

David C. Bloom

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Personal Data:

Birthplace and Date: Baltimore, Maryland
July 27, 1962

Marital Status: Married, Linda B. Bloom, Ph.D.
June 6, 1987

Children: Emily C. Bloom
b. January 21, 2001

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Education:

Vanderbilt University	1984-1990	Ph.D. (Microbiology)
University of North Carolina at Chapel Hill	1980-1984	B.S. (Biology)

Professional Positions:

Professor, Department of Molecular Genetics & Microbiology, UF	7/2009 - present
Associate Professor, Department of Molecular Genetics & Microbiology, UF	7/2005 - 6/2009
Assistant Professor, Department of Molecular Genetics & Microbiology, UF	8/1999 - 6/2005
Assistant Professor, Department of Microbiology, Arizona State University (ASU)	1/1996 - 8/1999
Research Assistant Virologist, Dept of Microbiology & Immunology, UCLA	1/1995 - 12/1995
Postdoctoral Fellow, Dept of Microbiology & Immunology, UCLA Mentor: Jack G. Stevens, DVM, Ph.D.	1/1991 - 12/1994

Honors and Awards:

University of Florida Term Professorship 2017-2019
University of Florida Research Foundation Professorship 2013-2015
Exemplary Teaching Award, UF College of Medicine 2005-2011, 2013-2016
Doctoral Dissertation Advisor Mentoring Award, UF College of Medicine 2004, 2008, 2015
Burroughs Wellcome Fund Investigator in Pathogenesis of Infectious Disease Award 2003
STOP! Children's Cancer Distinguished Young Investigator Award 2002
Nominee, Howard Hughes Medical Institute Investigator (ASU) 1996
National Multiple Sclerosis Society (NMSS) Postdoctoral Fellowship 1991-1994
Microbial Pathogenesis Training Grant (PHS) 1994 -1995
Dale McFarlin Travel Award (NMSS) 1993

Statement of Research Focus:

Herpes Simplex Virus type 1 (HSV-1) is a human pathogen responsible for cold sores or fever blisters. HSV-1 is also a cause of blindness (stromal keratitis) and encephalitis. Central to HSV-1's biology is its ability to establish a life-long latent infection within neurons of sensory nerve ganglia. In response to physiological stress the latent HSV-1 genomes reactivate and provide a source of virus to infect other individuals. There is currently no reliable cell culture system for studying HSV latency and reactivation therefore these processes must be studied in rabbit or mouse infection models. The mechanisms governing how HSV goes latent in neurons and what triggers it to reactivate are incompletely understood. Clearly, understanding the molecular basis of HSV latency and reactivation has the potential to provide better therapies against this disease.

My long-term research interest is the molecular basis of pathogenesis of the herpesviruses, and to apply these pathogenic concepts to the development of better therapies to treat or ultimately cure Herpes infections. My current research is focused in three major areas: 1) determining the molecular basis of HSV latency and reactivation; 2) identifying the molecular determinants of HSV latent gene expression and silencing of lytic genes; and 3) exploiting our understanding of the regulation of HSV-1 latency and reactivation in order to develop new therapies that are able to completely suppress HSV-1 reactivation, or to completely cure this disease.

Brief description of job duties at the University of Florida:

I have been on the faculty at the University of Florida for 18 years. During the past 8 years (since my promotion to the rank of Professor), my job duties as Professor in the Department of Molecular Genetics & Microbiology have been assigned as **60% Research and 40% Teaching. 10% of the teaching component is assigned to my administrative role as Program Director of the Training Program in Basic Microbiology and Infectious Diseases**, which is funded in part by a T32 Training Grant from the NIH on which I have served as P.I. since 2004.

1. Research. A primary responsibility has been in directing the activities of my research lab. This includes securing grant funding, managing lab personnel (graduate students and technical employees), directing experimental procedures and data analysis, and writing manuscripts and preparing presentations of our results. During the past 8 years my lab has typically consisted of approximately 3 Ph.D. students, 1 postdoc, one technician and one undergraduate student. During the past 8 years I have been awarded 10 grants or contracts, and published 23 peer-reviewed research publications and review articles.

Research highlights:

- Lab has been **continuously funded by the NIH since 2000**
- **Funding sources are diverse** and include R01s, R21s and SBIRs (NIH) as well as NASA, Corporate contracts and Private foundations.
- Awarded a **Investigator in the Pathogenesis of Infectious Diseases Award** by the Burroughs Wellcome Fund in 2004
- Published over **70 research publications and referred reviews**
- Filed a total of **7 patent applications** (3 have been awarded to date)
- Awarded **University of Florida Research Foundation Professorship** (2013) for research accomplishments
- Research focuses on both **basic and translational science**

2. Teaching. My teaching duties are split between mentoring graduate students in my lab, and didactic course work. From the mentoring side, *I have served as research advisor for a total of 18 Ph.D. students (16 have received their Ph.D.s and 2 are continuing students in my lab), and 3 postdoctoral associates.* From the didactic side, from the Fall of 2000 through 2012 I lectured in the Virology section of the *Medical Microbiology and Infectious Disease* course (BMS 6300C) for second-year medical students. I also was the organizer of the “Controversies in Medical Virology”. These “Controversies” were three small group presentation/discussions where groups of 10 – 12 students research and present current topics in medical virology. Some of the topics covered included: Control measures for BSE/mad cow disease, the safety of the varicella vaccine, strategies for Small Pox vaccination programs, and the merits/ethics of human trials for attenuated HIV vaccines. In 2013 our Medical Curriculum converted to a systems-based curriculum and I currently teach 8 lectures in the following course components (of the first and second year curricula): BMS6020 Clinical Neuroscience, BMS6635 Dermatology and the Neuromuscular System, BMS6300 Fundamentals of Microbiology and Immunology, BMS6642 Cardiovascular and Respiratory Systems, Gastroenterology and Hepatology and BMS6631 Hematology. Since the Spring of 2000 I have also lectured in the Viral Pathogenesis section of Advanced Virology II (GMS 6035). This is an advanced graduate course primarily comprised of between 8 and 15 second-year IDP graduate students. The format of these classes is a mixture of lecture and discussion. I also serve as course director for our Virology Journal Club (GMS 6196). I also co-directed GMS 5905 (Grant writing course) the past 4 years.

Teaching/mentoring highlights:

- **Mentored a total of 18 Ph.D. students**
- **Master Mentor Certificate.** Inducted into the UF Mentoring Academy. Completed semester long training to teach other faculty to become better mentors. UF Center for Translational Science Mentoring Academy 2017
- **10-time recipient of the Exemplary Teaching Award**, UF College of Medicine (2005-2011, 2013-2016). This is an award given for teaching excellence and exceptional contributions to the education mission of the College of Medicine
- **3-time recipient of the Doctoral Dissertation Advisor Mentoring Award**, UF College of Medicine 2004, 2008, 2015. Nominated by students, awardees are selected by a committee based on training record and trainee accomplishments
- Co-author of a best-selling virology text book *Basic Virology* (for upper division undergraduates and graduate students)

3. Service. A large component of my service during the past 14 years has been serving as the P.I. on our Department NIH T32 training grant (Basic Microbiology in Infectious Diseases). The training grant funds 5 predoctoral trainees. My administrative role includes recruiting trainees, organizing the training grant-sponsored seminar series, and helping to coordinate our monthly Combined Microbiology and Infectious Diseases Case Conference that is conducted in concert with the Infectious Diseases Division. In addition to the training grant, my service includes editing

manuscripts on an ad hoc basis for a number of Journals and reviewing grant applications for the NIH, including recently serving as the **Chair of several P01 review panels**. I also have served 4 years on the **Institutional Biosafety Committee (2 years as Chair)**, the UF Faculty Senate, and currently serve on the **Medical Student Admissions Committee**, the IBC Dual Use and Research of Concern Committee, the IDP Graduate Student Standards Committee and the University-wide Graduate Faculty Council. In 2015 I was a co-organizer of the International Herpesvirus Workshop (attended by 550 researchers and students). I also was recently selected to serve on **the FDA Cellular, Tissue and Gene Therapies Advisory Committee**.

