Curriculum Vitae
Ralph S. Baric

I. PERSONAL INFORMATION:

A. Business Address:
Department of Epidemiology
School of Public Health
University of North Carolina at Chapel Hill
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2600 Northstream Ct
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B. Personal Data

Born: April 3, 1954
US Citizen

Married: Antoinette Baric
Children: Cristina, Michelle, Michael, Thomas

II. EDUCATION:

A. North Carolina State University, Raleigh, North Carolina, B.S., Zoology, 1977
B. North Carolina State University, Raleigh, North Carolina, Ph.D., Microbiology, 1983
C. University of Southern California, School of Medicine, Department of Microbiology and Neurology, Post-doctoral Fellow, 1982-1986

III. PROFESSIONAL EXPERIENCE:

A. Assistant Professor, Department of Parasitology and Laboratory Practice, University of North Carolina at Chapel Hill, March 1986-June 1990
B. Assistant Professor, Department of Epidemiology, University of North Carolina at Chapel Hill, July 1990-June 1993.
C. Associate Professor, Department of Epidemiology, University of North Carolina at Chapel Hill, July 1993-2001.
D. Associate Professor, Department of Microbiology and Immunology, University of North Carolina at Chapel Hill, July 1993-2001
E. Professor, Department of Epidemiology, Department of Microbiology and Immunology, University of North Carolina at Chapel Hill, July 2001-current

IV. HONORS AND AWARDS:

A. Full Athletic Scholarship, Swimming, North Carolina State University, 1972-1976
B. Atlantic Coast Conference Champion and record holder: 500 yard Freestyle, 1000 yard Freestyle, 1650 yard Freestyle, 400 yard Individual Medley, 800 yard Freestyle Relay
C. Teaching Assistantship, North Carolina State University, 1977-1978
D. Agricultural Foundation Pre-doctoral Research Assistantship, 1978-1981
E. Teaching Assistantship, North Carolina State University, 1981-1982
F. NIH Postdoctoral Fellowship, Neurology Training Grant, 1982-1984
G. Harvey Weaver Scholar, National Multiple Sclerosis Society Fellowship, 1984-86
H. Outstanding Young Man of America, 1987
I. Established Investigator, American Heart Association, 1989-1994
J. Delta Omega Honor Society, 1990
K. WHO Working Group: SARS-CoV 2003
L. Nominated World Technology Award Finalist-2004;
M. World Technology Award Finalist and Member, 2004
N. Permanent Member, Virology B Study Section; Oct 2005-2009.
O. Editorial Board, Journal of Virology, 2004-2006, 2007-2011

P. Editorial Board, Plos Pathogen, 2007-
Q. Senior Editor-Plos Pathogens 2008-.
R. Member-Biological Sciences Expert Group (BSEG)-2009-
S. Internal Advisory Board, Pacific Northwest Regional Center for Excellence, 2009-present.
T. National Academy of Sciences: Working Group: Gene Sequence Methods for Classification of Select Agents
U. Fellow, American Academy of Microbiology, 2010
V. Innovation/Inspiration Award for Faculty Research, UNC Gillings School of Public Health, 2011.
W. WHO Working Group: Virus-like Particle Vaccines, June 2011.
X. WHO Working Group: Flu Vaccine selection, April 2013.
Y. National Academy of Sciences, Committee on Risks and Benefits of Gain of Function Research. Committee Member, 2014.
Z. MERS-CoV Stakeholders Workshop April 2015

V. SCIENTIFIC SOCIETIES:

A. American Society for Microbiology
B. American Society for Virology

VI. UNIVERSITY AFFILIATIONS:

A. Lineberger Cancer Center
B. Biotechnology Center
C. Curriculum in Genetics
D. Center for Infectious Diseases

VII. CONRACTS AND GRANTS

A. Current Funding

1. U19 AI100625 (Baric, Heise MPI) 08/05/2012-7/31/2017
NIH/NIAID Total Direct Cost $14,543071
Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross

The Collaborative Cross, a mouse resource designed to study complex genetic interactions in diverse populations, to identify novel polymorphic genes regulating immune responses to SARS, influenza and West Nile viruses, gain new insights into genetic interactions that shape immune phenotypes in mice and humans, and generate panels of genetically defined mice to probe how sets of polymorphic genes affect immune responses against a variety of pathogens or other immune stimuli.

2. U19 AI107810 (PI: Baric) 07/01/13-06/30/18
NIH/NIAID $7,346,408
Characterization of novel genes encoded by RNA and DNA viruses

Using highly pathogenic human respiratory and systemic viruses which cause acute and chronic life-threatening disease outcomes, we test the hypothesis that RNA and DNA viruses encode common and unique mechanisms to manipulate virus replication efficiency and host responses to determine severe disease outcomes.

U19 AI 107810-Supplement (PI: Baric) 09/01/14-05/31/15
NIH/NIAID $57,395
Characterization of novel genes encoded by RNA and DNA viruses

One year administrative supplement to identify viral gene products encoded by pathogenic human viruses that manipulate the host protein synthesis machinery and related signaling pathways.

3. **R01 AI 107731 (PI: De Silva) 07/01/13-06/30/18**
   NIH/NIAID $300,000
   Molecular Basis of Dengue Virus Neutralization by Human Antibodies

   These studies proposed here are directly relevant to developing simple assays to predict the performance of the leading dengue vaccine candidates and also for developing the next generation of safe and effective dengue vaccines.
   Role: Co-Investigator

4. **R01 AI108197 (MPI: Denison/Baric) 08/01/13-07/31/18**
   Vanderbilt University/NIH/NIAID $280,000
   Determinants of Coronavirus Fidelity in Replication and Pathogenesis

   Experiments in this aim will test the hypothesis nsp1 functions in maintaining high replication fidelity and viral RNA synthesis are coupled and that targeted engineered mutations across nsp14 alter: a) RNA fidelity outcomes; b) sensitivity nucleoside mutagens, terminators and polymerase inhibitors; c) the kinetics and magnitude of positive, negative, genomic and subgenomic RNA synthesis; and d) RNA recombination frequencies.

5. **U19-AI106772-02 (PI: Kawaoka) 08/01/13-05/31/18**
   Univ of Wisconsin/NIH/NIAID $411,563
   Modeling Host Responses to Understand Severe Human Virus

   The proposed studies will provide a more detailed look at the intracellular environment by taking “snapshots” of the lipids, metabolytes, and proteins present during viral infection time courses. These assays will allow us to determine the innate immune response occurring immediately following virus infection and to determine how the virus and cell interact over a 72 hour window.Role: Investigator

   Supplement to OMIC (PI: Kawaoka) 08/25/14-5/31/15
   Univ. of Wisconsin/NIH/NIAID $200,000
   Epigenetic Regulation of Interferon-Stimulated Genes Following MERS-CoV Infection
   The overriding hypothesis of this supplemental application is that MERS-CoV and H5N1 manipulate host epigenetic programs to specifically down-regulate certain classes of ISGs, which likely antagonize virus replication efficiency in vitro. The goal is to develop systems biology datasets and unbiased modeling algorithms to de-convolute the complex pathogen-host interactions that regulate severe disease outcomes following infection and identify common host pathways/genes that can be exploited for therapeutic control.
   Role: Investigator

6. **HHSN272201000019I-HHSN27200003 (PI: Palese) 09/30/13-03/31/16**
   MSSM/NIH $481,223
   MERS-CoV Mouse Model for Vaccine & Therapeutic Testing (Task Order A57)

   Specific Aims: Use generation of transgenic mice and modifications to the MERS-CoV genome to identify a mouse model for MERS-CoV that recapitulates human disease phenotypes for evaluating vaccine platforms and therapeutics. Role: Consortium PI

