CURRICULUM VITAE

Michael L. Grantham, Ph.D.

Notarization: I certify that this *curriculum vitae* is a current and accurate statement of my professional record.

Signature:  **Date: 08/31/2016**

Personal Information

Assistant Professor
Department of Biology
Missouri Western State University
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Saint Joseph, MO 64507
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Education/Training

Louisiana State University Health Sciences Center; Shreveport, Louisiana
Ph.D. in Microbiology and Immunology, 2006

Emporia State University; Emporia, Kansas
B.S. in Chemistry and Biology (Double Major); Emphasis in Microbial and Cellular Biology, 2000
magna cum laude

Employment History

8/2016-Present Assistant Professor
Department of Biology
Missouri Western State University
Saint Joseph, MO

9/2010-8/2016 Assistant Research Professor
University of Maryland School of Public Health
Maryland Institute for Applied Environmental Health
College Park, MD

7/2007-9/2010 Postdoctoral Research Fellow
Johns Hopkins Bloomberg School of Public Health
W. Harry Feinstone Department of Molecular Microbiology and Immunology
Baltimore, MD

6/2006-6/2007 Postdoctoral Research Assistant
Washington University School of Medicine
Department of Molecular Microbiology and Immunology
Saint Louis, MO

Research Experience

Postdoctoral Training

2007-2010 Postdoctoral Fellow
Johns Hopkins Bloomberg School of Public Health
Department of Molecular Microbiology and Immunology
Supervisor: Andrew Pekosz, Ph.D.

2006-2007 Postdoctoral Research Associate
Washington University School of Medicine
Department of Molecular Microbiology
Supervisor: Andrew Pekosz, Ph.D.

Postdoctoral Research: My research focused on the molecular determinants of influenza A virus assembly. Specifically, studies focused on the M2 ion channel protein and its role in the incorporation of internal virus components into budding virions. Using scanning alanine mutagenesis coupled with a protein *trans*-complementation system as well as the generation of recombinant viruses, specific critical sequences in the M2 cytoplasmic tail were identified. In addition, viruses that are able to replicate in the presence the normally lethal mutation of that critical residue have been identified.

Doctoral Research

Ph.D. Mentor: Martin I. Muggeridge, Ph.D.
Associate Professor
Department of Microbiology and Immunology
Louisiana State University Health Sciences Center-Shreveport

Ph.D. topic: Protein-protein interactions of glycoprotein B from herpes simplex virus type 2 were identified and characterized for their role in glycoprotein trafficking and in membrane fusion. Glycoprotein B was found to be endocytosed from the plasma membrane of infected or transfected cells, and an interaction with the AP-2 complex was important not only for the extent of endocytosis of the glycoprotein, but also for its subsequent trafficking.

Undergraduate Research

Supervisor: Michael V. Keck, Ph.D.
(Current Position)
Professor of Chemistry
Division Chair of Natural Sciences, Mathematics, and Physical Education
Keuka College

The objective of my undergraduate research was to characterize a cationic peroxidase that is produced as part of the defense response of rice. This research was carried out at Emporia State University.

Teaching

Courses Taught

Missouri Western State University

BIO251 Medical and Public Health Microbiology 4 credits

Fall 2016; Lecture - 55 students; Lab – 44 students

University of Maryland

MIEH321 From Syphilis to SARS 3 credits

Summer 2012 (online); 18 students
Fall 2013; 39 students
Fall 2014; 8 students
Fall 2015; 21 students

SPHL415 Essentials of Public Health Biology 3 credits

Fall 2014; 2 sections; 65 total students

Course Development

MIEH321 From Syphilis to SARS	Conceived of the course and developed online and traditional versions of the course from scratch

SPHL415 Essentials of Public Health Biology	Complete redevelopment of online and blended versions of the course

