope Library." *Proc. Natnl. Acad. Sci., USA.* **89**:5398-5402.
22. Olivera, B.M., River, J., Scott, J.K., Hillyard, D.R. and L.J. Cruz. 1991. Contoxins. *J. Biol. Chem.* **266**:22067-22070.
23. Scott, J.K. and G.P. Smith. 1990. Searching for Peptide Ligands with an Epitope Library. *Science* **249**:386-390.
24. Cariello, N.F., Scott, J.K., Kat, A.G., Thilly, W.G. and P. Keohavong. 1988. Resolution of a Mis-sense Mutant in Human Genomic DNA by Denaturing Gradient Gel Electrophoresis and Direct Sequencing Using *In vitro* DNA Amplification of HPRT-Munich. *Am. J. Human Genetics* **42**: 726-734.

#### Student Presentations and Posters (Past five years)

1. van Houten, N.E., Smith G.P., and Scott, J.K. Engineering Filamentous Phage as Carriers that Focus Antibody Responses against a Peptide. Immunology 2007 Conference, Miami, Florida, May 2007.
2. Montero, M., Wu, S., Scott, J.K. Characterization of the HIV-Neutralizing Antibody 4E10 Epitope in the Context of Cell Membrane: Implication for Vaccine Design. CAHR Conference, Toronto, Ontario. April 2007.
3. Scott, J.K.. Reactivity Profiles of HIV-1-Neutralizing MAbs, 2F5 and 4E10, and the Anti-Cardiolipin MAb, CL15. Keystone Symposium, HIV Vaccines: From Basic Research to Clinical Trials, Whistler, BC. March 2007.
4. Mai, M., Bahr, S., Wu, S., Lau, D., Pio, F., Montero, M., vanHouten, N., Menendez, A., Kunert, R., Katinger, H., Scott, J.K. Biochemical Characteristics and Immunogenicity of a Peptide Ligand for Broadly-Neutralizing MAb 4E10. Keystone Symposium, HIV Vaccines: From Basic Research to Clinical Trials, Whistler, BC. March 2007.
5. Montero, M., Wang, S., Wu, S., Lu, S., Scott, J.K. Immunogenicity of the Membrane Proximal External Region of HIV-1 gp41 on the Cell Surface. Keystone Symposium, HIV Vaccines: From Basic Research to Clinical Trials, Whistler, BC. March 2007.
6. Wang, X., Wu, S., Breden, F., Lepik, C., Montero, M., Kingsley, L., Kunert, R., Katinger, H., Rinaldo, C., Richman, D., Scott, J.K. Are HIV-1 Neutralizing Antibodies Autoantibodies? XVI International AIDS Conference, Toronto, Ontario. August, 2006.
7. Montero, M., Wang, S., Henderson, A., Tsai, S., Lu, S., Scott, J.K. Immunogenicity of the Membrane Proximal External Region of HIV-1 gp41 Protein as a DNA Vaccine. 19<sup>th</sup> Annual Spring Meeting for the Canadian Society for Immunology, Halifax, Nova Scotia. June 2006.
8. vanHouten, N., Irving, M., and Scott, J.K. A Prime Boost Immunization Model for Epitope-Targeting Vaccines. Cold Spring Harbor Laboratory Conference, "Molecular and Immunological Approaches Vaccine Design," Cold Spring Harbor, NY. December 2005.