Trainees:

	Degree Program	Dates in residence	Present position
Yue Zhang	M.N.S. (ASU)	1996-1997 (graduated 12/97)	unknown
Richard Jarman	Ph.D. (ASU)	1996-2000 (graduated 5/00)	Director, Viral Disease Branch Laboratory Walter Reed Army Institute of Research
Robert Tran	Ph.D.	1997-2002 (graduated 12/02)	Emergency Preparedness Coordinator Los Angeles County Public Health Laboratory Downy, CA
Jerome O'Neil	Ph.D.	1997-2003 (graduated 5/04)	Patent Attorney (Biotech) Kacvinsky Daisak Bluni, Plc Boston, MA
Nicole Kubat	Ph.D.	1997-2004 (graduated 5/04)	Director of Life Sciences Regenesis Biomedical Scottsdale, AZ
Lee Gary	Ph.D.	1997-2004 (graduated 5/04)	Life Science Application Specialist Thermo-Fisher Scientific Chapel Hill, NC
Anne Gussow	Ph.D.	1998-2004 (graduated 5/04)	Supervisory Patent Examiner US Patent and Trademark Office Rockville, MD
John Moffett, Ph.D.	Postdoctoral	1998-1999	Research Assistant Professor Arizona State University Tempe, AZ
Antonio Amelio	Ph.D.	2001-2005 (graduated 12/05)	Assistant Professor University of North Carolina Chapel Hill, NC
Zane Zeier	Ph.D.	2001-2007 (graduated 8/07)	Assistant Professor University of Miami School of Medicine, Miami, FL
Nicole Giordani	Ph.D.	2003-2007 (graduated 8/07)	Training Specialist Real-Time PCR Applications Thermo-Fisher Scientific

			Carlsbad, CA
Dacia Kwiatkowski	Ph.D.	2005-2009 (graduated 12/09)	Medical Director BGB Group Marketing and Advertising New York, NY
Zachary "Levi" Watson	Ph.D.	2007-2013	Postdoctoral Fellow Head and Neck Cancer Research Program University of Colorado Health Sciences Center Aurora, CO
Cameron Lilly	Ph.D.	2008-2013	Account Manager Cell Signaling Technologies Chicago, IL
Dennis Neeld, Ph.D.	Postdoctoral	2012-2013	Postdoctoral Associate Department of Microbiology & Immunology Emory University Atlanta, GA
Derek Jacobs	Ph.D.	2009-2014	Postdoctoral Associate McArdle Laboratory for Cancer Research University of Wisconsin Madison, WI
Harald Messer	Ph.D.	2010-2014	Monoclonal Antibody Scientific Director Interdisciplinary Center for Biotechnology Research University of Florida Gainesville, FL
Richard "Nat" Johns	Ph.D.	2009-2015	Scientific Illustrator, Freelance Jacksonville, FL
Sanae Nakayama, Ph.D.	Postdoctoral	2010-2015	Research Scientist Department of Reproductive Biol. National Center for Child Health and Development Tokyo, Japan
Adit Dhummakupt	Ph.D.	2012-2016	Postdoctoral Associate Molecular Microbiology and Immunology Johns Hopkins University Baltimore, MD
Dane Phelan	Ph.D.	2013-	Still in residence
Enrico Barrozo	Ph.D.	2016-	Still in residence

I have also mentored 19 undergraduate students at ASU either as independent studies students, ASU Honors College students, the BREU program (Hughes), or the MARC program. Have mentored 15 undergraduate students at UF as independent studies students (and 1 University Scholar program participant, and 2 Science for Life HHMI awardees).

Professional Associations:

American Society for Virology
American Society for Microbiology
International Society for NeuroVirology
Association for Research in Vision and Ophthalmology
Society for Neuroscience
Society for Tropical Veterinary Medicine
American Association for the Advancement of Science
Alpha Chi Sigma (Chemistry)
American Society for Gravitational and Space Research

Professional Service (Grant Reviewing):

1996 - 2003 Ad Hoc grant reviewer, USDA, Sustaining Animal Health and Well Being Program
1999 Ad Hoc grant reviewer, Veteran's Administration Merit Grants
1999, 2004-16 Ad Hoc grant reviewer, The Israel Science Foundation
1998-1999 Member, NIH Special Emphasis Panel Review Committee (NIDDK)
1999 Member, NCI Special Review Panel
2000-2001 Ad-hoc Member, NSD-B Study Section (NINDS)
2000 Member, NIH Special Emphasis Panel on Anti-viral Contracts (NIAID)
2003 Member, NIH Special Emphasis Panel on Novel HIV Vaccines (NIAID)
2003 Member, NIH Special Study Section (NIAID)
2004 Member, NIH Special Emphasis Panel Review Committee (NIDDK)
2004 Ad-hoc Member, IDM-G Study Section (NIH)
2005 Member, NIH Special Emphasis Panel Review Committee (NIDDK)
2006 Ad Hoc grant reviewer, The Alberta Heritage Foundation for Medical Research
2006 Member, NIH Special Emphasis Panel Review Committee (NINDS)
2006 - 2010 Ad-Hoc Member, Virology B (VIRB) Study Section (NIH)
2011 Chair, NIH Special Emphasis Panel, Immune Response to Infection (NIAID)
2012 Chair, NIH Special Emphasis Panel, Systems Approach to Innate Immunity and Inflammation U19 Review (NIAID)
2012 - 2015 Ad-hoc Member, Reviewer Conflict Panel (NIH)
2012 Chair, NIH Special Emphasis Panel, P01 Review (NIAID)
2012 - 2015 Ad-hoc Member, CNTB Study Section (NIH)
2015 - 2016 Ad-hoc Member, VIRA Study Section (NIH)
2015 - 2019 Member, FDA Cellular, Tissue and Gene Therapies Advisory Committee
2015 - 2017 Ad-hoc Member, MID1 T32 Study Section (NIAID)
2016 Chair, NIH Special Emphasis Panel, P01 Review (NIAID)
2017 Adhoc consultant, Board of Scientific Counselors, DIR, NIAID

Editorial Service:

Member, Editorial Board, Journal of Virology (2005 – 2019)
Member, Editorial Board, Virology Journal (2017 – 2020)

Occasional reviewer of manuscripts for the following journals:

Biotechniques (2004)
Biotechnology Progress (2001)
Brain Research (2006)
Cell Host and Microbe (2016)
Experimental Eye Research (2004 – 2005)
Human Gene Therapy (2004 - 2009)
Gene Therapy (2001)
Investigative Ophthalmology and Visual Science (2001 – 2003)
Journal of Clinical Investigation (2008, 2014)
Journal of Clinical Microbiology (2004)
Journal of General Virology (1998 – 2016)
Journal of Neurochemistry (2008)
Journal of Neuroscience Methods (2007)
Journal of NeuroVirology (2003-2009)
Journal of Veterinary Diagnostic Investigation (2006)
Journal of Virology (1998 – 2017)
Microbial Pathogenesis (1998)
MBio (2012-17)
Nature Reviews Microbiology (2007)
Nature Scientific Reports (2016-2017)
Proceedings of the National Academy of Sciences, USA (2008, 2012-16)
PLOS One (2009-2016)
PLOS Pathogens (2009-2017)
Vaccine (2001)
Virology (2000 – 2016)
Virus Research (1997 – 1999)
Virus Genes (1997 – 2005)

Guest Editor, Investigative Ophthalmology and Visual Sciences (2001)