Undergraduate Research Supervision

Kwabena Amoateng	Fall 2015-Summer 2016; Biology Major; Physiology and Neurobiology specialization
Kazim Ackie	Summer 2015 and Summer 2016; UMSTAR fellow
Mariah Balmaceno-Criss	Fall 2014-Spring 2016; Biology Major
Maxwell Silver-Alford	Spring 2015; Environmental Health and Public Health Sciences Major
Abibatou Deng	Fall 2015; Microbiology Major
Lindsey Ferry	Summer 2013-Spring 2013 and Spring 2015; Biology Major; Cell Biology and Genetics specialization
Jenny Wang	Fall 2012-Spring 2013; Biology Major
Ashley Kang	Summer 2012-Spring 2013; Biology Major; Physiology and Neurobiology Specialization
Samuel Choi	Summer 2012-Spring 2013; Biology Major; Physiology and Neurobiology Specialization
John Sittmann	Summer 2012-Spring 2013; Biology Major; Attending Graduate School at UMD Fall, 2014

Masters Student Committee Member

Jake Guag	Fall 2010-Fall 2012; MPH student in Environmental Health Sciences

Grants and Support

<u>Completed</u>

2/15-4/16 Testable Exposome Signatures of Influenza Threats (TESt-IT). Sponsor: Intelligence Advanced Research Projects Activity.
Role: Co-Investigator; Total funds: $3,381,760

The TESt-IT project is a multidisciplinary project designed to develop methods to identify biomarkers for a hypothetical person that is developing influenza virus as a bioweapon/bioterror agent. Dr. Milton serves as Principal Investigator, and I am one of eight Co-Investigators. I lead the laboratory that is responsible for the development of biomarkers that 1) differentiate between infection and vaccination, and 2) indicate that a person has been exposed to ferrets.

9/11-9/13 Evaluating Modes of Influenza Transmission (EMIT): A Human Challenge Model. Sponsor: Center for Disease Control and Prevention
Role: Co-Investigator; Total cost: $10,000,000

This was an international collaborative effort to examine the role of aerosols in the transmission of human influenza virus. As a Co-Investigator on Dr. Milton's team, I lead the laboratory responsible for the analysis of samples from human volunteers with either natural or experimental influenza virus infection.

1/08-6/10 Training Grant Support (Postdoctoral Fellow); W. Harry Feinstone Department of Molecular Microbiology and Immunology. (PHS Grant 5T32AI007417)

The MMI training grant allowed for the support of two postdoctoral fellows. I was selected as one of those fellows from 2008-2010.

1/07-6/07 Infectious Disease Scholars Program (Postdoctoral Research Associate); Department of Molecular Microbiology and Immunology. (PHS Grant 5T32AI007172)

The Infectious Disease Scholars Program was a competitive program designed to enhance the interactions between Postdoctoral Research Associates and clinical faculty at Washington University in St. Louis.

Honors and Awards

2010 Travel Award. American Society for Virology
Honors and Awards (continued)

2005 Travel Award. American Society for Virology
2000: *magna cum laude*, Emporia State University

1995-2000: Undergraduate Scholarships: Emporia State University
Emporia State University Presidential Academic Award
Dr. John and Ruth Breukelman Scholarship
Dr. S. Winston Cram Memorial Scholarship
Dwight B. Andrews Memorial Scholarship
Alfred T. Ericson Scholarship
Mayberry Family Scholarship
Richard W. and Inez K. Owen Scholarship

Helen I. Price Scholarship
Edith D. Whitted Scholarship
Albert E. and Beulah H. Woodruff Scholarship

Reviewing Activities

Manuscript Review for Peer-Reviewed Journals

PLOSPathogens
FEBSLetters

Service

At University of Maryland

Departmental Service

Search Committees

2012 Project Director, Mid-Atlantic Public Health Training Center
2012 Postdoc, Maryland Institute for Applied Environmental Health
2012 Project Coordinator, Maryland Institute for Applied Environmental Health

Other MIEH Service

2012-Present Biological/Chemical, and Nuclear Safety Committee

Publication Statistics: According to www.researcherid.com, as of 8/31/2016, my peer-reviewed publications have been cited a total of 194 times with an average of 32.33 times per publication.

Publications

Milton DK, Fabian MP, Cowling BJ, **Grantham ML**, McDevitt JJ (2013) Influenza Virus Aerosols in Human Exhaled Breath: Particle Size, Culturability, and Effect of Surgical Masks. PLoS Pathog 9(3): e1003205. doi:10.1371/journal.ppat.1003205.

