

BIOGRAPHICAL SKETCH

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NAME Michael Emerman, Ph.D		POSITION TITLE Member	
eRA COMMONS USER NAME MEMERMAN			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Ohio State University	BS	1977-81	Biochemistry
University of Wisconsin	PhD	1981-86	Molecular and Cellular Biology

A. Positions and Honors**RESEARCH AND PROFESSIONAL EXPERIENCE:**

1982-1986 University of Wisconsin-Madison, Graduate Student, Laboratory of Howard M. Temin
1986-1989 Institute Pasteur, Leukemia Society Postdoctoral Fellow, Unite d'Oncologie Virale, Laboratory of Luc Montagnier.
1989-1993 Fred Hutchinson Cancer Research Center, Assistant Member in Molecular Medicine.
1993-1997 Fred Hutchinson Cancer Research Center, Associate Member in Molecular Medicine.
1995-1998 University of Washington, Affiliate Associate Professor of Microbiology.
1998-present Fred Hutchinson Cancer Research Center, Member in Molecular Medicine (renamed Human Biology in 1999) and Basic Sciences.
1998-present University of Washington, Affiliate Professor of Microbiology.
1999-2000 Acting Director, Division of Human Biology, Fred Hutchinson Cancer Research Center.
2006- Co-director, Molecular and Cellular Biology Graduate Program, FHCRC/UW

ADVISORY/ EDITORIAL BOARDS:

NIH Study Section AARRI, 1998 - 2003.

Editor, *Virology*, 2002-present.

Editorial Boards: *Journal of Virology*, 1993-present; *Virology*, 1996-2001; *AIDS Research and Human Retroviruses*, 1998-present; *PLOS Biology*, 2003-present.

Co-Organizer, 1997 Keystone Symposium "AIDS Pathogenesis."

Co-Organizer, 1998 Cold Spring Harbor Meeting "Retroviruses."

Member, University-wide Californian AIDS Study Section, 1995-2001, 2005

HONORS:

1985: The Dorothy and Charles Inbusch Medical Research Award, University of Wisconsin **1990-93:** Scholar of the American Foundation for AIDS Research **2001:** MERIT award from National Institutes of Health **2001:** Eric C. Humphries Memorial Lecture. UT-Southwestern, Dept. of Microbiology **2003:** ISI Highly Cited Researcher.

B. Selected Peer-Reviewed Publications: (all publications since 1998, and selected publications earlier: 78 total)

22. Kimpton, J., and Emerman, M. 1992. Detection of replication competent and pseudotyped HIV with a sensitive cell line on the basis of activation of an integrated β -galactosidase gene. *J. Virol.*, 66: 2232-2239.
24. Lewis, P., Hensel, M., and Emerman, M. 1992. Human immunodeficiency virus infection of cells arrested in the cell-cycle. *EMBO J.*, 11: 3053-3058.
25. Deminie, C., and Emerman, M. 1993. Incorporation of human immunodeficiency virus Gag proteins into murine leukemia virus virions. *J. Virol.* 67: 6499-6506

26. Bukrinsky, M.I., Haggerty, S., Dempsey, M.P., Sharova, N., Adzubei, A., Spitz, L., Lewis, P., Goldfarb, D., Emerman, M., and Stevenson, M. 1993. A nuclear targeting signal within HIV-1 matrix protein that governs infection of non-dividing cells. *Nature* 365: 666-669.
27. Lewis, P., and Emerman, M. 1994. Passage through mitosis is required for onco-retroviruses, but not for the human immunodeficiency virus. *J. Virol.* 68: 510-516.
30. Deminie, C.A. and Emerman, M. 1994. Functional exchange of oncoretrovirus and lentivirus matrix proteins. *J. Virol.* 68: 4442-4449.
31. Heinzinger, N., Bukrinsky, M., Haggerty, S., Ragland, A., KewalRamani, V., Lee, M., Gendelman, H., Ratner, L., Stevenson, M., and Emerman, M. 1994. The Vpr protein of HIV-1 influences nuclear targeting of viral nucleic acids in non-dividing host cells. *Proc. Natl. Acad. Sci. (USA)* 91: 7311-7315.
33. Rogel, M.E., Wu, L.I., and Emerman, M. 1995. The HIV-1 vpr gene prevents cell proliferation during chronic infection. *J. Virol.* 69: 882-888.
43. Selig L, Benichou S, Rogel ME, Wu LI, Vodicka MA, Sire J, Benarous R and Emerman M. 1997. Uracil DNA glycosylase specifically interacts with Vpr of both human immunodeficiency virus type 1 and simian immunodeficiency virus of sooty mangabeys, but binding does not correlate with cell cycle arrest. *J Virology* 71: 4842-4846.
48. Goh WC, Rogel ME, Kinsey CM, Michael SF, Fultz PN, Nowak MA, Hahn BG and Emerman M. 1998. HIV-1 Vpr increases viral expression by manipulation of the cell cycle: a mechanism for selection of Vpr in vivo. *Nature Medicine* 4: 65-70.
49. Vodicka MA, Koepp DM, Silver PA and Emerman M. 1998. HIV-1 interacts with the nuclear transport pathway to promote macrophage infection. *Genes & Dev* 12: 175-185.
50. Emerman M and Malim M. 1998. HIV-1 regulatory/accessory genes: keys to unraveling viral and host cell biology. *Science* 280: 1880-1884.
51. Bartz SR and Emerman M. 1999. Human Immunodeficiency Virus Type 1 Tat Induces Apoptosis and Increases Sensitivity to Apoptotic Signals by Up-Regulation FLICE/Caspase-8. *J Virology* 73:1956-1963.
52. Goh WC, Markee RE, Akridge M, Meldor L, Musey T, Karchmer M, Krone A, Collier L, Corey L, Emerman M and McElrath M.J. 1999. Protection against Human Immunodeficiency Virus Type 1 Infection in Persons with Repeated Exposure: Evidence for T Cell Immunity in the Absence of Inherited CCR5 Coreceptor Defects. *J Inf Dis* 179: 548-57.
53. Gummuluru S and Emerman M. 1999. Cell Cycle and Vpr-Mediated Regulation of HIV-1 Expression in Primary and Transformed T Cell Lines. *J Virology* 73: 5422-5430.
54. Emerman M. 2000. Learning from lentiviruses. *Nature Genetics* 24: 8-9.
55. Holte S and Emerman M. 2000. A competition model for viral inhibition of host cell proliferation. *Mathematical Biosciences* 166: 60-84.
56. Harrington R, Wu L, Pullen H and Emerman M. 2000. Direct detection of infectious HIV-1 in blood using a centrifugation-indicator cell assay. *J Virological Methods* 88: 111-115.
57. Gummuluru S, Kinsey CM, Emerman M. 2000. In vitro rapid turnover assay for HIV-1 replication selects for cell-to-cell spread. *J Virology* 74: 10882-10891.
58. Malim MH and Emerman M. 2001. HIV-1 sequence variation: drift, shift, and attenuation. *Cell* 104: 469-472.
59. Bouyac-Bertoia M, Dvorin JD, Fouchier RAM, Jenkins Y, Meyer BE, Wu LI, Emerman M, Malim MH. 2001. HIV-1 infection requires a functional integrase NLS. *Molecular Cell* 7: 1025-1035.
60. Lewinsohn DA, Lines R, Lewinshohn DM, Riddell SR, Greenberg PD, Emerman M. and Bartz SR. 2002. HIV-1 Vpr does not inhibit CTL-mediated apoptosis of HIV-1 infected cells. *Virology* 294: 13-30.
61. Somasundaran M, Sharkey M, Brichacek B, Luzuraga K, Emerman M, Sullivan J and Stevenson M. 2002. Evidence for a cytopathogenicity determinant within HIV-1 Vpr. *Proc Natl Acad Sci USA* 99:9503-9508.
62. Gummuluru S, KewalRamani VN and Emerman M. 2002. Dendritic Cell Mediated viral transfer to T cells is required for HIV-1 Persistence in the Face of Rapid Cell Turnover. *J Virology* 76: 10692-10701.
63. McDonald D, Vodicka M, Lucero G, Svitkina TM, Borisy GG, Emerman M and Hope TJ. 2002. Visualization of the intracellular behavior of HIV in living cells. *J Cell Biology* 159: 441-452.
64. Dvorin JD, Bell P, Maul GG, Yamashita M, Emerman M and Malim MH. 2002. Reassessment of the roles of integrase and the central DNA flap in human immunodeficiency virus type-1 nuclear import. *J Virology* 76: 12087-12096.
65. Gummuluru S and Emerman M. 2003. AIDS 2002, A Year in Review: Advances in HIV molecular biology. *AIDS* 16: S17-S23.

66. Gummuluru S, Rogel M, Stamatatos L and Emerman M. 2003. Binding of human immuno-deficiency virus type 1 to immature dendritic cells can occur independently of DC-sign and mannose binding C-type lectin receptors via a cholesterol-dependent pathway. *J Virology* 77(23): 12865-12874.
67. Goh WC, Manel N and Emerman M. 2004. The human immunodeficiency virus Vpr protein binds Cdc25C: implications for G2 arrest. *Virology* 318: 337-349.
68. Kaiser SM and Emerman M. 2004. Controlling lentiviruses: single amino acid changes can determine specificity. *Proc Natl Acad Sci USA* 101(11): 3725-3726.
69. Yamashita M and Emerman M. 2004. Capsid is a dominant determinant of retrovirus infectivity in nondividing cells. *J Virology* 78(11): 5670-5678.
70. Sawyer SL, Emerman M and Malik HS. 2004. Ancient, positive selection of the antiviral DNA editing enzyme Apobec3G in primates. *PLoS Biology*, 2: 1278-1285.
71. Sawyer, SL, Wu, L, Emerman, M and Malik, HS. 2005. Positive selection in primate Trim5 α identifies a critical species-specific retroviral restriction. *Proc. Natl. Acad. Sci. USA* 102: 2832-2837.
72. Yamashita, M and Emerman, M. 2005. The Cell Cycle Independence of HIV Infections is Not Determined by Known Karyophilic Viral Elements. *PLoS Pathog.* 1 (3) e18: 170-178.
73. Voronin, Y, Overbaugh, J and Emerman, M. 2005. SIV Variants that Differ in Pathogenicity Differ in Fitness under Rapid Cell-turnover Conditions. *J. Virol.* 79: 15091-15098.
74. Yamashita, M and Emerman, M. 2006. Retroviral Infection of Non-dividing Cells: Old and New Perspectives. *Virology*, 344: 88-93.
75. Kaiser, SM and Emerman, M. 2006. Uracil DNA Glycosylase is Dispensable for HIV-1 Replication and Does Not Contribute to the Antiviral Effects of the Cytidine Deaminase, Apobec3G. *J. Virol.* 80:875-882.
76. Sawyer, SL, Wu, L, Akey, JM, Emerman, M and Malik, HS. 2006. High Frequency Persistence of an Impaired Allele of the Retroviral Defense Gene TRIM5 α in Humans. *Current Biology* 16: 1-6.
77. OhAinle, M, Kerns, JA, Malik, HS, and Emerman, M. 2006. Adaptive Evolution and Antiviral Activity of the Conserved Mammalian Cytidine Deaminase APOBEC3H. *J. Virol.*, 80: 3853-3862.
78. Emerman, M. 2006. How Trim5 α defends against retroviral invasions. *Proc. Natl Acad. Sci. (USA)*, 103: 5249-5250.

C. Research Support:

ACTIVE

R37 AI30927 (Emerman)

08/01/1991 – 04/30/2011

NIH

Role: P.I.

HIV Host-Cell Interactions

The overall goal of this project is to understand the interactions of HIV with its host cells. Specific aims include: determining the selective advantage for cell cycle arrest by Vpr and the mechanism of G2 arrest; determining the role of cellular uracil DNA-glycosylase (UNG) and Vpr-UNG interactions in the viral life-cycle; and describing the evolution of Apobec3G.

R01 AI51153 (Emerman)

04/01/2002 – 03/31/2006

NIH

Active under a one-year no-cost extension

Role: P.I.

Accessory Roles of Tat in HIV-1 Replication

The goal of this proposal is to identify functions attributable to the second exon of Tat and to ascertain the role of these Tat functions in HIV-1 replication and pathogenesis. This grant will not be renewed.

R01 AI034251 (Overbaugh)

06/15/2005 – 02/28/2009

NIH

Role: Co-Investigator

Lentiviral Variation and AIDS

Principal Investigator/Program Director (Last, First, Middle):

The major goals of this project are: to determine the selective pressures on late-stage variants when they are transmitted to a new host; to determine the replication of properties of late- versus early-stage virus under conditions when there is rapid turnover, and where virus spread is primarily cell-associated; and to determine the coreceptors that permit entry of different SIMVne in both a highly permissive simian cell line and in PBMCs that lack CCR5.

Emerman lab role in this grant: This grant supports the work of one postdoctoral fellow in the Emerman lab who is jointly mentored with Julie Overbaugh.

106622-38-RGHF (Malik)

07/01/2005 – 06/30/2006

AmFar

Role on Project: Co-Investigator

Evolutionary Screen to Identify Novel TRIM Restriction Factors

The specific aims of this project are: 1) Evolutionary identification of novel restriction factors in the TRIM family; and 2) Functional identification of restriction targets of TRIM genes using candidate viruses.

Emerman lab role in this grant: The Emerman lab performs the experimental work in this grant. The grant supports 20% of the salary of one technician plus supplies.

COMPLETED WITHIN THE LAST THREE YEARS

None.