

David Ian Watkins
Curriculum Vitae

1. Date: **July 19, 2018**

I. PERSONAL

2. Name: **David Ian Watkins**
3. Home Phone: 786-879-9926
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5. Home Address: Apt 603, 2560 SW 27th Ave, Coconut Grove, FL 33133
6. Current Academic Rank: Professor of Pathology
7. Primary Department: Pathology
8. Secondary or Joint Appointments: Cell Biology, Biochemistry
9. Citizenship: United States and the United Kingdom
10. Visa Type (if non-citizen):

II. HIGHER EDUCATION

11. Institutional (institution; degree; date conferred):

University of Durham, England	B. Sc. Botany & Zoology	1982
University of Rochester, NY	M. Sc. Immunology	1984
University of Rochester, NY	Ph. D. Immunology	1985

12. Non-Institutional (description; dates):
13. Certification, licensure (description; board or agency; dates):

III. EXPERIENCE

14. Academic (institutions; rank/status; dates):

Harvard Medical School	Instructor in Medicine	1988 - 1989
Harvard Medical School	Assistant Professor in Pathology	1989 - 1992
University of Wisconsin Medical School	Assistant Professor in Pathology	1992 - 1994
University of Wisconsin Medical School	Associate Professor in Pathology	1994 - 1998
University of Wisconsin	Director, Histocompatibility Laboratory	1994 - 1998
University of Wisconsin Hospital and Clinics	Director, HLA/Molecular Diagnostics Laboratory	1997 - 2011
Wisconsin National Primate Research Center	Chair Immunogenetics Research Group	1997 - 2011
University of Wisconsin Medical School	Professor in Pathology	1998 - 2011
University of Miami Medical School	Professor in Pathology, Vice Chair of Research	2012 –

15. Hospital Appointments: (institutions, dates)

16. Non-Academic (employers; title; responsibilities; dates):

17. Military (branch; rank; responsibilities; dates):

IV. PUBLICATIONS

18. Books and monographs published:

None

19. Juried or refereed journal articles and exhibitions:

- 1) Shin YC, Bischof GF, Lauer WA, Gonzalez-Nieto L, Rakasz EG, Hendricks GM, **Watkins DI**, Martins MA, Desrosiers RC. A recombinant herpesviral vector containing a near-full-length SIVmac239 genome produces SIV particles and elicits immune responses to all nine SIV gene products. *PLoS Pathog.* 2018 Jun 18;14(6):e1007143. doi: 10.1371/journal.ppat.1007143.
- 2) Martins MA, Tully DC, Pedreño-Lopez N, von Bredow B, Pauthner MG, Shin YC, Yuan M, Lima NS, Bean DJ, Gonzalez-Nieto L, Domingues A, Gutman MJ, Maxwell HS, Magnani DM, Ricciardi MJ, Bailey VK, Altman JD, Burton DR, Ejima K, Allison DB, Evans DT, Rakasz EG, Parks CL, Bonaldo MC, Capuano S 3rd, Lifson JD, Desrosiers RC, Allen TM, **Watkins DI**. Mamu-B*17+ rhesus macaques vaccinated with env, vif, and nef manifest early control of SIVmac239 replication. *J Virol.* 2018 Jun 6. pii: JVI.00690-18. doi: 10.1128/JVI.00690-18.
- 3) Magnani DM, Rogers TF, Maness NJ, Grubaugh ND, Beutler N, Bailey VK, Gonzalez-Nieto L, Gutman MJ, Pedreño-Lopez N, Kwal JM, Ricciardi MJ, Myers TA, Julander JG, Bohm RP, Gilbert MH, Schiro F, Aye PP, Blair RV, Martins MA, Falkenstein KP, Kaur A, Curry CL, Kallas EG, Desrosiers RC, Goldschmidt-Clermont PJ, Whitehead SS, Andersen KG, Bonaldo MC, Lackner AA, Panganiban AT, Burton DR, **Watkins DI**. Fetal demise and failed antibody therapy during Zika virus infection of pregnant macaques. *Nat Commun.* 2018 Apr 24;9(1):1624. doi: 10.1038/s41467-018-04056-4.
- 4) Mavigner M, Raper J, Kovacs-Balint Z, Gumber S, O'Neal JT, Bhaumik SK, Zhang X, Habib J, Mattingly C, McDonald CE, Avanzato V, Burke MW, Magnani DM, Bailey VK, **Watkins DI**, Vanderford TH, Fair D, Earl E, Feczko E, Styner M, Jean SM, Cohen JK, Silvestri G, Johnson RP, O'Connor DH, Wrammert J, Suthar MS, Sanchez MM, Alvarado MC, Chahroudi A. Postnatal Zika virus infection is associated with persistent abnormalities in brain structure, function, and behavior in infant macaques. *Sci Transl Med.* 2018 Apr 4;10(435). pii: eaao6975. doi: 10.1126/scitranslmed.aao6975.
- 5) Ricciardi MJ, Magnani DM, Grifoni A, Kwon Y, Gutman MJ, Grubaugh ND, Gangavarapu K, Sharkey M, Silveira CGT, Bailey VK, Pedreño-Lopez N, Gonzalez-Nieto L, Maxwell HS, Domingues A, Martins MA, Pham J, Weiskopf D, Altman J, Kallas EG, Andersen KG, Stevenson M, Lichtenberger P, Choe H, Whitehead SS, Sette A, **Watkins DI**. Ontogeny of the B- and T-cell response in a primary Zika virus infection of a dengue-naïve individual during the 2016 outbreak in Miami FL. *PLoS Negl Trop Dis.* 2017 Dec 21;11(12):e0006000. doi: 10.1371/journal.pntd.0006000