Grantham ML, Stewart SM, Lalime EN & Pekosz A. Tyrosines in the influenza A virus M2 protein cytoplasmic tail are critical for the production of infectious virus particles. (2010) Tyrosines in the influenza a virus m2 protein cytoplasmic tail are critical for production of infectious virus particles. *J Virol.* 84, 8765-76.

Grandea AG III, Olsen OA, Cox TC, Renshaw M, Hammond PW, Chan-Hui P-Y, Mitcham J, Cieplak W, Stewart SM, **Grantham ML**, Pekosz A, Hatta M, Kawaoka Y, & Moyle M. Human Antibodies Reveal a Protective Epitope that is Highly Conserved Among Human and Non-Human Influenza A Viruses. *PNAS.* 107, 12658-63.

Grantham ML, Wu WH, Lalime EN, Lorenzo M, Klein SL & Pekosz A. (2009) Palmitoylation of the influenza A virus M2 protein is not required for virus replication in vitro but contributes to virus virulence. *J Virol.* 83, 8655-61.

Muggeridge MI, **Grantham ML** & Johnson FB, (2004). Identification of syncytial mutations in a clinical isolate of herpes simplex virus 2. *Virology* 328, 244-253.

Fan ZF, **Grantham ML**, Smith MS, Anderson EA, Cardelli JA & Muggeridge MI. (2002). Truncation of herpes simplex virus type 2 glycoprotein B increases its cell surface expression and activity in cell-cell fusion, but these properties are unrelated. *J Virol.* 76, 9271-83.

Manuscripts in Preparation

Grantham ML, Pantelic J, Yan J, Liu F, Albert B, Ehrman SH, Milton, DK. Characterization of Influenza Virus Shedding in Respiratory Droplets in Naturally Infected Individuals. *Manuscript in Preparation*

Pantelic J, **Grantham ML**, Yan J, Wang J, Kang A, Liu F, Albert B, Ehrman SH, Killingly B, Van-Tam J, Milton DK and the EMIT Consortium. Comparison of Influenza Virus Shedding in Exhaled Breath Between Naturally Infected and Experimentally Infected Individuals. *Manuscript in Preparation.*

Pantelic J, **Grantham ML**, Yan J, Liu F, McDivett JJ, Ehrman SH, Milton DK. Efficiency of virus collection of the novel G-II bioaerosol collector. *Manuscript in Preparation.*

Abstracts/Meeting Presentations

Yan J, **Grantham ML**, Bueno de Mesquita PJ, Pantelic J, Ehrman SH, Milton DK. (2016) Influenza Virus in Respiratory droplets from Humans with Community-Acquired Infection. Options IX for the Control of Influenza, Chicago IL.

Bueno de Mesquita PJ, Yan J, **Grantham ML**, Pantelic J, Ehrman SH, Killingley B, Enstone J, Hewitt M, Forni J, Mann A, Gilbert A, Lambkin-Williams R, Van-Tam J, Milton DK. (2016) Influenza Virus in Respiratory Droplets Produced by Naturally and Experimentally Infected Volunteers. Options IX for the Control of Influenza, Chicago, IL

Liu H, **Grantham ML**, Pekosz A. (2015) Mutations in the Influenza A virus M1 protein complement lethal mutations in the M2 protein cytoplasmic tail. American Society for Virology, Annual Meeting. London, Ontario, Canada.

Yan J, Pantelic P, **Grantham ML**, Albert B, Liu F, Ehrman SH, Milton DK. (2015) Influenza Virus in Respiratory Droplets from Humans with Community Acquired Infection. American Association for Aerosol Research. 34th Annual Conference. Minneapolis MN.

Pantelic J, **Grantham ML**, Yan J, Liu F, Ehrman SH, Milton DK. (2014). Efficiency of virus collection with the novel G-II bioaerosol collector. American Association for Aerosol Research. 33rd Annual Conference. Orlando FL.

Pantelic J, Yan J, Albert B, **Grantham ML**, Liu F, Milton DK for the EMIT Consortium (2013). Characterization of Respiratory Droplets from Community Acquired and Experimental Laboratory Influenza Infection in Humans. Options for the Control of Influenza VIII. Cape Town, South Africa. Poster.