7. **U19 AI 109680 CETR (PI: Whitley) 03/01/14-02/28/19**

UAB/NIH/NIAID **$1,611,425**
Antiviral Drug Discovery and Development Center
The specific aims of the proposal will identify small molecule inhibitors of CoV fidelity and RNA capping, define their mechanism of action, and determine their efficacy against SARS-CoV and across CoV families using in vivo mouse models of acute and persistent CoV disease.Role: Co-Investigator

8. **U19 AI109761 CETR (PI: Lipkin) 03/01/14-02/28/19**
Columbia/NIH/NIAID **$2,999,060**
Diagnostic and Prognostic Biomarkers for Viral Severe Lung Disease

The overall goal of this program is to develop new platform technologies that use functional genomics as diagnostic and prognostic indicators of severe end stage lung disease following virus infection of the lung. Role: Project Leader, Consortium PI

9. **R56 AI106006 (PI: Baric) 09/01/14-8/31/16**
NIH/NIAID **$759,938**
Mechanisms of Norovirus Protective Immunity

The overall goal of this program is to prevent future norovirus outbreaks. We will identify molecular markers for long-term protective immunity and characterize the breadth of the protective antibody response after vaccination. Our studies will identify key norovirus neutralizing epitopes which mediate type specific and broadly cross reactive short and long-term protective immunity, develop robust platforms for discriminating between short and long-term memory B cell response following human vaccination and inform second generation norovirus vaccine design as certain strains evolve quickly.

11. **Not Assigned (PI: Desilva) 03/01/13-09/30/17**
Sanofi Pasteur Vaccines **$130,000**
UNC-Sanofi Pasteur Pilot Study to Characterize Human Antibody Response to Tetravalent Dengue Vaccine

To characterized the properties of antibodies in naïve individuals who received 3 doses of CYD tetravalent vaccine. Here we propose to continue these studies by analyzing a further 20 samples from both dengue naïve and immune individuals who received vaccine.
Role: Investigator

12. 246823 **(PI: Baric) 01/27/15-09/16/16**
PNNL/DHS **$205,569**
Generation of Predictive Models of Viral Pathogenesis
Using advances in transcriptomics, proteomics, and metabolomics, we will identify changes in the virus-host interaction expression networks associated with DENV infection of Aedes aegypti cells or human immune cells in vitro, the latter model after natural receptor-mediated or after ADE mediated entry processes.

13. **Not assigned (PI: deSilva) 02/01/2015-01/31/18**
Johns Hopkins U/Gates Foundation **$726,498**
The dengue human infection model: Defining correlates of protection and advancing vaccine development

The goal of these studies conducted by the Baric laboratory are to use recombinant dengue viruses encoding multiple homotypic neutralizing sites from multiple strains, as well as a collection of null mutants, to characterize the homotypic immune response elicited in

humans following natural infection and after challenge in GSK DENV tetravalent vaccinated individuals. This grant has been funded by Gates.
Role: Co-Investigator

14. R01 AI110700 (PI: Baric) 04/20/15-03/31/20
NIH/NIAID $3,675,513
Mechanisms of MERS-CoV Entry, Cross-species Transmission and Pathogenesis

The overall goal is to build a comprehensive understanding of the molecular mechanisms guiding group 2c CoV receptor recognition, entry and pathogenesis.

15. **Not Assigned (deSilva-PI) 05/01/14 – 05/31/16**
Takeda Global Res & Development Ctr, Inc $130,191
UNC-Takeda Study to Characterize Human Antibody Response to DENVax

Takeda and UNC will collaborate to determine if the Takeda vaccine induces antibodies against the neutralizing epitopes discovered at UNC.

16. 00008956 (PI: De Silva) 07/29/15-06/30/16
UCB/NIH/NIAID $275,000
Protective immunity following dengue virus natural infections and vaccination
We will perform studies to characterize the B-cell/ antibody (responses in people who receive dengue live attenuated virus vaccines (DLAV).
Role: Co-Investigator

B. Completed

1**. Harvey Weaver Scholar, National Multiple Sclerosis Society**. 7/1/84-5/1/86. Total: $44,000. Postdoctoral fellow research fellow support. PI: RS Baric

2. **National Institutes of Health, Allergy and Infectious Diseases (AI 23946 years 1-3)** Studies into the mechanism of MHV transcription. 7/1/86-3/31/90. $324,000 Direct costs. PI: RS Baric, 40% effort.

3. **National American Heart Association Grant in Aid.** Coronavirus-induced myocarditis in rabbits. July 1987-June 1990. $29,609 first year; total for three years: $94,227 (direct costs), PI: RS Baric 10% effort.

4. **Career Development Award from the National American Heart Association, Established Investigator Award** "Coronavirus-Induced Rabbit Cardiomyopathy". Established Investigator-American Heart Association. Direct costs: $175,000. 7/1/89 - 6/30/94. PI: RS Baric

5. **School of Public Health, BRSG**. Coronavirus-induced myocarditis in rabbits. 1986-1987. $7,150 Direct costs. PI: RS Baric

6. **School of Public Health, BRSG.** Incidence of the enteric rotaviruses, adenoviruses, and coronaviruses among migrant farm workers. 1987-88. Direct costs $7,150. PI: RS Baric

7. **School of Public Health, BRSG** Small Instrument Program. Direct costs $7,477.80. PI: RS Baric. 1989

8. **National American Heart Association Grant in Aid.** "Coronavirus-induced myocarditis and dilated cardiomyopathy. 7/1/90 - 6/30/93. Direct costs $108,000. PI: RS Baric, 10% effort.

9. **School of Public Health, BRSG.** Development of PCR techniques for detection of HAV and other enteroviruses. 1989 - 1990. Direct costs $3,200. PI: RS Baric

10. **School of Public Health, BRSG**. Small Instrument Program. $7,200. (1987), PI: RS Baric

11. **School of Public Health, BRSG**. Small Instrument Program $6,200. (1988), PI: RS Baric

12**. American Water Works Association.** "Gene probes to analyze for waterborne microorganisms and virus". 10/1/90 - 9/30/92. Direct costs $150,000/yr (Co-PI with Mark Sobsey ENVR).

13. **National Shellfish Indicator Study**. Detection of human and nonhuman fecal indicators in shellfish and environmental samples. 11/1/90 - 10/30/92. Direct costs $205,000 (Co-PI with Mark Sobsey, ENVR).

14. **Environmental Protection Agency**. Development of ultra-sensitive gene probes for the detection of HAV and other enteroviruses in environmental samples. Direct costs $315,000 (Co-PI with Mark Sobsey, ENVR). 6/5/91 - 6/4/93

15. **National Institutes of Health, Allergy and Infectious Diseases**. "Studies into the Mechanism of MHV Replication". 1/1/92 - 12/31/96. Total costs: ~$895,000. PI: RS Baric, 40% effort. Years 4-8.

16. **North Carolina Biotechnology Center**. Studies into the mechanism for mefloquine resistance in plasmodium falciparum in vitro. 7/1/92 - 12/31/93 $40,000 direct costs. PI: RS Baric, 5% effort.

17. **World Health Organization.** Molecular screening strategies for antimalarial drugs. 1994-1996, $75,000 Direct Costs. PI: RS Baric, 10% effort.

18. **North Carolina Biotechnology Center**. "**Molecular Methods to detect and control human calicivirus infections**" 7/1/2000-12/21/01. $55,000 total costs. RS Baric, PI 5% effort.