- 6) Grifoni A, Pham J, Sidney J, O'Rourke P, Paul S, Peters B, Martini S, de Silva A, Ricciardi M, Magnani D, Silveira C, Maestri A, Costa P, de-Oliveira-Pinto L, de Azeredo E, Damasco P, Phillips E, Mallal S, de Silva A, Collins M, Durbin A, Diehl S, Cerpas C, Balmaseda A, Kuan G, Coloma J, Harris E, Crowe J, Stone M, Norris P, Busch M, Vivanco-Cid H, Cox J, Graham B, Ledgerwood J, Turtle L, Solomon T, Kallás E, **Watkins DI**, Weiskopf D, and Sette A. Prior Dengue virus exposure shapes T cell immunity to Zika virus in humans. *J Virol.* 2017 Oct 4. pii: JVI.01469-17.
- 7) Magnani, DM, Rogers TF, Beutler N, Ricciardi MJ, Bailey VK, Gonzalez-Nieto L, Briney B, Sok D, Le K, Strubel A, Gutman MJ, Pedreño-Lopez N, Grubaugh ND, Silveira CGT, Maxwell HS, Domingues A, Martins MA, Lee DE, Okwuazi EE, Jean S, Strobert EA, Chahroudi A, Silvestri G, Vanderford TH, Kallas EG, Desrosiers RC, Bonaldo MC, Whitehead SS, Burton DR, **Watkins DI**. Neutralizing human monoclonal antibodies prevent Zika virus infection in macaques. *Sci Transl Med.* 2017 Oct 4. eaan8184. doi: 10.1126/scitranslmed.aan8184
- 8) Magnani DM, Silveira CGT, Ricciardi MJ, Gonzalez-Nieto L, Pedreño-Lopez N, Bailey VK, Gutman MJ, Maxwell HS, Domingues A, Costa PR, Ferrari L, Goulart R, Martins MA, Martinez-Navio JM, Fuchs SP, Kalil J, Timenetsky MDC, Wrammert J, Whitehead SS, Burton DR, Desrosiers RC, Kallas EG, **Watkins DI**. Potent Plasmablast-Derived Antibodies Elicited by the NIH Dengue Vaccine. *J Virol.* 2017 Sep 6. pii: JVI.00867-17. doi: 10.1128/JVI.00867-17.
- 9) Martins MA, Tully DC, Shin YC, Gonzalez-Nieto L, Weisgrau KL, Bean DJ, Gadgil R, Gutman MJ, Domingues A, Maxwell HS, Magnani DM, Ricciardi M, Pedreño-Lopez N, Bailey V, Cruz MA, Lima NS, Bonaldo MC, Altman JD, Rakasz E, Capuano S 3rd, Reimann KA, Piatak M Jr, Lifson JD, Desrosiers RC, Allen TM, **Watkins DI**. Rare Control of SIVmac239 Infection in a Vaccinated Rhesus Macaque. *AIDS Res Hum Retroviruses.* 2017 Aug;33(8):843-858.
- 10) Bischof GF, Magnani DM, Ricciardi M, Shin YC, Domingues A, Bailey VK, Gonzalez-Nieto L, Rakasz EG, **Watkins DI**, Desrosiers RC. Use of a Recombinant Gamma-2 Herpesvirus Vaccine Vector against Dengue Virus in Rhesus Monkeys. *J Virol.* 2017 Jul 27;91(16). pii: e00525-17.
- 11) Magnani DM, Ricciardi MJ, Bailey VK, Gutman MJ, Pedreño-Lopez N, Silveira CGT, Maxwell HS, Domingues A, Gonzalez-Nieto L, Su Q, Newman RM, Pack M, Martins MA, Martinez-Navio JM, Fuchs SP, Rakasz EG, Allen TM, Whitehead SS, Burton DR, Gao G, Desrosiers RC, Kallas EG, **Watkins DI**. Dengue Virus Evades AAV-Mediated Neutralizing Antibody Prophylaxis in Rhesus Monkeys. *Mol Ther.* 2017 Jul 24. pii: S1525-0016(17)30299-X. doi: 10.1016/j.ymthe.2017.06.020.
- 12) Martins MA, Shin YC, Gonzalez-Nieto L, Domingues A, Gutman MJ, Maxwell HS, Castro I, Magnani DM, Ricciardi M, Pedreño-Lopez N, Bailey V, Betancourt