9. Menendez, A., Calarese, D., Scanlan, C., Chow, K., Stanfield, R., Katinger, H., Burton, D.R., Wilson, I., and Scott, J.K. Peptide Ligands for the HIV-1 Neutralizing Monoclonal Antibody 2G12. International Consortium on Anti-Virals. Trent University, Petersborough, ON. 25 September, 2005.
10. Bahr, S., Montero, M., Menendez, A., Wu, S., Mai, M., Kunert, R., Katinger, H., and Scott, J.K. Peptide Markers for the HIV-1 Neutralizing Antibody 4E10. AIDS Vaccine 2005, Montreal, Quebec. September 2005.
11. Wang, C., Wang, X., Menendez, A, Bahr, S., Pantophlet, Bonnycastle, L., Little, S.J., R., Kingsley, L., Parren, P.W.H.I., Burton, D.R., VanCott, T.C., Rinaldo, C., Richman, D.D. and Scott, J.K. Evolution of the Antibody Response Against Envelope Proteins During HIV-1 Infection. AIDS Vaccine 2005, Montreal, Quebec. September 2005.
12. Menendez, A., Calarese, D., Scanlan, C., Chow, K., Stanfield, R., Katinger, H., Burton, D.R., Wilson, I., and Scott, J.K. Peptide Ligands for the HIV-1 Neutralizing Monoclonal Antibody 2G12. CAHR's 14th Annual Canadian Conference on HIV/AIDS Research, Hyatt Regency Hotel, Vancouver, BC. May 2005. (An invited talk)
13. Wang, C., Wang, X., Menendez, A, Bahr, S., Pantophlet, Bonnycastle, L., Little, S.J., R., Kingsley, L., Parren, P.W.H.I., Burton, D.R., VanCott, T.C., Rinaldo, C., Richman, D.D. and Scott, J.K. Evolution of the Antibody Response Against Envelope Proteins During HIV-1 Infection. CAHR's 14th Annual Canadian Conference on HIV/AIDS Research, Hyatt Regency Hotel, Vancouver, BC. May 2005.
14. Wang, C., Menendez, A., Zwick, M.B., Parren, P.W.H.I., Pantophlet, R., VanCott, T.C., Kingsley, L., Rinaldo, C., Burton, D.R., Richman, D.R. and Scott, J.K. Evolution of the Antibody Response against the HIV-1 Envelope Proteins during HIV-1 Infection. Submitted for the Keystone Symposium "HIV Vaccine Development: Immunological and Biological Challenges", Whistler, BC, Canada, April 2004.
15. Menendez, A., Chow, K., Pan, O., Astronomo, R., Zwick, M.B, Burton, D.R. and Scott, J.K. Neutralizing Human Monoclonal Antibody 2F5 Is Multispecific for Sequences Flanking the DKW Core. AIDS Vaccine 2003, New York, NY. 18-21 September 2003.
16. Montero, M., Menendez, A., Zwick, M., van Houten, N., Irving, M., Bonnycastle, L., Barbas III, C., Parren, P., Burton, D., and Scott, J.K. B2.1, a Peptide that Specifically Binds the Broadly anti-HIV-1 Neutralizing Antibody b12. Keystone Symposium, Keystone, CO. 5-11 April 2002.
17. Irving, M.B. and Scott, J.K. A Strategy to Elicit and Isolate Single Memory B Cells of Defined Antibody Specificity. Keystone Symposia: B Cells and Antibodies; Laboratory to Clinic. Keystone, Colorado. 5-11 April, 2002.
18. Menendez, A., Zwick, M.B., Montero, M., van Houten, N., Irving, M.B., Bonnycastle, L.C., Barbas III, C.F., Parren, P.W.H.I., Burton, D.R. and Scott, J.K. B2.1, a Peptide that Specifically Binds the Broadly HIV-1-Neutralizing, Human Antibody, b12. 9th Conference on Retroviruses and Opportunistic Infections. Washington State Convention and Trade Center, WA. 24-28 Feb. 2002.

#### **Invited Lectures (Past five years)**

1. Keystone Symposium, HIV Vaccines: From Basic Research to Clinical Trials, Whistler, BC, 25-30 March 2007.  
Title: Reactivity Profiles of HIV-1-Neutralizing MAbs, 2F5 and 4E10, and the Anti-Cardiolipin MAb, CL15.
2. IBC's 17th Annual Antibody Engineering Conference, San Diego Convention Center CA, 10-14 December 2006. (speaker and workshop organizer)  
Title: B-Cell Development and Tolerance by Receptor Editing.