Guest Editor, mBio (2016)

Guest Editor, PLoS Pathogens (2017)

University and College Service:

Programs

--Core faculty participant, graduate program in Molecular and Cellular Biology (ASU : 1996-99)
--Faculty participant, Program in Genetics (ASU: 1996-99)
--Faculty Mentor, Minority Access to Research Careers (MARC) program (ASU: 1997-99)
--Faculty mentor, Biology Research Experience for Undergraduates (BREU) (ASU: 1996-99)
--Member, UF Brain Institute (1999-present)
--Member, Center for Mammalian Genetics (1999-present)
--Member, UF Powell Center for Gene Therapy (1999-present)
--Member, UF Cancer Center (1999-present)
--Member, UF Genetics Institute (2001-present)
--Member, UF Emerging Pathogens Institute (2008-present)

Committee Service

- Chair, Department of Microbiology Seminars (ASU:1996-99)
- Molecular and Cell Biology Program (MCB) Executive committee member (ASU:1998-1999)
- Chair, Biotechnology Curriculum Committee, (ASU:1996-99)
Goal of this committee is to develop new curriculum at ASU in areas of Biotechnology, and to integrate this curriculum between CLAS departments of Microbiology, Zoology, Botany, Chemistry and the College of Engineering
- Organizer of Biotechnology Faculty Seminars (ASU: 1997)
- Biomaterials/Tissue Engineering Faculty Search Committee (ASU:1997-99)
- Pre-MARC program Admissions Committee (ASU: 1998)
- Biotechnology major curriculum planning committee (ASU: 1998-99)
- Vice-Provost's Animal User's Advisory Committee (ASU: 1998-99)
- UF Cancer Center Virologist Faculty Search Committee (UF: 2001-2003)
- Member, Institutional Biosafety Committee (UF: 2000-2007)
- Member, Interdisciplinary Program in Biomedical Sciences (IDP) Graduate Admissions Committee (UF: 2001-2004)
- Member, University Faculty Senate (UF: 2003-2006)
- Chair, Institutional Biosafety Committee (UF: 2005 – 2007)
- Member, Epigenetics (Biochemistry) Faculty Search Committee (2005 – 2006)
- Member, Student Data Security Task Force (UF: 2005 – 2006)
- Member, Sid Martin Biotechnology Incubator Facility Advisory Committee member (UF: 2005 – 2007)
- Member, Department of Neuroscience Chair Search Committee (2005 – 2008)
- Member, Plant Virologist Faculty Search Committee (2007-2008)
- Member, Department of Molecular Genetics & Micro. Chair Search Committee (2006-2008)
- Chair, Bacteriologist Faculty Search Committee (2008)
- Chair, Virologist Faculty Search Committee (2010)
- Member, Professorial Promotion and Tenure Committee, College of Medicine (2010-2012)
- Member, IDP Graduate Studies Committee (2008 – 2017)
- Member, Medical Student Admissions (Interview) Committee (2009-2015)
- Member, LCME Self-Study Admissions Sub-committee (2013-2014)
- Member, UF IBC Dual Use and Research of Concern Committee (2015 – 2018)
- Member, UF COM Medical Student Admissions Executive Committee (2014 -2018)
- Member, UF Graduate Faculty Council (2016-2019)

Other

- United Way Unit Representative, (ASU: 1997)
- Mentor, Red Mountain High School Honors Projects, (ASU: 1997-99)
- Department of Microbiology Undergraduate Advisor (ASU: 1997-99)
- Director, Training Program in Basic Microbiology and Infectious Disease (UF: 2003-present)
- Member, Advisory Board, Training Program in Biodefense and Emerging Infectious Disease (UF: 2004 – 2010)

National and International Service:

Committee Service

- Member, Program Committee, American Society for Virology (2005 – 2007)
- Member, Education and Career Development Committee, ASV (2006 – 2012)

-- Member, Planning Committee, Colorado Alphaherpesvirus Latency Symposium (2010-2017)
-- Member, International Herpesvirus Workshop Scientific Advisory Committee (2004-5; 2007-8; 2010-11, 2013-14)

Research Publications:

1. **Bloom, D.C.**, Massung, R., Savage, L., Morrison, D.K., and R.W. Moyer. 1989. Recruitment to the cytoplasm of a cellular lamin-like protein from the nucleus during a poxvirus infection. *Virology* 169: 115-126.
2. **Bloom, D.C.**, Edwards, K.M., Hager, C. and R.W. Moyer. 1991. Identification and characterization of two non-essential regions of the rabbitpox virus genome involved in virulence. *J. Virol.* 65: 1530-1542.
3. Brown, C.K., **Bloom, D.C.**, and R.W. Moyer. 1991. The nature of naturally occurring mutations in the hemagglutinin gene of vaccinia virus and the sequence of immediately adjacent genes. *Virus Genes* 5: 235-242.
4. **Bloom, D.C.**, Stern, R., Duke, M., Smith, D., and R.W. Moyer. 1993. A revised HindIII map and sequence analysis of a large 'left-hand' non-essential region of the rabbit poxvirus genome. *Virus Res.* 28:125-140.
5. Margolis, T.P., **Bloom, D.C.**, Dobson, A.T., Feldman, L.T., and J.G. Stevens. 1993. Decreased reporter gene expression during latent infection with HSV LAT promoter constructs. *Virology* 197: 585-592.
6. Devi-Rao, G.B., **Bloom, D.C.**, Stevens, J.G., and E.K. Wagner. 1994. Herpes simplex virus type 1 DNA replication and gene expression during explant induced reactivation of latently infected murine sensory ganglia. *J. Virol.* 68: 1271-1282.
7. **Bloom, D.C.**, Devi-Rao, G.B., Hill, J.M., Stevens, J.G., and E.K. Wagner. 1994. Molecular analysis of herpes simplex virus type 1 during epinephrine induced reactivation of latently infected rabbits *in vivo*. *J. Virol.* 68: 1283-1292.
8. **Bloom, D.C.** and J.G. Stevens. 1994. Neuron-specific restriction of a herpes simplex virus recombinant maps to the UL5 gene. *J. Virol.* 68: 3761-3772.
9. Lokensgard, J.R., **Bloom, D.C.**, Dobson, A.T., and L.T. Feldman. 1994. Long term promoter activity during herpes simplex virus latency. *J. Virol.* 68: 7148-7158.
10. **Bloom, D.C.**, Maidment, Tan, A., N.T., Feldman, L.T., and J.G. Stevens. 1995. Latent expression of a reporter gene from HSV in the rat hippocampus. *Mol. Brain Res.* 31: 48-60.
11. **Bloom, D.C.**, Hill, J.M., Wagner, E.K. Feldman, L.T., and J.G. Stevens. 1996. A 348-base-pair region in the latency-associated transcript facilitates herpes simplex virus type 1 reactivation. *J. Virol.* 70: 2449-2459.
12. Maidment, N.T., **Bloom, D.C.**, Tan, A., Anton, B., Feldman, L.T., and J.G. Stevens. 1996. Expression of the *lacZ* reporter gene in the rat basal forebrain, hippocampus and nigro-striatal pathway using a non-replicating herpes simplex virus vector. *Exp. Neurol.* 139: 107-114.
13. Hill, J. M., Garza Jr., H., Su, Y.-H., Meegalia, R., Hanna, L.A., Thompson, H. W. Varnell, **Bloom, D.C.**, and T.M. Block. 1997. A 437-base-pair deletion at the beginning of the LAT promoter is essential

for adrenergically-induced herpes simplex virus type 1 ocular reactivation in latently infected rabbits. *J. Virol.* 71: 6555-6559.