- D, Altman JD, Pauthner M, Burton DR, von Bredow B, Evans DT, Yuan M, Parks CL, Ejima K, Allison DB, Rakasz E, Barber GN, Capuano S 3rd, Lifson JD, Desrosiers RC, **Watkins DI**. Vaccine-induced immune responses against both Gag and Env improve control of simian immunodeficiency virus replication in rectally challenged rhesus macaques. *PLoS Pathog.* 2017 Jul 21;13(7):e1006529. doi: 10.1371/journal.ppat.1006529.
- 13) Termini JM, Magnani DM, Maxwell HS, Lauer W, Castro I, Pecotte J, Barber GN, **Watkins DI**, Desrosiers RC. Simian T Lymphotropic Virus 1 Infection of Papio anubis: tax Sequence Heterogeneity and T Cell Recognition. *J Virol.* 2017 Sep 27;91(20). pii: e00950-17. doi: 10.1128/JVI.00950-17.
- 14) Magnani DM, Silveira CGT, Rosen BC, Ricciardi MJ, Pedreño-Lopez N, Gutman MJ, Bailey VK, Maxwell HS, Domingues A, Gonzalez-Nieto L, Avelino-Silva VI, Trindade M, Nogueira J, Oliveira CS, Maestri A, Felix AC, Levi JE, Nogueira ML, Martins MA, Martinez-Navio JM, Fuchs SP, Whitehead SS, Burton DR, Desrosiers RC, Kallas EG, **Watkins DI**. A human inferred germline antibody binds to an immunodominant epitope and neutralizes Zika virus. *PLoS Negl Trop Dis.* 2017 Jun 12;11(6):e0005655.
- 15) Aliota MT, Bassit L, Bradrick SS, Cox B, Garcia-Blanco MA, Gavegnano C, Friedrich TC, Golos TG, Griffin DE, Haddow AD, Kallas EG, Kitron U, Lecuit M, Magnani DM, Marrs C, Mercer N, McSweegan E, Ng LFP, O'Connor DH, Osorio JE, Ribeiro GS, Ricciardi M, Rossi SL, Saade G, Schinazi RF, Schott-Lerner GO, Shan C, Shi PY, **Watkins DI**, Vasilakis N, Weaver SC. Zika in the Americas, year 2: What have we learned? What gaps remain? A report from the Global Virus Network. *Antiviral Res.* 2017 Aug;144:223-246.
- 16) Grubaugh ND, Ladner JT, Kraemer MUG, Dudas G, Tan AL, Gangavarapu K, Wiley MR, White S, Thézé J, Magnani DM, Prieto K, Reyes D, Bingham AM, Paul LM, Robles-Sikisaka R, Oliveira G, Pronty D, Barcellona CM, Metsky HC, Baniecki ML, Barnes KG, Chak B, Freije CA, Gladden-Young A, Gnirke A, Luo C, MacInnis B, Matranga CB, Park DJ, Qu J, Schaffner SF, Tomkins-Tinch C, West KL, Winnicki SM, Wohl S, Yozwiak NL, Quick J, Fauver JR, Khan K, Brent SE, Reiner RC Jr, Lichtenberger PN, Ricciardi MJ, Bailey VK, **Watkins DI**, Cone MR, Kopp EW 4th, Hogan KN, Cannons AC, Jean R, Monaghan AJ, Garry RF, Loman NJ, Faria NR, Porcelli MC, Vasquez C, Nagle ER, Cummings DAT, Stanek D, Rambaut A, Sanchez-Lockhart M, Sabeti PC, Gillis LD, Michael SF, Bedford T, Pybus OG, Isern S, Palacios G, Andersen KG. Genomic epidemiology reveals multiple introductions of Zika virus into the United States. *Nature.* 2017 Jun 15;546(7658):401-405.
- 17) Castro I, Giret TM, Magnani DM, Maxwell HS, Umland O, Perry JK, Pecotte JK, Brasky KM, Barber GN, Desrosiers RC, **Watkins DI**. Cellular Immune Responses Against the Simian T-Lymphotropic Virus type 1 (STLV-1) Target Tax in Infected Baboons. *J Virol.* 2016 Mar 16. pii: JVI.00281-16.
- 18) Martins MA, Tully DC, Cruz MA, Power KA, Veloso de Santana MG, Bean DJ, Ogilvie CB, Gadgil R, Lima NS, Magnani DM, Ejima K, Allison DB, Piatak M

- Jr, Altman JD, Parks CL, Rakasz EG, Capuano S 3rd, Galler R, Bonaldo MC, Lifson JD, Allen TM, **Watkins DI**. Vaccine-Induced Simian Immunodeficiency Virus-Specific CD8+ T-Cell Responses Focused on a Single Nef Epitope Select for Escape Variants Shortly after Infection. *J Virol*. 2015 Nov 1;89(21):10802-20.
- 19) Rainho JN, Martins MA, Cunyat F, Watkins IT, **Watkins DI**, Stevenson M. Nef Is Dispensable for Resistance of Simian Immunodeficiency Virus-Infected Macrophages to CD8+ T Cell Killing. *J Virol*. 2015 Oct;89(20):10625-36.
- 20) Connick E, Folkvord JM, Lind KT, Rakasz EG, Miles B, Wilson NA, Santiago ML, Schmitt K, Stephens EB, Kim HO, Wagstaff R, Li S, Abdelaal HM, Kemp N5, **Watkins DI**, MaWhinney S, Skinner PJ. Compartmentalization of simian immunodeficiency virus replication within secondary lymphoid tissues of rhesus macaques is linked to disease stage and inversely related to localization of virus-specific CTL. *J Immunol*. 2014 Dec 1;193(11):5613-25.
- 21) Martins MA, Wilson NA, Piaskowski SM, Weisgrau KL, Furlott JR, Bonaldo MC, Veloso de Santana MG, Rudersdorf RA, Rakasz EG, Keating KD, Chiuchiolo MJ, Piatak M Jr, Allison DB, Parks CL, Galler R, Lifson JD, **Watkins DI**. Vaccination with Gag, Vif, and Nef gene fragments affords partial control of viral replication after mucosal challenge with SIVmac239. *J Virol*. 2014 Jul;88(13):7493-516.
- 22) de Santana MG, Neves PC, dos Santos JR, Lima NS, dos Santos AA, **Watkins DI**, Galler R, Bonaldo MC. Improved genetic stability of recombinant yellow fever 17D virus expressing a lentiviral Gag gene fragment. *Virology*. 2014 Mar;452-453:202-11.
- 23) Martins MA, Bonaldo MC, Rudersdorf RA, Piaskowski SM, Rakasz EG, Weisgrau KL, Furlott JR, Eernisse CM, Veloso de Santana MG, Hidalgo B, Friedrich TC, Chiuchiolo MJ, Parks CL, Wilson NA, Allison DB, Galler R, **Watkins DI**. Immunogenicity of seven new recombinant yellow fever viruses 17D expressing fragments of SIVmac239 Gag, Nef, and Vif in Indian rhesus macaques. *PLoS One*. 2013;8(1):e54434.
- 24) Moldt B, Rakasz EG, Schultz N, Chan-Hui PY, Swiderek K, Weisgrau KL, Piaskowski SM, Bergman Z, **Watkins DI**, Poignard P, Burton DR. Highly potent HIV-specific antibody neutralization in vitro translates into effective protection against mucosal SHIV challenge in vivo. *Proc Natl Acad Sci U S A*. 2012 Nov 13;109(46):18921-5.
- 25) Mudd PA, Martins MA, Ericson AJ, Tully DC, Power KA, Bean AT, Piaskowski SM, Duan L, Seese A, Gladden AD, Weisgrau KL, Furlott JR, Kim YI, Veloso de Santana MG, Rakasz E, Capuano S 3rd, Wilson NA, Bonaldo MC, Galler R, Allison DB, Piatak M Jr, Haase AT, Lifson JD, Allen TM, **Watkins DI**. Vaccine-induced CD8+ T cells control AIDS virus replication. *Nature*. 2012 Nov 1;491(7422):129-33.