3. Cambridge HealthTech Institute, Novel Vaccines: Bridging Research, Development and Production. Royal Sonesta Hotel, Cambridge, MA. 21 August 2006.  
Title: Epitope Targeting: Focusing the Antibody Response against Conserved Sites on HIV-1 and Other Highly-Variable Pathogens.
4. IBC's 16th Annual Antibody Engineering Conference, San Diego Convention Center CA, 2 December 2005. (speaker and session organizer)  
Title: Designing Vaccines and Therapeutic Antibodies that Target Pre-selected Epitopes.
5. Cold Spring Harbor Labs, Molecular Approaches to Vaccine Design. 2 December 2005.  
Title: Evolution of the Antibody Response against Envelope Proteins during HIV-1 Infection.
6. Dept. of Medicine, University of Massachusetts-Worcester. 9 June 2005.  
Title; Peptide Ligands for HIV-1 Neutralizing Antibodies: Implications for Vaccine Design.
7. Ontario Health Research Institute, Ottawa. 25 April 2005  
Title: Vaccines for Producing Neutralizing Antibodies against HIV-1.
8. President's Research Lecture, SFU, 23 February 2005  
Title: The Prevention of AIDS.
9. Institute of Applied Microbiology, Vienna, Austria. 15 December, 2005.  
Title: Peptide Ligands for HIV-1 Neutralizing Antibodies: Approaches to Vaccine Design.
10. UCLA AIDS Institute, David Geffen School of Medicine, CA. 19 October 2004  
Title: Peptide Ligands for HIV-1 Neutralizing Antibodies: Approaches to AIDS Vaccine Design.
11. BC Centre of Excellence in HIV/AIDS, St. Paul's Hospital, Vancouver, BC, 18 May 2004.  
Title: Neutralizing Antibody Responses against HIV-1 and the Development of a Protective Vaccine against AIDS.
12. Cambridge Healthtech Institute's 5th Annual Conference:Molecular Display: The Chemistry Set for Proteins and Small Molecules. Hyatt Regency Cambridge, MA. 11 to 13 May 2003.  
Title: Display Technologies, Library Construction and Screening (a 3-hour workshop)
13. University of New Mexico, Albuquerque, Dept. Pathology, 18 August, 2003.  
Title: Peptide Vaccine Leads from Neutralizing Antibodies against HIV-1.
14. Understanding Phage Display, 17-20 January 2003  
Title: Identifying Dominant and Lesser Subsites in Antibody Binding Sites
15. UCSD, Center for AIDS Research, La Jolla, CA, 3 December 2002.  
Title: Peptide Vaccine Leads from Neutralizing Antibodies against HIV-1.
16. IBC's 13th Annual Antibody Engineering Conference, Paradise Point Resort, San Diego, CA, 4 December 2002. (session co-organizer)  
Title: Peptide Vaccine Leads from Neutralizing Antibodies against HIV-1.
17. 85th Canadian Society for Chemistry, 2002 Conference, Biological & Medicinal Topics, Session on Directed Evolution, University of British Columbia, Vancouver, B.C. 1-5 June 2002.  
Title: Peptide Ligands for Neutralizing Antibodies Against HIV-1.
18. University of Oklahoma Health Science Center, Dept. Biochemistry, Oklahoma City. 16 May 2002.  
Title: Peptide Vaccine Leads from Neutralizing Antibodies against HIV-1.
19. National Institutes of Health, National Institute on Aging, Gerontological Research Center, One-day Symposium on Phage Display Technology. 5 May 2002.  
Title: Peptide Ligands for Neutralizing Antibodies Against HIV-1.
20. Pacific Northwest Research Institute, Weekly Seminar Series, Seattle, WA. 24 April 2002.  
Title: Peptide Ligands for Neutralizing Antibodies Against HIV-1.
21. Cambridge Healthtech Institute's 4th Annual Phage Display Meeting, University Park Hotel at

MIT, Cambridge, MA. 22-23 April 2002.

Title: Peptide Ligands for Neutralizing Antibodies against HIV-1.

22. IBC's 12th Annual Conference on Antibody Engineering, Loews Coronado Resort, Coronado, CA. 2-6 December 2001.

Title: Peptide Mimics of Neutralizing Sites on HIV-1 Envelope Proteins.

## Activities and contributions.

### International Memberships and Review Panels:

**Review Panel Member:** NIH Study Sections ZRG1 VACC 01 (11/02 - present), NCI D RPRB Q3 (10/04), F31- Predoctoral Fellowship Applications for Disabled & Minority People (07/02), and NIH/NCI Special Review Committee for RFA CA (10/04); NCI, The National Cooperative Drug Discovery Groups (08/94-04/96), Canada Research Chair Program, College of Reviewers (11/00-present), Biotechnology Award Review Committee, Science Council of British Columbia (01/97-10/97)

**Memberships:** American Association of Immunologists, American Society for Microbiology, American Chemical Society, Canadian Association of HIV Researchers, Canadian Bacterial Diseases Network of Excellence, Member (10/97-09/00), Associate Member (09/93-09/97).