Pantelic J, Yan J, Albert B, **Grantham ML**, Liu F, Ehrman SH, Milton DK, For the EMIT Consortium. (2013). Characterization of Respiratory Droplets from Community Acquired Infection in Humans. University of Maryland Bioscience Research and Technology Day. College Park MD. Poster.

Pantelic J, **Grantham ML**, Yan J, Milton DK, Ehrman SH. (2013). Characterization of GII with Influenza Virus. Public Health Research at Maryland. College Park MD. Poster

Milton DK, Fabian MP, Cowling BJ, **Grantham ML**, McDevitt JJ. (2013). Influenza Virus Aerosols in Human Exhaled Breath: Particle Size, Culturability, and Effect of Surgical Masks. Public Health Research at Maryland. College Park MD. Poster.

Wang MQ, May L, Albert B, Pantelic J, Yan J, Ehrman SH, **Grantham ML**, Liu F, Choudhury A, Milton D. (2013). Evaluating Modes of Influenza Transmission. Public Health Research at Maryland. College Park MD. Poster.

Grantham ML & Pekosz A. (2010). Identification of a tyrosine residue in the cytoplasmic tail of the influenza A virus M2 protein that is critical for infectious virus production. American Society for Virology, Annual Meeting. Bozeman MT. Oral Presentation.

Grantham ML & Pekosz A. (2008). Role of M2 posttranslational modification in the production of infectious H3N2 and H1N1 influenza A viruses. Keystone Symposia: Molecular Basis for Biological Membrane Organization. Big Sky MT. Poster.

Grantham ML & Pekosz A. (2007). Role of M2 palmitoylation in the production of infectious H3N2 and H1N1 influenza A viruses. American Society for Virology, Annual Meeting. Corvallis OR. Poster.

Grantham ML & Muggeridge MI. (2006). Identification of cell proteins potentially involved in regulating HSV-2-mediated membrane fusion and/or virion assembly. LSUHSC FWCC Barlow Symposium. Poster.

Grantham ML & Muggeridge MI. (2005). Glycoprotein B of herpes simplex virus type 2 interacts with the clathrin adaptor AP-2. American Society for Virology, Annual Meeting. Hershey PA. Oral Presentation.

Grantham ML & Muggeridge MI. (2005). Identification of cell proteins potentially involved in regulating HSV-2-mediated membrane fusion and/or virion assembly. LSUHSC FWCC Barlow Symposium. Poster.

Grantham ML & Muggeridge MI. (2004). Regulation of herpes simplex virus type 2 membrane fusion. Southeastern Regional Virology Meeting of American Society for Microbiology, Atlanta GA. 2004. Oral Presentation.

Grantham ML & Muggeridge MI. (2004). Regulation of herpes simplex virus type 2 membrane fusion. Annual Graduate Student Research Day. LSUHSC. Shreveport LA. Poster.

Grantham ML & Muggeridge MI. (2004). Regulation of HSV-2 membrane fusion. LSUHSC FWCC Barlow Symposium. Poster.

Li W, Minova T, **Grantham ML** & Muggeridge MI. (2003). Identification of functional domains in glycoprotein B of HSV-2. 28th International Herpesvirus Workshop. Madison WI. Poster.

Grantham ML & Muggeridge MI. (2003). Regulation of herpes simplex virus type 2 membrane fusion. American Society for Microbiology, South Central Meeting. New Orleans LA. Oral Presentation.

Grantham ML & Muggeridge MI. (2003). Role of syncytial mutations in glycoprotein B of HSV-2. LSUHSC FWCC Barlow Symposium. Poster.

Grantham ML, Muggeridge MI, & Johnson FB (2002). Novel mutations in syncytial clinical isolates of HSV-2. 27th International Herpesvirus Workshop, Cairns, Australia. Poster.

Grantham ML & Muggeridge MI. (2002). Role of syncytial mutations in the glycoprotein B gene of HSV-2. South Central Branch of American Society for Microbiology. Jackson MS. Oral Presentation.

Keck MV, **Grantham ML** & Leach JE (1999). Characterization of a rice cationic peroxidase associated with the defense response. 34th Annual Meeting of the Midwest Region of the American Chemical Society, Quincy IL. Poster.

Invited Talks

Emporia State University, Department of Biology Seminar, February 2004.