- 26) Poignard P, Moldt B, Maloeste K, Campos N, Olson WC, Rakasz E, **Watkins DI**, Burton DR. Protection against high-dose highly pathogenic mucosal SIV challenge at very low serum neutralizing titers of the antibody-like molecule CD4-IgG2. *PLoS One*. 2012;7(7):e42209.
- 27) **Watkins DI**. Update on progress in HIV vaccine development. *Top Antivir Med*. 2012 Jun;20(2):30-1.
- 28) Reynolds MR, Weiler AM, Piaskowski SM, Piatak M Jr, Robertson HT, Allison DB, Bett AJ, Casimiro DR, Shiver JW, Wilson NA, Lifson JD, Koff WC, **Watkins DI**. A trivalent recombinant Ad5 gag/pol/nef vaccine fails to protect rhesus macaques from infection or control virus replication after a limiting-dose heterologous SIV challenge. *Vaccine*. 2012 Jun 22;30(30):4465-75.
- 29) de Groot NG, Otting N, Robinson J, Blancher A, Lafont BA, Marsh SG, O'Connor DH, Shiina T, Walter L, **Watkins DI**, Bontrop RE. Nomenclature report on the major histocompatibility complex genes and alleles of Great Ape, Old and New World monkey species. *Immunogenetics*. 2012 Aug;64(8):615-31.
- 30) Moldt B, Shibata-Koyama M, Rakasz EG, Schultz N, Kanda Y, Dunlop DC, Finstad SL, Jin C, Landucci G, Alpert MD, Dugast AS, Parren PW, Nimmerjahn F, Evans DT, Alter G, Forthal DN, Schmitz JE, Iida S, Poignard P, **Watkins DI**, Hessel AJ, Burton DR. A nonfucosylated variant of the anti-HIV-1 monoclonal antibody b12 has enhanced FcγRIIIa-mediated antiviral activity in vitro but does not improve protection against mucosal SHIV challenge in macaques. *J Virol*. 2012 Jun;86(11):6189-96.
- 31) Mudd PA, Ericson AJ, Burwitz BJ, Wilson NA, O'Connor DH, Hughes AL, **Watkins DI**. Escape from CD8(+) T cell responses in Mamu-B*00801(+) macaques differentiates progressors from elite controllers. *J Immunol*. 2012 Apr 1;188(7):3364-70.
- 32) Sette A, Sidney J, Southwood S, Moore C, Berry J, Dow C, Bradley K, Hoof I, Lewis MG, Hildebrand WH, McMurtrey CP, Wilson NA, **Watkins DI**, Mothé BR. A shared MHC supertype motif emerges by convergent evolution in macaques and mice, but is totally absent in human MHC molecules. *Immunogenetics*. 2012 Jun;64(6):421-34.
- 33) Vojnov L, Martins MA, Bean AT, Veloso de Santana MG, Sacha JB, Wilson NA, Bonaldo MC, Galler R, Stevenson M, **Watkins DI**. The majority of freshly sorted simian immunodeficiency virus (SIV)-specific CD8(+) T cells cannot suppress viral replication in SIV-infected macrophages. *J Virol*. 2012 Apr;86(8):4682-7.
- 34) Burwitz BJ, Sacha JB, Reed JS, Newman LP, Norante FA, Bimber BN, Wilson NA, **Watkins DI**, O'Connor DH. Pyrosequencing Reveals Restricted Patterns of CD8+ T Cell Escape-Associated Compensatory Mutations in Simian Immunodeficiency Virus. *J Virol*. 2011 Dec;85(24):13088-96.
- 35) Mudd PA, Ericson AJ, Walsh AD, León EJ, Wilson NA, Maness NJ, Friedrich TC, **Watkins DI**. CD8+ T Cell Escape Mutations in Simian Immunodeficiency Virus SIVmac239 Cause Fitness Defects In Vivo, and Many Revert after Transmission. *J Virol*. 2011 Dec;85(23):12804-10.
- 36) Vojnov L, Martins MA, Almeida JR, Ende Z, Rakasz EG, Reynolds MR, Leon