14. Devi-Rao, G.B., Aguilar, J.S., Rice, M.K., Garza, H., **Bloom, D.C.**, Hill, J.M., and E.K. Wagner. 1997. Herpes simplex virus genome replication and transcription during induced reactivation in the rabbit eye. *J. Virol.* 71: 7039-7047.

15. **Bloom, D.C.**, Stevens, J.G., Hill, J.M., and R.T. Tran. 1997. Mutagenesis of a cAMP response element within the latency-associated transcript promoter of HSV-1 reduces adenergic reactivation. *Virology* 236: 202-207.

16. Barrera I., **Bloom, D.**, and M. Challberg. 1998. An intertypic herpes simplex virus helicase-primase complex associated with a defect in neurovirulence has reduced primase activity. *J. Virol.* 72: 1203-1209.

17. Jarman, R.G., Wagner, E.K., and **D.C. Bloom.** 1999. LAT expression during an acute HSV infection in the mouse. *Virology* 262: 384-397.

18. Peng, H., Moffett, J., Myers, J., Fang, X., Stachowiak, E.K., Maher, P., Kratz, E., Hines, J., Fluharty, S.J., Mizukoshi, E., **Bloom, D.C.**, and M. K. Stachowiak. 2001. Novel nuclear signalling pathway mediates activation of fibroblast growth factor-2 gene by type 1 and type 2 angiotensin II receptors. *Mol. Biol. Cell.* 12: 449-462.

19. Marquart, M.E., Zheng, X., Tran, R.K., Thompson, H.W., **Bloom, D.C.**, and J.M. Hill. 2001. A cAMP response element within the latency-associated transcript promoter of HSV-1 facilitates induced ocular reactivation in a mouse hyperthermia model. *Virology* 284: 62-69.

20. Klebe, S., Sykes, P.J., Coster, D.J., **Bloom, D.C.** and K.A. Williams. 2001. Gene transfer to ovine corneal endothelium. *Clin. Experiment. Ophthalmol.* 29: 316-322.

21. Jarman, R.G., Loutsch, J.M., Devi-Rao, G.B., Marquart, M.E., Banaszak, M.P., Zheng, X., Hill, J.M., Wagner, E.K., and **D.C. Bloom.** 2002. The region of the HSV-1 latency associated transcript required for epinephrine-induced reactivation in the rabbit does not include the 2.0 kb intron. *Virology* 292: 59-69.

22. Tran, R.K., Lieu, P.T., Aquilar, S., Wagner, E.K., and **D.C. Bloom.** 2002. Altering the expression kinetics of VP5 results in altered virulence and pathogenesis of HSV-1 in mice. *J. Virol.* 76: 2199-2205.

23. Bhattacharjee, P.S., Tran, R.K., Myles, M.E., Maruyama, K., Mallakin, A., **Bloom, D.C.**, and J.M. Hill. 2003. Overlapping subdeletions within a 348 bp region in the 5' exon of the LAT regions that facilitates epinephrine-induced reactivation of HSV-1 in the rabbit ocular model do not further define a functional element. *Virology* 312:151-158.

24. Origgi, F.C., C. H. Romero, **Bloom, D.C.**, P.A. Klein, J.M. Gaskin, S. J. Tucker and. E.R. Jacobson. 2004. Experimental transmission of a herpesvirus in Greek tortoises (*Testudo graeca*). *Vet Pathol.* 41: 50-61.

25. Kubat, N.J., Tran, R.T., McAnany, P.J. and **D.C. Bloom.** 2004. Specific histone tail modification and not DNA methylation is a determinant of HSV-1 latent gene expression. *J. Virol.* 78: 1139-1149.

26. O'Neil, J.E., Loutsch, J.M., Aguilar, J.S., Hill, J.M., and Wagner, E.K, and **D.C. Bloom.** 2004. Wide variations in herpes simplex virus type 1 inoculum dose and latency-associated transcript expression phenotype do not alter the establishment of latency in the rabbit eye model. *J. Virol.* 78: 5038-5044.

27. Sun, A., Devi-Rao, G.B., Rice, M.K., Gary, L.W., **Bloom, D.C.**, Sandri-Goldin, R.M., Ghazal, P., and E.K. Wagner. 2004. Immediate-early expression of the HSV-1 ICP27 transcript is not critical for efficient replication *in vivo* or *in vivo*. *J. Virol.* 78: 10470-10478.
28. Kubat, N.J., Amelio, A.L., Giordani, N.V., and **D.C. Bloom**. 2004. The HSV-1 LAT enhancer/*rcr* is hyperacetylated during latency independently of LAT transcription. *J. Virol.* 78: 12508-12518.
29. Sun, A., Devi-Rao, G.B., Rice, M.K., Gary, L.W., **Bloom, D.C.**, Sandri-Goldin, R.M., Ghazal, P., and E.K. Wagner. 2004. The TATGARAT box of the HSV-1 ICP27 gene is essential for immediate early expression but not critical for efficient replication *in vitro* or *in vivo*. *Virus Genes* 29: 335-343.
30. Castaneda, E., Fleming, S., Paquette, M.A., Boat, K., Moffett, J., Stachowiak, E.K., **Bloom, D.C.**, and M.K. Stachowiak. 2005. Assessment of recovery in the hemiparkinson rat: Drug-induced rotation is inadequate. *Physiol. Behav.* 84:525-535.
31. Corso T.D., Torres G., Goulah C., Roy I., Gambino A.S., Nayda J., Buckley T., Stachowiak E.K., Bergey E.J., Pudavar H., Dutta P., **Bloom D.C.**, Bowers W.J., Stachowiak M.K. 2005. Transfection of tyrosine kinase deleted FGF receptor-1 into rat brain substantia nigra reduces the number of tyrosine hydroxylase expressing neurons and decreases concentration levels of striatal dopamine. *Brain Res Mol Brain Res.* 139:361-366.
32. Corso T.D., Torres G., Goulah C., Roy I., Gambino A.S., Nayda J., Buckley T., Stachowiak E.K., Bergey E.J., Pudavar H., Dutta P., **Bloom D.C.**, Bowers W.J., Stachowiak M.K. 2005. Assessment of viral and non-viral gene transfer into adult rat brains using HSV-1, calcium phosphate and PEI-based methods. *Folia Morphol.* 64:130-44.
33. Walwyn, W.M., Matsuka, Y., Arai, D., **Bloom, D.C.**, Lam, H., Tran, C., Spigelman, I. and N.T. Maidment. 2005. HSV-1-mediated NGF delivery delays nociceptive deficits in a genetic model of diabetic neuropathy. *Exp. Neurol.* 198:260-270.
34. Amelio, A.L., Giordani, N.V., Kubat, N.J., O'Neil, J.E., and **Bloom, D.C.** 2006. Deacetylation of the HSV-1 LAT Enhancer and a Decrease in LAT Abundance Precede an Increase in ICP0 Transcriptional Permissiveness at Early Times Post Explant. *J. Virol.* 80:2063-2068.
35. Amelio, A.L., McAnany, P.J., and **D.C. Bloom**. 2006. Identification of a Chromatin Insulator-like element within the HSV-1 LAT Region that Binds CTCF and Displays Enhancer- Blocking Activity. *J. Virol.* 80:2358-2368.
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Giordani, N.V.*, Gussow, A.M.*, Rall, G.F., and D.C. Bloom. An HSV-1 LAT transgenic mouse accumulates the LAT intron only in nervous tissue and only in a subset of neurons. 29th International Herpesvirus Workshop, Reno, NV, July 25 – 30, 2004.

Sun, A., Devi-Rao, G.V., Rice, M.K., Gary, L.W.*, Bloom, D.C., Sandri-Goldin, R.M., Ghazal, P and E.K. Wagner. Immediate-early expression of the HSV-1 ICP27 transcript is not critical for efficient replication in vivo or in vitro. 29th International Herpesvirus Workshop, Reno, NV, July 25 – 30, 2004.