19. **National Institutes of Health, Allergy and Infectious Diseases**. "Studies into the Mechanism of MHV Replication". 7/1/97-6/30/02. Total costs: 1,000,000. PI: RS Baric, 40% effort. Years 9-13.

20. **American Water Works Association Research Foundation. "Development of a Molecular Method to Detect Infective Viruses."** T. Cromeans and M.Sobsey, PI; RS Baric, co-investigator 5% effort. $250,000 total costs, 1/1/2000-12/31/03.

21. **Environmental Protection Agency**. "**Research to Assess the Potential for the Use of Noninvasive Assays to Measure Infections Caused by Exposure to Viral Pathogens in Drinking and Recreational Waters**." PI: C.Moe, subproject: to RS Baric. 10/1/01-9/31/03. $400,000 total costs, 5% effort.

22. **National Institute of Health, Allergy and Infectious diseases**. **"Reverse Genetics with a Coronavirus Infectious cDNA Construct."** 4/1/2001-3/31/005 $1.0 million total costs/yr. RS Baric, PI 25% effort. GM 63228

23. **National Institutes of Health, Allergy and Infectious Diseases**. R01. **Remodeling the SARS Coronavirus Genome Regulatory Network.** RS Baric, PI 10% effort. 7/1/04-6/30/09. $2.1 million.

24. **NIH Southeastern Regional Center for Excellence**. Marburg virus reverse genetics and pathogenesis 12/1/04-11/30/06. $200,000 total costs. RS Baric, PI 2% effort.

25. **National Institute of Health, Allergy and Infectious Diseases: "Studies into the Mechanism of MHV Replication".** 4/1/03-3/30/08, ~2,000,000 total costs. RS Baric, PI-30% effort. (years 14-19) AI23946, 1 year no cost extension in progress.

    This project focuses on identifying the important virus-receptor interactions which mediate Mouse hepatitis virus cross species transmissibility during persistence and in mixed cell cultures in vitro.

26. **NIH AID Supplement 1 and 2: SARS Reverse Genetics**. AI23946-14A1 $250,000 direct costs. Supplements to develop a full length cDNA of the SARS-CoV and equip a BSL3 laboratory in the School of Public Health, Room 3221D McGaveran Greenberg Hall. RS Baric, 5% effort, PI. 9/1/03-8/30/04.

27. **National Institute of Health, Allergy and Infectious Diseases. Susceptibility and Protective Immunity to Noroviruses.** 7/1/03-6/30/08. RS Baric, PI; 20% effort; 2.3 million total costs. **RO1 AI056351-01**.

28. **National Institutes of Health, Allergy and Infectious Diseases. SARS Reverse Genetics. AI059136-01**. $1.7 million total costs, RS Baric, PI. 10% effort. 4/1/04-3/31/09.

    The project develops a SARS-CoV full length infectious cDNA, the development of SARS-CoV replicon particles expressing heterologous genes, and seeks to adapt SARS-CoV to mice, producing a pathogenic mouse model for SARS-CoV infection.

29. **GC11714-130654 (Engle, PI; Baric, Co-PI) NIH Univ VA-Subcontract** 6/1/08 - 5/31/09. Yeast Based Assays for Chemical Screens Against SARS-CoV Targets

    Specific Aims: The ultimate goal of this proposal is to develop a rationale, high throughput yeast-based antiviral screen that identifies small molecule inhibitors that target novel viral genes.

30. **Gillings Foundation. UNC GIL 200710.0017. "Vaccines for Global Health".** Baric, RS PI. Total Direct Costs: $528,371. 09/01/2008-08/31/2010.

31. **National Institutes of Health, Allergy and Infectious Diseases. P01 AI059443-05. Developing vaccine candidates for the SARS Coronavirus**. RS Baric, PI 30% effort. Total direct costs: $9,025,984; 5/1/05-1/31/11.

    The program project grant enlists Dr. Robert E. Johnston, Dr. Mark Heise, Dr. Nancy Davis from the University of North Carolina at Chapel Hill, Dr. Mark Denison from Vanderbilt University and Dr. Peter Palese from Mt. Sinai School of Medicine to develop vaccine candidates for the SARS-CoV using a combination of molecular genetic approaches to

develop live attenuated vaccines and vaccine platforms based on alphaviruses and new castle disease virus. Vaccine efficacy is tested following SARS-CoV infection in mice and ferrets as models.

32. **National Institutes of Health, Allergy and Infectious Diseases. RO1. HL080621**. **Macaque Model and Gene Expression Profiling of SARS** Michael Katze, PI (University of Washington); RS Baric Subcontract PI. 5% effort. Total direct costs: $375,000 direct costs/year. 01/01/06-12/30/10.

    The proposal seeks to study the pathophysiological consequences of SARS-CoV pathogenesis in the macaque model developed by Ab Osterhaus. Our role on the proposal is to use reverse genetics to a) reconstruct a molecular clone of strain (HKU-39849) and compare the pathogenesis of this recombinant virus to recombinant Urbani. The proposal studies the pathogenesis of these isolates in the macaque model and performs array analysis to identify alterations in gene expression profiles during infection in airway cultures derived from macaques.

33. **NIAID/NHLB, R21 AI079521 Targeted Gene Expression from NL63 Vaccine Vectors (Sims-PI; Baric Co-Investigator, 5% effort)** Total Direct costs: $275,000. 07/01/08-06/30/11

    Dr. Sims develops attenuated, coronavirus vaccine vectors that express influenza hemagglutinin antigens and that protect from lethal influenza virus challenge.

34. **National Institutes of Health, Allergy and Infectious Diseases. R21/R33 AI 076159-03 Human Coronaviruses as Multigene Mucosal Vaccine Vectors for HIV (Sims-PI; Baric Co-Investigator); Total Direct costs: $286,661. 04/01/08 - 03/31/11**

    This project will provide the first critical evaluation of the potential use of common cold human coronaviruses as live mucosal vaccine vectors for HIV.

35. **HHSN2722010000191/HHSN27200001 (Palese, P. PI) 9/30/11-9/29/2012**
    Mt Sinai School of Medicine/NIH/NIAID Total Direct Costs: $200,000
    NIAID Animal Models of Infectious Diseases-Task Order A26
    New Animal Models for Chronic Chikungunya Virus Diseases in At-Risk Populations

    The goal of this project is to test a variety of mouse strains for their susceptibility to chronic chikungunya virus-induced disease.
    Role on Project: Consortium Co-investigator

36. **National Institute of Health, Allergy and Infectious Diseases. R01AI075297**
    SARS-CoV Pathogenic Mechanisms in Senescent Mice. 4/1/08-3/31/14 NCE. Baric, R.S. (PI); Total direct costs: $1,966,516

    The proposal seeks to unravel the host and virological factors present in zoonotic and epidemic strains of the SARS-CoV that contribute to increased morbidity and mortality in the senescent mouse model. We will use reverse genetics to identify genetic determinants in the zoonotic S glycoprotein and replicase that contribute to increased pathogenesis and mortality in senescent mice and identify host factors which are differentially regulated in young and senescent mice that contribute to pathogenesis. The role of select pathways in disease progression will be evaluated with null animals.

37. **SERCEB U54 AI057157 (Sparling, PI; Denison, Project PI; Vanderbilt; Baric, R-Co-PI) 3/1/09 – 2/28/14 Project 1.1. Platforms for the Synthesis and Testing of Emerging Zoonotic Viruses**

    The project will use emerging group 1 Bat-CoV, coupled with synthetic genome and gene design, to define conserved determinants of host species movement, adaptation, and pathogenesis in a senescent mouse model.