### Meetings and Lectures:

**Meetings:** *Primary organizer:* "Understanding Phage Display 2003: Structure and Biology", SFU's Harbour Centre, Vancouver, BC, Canada (01/03) and "Understanding Phage Display: Structure, Biology and Applications", SFU's Harbour Centre, Vancouver, BC, Canada (09/2000).

*Session Organizer/Co-organizer:* IBC's 13-17th Annual Antibody Engineering Conferences, San Diego, CA, (12/2003-2006). Canadian Association of HIV Researchers' 14<sup>th</sup> Annual Conference, Basic Biomedical Session, Hyatt Regency Hotel, Vancouver, BC, (05/2005).

**Lectures:** International Conference Speaker and Invited Lectures Since 1990, Total of 100.

**Editorial:** Editor, *Analytical Biochemistry* (05/98-01/99); Editorial Board, *Molecular Diversity* (95-present), *Current HIV Research* (12/05-present)

**Student and Research Training:** Since 1994, I have supervised five Ph.D. and two M.Sc. students who have completed their degrees. Previous trainees include Shannon Harris, MRC Student Fellowship; Michael Zwick, funded by an NSERC Student Fellowship, Lisa Craig, funded by a GREAT award, Alfredo Menendez, funded by Michael Smith and NSERC scholarships, and Melita Irving. Dr. Harris is now a Staff Scientist at Wyeth. Dr. Zwick is an Assistant Professor at The Scripps Research Institute. Dr. Craig is an Associate Professor at Simon Fraser University. Dr. Menendez is a CIHR-funded postdoctoral fellow in Brett Finlay's lab at UBC. Dr. Irving just completed postdoctoral work at the Terry Fox Laboratory, BC Cancer Research Centre. I co-supervised one Ph.D. student, Pilar Blancafort, with Dr. Bob Cedergren at the Universite de Montreal; she is now an Assistant Professor at UNC, Chapel Hill. Currently I supervise two Ph.D. students. Dr. L. Bonnycastle, a previous Research Associate is now a Staff Scientist at NIH, and Dr. J. Shen is a Staff Scientist at ImmClone. During career at SFU, I have supervised two postdoctoral fellows, four research associates, 6 senior research technicians, 26 junior technicians, 14 research assistants and 32 undergraduate research projects. I hosted visiting scientist, Juan Carlos Almagro, Ph.D. from the Instituto de Biotecnologia of the Universidad Nacional Autonoma de Mexico in Cuernavaca; Valeria Vasta, Ph.D., visiting Postdoctoral Fellow from the Univ. Washington, Seattle; and Min Liu, M.Sc. WHO Fellow and Associate Professor, Biochemistry Department, Da Lian Medical University, Liao Ning Province, PRC.

**Joint Major: Biotechnology/Business.** At SFU, I envisioned and helped mount the undergraduate, joint major program in Biotechnology and Business that began in the fall 2002.

**Faculty of Health Science, Simon Fraser University.** As the only research-based scientist in this new faculty, I have worked in designing the BSc program, as well as the Graduate and Undergraduate Programs in Infectious Diseases. I helped design new lab space for the ID hires. Additionally, I have been very active in the Search Committees for the new FHS hires. Concurrently, I served on the Search Committee for ID-program-related Immunologist and Virologist positions in the Department of Molecular Biology & Biochemistry. This fall I expect to be on at least 4 search committees.

### Patents

**Title:** Immunogenicity of the Membrane-Proximal External Region of HIV-1 gp41 Protein as a DNA Vaccine.

**Co-Inventor(s):** J.K. Scott and M. Montero.

<b>Country</b>	<b>Date Filed</b>	<b>Date Issued</b>	<b>Patent #</b>
Canada/USA provisional	26 March 2007		

**Title:** Peptides for Use as a Vaccine and/or Treatment for HIV Infection.

**Co-Inventor(s):** J.K. Scott, Burton, Barbas, Zwick, Parren.

<b>Country</b>	<b>Date Filed</b>	<b>Date Issued</b>	<b>Patent #</b>
Canada/USA provisional	May 01, 2000		

**Title:** Method of Obtaining Small, Conformationally Rigid Conopeptides

**Co-Inventor(s):** B.M. Olivera, D.R. Hillyard, R.A. Myers, J.K. Scott, G.P. Smith

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