Liu, J.*, Schultz, G.S., Tuli, S.S., and D.C. Bloom. Gene Therapy of Herpes simplex Keratitis using ribozymes. 23rd Annual Meeting, American Society for Virology, Montreal, Quebec, Canada, July 10-14, 2004.

A.M. Gussow, G.F. Rall, and D.C. Bloom. Characterization of a transgenic mouse expressing the HSV-1 latency-associated transcript. 28th International Herpesvirus Workshop, Madison, Wisconsin, July 26th – 31st, 2003.

L. Gary and D.C. Bloom. Mapping a region overlapping the HSV-1 LAT that dramatically alters virulence in the mouse. 28th International Herpesvirus Workshop, Madison, Wisconsin, July 26th – 31st, 2003.

D.C. Bloom, N.K. Kubat, R.K. Tran and P.J. McAnany. Evidence that specific histone tail modifications and not DNA methylation is a determinant of HSV-1 latent gene expression. Gordon Research Conference: Viruses and Cells, Lucia, Italy, May 17 – 21, 2003.

N.M. Sawtell, D. Bloom, R. Haas, J. Ireland, P. Bhattacharjee, K. Maruyama, N.M.T. Nguyen, B. Gebhardt, E. Burger, J. Hill and R. Thompson. LAT and neuronal apoptosis in rabbit trigeminal ganglion neurons revisited. 28th International Herpesvirus Workshop, Madison, Wisconsin, July 24th – 28th, 2003.

N. Hamilton, D. Bloom, and L.T. Feldman. Analysis of the ICP4 promoter enhancer region. 28th International Herpesvirus Workshop, Madison, Wisconsin, July 26th – 31st, 2003.

J. Liu, D.C. Bloom, G.S. Schultz, S.S. Tuli, and A.S. Lewin. Development of HSV-1 vectored ribozymes for the treatment of HSV keratitis. ARVO, Ft. Lauderdale, FL, May 5 – 12, 2003.

Kubat, N.J., Tran, K.K., McAnany, P.J., and D.C. Bloom. Evidence that specific histone tail modifications and not DNA methylation are determinants of HSV-1 latent gene expression. 27th International Herpesvirus Workshop, Cairns, Queensland, Australia, July 21 – 27, 2002.

O'Neil, J.E., J.M. Loutsch, R.G. Jarman, J.M. Hill and D.C. Bloom. Mutations within two CRE sites within the HSV-1 LAT promoter result in altered virulence and reactivation phenotypes in the mouse and rabbit. 27th International Herpesvirus Workshop, Regensburg, Germany, July 27-August 3, 2001.

Avila, I., F. Manfredsson, S. Austin, C. Chavez, M.A. Paquette, R.K. Tran, E. Castañeda, D.C. Bloom. Gene Therapy for Parkinson's Disease: Parametric Studies of HSV/β-gal Expression in the Rat Brain. Society for Neuroscience, 31st Annual Meeting, San Diego, California, November 10-15, 2001.

Tran, R.K., S. Tabbaa, D.C. Bloom, M.K. Stachowiak. *In Vivo* Gene Transfer to the Brain Cortex Using Single Injection of HSV-1 Vector into the medial septum. Society for Neuroscience, 31st Annual Meeting, San Diego, California, November 10-15, 2001.

Tran, R.K., Lieu, P.T., Aguilar, S., Wagner, E.K., and Bloom, D.C. Changing the kinetics of VP5 expression results in altered virulence and pathogenesis of HSV-1 in mice. 25th International Herpesvirus Workshop, Portland, OR, July 29-August 4, 2000.

O'Neil, J., J.P. Moffett, R.G. Jarman, and D.C. Bloom. Patterns of acute and latent-phase HSV-1 transcription in mouse dorsal root ganglia organotypic cultures. 24th International Herpesvirus Workshop, Boston, MA, July 17-23, 1999.

Bloom, D.C., H.H. Garza Jr., J.M. Hill, and E.K. Wagner. Analysis of the spacing requirements within the 5' end of LAT on HSV-1 epinephrine-induced reactivation in the rabbit. 24th International Herpesvirus Workshop, Boston, MA, July 17-23, 1999.

Bloom, D.C. and M.M. Hoseyni. Long-term expression of nerve growth factor in dorsal root ganglia neurons by a non-replicating HSV-1 vector. Society for Neuroscience, Arizona Chapter, Phoenix, AZ, January 9, 1998.

Bloom, D.C., R.G. Jarman, H.H. Garza, J.M. Hill, and E.K. Wagner. Region at the 5' end of LAT involved in HSV-1 reactivation in the rabbit. Ocular Herpesvirus Infection Workshop, Lake Tahoe, CA., September 5-7, 1997.

Jarman, R.G., E.K. Wagner, and D.C. Bloom. Tissue distribution and levels of LAT expression during an acute HSV infection in the mouse. 22nd International Herpesvirus Workshop, LaJolla, CA., August 2-8, 1997.

Bloom, D.C., H.H. Garza Jr., R.G. Jarman, J.M. Hill, and E.K. Wagner. Deletion analysis of the 5' region of the latency associated transcript (LAT) required for epinephrine-induced reactivation. 22nd International Herpesvirus Workshop, LaJolla, CA., August 2-8, 1997.

Bloom, D.C., J.M. Hill, and E.K. Wagner. Physical extent of the critical 5' LAT element mediating efficient epinephrine-induced reactivation in the rabbit. 21st International Herpesvirus Workshop: Northern Illinois University, DeKalb, IL., July 27-August 2, 1996.

Invited seminars:

- Microbiology Department seminar, Northern Arizona University, September, 1996
- Microbiology and Immunology Department Seminar, University of Arizona, February, 1997
- Departments of Ophthalmology and Neuroscience, Louisiana State University, April, 1997
- Invited Speaker, Ocular Herpesvirus Infection Workshop, Granlibakken Conference Center, North Lake Tahoe, CA, September 5 – 7 , 1997
- Department of Biochemistry and Molecular Biology, Univ. of Cal./Irvine, October, 1997
- Barrow Neurological Institute, Phoenix, AZ, October, 1997.
- Gene Therapy Center, University of Florida, Gainesville, FL, March, 1999
- Invited Speaker, Biennial Meeting of the Society for Tropical Veterinary Medicine, Key West, FL, July, 1999
- Department of Biological Sciences, University of Southern California, Los Angeles, CA , May, 1999
- Beckman Institute, University of Illinois, Urbana-Champaign, May 2000
- Department of Microbiology and Immunology, University of California, Irvine, January, 2002
- Department of Microbiology, University of Pennsylvania, Philadelphia, PA, March, 2003
- Istituto Scientifico San Raffaele, Milan, Italy, May 2003
- Invited Symposium Speaker, 29th International Herpesvirus Workshop, Reno, NV, July, 2004
- Center for Virus Research, University of California, Irvine, CA, April, 2005.