38. **SERCEB U54 AI057157 (Sparling, PI; De Silva, Project PI; Baric, R-Co-PI). Project 3.2. "Antibody in Protective and Pathogenic Immunity to Dengue Type 3" 3/1/09 – 2/28/14**

39. **PNWRCE U54 AI080680 (Nelson, PI Baric-Project PI) 4/21/09 – 2/28/14**
    Project 3.1 Pathogenomics of Severe Respiratory Virus Infection. PI, RS Baric. Annual total direct costs: $430,000.

    The project uses a systems genetic approach and novel mouse genetic resources, the collaborative cross, to map susceptibility loci regulating SARS-CoV and influenza virus pathogenesis in young mice.

40. **02-340-0213337 (PI: Baric) 03/01/13-02/28/14**
    RTI/DOD $200,000
    Human Emulated Response with Microfluidic-Enhanced Systems (HERMES)

    The overall goal of RTI's proposal is to develop in vitro, cell-based platform that mimics human physiological systems as a new paradigm for assessment of efficacy, toxicity, and pharmacokinetics of pharmaceuticals.

41. **Univ Wash/NIH-Subcontract, R01 HL080621 A Systems biology Approach to Emerging Respiratory Viral Diseases, PI: M. Katze(UWash) $16,954,607 (total contract); Baric SubProject: Systems Biology of Lethal and Attenuated SARS-CoV Infection (~$300,000/yr direct costs). 9/15/08 - 9/14/13.**

    This project uses a systems genomic and proteomic approach to elucidate the host signaling networks that regulate highly pathogenic respiratory virus induced severe and end-stage lung disease.

42. **RO1 RO1 AI056351 (PI: Baric) 02/01/2009 - 01/31/2015**
    NIH/NIAID Total direct cost: $2,854,241
    Susceptibility and Protective Immunity to Noroviruses.

    This application seeks to study the function of susceptibility alleles in human Norovirus infection. Using a human challenge model, we will determine if individuals initially infected with Norwalk virus develop long-term resistance that protects against subsequent challenge. We will also determine if other Noroviruses use ABH antigens as receptors for docking and entry.

43. **R01 AI085524 (PI: Marasco) 06/09/10-05/31/15**
    Dana Farber/NIH $184,059
    Broad Spectrum Neutralizing Human Abs to SARS-CoV and Related Zoonotic Coronaviruses.
    Specific Aims: We will use SARS-CoV as a model to: 1) establish new paradigms for developing universal therapeutic platforms that protect against new emerging and deliberately designed human pathogens; 2) define pathways of virus escape as a function

therapeutic composition and evaluate pathogenic consequences and 3) evaluate therapeutic potential in robust animal models, especially in vulnerable populations that develop acute respiratory distress syndrome (ARDS).
Role: Consortium PI

C. Career Development Awards (Also listed in previous support)

1. **Harvey Weaver Scholar, National Multiple Sclerosis Society**. 7/1/84-5/1/86. $44,000**.** Postdoctoral fellow research fellow support. **PI: RS Baric**

2. **Career Development Award from the National American Heart Association, Established Investigator Award** "Coronavirus-Induced Rabbit Cardiomyopathy".. Direct costs $175,000. 7/1/89 - 6/30/94. PI: RS Baric

D. Mentor: Student/Postdoc Fellowship Awards

1. Lorraine K. Alexander. Rabbit Coronavirus induced myocarditis and dilated cardiomyopathy. $60,000, Bird Dunn Awardee.(Postdoctoral Fellowship-North Carolina Chapter from the American Heart Association, RS Baric, Mentor

2. Wan Chen. Persistence and evolution mechanisms of Mouse Hepatitis Virus. Pathogenesis Training Grant. Postdoctoral Fellowship Support $36,000 direct costs. RS Baric, Mentor

3. Kris Curtis, Virology Training Grant 9/1/01-8/30/02. Coronavirus reverse genetics, $18,000 direct costs, RS Baric, Mentor

4. Patrick Harrington, Virology Training grant 9/1/02-8/30/03. Norovirus capsid-ABH antigen interactions. $18,000 Direct Costs, RS Baric, Mentor.

5. Will McRoy, Virology Training Grant 9/1/03-8/30/04. Coronavirus Host Shifting Mechanisms. ~$18,000 Direct Costs. RS Baric, Mentor

6. R.J. Cleveland, Department of Defense, Breast Cancer Research Program. Insulin-like-growth factor 1-gene polymorphisms in breast cancer. Predoctoral fellowship award 4/1/01-3/31/04; $65,858 total costs. Mentor: M. Gamon, RS Baric and B. Millikan, co investigators.

7. Amy Sims, Postdoctoral Fellowship Award; Pathogenesis Training Grant. 6/1/02-5/30/04. $75,000/total costs. RS Baric, Mentor

8. Matt Frieman, NIH Postdoctoral Fellowship Award, “SARS-CoV mediated Modulation of Innate Immunity”. $120,000 total costs; Oct 1, 2005-Sept 31, 2008. RS Baric, Mentor

9. Rachael Graham, NIH Postdoctoral Fellowship Award. Rewiring the SARS-CoV Genome. $120,000 total costs; Oct 2008-2010. RS Baric, Mentor

10. Vineet Menachery, NIH Postdoctoral Fellowship Award. RS Baric, Mentor

E. Training Grant Participation at UNC

1. Virology Training Grant (Department of Microbiology, Ronald Swanstrom, Director) 1993-present.

2. Pathogenesis Training Grant (Department of Microbiology and Division of Infectious Diseases; David Margolis, Director) 1992-Present.