- EJ, Weisgrau KL, Burwitz BJ, Folkvord JM, de Santana MG, Neves PC, Connick E, Skinner PJ, Gostick E, O'Connor DH, Wilson NA, Bonaldo MC, Galler R, Price DA, Douek DC, **Watkins DI**. GagCM9-specific CD8⁺ T cells expressing limited public TCR clonotypes do not suppress SIV replication in vivo. *PLoS One*. 2011;6(8):e23515.
- 37) Mladinich KM, Piaskowski SM, Rudersdorf R, Eernisse CM, Weisgrau KL, Martins MA, Furlott JR, Partidos CD, Brewoo JN, Osorio JE, Wilson NA, Rakasz EG, **Watkins DI**. Dengue virus-specific CD4(+) and CD8 (+) T lymphocytes target NS1, NS3 and NS5 in infected Indian rhesus macaques. *Immunogenetics*. 2012 Feb;64(2):111-21.
- 38) Vojnov L, Bean AT, Peterson EJ, Chiuchiolo MJ, Sacha JB, Denes FS, Sandor M, Fuller DH, Fuller JT, Parks CL, McDermott AB, Wilson NA, **Watkins DI**. DNA/Ad5 vaccination with SIV epitopes induced epitope-specific CD4⁺ T cells, but few subdominant epitope-specific CD8⁺ T cells. *Vaccine*. 2011 Oct 6;29(43):7483-90.
- 39) Reynolds MR, Sacha JB, Weiler AM, Borchardt GJ, Glidden CE, Sheppard NC, Norante FA, Castrovinci PA, Harris JJ, Robertson HT, Friedrich TC, McDermott AB, Wilson NA, Allison DB, Koff WC, Johnson WE, **Watkins DI**. The TRIM5{alpha} genotype of rhesus macaques affects acquisition of simian immunodeficiency virus SIVsmE660 infection after repeated limiting-dose intrarectal challenge. *J Virol*. 2011 Sep;85(18):9637-40.
- 40) Reed JS, Sidney J, Piaskowski SM, Glidden CE, León EJ, Burwitz BJ, Kolar HL, Eernisse CM, Furlott JR, Maness NJ, Walsh AD, Rudersdorf RA, Bardet W, McMurtrey CP, O'Connor DH, Hildebrand WH, Sette A, **Watkins DI**, Wilson NA. The role of MHC class I allele Mamu-A*07 during SIV(mac)239 infection. *Immunogenetics*. 2011 Dec;63(12):789-807.
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- 42) Mudd PA, Ericson AJ, Price AA, Wilson NA, Reimann KA, **Watkins DI**. Reduction of CD4⁺ T cells in vivo does not affect virus load in macaque elite controllers. *J Virol*. 2011 Jul;85(14):7454-9.
- 43) Neves PC, Rudersdorf RA, Galler R, Bonaldo MC, de Santana MG, Mudd PA, Martins MA, Rakasz EG, Wilson NA, **Watkins DI**. CD8⁺ gamma-delta TCR⁺ and CD4⁺ T cells produce IFN- γ at 5-7 days after yellow fever vaccination in Indian rhesus macaques, before the induction of classical antigen-specific T cell responses. *Vaccine*. 2010 Nov 29;28(51):8183-8.
- 44) Sacha JB, Buechler MB, Newman LP, Reed J, Wallace LT, Loffredo JT, Wilson NA, **Watkins DI**. Simian immunodeficiency virus-specific CD8⁺ T cells recognize Vpr- and Rev-derived epitopes early after infection. *J Virol*. 2010 Oct;84(20):10907-12.
- 45) Maness NJ, Walsh AD, Piaskowski SM, Furlott J, Kolar HL, Bean AT, Wilson NA, **Watkins DI**. CD8⁺ T cell recognition of cryptic epitopes is a ubiquitous

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- against mucosal challenge by simian-human immunodeficiency virus SHIVBa-L. *J Virol.* 2010 Feb; 84(3): 1302-13.
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20. Other works, publications and abstracts:

21. Other works accepted for publication:

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- 14) Picker LJ, **Watkins DI**. HIV pathogenesis: the first cut is the deepest. *Nature Immunology* 2005 May: 6(5): 430-2.
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- 16) Goulder PJ, **Watkins DI**. HIV and SIV CTL escape: implications for vaccine