- Department of Microbiology, Medical College of Wisconsin, Milwaukee, WI, November 2005
- Department of Microbiology, New York University Medical Center, New York, NY, December 2005
- Invited speaker, 32nd International Herpesvirus Workshop, July 7 – 13, 2007, Asheville, NC
- Department of Neurology, University of Colorado, Denver, CO, October 2007
- Department of Microbiology, University of Kentucky College of Medicine, Lexington, KY, November 2007
- Department of Oral Biology, University of Kentucky College of Dentistry, Lexington, KY, November 2007
- “Viroológica 2008”- XIX National Meeting Virology to be held in Caxambú City, Minas Gerais, Brazil, from 16 to 19 November 2008
- Institute for Molecular Virology, University of Minnesota, Minneapolis, MN, June 2009
- Department of Microbiology, University of Iowa, Iowa City, IA, September 2009
- Department of Molecular Genetics & Microbiology, Duke University, February 2011
- Department of Microbiology and Immunology, University of North Carolina at Chapel Hill, Chapel Hill, NC, March 2011.
- Invited Speaker, Workshop: Epigenomic Modifications of Oral Viruses, National Institute of Dental and Craniofacial Research, NIH, September 13, 2011, Bethesda, MD
- Invited Speaker, 15th International Conference on Immunobiology and Prophylaxis of Human Herpesvirus Infections, San Servolo Conference Center, Venice, Italy, October 13 – 15, 2011.
- Center for Diseases and Vaccinology, Arizona State University Biodesign Institute, Tempe, AZ, April 2012
- Department of Pharmacology and Experimental Therapeutics, Louisiana State University Health Sciences Center, New Orleans, LA, May 2012
- Division of Infectious Diseases, Department of Pediatrics, Vanderbilt University, Nashville, TN, September 2012
- Invited Speaker, Chromatin Control of Viral Infection, National Institutes of Health, September 17-18, 2012, Bethesda, MD
- Department of Microbiology and Immunology, University of Illinois at Chicago, Chicago, IL, November 2012
- Department of Microbiology, University of Chicago, Chicago, IL, May 2013
- Invited speaker, 38th Annual International Herpesvirus Workshop. July 20-24, 2013, Grand Rapids, MI.
- Invited speaker, Stanley Medical Research Institute Symposium, University of Pittsburgh, Pittsburgh, PA, February 25, 2014.
- Invited speaker, 12th Annual Duke Mini-symposium on Pathogenic Human Viruses, Duke University, Durham, NC, April 10, 2014.
- Invited Speaker, Chromatin Control of Viral Infection, National Institutes of Health, September 18-19, 2014, Bethesda, MD
- Invited speaker, Stanley Medical Research Institute Symposium, Johns Hopkins University, Baltimore, MD, December 3, 2014.
- Invited speaker, NASA Ames Research Center, Mountain View, CA, May 20, 2015.
- Department of Microbiology, University of Washington, Seattle, WA, October 20, 2015
- Invited speaker, Instituto de Biologia, Universidade Federal Fluminense, Niteroi, Brazil, March 21, 2016
- Invited speaker, College of Pharmacy, Universidade Federal Fluminense, Niteroi, Brazil, March 23, 2016
- Invited speaker, Microbial Pathogenesis Seminar Series, University of Utah School of Medicine, Salt Lake City, UT, August 29, 2016
- Invited Speaker, The Fels Institute for Cancer Research and Molecular Biology, Temple University School of Medicine, Philadelphia, PA, April 25, 2017.

Session Chairperson/ Convenor:

- Chair of Session 823. Staining, tracing and imaging techniques. Society for Neuroscience Annual Meeting. October 28, 1999.
- Session Convenor. Antivirals and Gene therapy. American Society for Virology Annual Meeting, July 13, 2004.
- Session Chair. Latency. 30th International Herpesvirus Workshop, July 30 - August 4, 2005, Turku, Finland.
- Session Convenor. Herpesviruses. American Society for Virology Annual Meeting, July 16, 2007.
- Session Chair. Latency. 33rd International Herpesvirus Workshop, July 27 - July 31, 2008, Estoril, Portugal.
- Session Chair. Latency. 35th Annual International Herpesvirus Workshop. July 24 - July 29, 2010, Salt Lake City, UT.
- Session Chair. Latency. 36th Annual International Herpesvirus Workshop. July 24 - 28, 2011, Gdansk, Poland.
- Session Chair. Gene Expression. 37th Annual International Herpesvirus Workshop. July 24 - 28, 2012, Calgary, Canada.
- Session Chair, Latency. 38th Annual International Herpesvirus Workshop. July 20-24, 2013, Grand Rapids, MI.
- Session Chair, Latency. 4th Annual Colorado Alphaherpevirus Latency Symposium, May 14 – 16, 2014, Vail, CO.
- Session Chair, The Inaugural Conference of Shenzhen International Institute for Biomedical Research, November 11-12, 2016, Shenzhen, China.

Meetings and Workshops Organized:

- Co-organizer, Third Annual Herpes Simplex Virus Workshop, Estoril, Portugal, July 26, 2008.
- Co-organizer, Fourth Annual Herpes Simplex Virus Workshop, Ithaca, NY, July 25, 2009.
- Co-organizer, Fifth Annual Herpes Simplex Virus Workshop, Salt Lake City, UT, July 24, 2010.
- Co-organizer, 6th Annual Herpes Simplex Virus Workshop, Gdansk, Poland, July 24, 2011.
- Co-organizer, 40th *International Herpesvirus Workshop*, Boise, ID, July 25-29, 2015.
- Co-organizer, 14th Southeastern Regional Virology Conference, Atlanta, GA, April 8-10, 2016.

Patents and Patent Applications:

1) Biological system for constructing and testing viral vaccines. **U.S. Patent #5,212,057** issued May 18, 1993 to the Univ. of Florida, Gainesville, FL. Inventors: Richard W. Moyer and David C. Bloom.

This invention consisted of an avirulent poxvirus vector system for use as a vaccine vector. The advantages of this system over existing technologies is that this vaccine vector was completely avirulent in vivo, and allowed rapid insertion of antigens using a specialized recombination system.

2) Herpesvirus Ribozymes and Vectors. **U.S. Patent #7,335,763** issued February 26, 2008. Inventors: Alfred S. Lewin, David C. Bloom, Gregory S. Schultz, Sonal S. Tuli, and Jia Liu.

This invention consists of a novel therapeutic approach to treating HSV infections. Existing antiviral treatments must be taken during recurring infections and only curtail the severity and timeframe of symptoms; by contrast, the therapy at hand has the potential to

block recurrence. The novel approach of this technology is its employment of hammerhead ribozymes, RNA enzymes that can cleave mRNA, deactivating it and leaving it to be digested by the intracellular degradation mechanism. These ribozymes target sequences in several genes of the herpes virus and block viral replication. Defective forms of the herpes simplex virus type I (HSV-1) function as vectors to deliver the ribozymes to cells capable of sustaining infection. The technology can potentially be used as a preventative vaccine against HSV-1 and HSV-2 outbreaks.

3) Insulated Herpesvirus-Derived Gene Expression Cassette for Sustained and Regulatable Gene Expression. **U.S. Patent Application #9,023,617** issued May 5, 2015. Inventors: David C. Bloom and Antonio L. Amelio.

This invention consists of a gene expression cassette that can insulate the therapeutic genetic material inside from the influence of surrounding genetic material. The cassette is also highly controllable and can be targeted to specific cell types. The technology at hand employs a defective form of a herpesvirus as the vector to carry a gene expression cassette for gene transfer to the central and peripheral nervous systems. Specifically, the technology allows a transgene to maintain persistent, long-term and highly regulable gene expression, unhindered by host cell silencing mechanisms such as histone methylation/deacetylation, DNA methylation, position effects, or transgene copy number. The delivery system is thus composed of (1) the insulated gene expression cassette and (2) a defective herpesvirus-based vector for delivery of the transgene to the central nervous system. The insulation cassette has the potential to become a useful tool in the field of gene therapy, basic gene expression assays, and development of animal disease models.

4) Materials and Methods for the Treatment of Latent Viral Infection. **U.S. Patent Application #61/973,995 (UF#14741)** filed April 2, 2014. Inventors: David C. Bloom, Bryan Cullen, Matthew Kennedy, Dane Phelan.

This invention consists of gene delivery system and specifically designed targeting molecules whose goal is to reduce, eliminate or incapacitate latent HSV genomes in order to reduce or eliminate HSV clinical reactivation. The delivery system consists of AAV vectors which allow the delivery of HSV-specific TALENs (TAL-effector nucleases) or CRISPR/Cas9 cleavage systems to the sensory neurons where latent HSV resides.

5) Novel Immunization Agents and Methods of Use. **International Patent Application #WO2016/030392 (UF#16564)** filed August 25, 2015. Inventors: Richard Voellmy and David C. Bloom.

This invention consists of engineered replication conditional HSV-1 vector that allows for safe but effective immunization against HSV-1 or other expressed bacterial or viral antigens. The novelty of this vaccine strategy is that the vector is not attenuated, but replication controlled, such that it efficiently undergoes 1 or 2 rounds of replication, but only in the presence of both local heat and a small molecule activator.

6) Method for Delivering RNA to Neurons to Treat Herpes Infections. **U.S. Provisional Patent Application #62/353,019 (UF#16175)** filed June 21, 2016. Inventors: David C. Bloom, Alfred S. Lewin, Donna M. Neumann, Zachary L. Watson, and Sonal S. Tuli.

This invention consists of a gene delivery system and a method of surface preparation that affords efficient delivery of AAV vectors expressing therapeutic RNAs (siRNAs, ribozymes, shRNAs) to neurons following peripheral application of the vectors to the skin or the eye. The purpose of this treatment is to express interfering or catalytic RNAs targeting HSV RNAs in order to block HSV reactivation and prevent clinical disease.

7) Use of ATR and CHK1 Inhibitor Compounds. **U.S. Provisional Patent Application #62/393,166 (UF#16265)** filed September 12, 2016. Inventors: Christopher Fisher, Terri G. Edwards, and David C. Bloom.

This invention consists of the discovery that the activation of the ATR DNA-damage response pathway early in infection is required for efficient viral replication. We have determined that the use of specific ATR and Chk1 inhibitors have antiviral activity and may have therapeutic potential, either on their own or as tools to define new viral targets for therapies that block the viruses requirement for this pathway.

Consulting:

Hoechst Roussel Vet GmbH, Wiesbaden, Germany (1996-2000) *Providing advice on the construction and testing of recombinant herpesvirus vaccines for veterinary applications.*

Sponsored research:

Current

1) National Institutes of Health (R01 AI097376-01) UF#13012475
“Regulation of lytic and latent infection by HSV-1 encoded miRNAs”
D. Bloom, P.I.

Duration: 1/01/2012 – 12/31/2017

Annual Direct Costs: \$250,000

The major goal is to understand how HSV-1-encoded microRNAs regulate viral latency and replication by generating virus mutants and analyzing their *in vivo* replication and pathogenesis and by identifying mRNA targets for viral microRNAs. Subcontract to B. Cullen (Duke)

Renewal submission (A0) planned for Nov 5, 2017

2) R21 NS096405-01A1 (PI: L. D’Aiuto)
NIH/NIAID

Duration: 9/01/16-08/31/18

Annual direct costs (to Bloom): \$50,000

“Analysis of human-specific aspects of HSV-1 latency in human iPSC-derived neurons”

The goal of this proposal is to develop human differentiated iPSC neurons as a platform to study human-cell-specific aspects of HSV-1 latency.

(Role: Co-I)

3) UF#109333 Bloom (PI)
HSF Pharmaceuticals, SA

Duration: 3/1/15- 2/28/18

“Evaluation of the suitability of SafeSwitch-controlled HSV as an anti-herpetic “vaccine” or immunization platform”

Annual direct costs: \$50,000

The goal of this project is to evaluate the molecular and immunogenic properties of a replication-conditional construct of HSV-1 that employs a heat and small molecule inducible activation cassette.

Role: collaborator (subcontractee)

4) R21 AI112382-01 (PI: Ishov)

NIH/NIAID

Duration: 7/1/2015-6/30/2018 (NCE)

Annual direct costs (to Bloom): \$75,000

“Function of histone chaperones in HSV-1 chromatin structure during latency, establishment, maintenance and reactivation”

The goal of this grant is to investigate the role that the cellular proteins Daxx/ATRAX play in regulating the deposition of histone modifications and the chromatin insulator protein CTCF on the regulation of HSV-1 latent gene expression, and the potential to reactivate.

Role: co: PI

5) UFIRST ID#5228 (PIs Bloom and Martens)

UF Opportunity Fund Award

Duration: 7/01/16-06/30/18

Annual direct costs (to Bloom): \$45,500

“Visualizing viral entry into neurons and the brain: Changing the paradigm”

The goal of this proposal is to examine the role that the olfactory neuron cilia play as a mechanism of HSV infection entering the CNS.

Role: Co-PI

6) National Institutes of Health (T32 AI07110) UF#2906426

“Basic Microbiology and Infectious Disease”

D. Bloom, P.I.

Duration: 07/01/78 – 07/31/19

Annual direct costs: \$177,403

The main goal of this training grant is to provide training to 5 pre-doc trainees in the principles of model systems to study the molecular and pathogenic basis of infectious diseases. This is currently the longest-standing training grant at UF. Bloom has served as P.I. since 2004.

7) National Institutes of Health (R01 AI48633) UF#2906416

“Molecular Genetics of HSV Reactivation”

D. Bloom, P.I.

Duration: 07/01/01 – 06/30/16

Annual direct costs: \$278,734

The major goal of this project is a functional understanding of molecular mechanism of HSV reactivation. This project studies the viral genetic basis of reactivation and how these genetic elements respond to external stimuli to facilitate reactivation *in vivo*. Subcontract to D. Neumann (LSU). *Submitted for renewal (A0) on July 5, 2017*

Completed Research Support

National Aeronautics and Space Administration (NNX14AD13G)

“Determination of Roles of Microgravity and Ionizing Radiation on the Reactivation of Epstein-Barr Virus”

D. Bloom, co-P.I. (P.I. Duane Pearson, Johnson Space Flight Center)

Duration: 01/07/2014-01/06/2017

Annual direct costs: \$47,000

The goal of this project determine the effect of microgravity and ionizing radiation on altering EBV chromatin and transcription in order to determine the mechanism of enhanced reactivation of EBV seen in astronauts on space missions.

R43 AI120302-01 (PI: D. Bumcrodt)
NIH/NIAID

Duration: 7/01/2015-06/30/2017

Annual direct costs (to Bloom): \$33,000

“Vector-delivered CRISPR/Cas as a cure for HSV-1 induced keratitis”

The goal of the SBIR grant (with Editas Medicine, Cambridge, MA) is to develop and test the ability of AAV-vector-delivered HSV-1-specific CRISPR/Cas9 as a means of mutating and/or eliminating HSV-1 genomes from latently infected ganglia as a means of curing HSV recurrent disease.

Role: co-investigator (subcontractee)

National Institutes of Health (RC2CA148407-01)

“Building a recombinant herpesvirus core laboratory to systematically analyze the role of miRNAs”

D. Bloom, co-investigator (R. Renne, PI)

Duration: 9/29/2009 - 8/31/2011 (no cost extension through 2012)

Annual Direct costs: \$250,000

The goal of this project is to construct a core lab that will construct and characterize recombinants of HSV-1, EBV and KSHV containing hairpin deletions in all known miRNAs. Once characterized these viral recombinants will be available to other researchers to characterize the miRNA’s biological role in the replicative and pathogenic processes of infection.

Burroughs Wellcome Fund (1004448) UF#2906099

“Identification of neuron-specific factors that regulate HSV-1 chromatin structure and transcription during latency”

D. Bloom, P.I.

Duration: 01/01/04 – 3/31/09

Annual direct costs: \$80,000

Total costs (through 2009): \$450,000

The major goal of this study is to map the boundary elements that separate chromatin domains of the HSV-1 genome during latency and to determine their contribution to the regulation of latent gene expression. *This grant was awarded to D. Bloom as part of the “Investigator in Pathogenesis of Infectious Disease Award” and was one of 8 out of 92 applications funded.*

2 R01 EY06311-20 Hill (PI)

NIH/NEI (LSU, New Orleans; subcontract to Bloom at UF)

Duration: 9/01/05 – 6/30/08

“Ocular HSV: Latency, reactivation, and recurrence”

Annual direct costs: \$47,500

Total costs (through 2008): \$206,841

The major goals of this sub-project are to: 1) construct viral recombinants with site-directed mutations in the NF- κ B sites in the ICP0 promoter and 2) screen butyrate-induced rabbit TG for changes in gene expression by rabbit microarray analysis.

UF-HSF-001 Bloom (PI)

HSF Pharmaceuticals, SA

Duration: 5/1/07- 10/31/08

“Construction of a Recombinant HSV Vector”

Total direct costs: \$50,000

The purpose of this contract is to construct and test an HSV-1 oncolytic vector for targeting tumors *in vivo*.

FRAXA Foundation (UF#2906433 and 2906411)
“Studies on FMR1 gene delivery using Herpes Simplex Viral Vectors”
D. Bloom, P.I.

Duration: 03/01/01 – 02/28/04
Annual direct costs; \$38,919
Total Costs: \$190,177

The major goal of this study is to deliver and express the gene that is responsible for Fragile X Disease (FMR1) in FMR1 knockout mice in order to study its function in synapse formation and assess the possibility of HSV vectors as a therapy for Fragile X Disease.

Stop! Children’s Cancer, Inc. (UF#2906444)
“Development of a Novel Herpes Simplex Viral Vector for the Treatment of Malignant Glioma”
D. Bloom, P.I.

Duration: 01/01/02 – 12/31/03
Annual direct costs: \$25,000
Total costs: \$75,000

The goal of this pilot study is to evaluate the potential of several novel HSV neurovirulence mutants as potential vectors for the treatment of malignant gliomas. *This two year grant was part of the STOP!CC Distinguished Young Investigator Award to D. Bloom.*

Howard Hughes Medical Institute (UF#2906054)
Biomedical Research Support Program for Medical Schools Pilot Project Funding
D. Bloom, P.I.

Duration: 3/1/2000 – 3/31/2001
Annual Direct Costs: \$25,000
Total costs: \$25,000

The goal of this pilot study is to evaluate the potential of candidate HSV neurovirulence mutant as a potential vector for the treatment of malignant gliomas.

"Latency in Herpesvirus Infections of Cells and Tissues"
Principal Investigator: David C. Bloom, Ph.D.
Agency: National Institute of Allergy and Infectious Disease
Type: R01 (AI06246) Period May 1, 1996 to April 30, 2000.
Annual direct costs: \$225,000
Total Costs: \$978,879

The major goal of this project was a functional understanding of HSV latency, reactivation and virulence. This project studied the viral genetic basis for neurovirulence and reactivation and investigates the role these genetic elements play on the course of the viral infection *in vivo*. Subcontracts to E. Wagner (UC-Irvine) and J. Hill (LSU).

“Long-term effects of nicotine – new molecular mechanisms”
Principal Investigator: David C. Bloom, Ph.D.
Agency: Arizona Disease Control Research Commission (State of Arizona)
Type: Research Grant (July 1, 1998 to September 30, 1999)
Annual direct costs: \$50,000

The major goals of this project were to understand the signaling pathway by which nicotinic acetylcholine receptors induces basic fibroblast growth factor (FGF-2) in the central and peripheral nervous system.

"Recombinant Equineherpesvirus Vector Project"

Co-principal Investigator: David C. Bloom, Ph.D.

Agency: Hoechst Roussel Vet, GmbH

Type: Industry Contract (June 1, 1996 to August 30, 2000)

Annual direct costs: \$92,500

Total Costs: \$387,152

The major goals of this project were to construct and evaluate recombinant equine vaccines based on herpesvirus vectors.

Teaching experience:

MIC445/446 Techniques in Molecular Biology. Lecture and laboratory (5hr/wk). Focus on the theory and application of techniques used in molecular biology. Topics include: preparation and analysis of DNA and RNA; Southern, Northern, and Western blot analysis; hybridization, polymerase chain reaction (PCR), *in situ* hybridization; CHEF and pulse-field electrophoresis; oligo-directed mutagenesis; DNA sequence analysis. (D. Bloom taught 1/2 of course and laboratory each Fall, 1996-98, ASU).

MIC381 Microbial Pathogens. Lecture (3hr/wk). Upper division undergraduate survey course of medically important bacterial and viral pathogens, with an emphasis on mechanisms of causing disease. (D. Bloom sole instructor, 1996 – 1998; ASU).

MIC581 Molecular Mechanisms of Pathogenesis (3hr/wk). (Developed by D. Bloom) Graduate course focusing on molecular basis of viral pathogenesis. Focus is on interactions with immune system and replication at the tissue level. (D. Bloom, sole instructor, 1998; ASU).

MIC481 General Virology (3hr/wk). Fundamental nature of viruses and their replication. Focus on molecular aspects of their biology. (Team taught; D. Bloom taught 1/5, 1996-1998; ASU)

MIC598 Gene Therapy in the Nervous System (2hr/wk). (Developed by D. Bloom at ASU, and M. Stachowiak, SUNY/Buffalo, 1998-99). Graduate course surveying diseases of the nervous system that are potential targets of gene therapeutics and the approaches that are under development. Focus will be on problems of delivery and vector design, role of DNA structure and promoter selection, *in vivo* vs. *ex vivo* delivery systems, and the use of animal models to evaluate therapeutic potential. This course is offered by the faculty of the joint Molecular and Structural Neurobiology and Gene Therapy Program of SUNY/Buffalo and ASU, and is directed by Dr. David C. Bloom (Department of Microbiology, Arizona State University) and Dr. Michal K. Stachowiak (Department of Anatomy and Cell Biology, SUNY at Buffalo). The sessions are conducted simultaneously and interactively in both institutions via video-conferencing.

BMS 6300C Medical Microbiology and Infectious Disease (UF COM). Fall 2000-2012, D. Bloom has presented 5 – 6 lectures per year in the virology section of this component of the 2nd year medical student curriculum.

GMS 6036 Advanced Virology III (UF COM). Spring of 2000-2009, D. Bloom presented 5 – 6 lectures per year in the viral pathogenesis section of this upper division graduate course.

GMS 6035 Advanced Virology II (UF COM). Spring 2009-present, D. Bloom has presented 2 lectures per year in the viral pathogenesis section of this upper division graduate course.

GMS 5905 Grant writing course (Genetics) (Team taught with Peggy Wallace). Meets every Thursday during Summer A. Has taught since 2012.

GMS 6196 Virology Journal Club. Course director of the Virology Journal Club that meetings every Monday at noon. Has taught since 2006.

BMS 6020 Clinical Neuroscience, 1 lecture (viruses of the nervous system). Has taught since 2013.

BMS 6635 Dermatology and the Neuromuscular System, 1 lecture (virus of the skin and mucosa). Has taught since 2013.

BMS 6300 Fundamentals of Microbiology and Immunology, 1 lecture (antivirals). Has taught since 2013.

BMS 6642 The Cardiovascular and Respiratory Systems, 1 lecture + 1 self-study (respiratory viruses). Has taught since 2013.

BMS Gastroenterology and Hepatology, 1 lecture (viral hepatitis and diarrhea). Has taught since 2013.

BMS6631 Hematology, 1 lecture (viruses of the blood). Has taught since 2013.

PHA6183 Pharmaceutical Gene Delivery, 1 lecture + 1 paper discussion. Has taught since 2008 (offered every other year).

BCH7412 Epigenetics of Human Disease and Development, 1 lecture. Has taught since 2004 (offered every other year).