3. Nutritional Biochemistry and Epidemiology of Cancer (Epidemiology Department; Lenore Kohlmeier, Director). 1997

4. Environmental and Molecular Epidemiology Training Grant (David Savitz, Director) 1997-2004.

VIII. PUBLISHED MANUSCRIPTS:

A. Manuscripts

1. **Baric, R.S**., Moore, D.B., and Johnston, R.E., 1980. In vitro selection of an attenuated variant of Sindbis virus. **Mol. Cell Biol**. 18:685-694.
2. **Baric, R.S.**, Trent, D.W., and Johnston, R.E., 1981. A Sindbis virus variant with a cell determined latent period. **Virology** 110(1):237-242. PMID: 7210508
3. **Baric, R.S.**, Carlin, L.J., and Johnston, R.E., 1983. Requirement for host transcription in the replication of Sindbis virus. **J. Virol.** 45(1):200-205. PMCID: PMC256402
4. **Baric, R.S.**, Lineberger, D.W., and Johnston, R.W., 1983. Reduced synthesis of Sindbis virus negative strand RNA in cultures treated with inhibitors of host transcription. **J. Virol.** 47(1):46-54. PMCID: PMC255196
5. **Baric, R.S.**, Stohlman, S.A., and Lai, M.M.C., 1983. Characterization of replicative intermediate RNA of mouse hepatitis virus: Presence of leader RNA sequences on the nascent chains. **J. Virol.** 48(3):633-640. PMCID: PMC255394
6. Lai, M.M.C., Patton, C.D., **Baric, R.S.**, and Stohlman, S.A., 1983. Presence of leader sequences in mRNA of mouse hepatitis virus. **J. Virol.** 46(3):1027-1033. PMCID: PMC256579
7. Lai, M.M.C**., Baric, R.S.,** Brayton PR and Stohlman, R.A. 1984. Characterization of leader RNA sequences on the virion and mRNAs of mouse hepatitis virus, a cytoplasmic RNA virus. **PNAS** 81(12):3626-3630. PMCID: PMC345271
8. Lai MM, **Baric RS**, Brayton PR, Stohlman SA.1984. Studies on the mechanism of RNA synthesis of a murine coronavirus. **Adv Exp Med Biol.** 1984;173:187-200. PMID: 6331110
9. Olmstead, R.A., **Baric, R.S.**, Sawyer BA and Johnston, R.E., 1984. Sindbis virus mutants selected for rapid growth in cell culture display attenuated virulence in animals. **Science** 225(4660):424-426. PMID: 6204381
10. **Baric, R.S.**, Stohlman, S.A., Razavi, M.K., and Lai, M.M.C., 1985. Characterization of leader-related small RNAs in coronavirus-infected cells: further evidence for leader-primed mechanism of transcription. **Virus Research** 3(1):19-33. PMID: 2992183
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49. Baric, RS and Yount, B. 2001. Coronavirus Heterologous Expression Vectors. American Society for Virology, Madison, Wis.
50. Lindesmith, L., Baric, RS and Moe, CL. 2001. Evidence of a protective immune response against Norwalk like viruses. American Society for Virology, Madison, Wis.
51. Curtis, C., Yount, B. and Baric, RS. 2001. Heterologous gene expression from transmissible gastroenteritis virus replicon particles. International Symposium on Positive Strand RNA Viruses, Paris, Fr.
52. Baric, RS, Curtis, K. and Yount, B. 2001. Coronavirus heterologous gene expression vectors. International Symposium on Positive Strand RNA viruses. Paris, Fr.
53. Harrington, P., Moe, C. and Baric, RS. 2001. Systemic, mucosal and heterotypic protection against Norwalk like viruses using Venezuelan equine encephalitis virus replicons. International symposium on positive strand RNA viruses. Paris, Fr.
54. Harrington, P and Baric, RS. NLV Vaccines. Southeastern Virology Meetings, Atlanta GA, April, 2002.
55. Mcroy, W and Baric, RS. Mechanisms of MHV Cross species Transmission. Southeastern Virology Meeting, Atlanta GA, 2002.
56. McRoy, W and Baric, RS. Molecular Mechanisms of MHV Cross Species Transmission, American Society for Virology, Lexington, Ky. July, 2002.
57. Curtis, K, Yount, B and Baric, RS. Development of TGEV Replicon Particles. American Society for Virology, Lexington, Ky. July 2002.

58. Executive decision to stop listing abstracts, but on average we are providing abstracts at a rate of 4-8/yr.

IX. SERVICE

A. Professional Development/Invited Presentations

Selected Invited Presentations:

1. Studies into the Mechanism of MHV Transcription. N.C. State University, November 19,1987.
2. Studies into the mechanism for MHV transcription, May 1988, Virology Triangle Meeting.
3. Rabbit cardiomyopathy. Glaxo, Research Triangle Park, December 13, 1988.
4. AIDS, SPH Alumni Conference, April 1988.
5. AIDS, AHEC Fayetteville, NC, March 1989.
6. Modern approaches for health risk assessment, SPH Alumni Conference, May 2-3, 1990.
7. Studies into the Mechanisms of MHV Transcription and RNA Recombination. Loyola University, Department of Microbiology, Chicago, Illinois, February 6, 1991.
8. Genetics of MHV transcription. University of Pennsylvania, School of Medicine, Department of Microbiology and Immunology, Philadelphia, Pa. October 1992.
9. Transcription and Recombination Mechanisms of Mouse Hepatitis Virus, Uniformed Services, Department of Microbiology, Bethesda, MD, November 1993.
10. Convener and presentor: Coronavirus RNA transcription and Recombination, International Coronavirus Symposium, Quebec, Canada 1994.
11. Invited Speaker: International Symposium on Positive Strand RNA Viruses. Genetics of Mouse Hepatitis Virus Transcription. The Netherlands, May 26 - June 1, 1995. Audience of 600+
12. Evolutionary Mechanisms of virus persistence and interspecies spread. Univ. Colorado Health Sciences Center, Dept. of Microbiology, Denver, Co. Feb. 1996.
13. Evolutionary Mechanisms of Mouse Hepatitis virus Persistence and interspecies spread. Research Triangle Park, Triangle Virology, NC, April 1996.
14. Molecular Mechanisms of Virus Persistence and Interspecies Traffic. Vanderbilt University, Department of Microbiology, Nashville, Tn. Jan 7, 1997.
15. Invited Speaker: Molecular and Evolutionary mechanisms of virus cross species transmission. Meeting on the Pathogenesis and Cross species Transmission of Viruses. National Institutes of Health. July 1997. Audience of 400+. Part of USDA hearings on the Public Health Concerns of Xenotransplantation and virus cross species transmission. (Bethesda, Md)
16. Molecular Mechanisms of Virus Cross Species Transmission. North Carolina State University, Department of Microbiology, Oct. 1998
17. Coronavirus reverse genetics. Baylor School of Medicine, Department of Microbiology, Houston Tx. April, 2001
18. Coronavirus reverse genetics. Department of Microbiology, University of Tennessee, Knoxville, Tn. April, 2001

19. Invited Speaker: Consequences of gene order rearrangements on coronavirus replication. International Symposium on Positive Strand RNA Viruses. Paris, France. May 27-June 2, 2001. 500 in attendance.
20. Coronavirus vaccine vectors. Department of Microbiology, North Carolina State University, Sept. 2001
21. Coronavirus reverse genetics. Department of Microbiology, East Carolina University, Oct. 2001
22. Combination vaccines against swine nidoviruses. Department of Microbiology and Immunology, School of Veterinary Medicine, Univ. of Minn., Dec. 2001
23. Coronavirus Heterologous gene expression vectors. Department of Microbiology, University of Iowa, Dec. 2001.
24. Coronavirus Heterologous Gene Expression Vectors. Department of Pathobiology, Microbiology and Immunology, Univ. of Texas, Austin. Mar 2002.
25. Invited speaker, Seventh Southeastern Regional Virology Conference, Georgia State University, Atlanta Ga. April 12-14, 2002. ~150 participants
26. Coronavirus Reverse Genetics. Baylor University, Houston Texas. Department of Microbiology and Immunology. April 9, 2001.
27. Coronavirus Reverse Genetics. University of Tennessee, Department of Microbiology and Immunology, Nashville, TN. April 24, 2001.
28. Invited speaker: International Symposium on RNA Positive Strand Viruses, Paris France. May 27th-June 2nd 2001.
29. Coronavirus Reverse Genetics. East Carolina University, Department of Microbiology, Oct 3, 2001.
30. Coronavirus Reverse Genetics. University of Iowa, Department of Microbiology, Nov, 2001.
31. Coronavirus Reverse Genetics. University of Minn. Dec, Department of Path biology, School of Veterinary Medicine. 2002.
32. Coronavirus Reverse Genetics. University of Texas at College Station, Department of Pathology, March 2002.
33. Reverse Genetics using Coronavirus Infectious cDNAs. University of Texas at Galveston, Department of Microbiology and Immunology, Oct 2002.
34. Coronavirus Reverse Genetics. University of Minn, Department of Path biology, School of Veterinary Medicine. December 2002.
35. Coronavirus Reverse Genetics. University of Texas at College Station, Department of Pathology, March 2002.
36. Reverse Genetics using Coronavirus Infectious cDNAs. University of Texas at Galveston, Department of Microbiology and Immunology, Oct 2002.
37. Coronavirus Reverse Genetics. Layola University School of Medicine, March 2003.
38. Invited Speaker: Engineering the Genomes of Microorganisms. DARPA Meeting on “Synthetic Biology”, Menlo Park, California. March 2003.
39. Invited Speaker: Coronavirus Vaccines. NIAID. SARS: Developing a Research Response, May 30, 2003.
40. Invited Speaker: Susceptibility to Norovirus Infections. International Glycovirology Meeting, Sweden. June 2003.