- design. *Nat Rev Immunol*. 2004 Aug; 4(8): 630-40.
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 - 18) O'Connor DH, Allen TM, **Watkins DI**. 2002. Cytotoxic T-lymphocyte escape monitoring in simian immunodeficiency virus vaccine challenge studies. *DNA and Cell Biology* 21(9): 659-664.
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 - 20) Allen TM, **Watkins DI**. 2001. New insights into evaluating effective T-cell responses to HIV. *AIDS*.15 (Suppl 5):S117-26.
 - 21) O'Connor DH, Friedrich T, Hughes A, Allen TM, **Watkins DI**. 2001. Understanding cytotoxic T-lymphocyte escape during simian immunodeficiency virus infection. *Immunol. Rev.* 183:115-26.
 - 22) Marx PA, **Watkins DI**. 2001. The symposium on Nonhuman Primate Models for AIDS. Introduction. *J. Med. Primatol.* 30(4):189.
 - 23) O'Connor DH, Allen TM, **Watkins DI**. 2001. Vaccination with CTL epitopes that escape: an alternate approach to HIV Vaccine Development. *Immunol. Lett.* 79(1-2):77-84.
 - 24) Allen TM, **Watkins DI**. 2001. New insights into effective T-cell responses to HIV and the evaluation of AIDS vaccine candidates. *AIDS: 2001 (A Year in Review)*; 15 Suppl 5: S117-26.
 - 25) O'Connor DH, **Watkins DI**. 1999. Houdini's Box: Towards an Understanding of AIDS Virus Escape from the Cytotoxic T Lymphocyte Response. *Immunogenetics* 50:237-241.
 - 26) Vogel TU, Evans DT, Urvater JA, O'Connor DH, Hughes AL, **Watkins DI**. Major Histocompatibility Complex Class I Genes in Primates: Coevolution with Pathogens. *Immunol. Rev.* 1999 167:327-337.
 - 27) Allen TA, **Watkins DI**. Primate (non-human) immune system. *Encyclopedia of Immunology (2nd Ed.)*, Academic Press, London. 1998. pp. 2004-2011.
 - 28) Cadavid LF, **Watkins DI**. The duplicative nature of the MHC class I genes: An evolutionary perspective. *Eur. J. Immunogenetics*. 1997 24:313-322.
 - 29) Cadavid LF, **Watkins DI**. Heirs of the Jaguar and the Anaconda: HLA, Conquest and Diseases in the Indigenous Populations of America. 1997 *Tissue Antigens* 50:702-711.
 - 30) **Watkins DI**. 1995. The evolution of major histocompatibility class I genes in primates. *Crit. Rev. Immunol.* 15(1):1-29.
 - 31) **Watkins DI**. MHC of non-human primates. In: *Simian Immunodeficiency Virus. Current Topics in Microbiology and Immunology*. (R. Desrosiers & N. Letvin, eds.), Springer-Verlag, Heidelberg. 1994; 145-159.
 - 32) **Watkins DI**, Zemmour J, Parham P. Non-human primate MHC class I sequences 1992. *Immunogenetics* 1993; 37:317-330.
 - 33) Klein J, Bontrop RE, Dawkins RL, Erlich HA, Gyllensten UB, Heise ER, Jones PP, Parham P, Wakeland EK, **Watkins DI**. Nomenclature for the major histocompatibility complexes of different species: A proposal. *Immunogenetics*

1990; 31:217-219.

- 34) Cohen N, **Watkins DI**, Parsons S. Interleukins and T-cell ontogeny in *Xenopus laevis*. *Prog. Clin. Biol. Res.* 1987; 233:53-68.
- 35) **Watkins DI**, Cohen N. The phylogeny of IL-2. *Dev. Comp. Immunol.* 1985; 9:819-824.

Other publications:

- 1) Allen TM, Watkins DI. 1999. SIV and SHIV CTL epitopes identified in macaques. <http://hiv-web.lanl.gov/immunology/index.html>.
- 2) Allen TM, Watkins DI. 2000. SIV and SHIV CTL epitopes identified in macaques. <http://hiv-web.lanl.gov/immunology/index.html>.

V. PROFESSIONAL

22. Current Funded Research:

Source: NIH R37 AI052056
Title: The functional significance of CTL escape
Entire Period: 04/01/02 - 06/30/19 NCE
Annual Direct Costs: \$536,429
Annual Indirect Costs: \$177,859
Role: PI
Percent funded effort: 20%

Source: NIH R01AI108421
Title: Can vaccine-induced CD8 T cells prevent chronic phase AIDS virus replication?
Entire Period: 01/01/14 – 12/31/18
Annual Direct Costs: \$438,185
Annual Indirect Costs: \$91,794
Role: PI
Percent funded effort: 10%

Source: Bill & Melinda Gates Foundation
Title: Zika Virus: Pathogenesis in Pregnant Macaques
Entire Period: 05/25/16 - 5/31/19 (Currently in a NCE)
Annual Direct Costs: \$747,037
Annual Indirect Costs: \$74,704
Role: CO-PI
Percent funded effort: 2%

23. Editorial responsibilities:

American Editor (1997-2001), *Immunogenetics*

Editorial Board *Immunogenetics*

Have reviewed manuscripts for *Science*, *Science Translational Medicine*, *Nature*, *Nature Medicine*, *Nature Immunology*, *Proc. Natl. Acad. Sci. (USA)*, *J. Exp. Med.*, *J. Immunol.*, *J. Virol.*, *J. Imm. Methods*, *J. Gen Virol.*, *Virology*, *J. Infectious Dis.*, *Mol. Biol. Evol.*, *Immunogenetics*, *Infection and Immunity*, *Amer. J. Primatol.*, *J. Med. Primatol.*, *Dev. Compar. Immunol.*, *Tissue Antigens*, *Blood*, *J. Clin. Invest. and AIDS Res. Hum. Retrovirus*.

24. Professional and Honorary Organizations

Society Memberships

American Society for Microbiology

25. Honors and Awards:

University Fellowship in Biology and Medicine (University of Rochester)	1983-1984
FIRST Award, NIH	1992
Arthritis Foundation Biomedical Science Grant	1993
American Editor, <i>Immunogenetics</i>	1997-2001
Editorial Board, <i>Immunogenetics</i> ,	1997-2012
Elizabeth Glaser Scientist Award	1998
NIH Study section ARR-2	1998-2004
Journal of Virology	2002-2012
Member, External Advisory Board–New England Primate Research Center, Immunology Group	
Member, AIDS Vaccine Research Working Group	2003-2007
Member, IAVI Vaccine Science Subcommittee	2003-2008
Kellett Mid-Career Award, University of Wisconsin	2005
Member, AIDS Immunology and Pathogenesis Study Section	2008-2012
Fellowship in the American Academy of Microbiology	2015-present
Provost’s Award for Scholarly Activity, University of Miami	2017