41. Coronavirus Reverse Genetics. Mount Siani School of Medicine, New York. Sept 9, 2003.
42. University of Colorado, Health Sciences Center. Sept. 2003. SARS Reverse Genetics.
43. Focus Technology: Expert Consultant: Norovirus Pathogenesis and SARS-CoV Pathogenesis, Sept. 2003.
44. World Health Organization: SARS: Oct 29-Nov1, 2003. Geneva Switzerland. Invited Speaker.
45. SARS CoV Pathogenesis and Reverse Genetics. Jan 6-11th, 2004. Keystone Colorado. Invited speaker: Bioterrorism and Emerging Infectious Diseases: antimicrobials, therapeutics and immune modulators.
46. SARS CoV Reverse Genetics. Emory University, Jan 15th, 2004.
47. Cruising with Noroviruses. Southeastern Viroogy Conference, Atlanta Ga. March 26th-28th, 2004. Keynote Address.
48. SARS-CoV Genome Organization and Replication. American Society for Virology. Invited Speaker, May 24-27th, 2004. New Orleans
49. Cruising with Noroviruses. International RNA Positive Strand RNA Virus Meeting. May 27-30th, 2004. Invited Speaker. San Francisco, Calif.
50. SARS-CoV Reverse Genetics, Beijing, China. July 2004.
51. Invited Seminar Speaker, Sept 29, 2004. University of Virginia. Title: TBA.
52. SARS-CoV Genetics and Pathogenesis, Madrid Spain, Oct 2004.
53. SARS Pathogenesis, Regional Center for Excellence, Durham, NC (Invited speaker). Nov 2004.
54. SARS-CoV Pathogenesis. The US-Japan Cooperative Medical Science Program 40th Anniversary Meeting Kyoto, Japan December 7-10, 2004 (Invited speaker)
55. SARS-CoV Replication and Genetics. Department of Microbiology, University of Utah, Mar, 2005.
56. Coronavirus Reverse Genetics and Pathogenesis, University of Washington, Seattle, WA. April, 2005. (Invited speaker)
57. Synthetic Coronaviruses. Biohacking: Biological Warfare Enabling Technologies, June 2005. Washington, DC. DARPA/MITRE sponsored event. Invited Speaker
58. SARS-CoV Genetics and Pathogenesis. American Society for Virology, College Park, Penn State University. June 2005. "State of the Art Lecturer"
59. SARS-CoV Genetics and Vaccine Development. International Nidovirales Conference, Colorado, June 2005. Invited keynote speaker.
60. Coronavirus Cross Species Transmission Mechanisms. NIH Workshop, Sept 2005. Emergence of new epidemic viruses through host switching. (Invited Speaker).
61. Human Coronavirus Pathogenesis and Genetics. Charles Gould Easton Seminar series, Department of Immunology, University of Toronto. Sept. 2005. (Invited Speaker)
62. SARS-CoV Pathogenesis. Department of Microbiology, UCLA. Sept 2005. (Invited speaker).
63. SARS-CoV Pathogenesis and Replication, University of Pittsburg, 2006.
64. American Society for Virology, Keynote Speaker, July 2006.
65. Synthetic Genomics. March 27-28. Washington, DC. 2006

66. SARS-CoV Pathogenesis. University of Washington, March 7, 2006.
67. Genetics of SARS-CoV Pathogenesis. Vanderbilt University. May 9, 2006.
68. Biosafety and SARS-CoV. American Society for Microbiology, National Meeting Orlando Florida. May 22, 2006.
69. Synthetic biology Workshop. Synthetic Reconstruction of Viral Genomes. June 1, 2006; Washington DC.
70. Plenury Address, American Society for Virology. Madison Wisconsin, July 2006. SARS-CoV Pathogenesis
71. Synthetic Virology. NSAAB Meeting, Washington DC, July 2006
72. SARS-CoV Pathogenesis, University of Kentucky, Sept. 2006.
73. Genetics of SARS-CoV Pathogenesis. SARS Workshop, Paris, Fr. Oct, 2007
74. SARS-CoV Pathogenesis, North Carolina State University, Feb, 2007.
75. Norovirus Pathogenesis, UNC Chapel Hill, Friday Morning ID Seminar, March 2007
76. SARS-CoV Innate Immunity, University of Florida, April, 2007.
77. Norovirus Pathogenesis, Layola University, Chicago, May 2007.
78. Norovirus Vaccine Design, NIH Food and Waterborne Disease Network Vaccine Development Meeting. Baltimore, Md. May 2007.
79. Synthetic Virology, American Society for Mircobiology, Toronto, Ca. May 2007.
80. Rewiring Coronavirus Genomes, Positive Strand RNA Virus Meeting, Washington, DC, May 2007.
81. Genetics of SARS-CoV Pathogenesis and Norovirus Evolution and Pathogenic Mechanisms, University of Madrid, Spain. June 2007.
82. Norovirus Pathogenesis and Vaccine Design. Atlanta GA. SERCEB Planning Meeting. June 2007.
83. Genetics of SARS-CoV Pathogenesis, University of Amsterdam, The Netherlands, June 2007
84. SARS-CoV Pathogenesis, Vaccine Design and Therapeutics, NIH Advisory Meeting and Planning Committee, Oct 1-2, 2007.
85. Norovirus Evolution and Persistence in Human Populations, Invited Speaker, International Calicivirus Meeting, Cancun Mexico, Nov 2007.
86. SARS-CoV Antagonism of Host Innate Immunity, University of Penn, Department of Microbiology, April 2008.
87. Norovirus Evolution and Persistence, Invited Speaker, American Society for Microbiology, Boston, MA June 2008
88. Mechanisms of Coronavirus Cross Species Transmission. American Society for Virology, medical virology working group, July 2008.
89. Norovirus Pathogenic Mechanisms, Louisiana State University, Baton Rogue, Oct 2008.
90. Synthetic Virology, Invited Speaker, Synthetic Biology 4.0, Hong Kong, China. Oct 2009.
91. Synthetic Virology and Biodefense, American Society for Microbiology and Biodefense Meeting, Baltimore Feb 2009. Invited speaker.
92. SARS Pathogenesis Seminar-University of Arkansas-April 2010

93. Synthetic Genomics National RCE meeting. Las Vegas, NV. Invited Speaker. April 2010.
94. Systems Virology Meeting. Madison, WI Invited Speaker. May 2010.
95. Positive Strand Meeting. Atlanta, GA. Invited Speaker. May 2010.
96. System Biology and Immune Response. Veyrier du Lac France. Invited Speaker. June 2010.
97. American Society for Virology. Bozeman Montana. Session Host, 14 presentations. July 2010.
98. NIAID Workshop on Dengue Virus Infection & Immunity. Portland, OR. Invited Speaker. August 2010.
99. PNWRCE Meeting. Invited Speaker. September 2010.
100. SERCEB Meeting. Presenter. October 2010.
101. International Calici Virus Meeting. Santiago, Chile. Keynote address. October 2010.
102. University of Texas, Austin, TX Invited Seminar. October 2010.
103. St. Louis, MO. Invited Seminar November 2010
104. Systems Virology Meeting. Boston, MA. Invited Speaker. November 2010.
105. University of TX. Galveston. Invited Seminar. November 2010.
106. Arterivirus Meeting. Chicago, IL Keynote Speaker. December 2010
107. University of Iowa. Invited Seminar. December 2010.
108. Gordon Conference, Invited Speaker. Ventura, CA. March 2011.
109. National RCE meeting. Presenter. Denver, CO April 2011.
110. Vaccines and Adjuvants for Emerging Infectious Diseases. Invited Speaker. Montego Bay Jamaica. May 2011
111. BSEG Meeting, Richmond, VA. May 2011.
112. International Nidovirus Conference. June 2011
113. Molecular Basis of Disease Research Day, Keynote Speaker, Georgia State University. June 2011
114. WHO. Geneva Switzerland. Invited Speaker. June 2011.
115. 27th International Mammalian Genome Conference, 2 lab presentations, Education session, Salamanca, Spain July 2013
116. Campus Universidad Autonoma, Cantoblanco, Invited Lecturer, Madrid Spain July 2013
117. St. Louis University, Invited Speaker, “Cruising with Noroviruses”
118. St. Louis, MO Oct 2013
119. 5th Int’l Conference on Calicivirus, State of Art Speaker. 3 lab presentations, Beijing, China Oct 2013
120. 43rd Annual Symposium-Eastern Pennsylvania Branch-American Society for Microbiology, Invited Speaker “Emerging Human Coronaviruses including SARS and MERS-COV: Mechanisms of cross-species transmission”, Philadelphia, PA Nov 2013
121. BSC program review, NIH invited reviewer, Washington, DC Dec 2013
122. RTI-DOD review meeting. Participant. Washington DC, Dec 2013
115. Emerging Viral Diseases Meeting, IOM Forum, Invited participant. Washington, DC Mar 2014

116. 3rd WHO meeting for Improving Influenza Vaccine Virus Selection, Invited Speaker/consultant. Geneva Switzerland. April 2014
117. Mahy Lecture, Guest Lecturer, Emory University, Atlanta, GA May 2014
118. 27th International Conference on Antiviral Research, Invited Speaker. Raleigh, NC. May 2014
119. XIIIth International Nidovirus Symposium, Invited Speaker. Salamanca Spain June 2014
120. Common Barriers in Vaccine Research & Development, Invited Speaker, Rockville, MD. June 2014
121. American Society for Virology Annual Meeting, Plenary Talk, (13 lab presentations) Ft Collins, CO June 2014
122. Symposium, "Virology in the Last 4 decades: Breakthroughs & Benefits" Invited speaker. Rotterdam, Netherlands July 2014
123. Congress. International Union of Microbiological Societies. "Pathogenic mechanisms of emerging coronaviruses". Invited Speaker. Montreal Canada July 2014
124. Systems Biology of Infectious Diseases: Pathogenesis to Personalized Medicine. Invited Speaker. Seattle, Washington August 2014
125. Workshop. NIAID Human Rotaviruses and Noroviruses: Models for Understanding Virology, Cell Biology and Treatment/Prevention Strategies. Invited Speaker. Washington DC September 2014
126. American Society for Tropical Medicine and Hygiene. 3 presentations from lab. New Orleans, LA November 2014
127. Biological Safety Experts Group. Presenter. Washington DC Dec 2014
128. 11th Annual One Medicine Symposium, Invited Speaker Durham NC Dec 2004
129. Systems analysis and host-pathogen interactions Meeting, Invited Speaker. San Diego, CA
130. US-Japan Cooperative Medical Science Program 17th International EID Conference. Invited Speaker. Taipei, Taiwan Jan 2015
131. BSEG meeting, Washington DC, Presenter, Mar 2015
132. University of Kentucky, Invited Speaker, Louisville, KY Mar 2015
133. MERS-CoV Stakeholders Workshop, Invited participant, Washington, DC April 2015
134. UC Irvine, Invited Speaker Irvine California May 2015
135. Gilead Sciences, Inc. Collaborative meeting. Invited Speaker Foster City, CA May 2015
136. BSEG meeting, Meeting attendee, Washington DC, June 2015

X. UNC Patent/Invention Reports

A. US. Patent No. 6,593,111. 2003. Ralph S. Baric, Boyd Yount. Directional Assembly of Large Viral Genomes and Chromosomes.
B. US Patent No. 7,279,327, 2007. Ralph S. Baric, Boyd Yount, Kristopher Curtis. Methods for Producing Recombinant Coronavirus
C. US Patent No.7,618,802. Ralph S. Baric, Kristopher Curtis, Rhonda Roberts, Boyd Yount. Methods and Compositions for Infectious cDNA of SARS Coronavirus.

D. US Patent Pending. Application #: 12/875367. Ralph S. Baric, Anna LoBue, Joseph M. Thompson, Robert E. Johnston, and Lisa Lindesmith. Multivalent Immunogenic Compositions against Noroviruses and methods of use.
E. Invention Report (Protected under US Patent 6,593,111). Dengue virus infectious clone: Methods for producing recombinant Dengue Viruses. Ralph S. Baric, Boyd Yount, William Messer and Aravinda de Silva.
F. WIPO/PCT International Publication Number WO 2014/145245 A2. Ralph S Baric, Lisa C Lindesmith, Kari M Debbink, Eric F Donaldson, Jesica A Swanstrom. Methods and Compositions for Norovirus Blockade Epitopes.

XI. Grant Review

A. Grant Review-pre1998

1. USDA, Molecular Biology/Gene Animal Structure, 1988-2002
2. NIH AID Ad Hoc reviewer 1992 (1 proposal)
3. Veterans Administration 1992, 1996 (1 proposal each)
4. NIH Evolution of Infectious Diseases, Special ad hoc committee. July 1997
5. Programme de Recherche Fondamentale en Microbiologie et Maladies Infectieuses et Parasitaires French Government 1998 (1 proposal).

A2. Grant Review 1999:

1. NIH MBRS Score: primary reviewer 7 grant applications from University of Puerto Rico MBRS-SCORE PROGRAM, Decide which proposals are submitted to NIH for review
2. Ad hoc reviewer United States Department of Agriculture-Animal Health and well-being
3. Ad hoc reviewer, National Institutes of Health, Experimental Virology Study Section, 1 grant, conference call

A3. Grant Review 2000-2001

1. National Institutes of Health, Genetics Study Section, Feb 2000. Ad hoc
2. National Institutes of Health, Genetics Study Section June 2000. Ad hoc National Institutes of Health, AIDS Vaccines Study Section, Sept. 2000. Conference call
3. National Institutes of Health, Genetics Study Section, Feb 2001. Ad hoc National Institutes of Health, 3. Genetics Study Section June 2001. Ad hoc.
4. Veterans Administration, Virology (March, 2001). Ad hoc.
5. Experimental Virology Study Section. Ad hoc reviewer with 6 grants to review. Oct 15-17, 2001.

A4. Grant Review 2002

1. National Institutes of Health, Genetics Study Section, Feb 2002. Ad hoc
2. AD hoc reviewer, The Welcome Trust. March, 2002

A5. Grant Review 2003

1. Genetics study section Feb and Oct, 2003. Ad hoc.
2. Experimental Virology, February, 2003. Ad hoc
3. NIH ad hoc review, Poxvirus vaccine program project. Sept 2003.

A6. Grant Review 2004

1. National Institutes of health, Experimental Virology Study Section, Feb 2004. Ad hoc member
2. National Institutes of health, Experimental Virology Study Section, Oct 2004. Ad hoc reviewer
3. National Institutes of health, Experimental Virology Study Section, Mar, 2005. Ad hoc reviewer

A7. Grant Review, 2005-09

1. Permanent Member, Virology B Study Section, Oct 2005-2009. Three Meetings/year in Oct, Feb and June. Average 6-9 grants to review per session.

XII. Other Professional Development

1. NIH MBRS External Review Committee (1999-2010) National Institutes of Health, MBRS SCORE Proposal for the University of Puerto Rico at San Juan. Visit yearly and review the UPR MRBS SCORE NIH PROGRAM PROJECT GRANT (a compilation of 17 NIH grants to a minority institution), recommended and reviewed new grants for submission to NIH as part of MBRS SCORE (5 projects), reviewed individual PI progress (5 funded applications), reviewed UPR research infrastructure and made recommendations to the Chancellor and Dean of the Medical School for enhancing basic and clinical research on campus.
2. Task force on Veterinary Virology-American Society for Virology
3. Veterinary Virology Finance Committee-American Society for Virology
4. Manuscript Review/Editorial Boards:
    a. Editorial Board, Journal of Virology 2004-2006.
    b. Editorial board, Journal of Virology, 2007-.
    c. Associate Editor, Plos Pathogen 2007-2008.
    d. Senior Editor, Plos Pathogens 2008-2014.

5. University and Department Committees:
    a. UNC-School of Public Health Shop Committee, 1987-89
    b. Departmental (Parasitology and Lab Practice) Curriculum Committee, 1987-1990
    c. Co-Chair, Parasitology Departmental Space Committee, 1987, 1988
    d. Infectious Disease Program Task Force, 1988
    e. UNC-School of Public Health Safety Committee, 1988-1989
    f. Epidemiology Doctoral Program Committee, 1990-95
    g. Infectious Disease Program Committee, 1990-present
    h. Epidemiology Laboratory Committee, 1991-present, Chair
    i. University Recombinant DNA Committee (1996-2001)
    j. Space Committee (School of Public Health) 1998-2009
    k. BSL-3 Team Committee (University wide) 2012-present
    l. Task Force for Select Agents (University wide) 2013-present
    m. School of Public Health Appointment and Promotion Committee 2014-present

6. Meeting Organization, Planning and Committees:
    a. International RNA Positive Meeting Steering Committee, Atlanta 2010
    b. International Calcivirus Conference Steering Committee, Chile 2010
    c. International Nidovirus Conference Steering Committee, US 2011
    d. Systems Biology Conference, Host: Chapel Hill, NC 2011
    e. International Nidovirus Conference Steering Committee, US 2014

7. Faculty Mentorship Committee
    a. Raymond Pickles, Associate Professor, Microbiology and Immunology
    b. Jason Whitmire, Assistant Professor, Genetics
    c. Jennifer Smith, Research Assistant Professor, Epidemiology
    d. Amy Sims, Research Assistant Professor, Epidemiology
    e. Martin Ferris, Research Assistant Professor, Genetics
    f. Kathleen Dorsey, Research Assistant Professor, Epidemiology
    g. Rachel Graham, Research Assistant Professor, Epidemiology
    h. Patricia Basta, Research Assistant Professor, Epidemiology

XIII. Student and Postdoc Training

A. Current Students-Dissertation Advisor

1. Kayla Peck 2013-2016
2. Emily Gallichotte Fall 2014-Present
3. Anne Beall Fall 2014- Present
4. Kenneth Dinnon 2016-Present

B. Current Postdoctoral Research Associate

1. Dr. Lisa Gralinski, 2008- present
2. Dr. Alexandra Schaefer, 2010-present
3. Dr. Vineet Menachery, 2010-present
4. Dr. Douglas Widman, 2013-present
5. Dr. Jessica Plante, 2014-present
6. Dr. Jacob Kocher, 2014-present
7. Dr. Adam Cockrell, 2014-present
8. Dr. Kara Jensen, 2015-present
9. Dr. Sarah Leist, 2016-present

C. Current Research Faculty

1. Dr. Amy Sims
2. Dr. Rachel Graham
3. Dr. Timothy Sheahan

D. Staff Supported by Baric Laboratory

1. Boyd Yount-1990-present
2. Lisa Lindesmith 1999-present
3. Trevor Scobey 2009-present
4. Jesica Swanstrom 2010-present

E. Dissertation Committee Member

1. John Meschke (ENVR)
2. Fu-Chih Hsu (ENVR)
3. Jin Haw Chou, (EPID)
4. Julie Smith (ENVR)
5. Rebecca Cleveland (EPID)
6. Nicole Gregoricus (ENVR)
7. Amy Pickard (Epid), graduated Spring 2004
8. Jennifer Konnapka (M&I), graduated Spring 2007
9. Cindy Ma (Epid), graduated Spring 2007
10. Jason Simons (M&I) graduated Spring 2010
11. Catherine Cruz (M&I) graduated Spring 2010

12. Amy Wollish (M&I)
13. Alina Lotstein (M&I)
14. Kari Hacker (M&I)
15. Yang Zhou (M&I)
16. Bronwyn Gunn (M&I)
17. Richard Watkins (M&I)
18. Kizzmekia Corbett (M&I)
19. Jennifer McGraw (M&I)
20. Paul Maurizio (Genetics)

F. Former Postdoctoral Fellows

1. Sheila Peel, Senior Researcher, Walter Reed Medical Institute
2. Lorraine Alexander, Research Assistant Professor, Dept. of Epidemiology, UNC Chapel Hill
3. Carol Shieh, Research Scientist, Food and Drug Administration
4. Amy Sims, 2002-2005 Research Assistant Professor, UNC-CH
5. Kirk Prutzman, 2006-2008, Food and Drug Administration
6. Damon Deming, 2007-2009Food and Drug Administration,
7. Matthew Frieman, 2004-2009 Assistant Professor, Univ. of Maryland
8. Barry Rockx, 2004-2008 University of Texas, Galveston
9. Eric Donaldson, 2008-2009, Research Scientist, Food and Drug Administration
10. William Messer, 2008-2012, Asst Professor, Oregon Health Science University
11. Rachel Graham, 2007-2013, Research Assistant Professor, UNC-CH
12. Sudhakar Agnihothram, 2008-2014, Fellow, Food and Drug Administration
13. Schafer, Alexandra, 2010-2012, Research Associate, UNC-CH
14. Gralinski, Lisa 2008-2013, Research Associate, UNC-CH
15. Widman, Douglas 2013-2015, Research Associate, UNC-CH
16. Cockrell, Adam, 2014-2016, Research Associate, UNC-CH

G. Former Doctoral Students

1. Mary Schaad (Epid), Fall 1987- Spring 1994 Senior Scientist Ambion
2. Kaisong Fu (Epid), Fall 1989-Spring 1995 Senior Scientist, RTP
3. Sheila Peel (Epid), Fall 1986-1990 Research Scientist, Walter Reed Medical Center
4. Lisa Hensley, (Epid) spring 1994-1999, Senior Scientist USAMRIID
5. Kristopher Curtis, Fall 1998-Fall 2003, Senior Scientist, INDEXX.
6. Patrick Harrington, Fall 1999-Fall 2003, FDA
7. Will McRoy (Micro) Fall 2001-2006, Assistant Professor
8. Damon Deming (Micro), Fall1999- Spring 2007, FDA
9. Anna LoBue (Micro) PhD Fall 2002-Spring 2008
10. Eric Donaldson (Micro) PhD Spring 2004-Spring 2008, FDA
11. Timothy Sheahan (Micro) PhD Fall 2003- Spring 2008, Res Assistant Professor, UNC
12. Meagan Bolles (Micro) Md, PhD Fall 2008 –Spring 2013, Medical Student, UNC
13. Kari Debbink (Micro) PhD Fall 2010-Spring 2014, Postdoctoral fellow, NIH
14. Allison Totura (Micro) PhD Fall 2007-Spring 2014, USAMRID