26. Post-Doctoral Fellowships:

Post-Doctoral Fellow, University of Rochester, NY	1985-1986
Research Fellow in Medicine Harvard Medical School, Boston, MA	1986-1988

27. Other Professional Activities (e.g., papers presented; performances; conference proceedings; seminar or conference panel member; catalogue work; etc.):

Invited papers published in conference proceedings:

- 1) Horton H, Vogel T, O’Connor DH, Picker L, **Watkins DI**. 2001. Analysis of the Immune Response and Viral Evolution during the Acute Phase of SIV Infection

- In: *Karolinska Institutet Nobel Foundation No. 119 Global HIV Therapeutics-Vaccines*, Stockholm, Sweden.
- 2) Allen TM, **Watkins DI**. (2000) HIV Vaccines: And The Band Plays On. In: *Immunology News* 1:23-25.
 - 3) Kiekhäfer CM, O'Connor DH, **Watkins DI**. 1999. MHC class I polymorphism and selection in HIV. *Proc. 6th Inst. Wkshp. on MHC Evolution, Hayama, Kanagawa, Japan*. Kasahara, M. (Ed.) Springer, 320-326.
 - 4) Evans DT, Knapp LA, Jing P, Mitchen JL, Dykhuizen M, Montefiori DC, Pauza CD, **Watkins DI**. 1999. Rapid and slow progressors differ by a single MHC class I haplotype in a family of MHC-defined rhesus macaques infected with SIV. *Immun. Letters* 66: 53-59.
 - 5) Fechner JH, Vargo DJ, Geissler EK, Graeb C, Wang JH Jr., Hanaway JJ, **Watkins DI**, Piekarczyk M, Neville DM, Knechtle SJ. Split tolerance induced by immunotoxin in a rhesus kidney allograft model. *Transplantation Proceedings* 1997 63: 1339-1345.
 - 6) Bontrop RE, Klein J, Parham P, **Watkins DI**. Nomenclature rules for the major histocompatibility complexes and alleles of different non-human primate species. In: *Proc. 12th Int. Histocompatibility Wkshp. and Conf. Paris, France*. Charron, D. (Ed.) EDK Medical and Scientific International Publisher, Vol I 1997; 648-649.
 - 7) Bontrop RE, **Watkins DI**. MHC class II exon nucleotide sequences of the chimpanzee (*Pan troglodytes*) and rhesus macaque (*Macaca mulatta*). In: *Proc. 12th Int. Histocompatibility Wkshp. and Conf. Paris, France*. Charron D. (Ed.) EDK Medical and Scientific International Publisher, Vol I 1997; 650-655.
 - 8) Shufflebotham C, Parham P, Bontrop RE, **Watkins DI**. MHC class I nucleotide sequences of the pygmy chimpanzee (*Pan paniscus*), chimpanzee (*Pan troglodytes*) and the rhesus macaque (*Macaca mulatta*). In: *Proc. 12th Int. Histocompatibility Wkshp. and Conf. Paris, France*. Charron, D. (Ed.) EDK Medical and Scientific International Publisher, Vol. I 1997; 656-662.
 - 9) Shufflebotham C, Boyson JE, Cadavid LF, Urvater JA, Knapp LA, Hughes AL, **Watkins DI**. The MHC class I genes of the rhesus monkey: Different evolutionary histories of MHC class I and II genes in primates. In: *Proc. 12th Int. Histocompatibility Wkshp. and Conf. Paris, France*. Charron, D. (Ed.) EDK Medical and Scientific International Publisher, Vol. II 1997; 259-261.
 - 10) **Watkins DI**, CD4⁺CD8⁺ T-Lymphocytes in the Cotton-top tamarin. In: *Agents and Actions, Special Conference Issue: Inflammation*. Birkhäuser Verlag, Basel, Switzerland. 1994; C249.
 - 11) Chen ZW, Yamamoto H, **Watkins DI**, Levinson G, Letvin NL. A predominant usage of a TCR V β gene family in SIVmac gag-specific cytotoxic T lymphocytes. In: *Vaccines 92*: Brown F, Chanock RM, Ginsberg HS, Lerner RA (Eds.), Cold Spring Harbor Laboratory, New York. 1992; 237-241.
 - 12) **Watkins DI**, Garber TL, Chen, ZW, Hughes AL, Letvin NL. Evolution of New World primate MHC class I genes. In: *Molecular Evolution of the Major Histocompatibility Complex*. Klein J, Klein D (Eds.), Springer-Verlag, Berlin, Heidelberg, 1991; 177-191.
 - 13) Chen ZW, Hughes AL, Letvin NL, **Watkins DI**. Evolution of great ape MHC class I genes. In: *Molecular Evolution of the Major Histocompatibility Complex*. Klein J, Klein D (Eds.), Springer-Verlag, Berlin, Heidelberg, 1991; 171-175.
 - 14) Garber TL, Hughes AL, Letvin NL, Templeton JW, **Watkins DI**. Sequence and

- evolution of Bovine MHC class I genes. In: *Molecular Evolution of the Major Histocompatibility Complex*. Klein J, Klein D (Eds.), Springer-Verlag, Berlin, Heidelberg, 1991; 323-327.
- 15) **Watkins DI**, Hughes AL, Letvin NL. A primate species expresses *HLA-G* related MHC class I genes: Possible relationship with ulcerative colitis and adenocarcinoma of the colon. In: *Frontiers of Mucosal Immunology*. Tsuchiya M *et al.*, (Eds.), Elsevier, Amsterdam, The Netherlands. 1991; 185-188.
- 16) Miller MD, **Watkins DI**, Letvin NL. Definition of the epitope and major histocompatibility complex class I molecule recognized by gag-specific cytotoxic T lymphocytes in SIV mac-infected rhesus monkeys. *Vaccines 91*. Chanock RM *et al.*, (Eds.), Cold Spring Harbor Laboratory, New York. 1991; 139-144.
- 17) **Watkins DI**, Cohen N. Description and partial characterization of T-cell growth factors from the frog *Xenopus laevis*. In: *Immune Regulation by Characterized Polypeptides*. Goldstein G, Bach J, and Wigzell H, (Eds.), Alan Liss, New York, 1987; 495-508.

VI. TEACHING

28. Teaching Awards Received:

29. Teaching Specialization:

My approach to undergraduate and graduate teaching is to try and enthuse the students with the excitement of the topic. To that end I put together a set of slides and an extensive handout. This includes required reading (generally an introductory chapter and selected primary texts) and a duplication of each slide. I encourage students not to take notes but instead, to sit back and enjoy the story. At the end of my session, I leave 10 minutes for a question and answer period. My goal is to communicate to the students the beauty of the subject and the investigations described. My teaching is, therefore, not based on learning facts but concentrates on understanding basic concepts. This is reflected in my exam questions, where I ask students to design experiments to test hypotheses given a set of preliminary data. Again, I am willing to accept answers that may be different from the straightforward answer, as long as the student shows some creativity.

Four thirty-minute lectures entitled "DNA technology" to high school students visiting the Primate Center. One one-hour lecture entitled "The cellular immune response to the AIDS virus" to high school teachers in the Madison AIDS module.

Two one-hour lectures entitled "MHC and Disease" to Undergraduate students in Immunology 528, 3 credits, 150 students (1994 and 1995).

Two one-hour lectures entitled "MHC and Disease" to Graduate students in Pathology 750, 3 credits, 50 students (1993).

Three one-hour lectures entitled "MHC and Disease" to Graduate students in Pathology 750, 3 credits, 50 students (1993, 1994, 1995, 1996, 1997, 1998 and 1999).

One credit course entitled "HIV: Sex, Society and Science." This undergraduate course met for one hour each week during the Fall 2005 and Fall 2006 semesters.

Three credit course entitled “HIV: Sex, Society and Science.” This undergraduate course met for one hour three times each week during the Fall 2007 and Fall 2008 semesters.

Three credit course entitled “HIV: Sex, Society and Science.” This undergraduate course met for two hours twice each week during the Fall 2015, 2016 and 2017 semesters at the University of Miami.

30. Thesis and Dissertation Advising/Post-doctoral student supervision:

Previous Trainees

Trainees	Position in Lab	Post-doc	Present position
Jonathan Boyson	Ph.D. student	Jack Strominger	Associate Professor, University of Vermont
Deborah Fuller	Ph.D. student		Associate Professor, University of Washington
David Evans	Ph.D. student	Ron Desrosiers	Professor of Pathology, University of Wisconsin-Madison
Todd Allen	Ph.D. student	Bruce Walker	Professor of Medicine, Harvard Medical School
David O’Connor	Ph.D. student		Professor of Pathology, University of Wisconsin - Madison
Thomas Friedrich	Ph.D. student		Associate Professor, University of Wisconsin-Madison
Bianca Mothe	Ph.D. student	Alex Sette	Professor California State University -San Marcos
Jonah Sacha	Ph.D. student		Associate Professor, Oregon Health Sciences
Nicholas Maness	Ph.D. student		Assistant Professor, Tulane
Philip Mudd	Ph.D. student		Resident Physician, University of Cincinnati
Zheng Chen	Post-doc	N/A	Professor, University of Illinois, Chicago
Luis Cadavid	Post-doc	N/A	Professor, University of New Mexico
Leslie Knapp	Post-doc	N/A	Professor and Chair, Department of Anthropology, University of Utah
Mauricio Martins	Post-doc	N/A	Assistant Professor, University of Miami

VII. SERVICE

31. University Committee and Administrative Responsibilities:

Department/University

Animal Use Committee, New England Regional Primate Research Center, Harvard Medical School, Boston, MA. (1990-1992)

Thesis committee for Texas A&M graduate student Theodore L. Garber (1990-1992).

Thesis committee for CMB graduate students Patrick Lundberg, Cheryl Hertz and Alan Schenkel, Pathology graduate student Jason Jarzembowski, AHABS graduate student Yuan Zhai and Brian Aldridge (1992-1998).

Admissions Committee, Cell and Molecular Biology Graduate Program (1993,1994 and 1995).

Chair, Dept. Pathology Incentive Committee (1997), Molecular Diagnostics/HLA Reorganization Committee (1996). Member Graduate Education Committee (1996).

Member Primate Center Director Search Committee (1997-1998).

Member Medical Microbiology and Immunology Faculty Search Committee.

Professional

Abstract Reviewing Committee, International Primate Society Meeting, Madison, WI (1996), New Orleans (1999)

Planning and Organizing Committee for the Fourth, Fifth and Sixth International Workshop on MHC evolution, St. Augustine FL (1995), Sweden (1997) and Japan (1999).

Planning and organizing committee for the 11th International Symposium on non-human primate models for AIDS research (1993)

Conference Chair, Scientific Program Chair, 18th Annual Symposium on Nonhuman Primate Models for AIDS, Madison (2000)

IAVI Macaque Vaccine Committee (2000-present)

Program Review 19th, 20th Annual Symposium on Nonhuman Primate Models for AIDS (2001-2002)

Program committee for the Conference on Retroviral and Opportunistic Infections (CROI), 2010.

32. Community Activities: