CURRICULUM VITAE

NAME: Teresa Rene' Johnson

WORK ADDRESS: Edward Via College of Osteopathic Medicine
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EDUCATION

Liberty University
Lynchburg, Virginia
August 1981 - December 1985
B. S. Mathematics (major) Chemistry, Psychology (minors)
May 1986

Radford University
Radford, Virginia
January - May 1986

Medical College of Virginia/Virginia Commonwealth University
Richmond, Virginia
August 1986 - April 1990
M.S. Microbiology/Immunology
May 1990

Vanderbilt University School of Medicine
Nashville, Tennessee
August 1994 - August 1999
Ph.D. Microbiology/Immunology

CAREER DEVELOPMENT CERTIFICATES

Essentials of Supervision, August – December 2008
Practical Management Skills – Effective Time Management, March 2010

EMPLOYMENT

Edward Via College of Osteopathic Medicine
Chair, Microbiology and Immunology – December 2013 – present

Assistant Professor, Department of Biomedical Affairs and Research – February 2014 – present

GenVec Incorporated

Research Scientist I – May 2011 – July 2012
Research Scientist II – August 2012 – June 2013

Vaccine Research Center (VRC), National Institute of Allergy and Infectious Diseases, National Institute of Health

Staff Scientist, Viral Pathogenesis Laboratory (VPL) – May 2001 – May 2011
Post-doctoral fellow – December 2000 – May 2001

Vanderbilt University School of Medicine

Post-doctoral fellow – June 1999 – November 2000

Medical College of Virginia/Virginia Commonwealth University

Senior research associate – April 1990 – July 1994

MEMBERSHIPS

Clinical Cytometry Society (1992-1994)
Virginia Regional Flow Cytometry Users' Group (1991-1994)
Richmond Chromatography Discussion Group (1991-1994)
Microbes and Defense Academic Society (1995-2000)
Events Coordinator, 1996-1999
Senior Member, 1999-2000
International Society for Infectious Diseases (2013)
International Cytokine and Interferon Society (1996-present)
Society for Leukocyte Biology (2005-present)
American Association of Immunologists (1998-present)
American Society for Microbiology (2004-present)

PATENTS

Graham BS, **Johnson, TR**. Codon Modified Immunogenic Compositions and Methods of Use. **Patent: US-20100247621 A1.**

Graham BS, Buck CB, **Johnson TR**, Kines RC, Nicewonger JD, Roberts JN, Schiller JT Use Of Hpv Virus-like Particles To Deliver Gene-based Vaccines. **Patent pending: WO2009092113.**

GRANT REVIEWER FOR:
The Medical Research Council, South Africa
The Graduate Women in Science
National Science Foundation

JOURNAL EDITOR FOR:
The Journal of Human Virology and Retrovirology
MOJ Immunology

JOURNAL REVIEWER FOR:
The Journal of Clinical Microbiology 2002-present
Virology 2003-present
The Journal of Virology 2003-present
The Journal of Immunology 2004-present
Vaccine 2004-present
Expert Reviews of Vaccines 2004-present
American Journal of Respiratory and Critical Care Medicine 2004-present
Medical Science Monitor 2005-present
Clinical and Experimental Immunology 2005-present
Antimicrobial Agents and Chemotherapy 2005-present
Expert Review of Anti-Infective Therapy 2007-present
PLoS ONE 2010-present
Antiviral Research 2011-present
Clinical and Vaccine Immunology 2011-present
Immunology 2011-present
Viruses 2012-present

PRESENTATIONS

Johnson, T. R. and S. Ruddy. Isotype-Specific Potentiation of the Alternative Complement Pathway. Regional Meeting of the American Society of Microbiologists. Richmond, Virginia. December 1-2, 1989.

Johnson, T. R., S. Ruddy, J. Knisely, and S. H. Schnoll. Evaluation of Immune Parameters During Acute Cocaine Withdrawal in Pregnant Abusers. Clinical Applications of Cytometry. Charleston, SC. September, 1991.

Johnson, T. R. and S. Ruddy. Separation of Fab and Fc Immunoglobulin Fragments by Mono-Q Sepharose HPLC Chromatography. ChromFare '92. Richmond, VA. October, 1992.

Johnson, T. R. and S. Ruddy. Flow Cytometric Analysis of Neutrophils During Activation by Crosslinking of $Fc_{\gamma}RII$. Virginia Regional Flow Cytometry Workshop. Richmond, VA. May 12, 1993. Clinical Applications of Cytometry. Charleston, SC. September 14-19, 1993.

Johnson, T. R., P. Veldkamp, and B. S. Graham. Interleukin-4 Co-Expression by RSV-F-Vaccinia Recombinants at Priming Enhances Illness in IL-4 Deficient Mice Following Viral Challenge. First International Meeting of the International Cytokine Society. Geneva, Switzerland. October 6-10, 1996.

Johnson, T. R., S. R. Roberts, G. W. Wertz, and B. S. Graham. Presence of Soluble Glycoprotein G of Respiratory Syncytial Virus during Priming Predisposes for Severe Illness Upon Challenge. RSV After 40 Years - A Symposium. Kiawah, SC. November 9-12, 1996.

Johnson, T. R. and B. S. Graham. Respiratory Syncytial Virus (RSV) Secreted G Protein Induces Eosinophilia, IL-5, and Eotaxin Independently of IL-4. Keystone Symposia: Molecular Aspects of Viral Immunity. Tamarron, CO. February 16-22, 1998.

Johnson, T. R. and B. S. Graham. Respiratory Syncytial Virus (RSV) Secreted G Protein Induces Eosinophilia, IL-5, and Eotaxin Independently of IL-4. Southeast Regional Virology Conference. Atlanta, GA. April 10-12. 1998.

Johnson, T. R., S. Hong, L. Van Kaer, and B. S. Graham. Delayed Viral Clearance and Decreased Illness and IFN-γ Production in CD1 -/- Mice Following Infection with Respiratory Syncytial Virus. Workshop on NK T Cells and CD1 Mediated Antigen Presentation. San Diego, CA. April 8-11, 1999.

Johnson, T. R. and B. S. Graham. Secreted Respiratory Syncytial Virus G Glycoprotein Induces Pulmonary Eosinophilia by an IL-4-Independent, IL-5-Dependent Pathway. FASEB′99. Washington, DC. April 17-21, 1999.

Johnson, T. R., J. E. Johnson, L. Van Kaer, S. Hong, and B. S. Graham. Delayed Viral Clearance and Decreased IFN-γ Production and CTL Induction Following Primary Respiratory Syncytial Virus Infection of CD1 -/- Mice. RSV Symposium - RSV After 43 Years. Stuart, FL. November 8-11, 1999.

Johnson, T. R. and B. S. Graham. CD4+ T and Production of IL-5 are Required during vvGs Immunization for Eosinophilia and Type 2 Cytokine Production Following RSV Challenge. FASEB ’01. Orlando, FL. March 31 – April 4, 2001.

Johnson, T. R., J. E. Johnson, and B. S. Graham. IL-13 is Sufficient for Respiratory Syncytial Virus (RSV) G-Induced Eosinophilia Following RSV Challenge. Keystone Symposia: Molecular Aspects of Viral Immunity. Keystone, CO. April 17-22, 2001.

Johnson, T. R., P. L. Collins, M. N. Teng, and B. S. Graham. Immune Responses to Respiratory Syncytial Virus (RSV) G Glycoprotein are not Necessary for Formalin-Inactivated RSV (FI-RSV) Vaccine-Enhanced Disease. AAI 2003. Denver, CO. May 5-10, 2003.

Johnson, T. R., S. M. Varga, T. J. Braciale, and B. S. Graham. Respiratory Syncytial Virus (RSV) G-Induced Vaccine Enhanced Disease, but not FI-RSV-Induced Disease, is Mediated by Vβ14+ T Cells. AAI 2003. Denver, CO. May 5-10, 2003.

Johnson, T. R., S. M. Varga, M. N. Teng, P. L. Collins, T. J. Braciale, and B. S. Graham. The Contribution of RSV G Antigenicity to Vaccine-Enhanced Illness. RSV2003 Symposium. Stone Mountain, GA. November 8-11, 2003.

Johnson, T. R., R. A. Seder, and B. S. Graham. Co-Administration of CpG During FI-RSV Immunization Protects Against Vaccine-Enhanced Disease Following Challenge with Live Respiratory Syncytial Virus (RSV). FASEB 2004. Washington, DC. April 17-21, 2004.

Johnson, T. R. and B. S. Graham. Respiratory syncytial virus (RSV) G glycoprotein-induced eosinophilia requires IL-5, eotaxin, and CD4+ T cells: iIlness is dependent on CD4+ T cells and not eosinophils. US/Japan Glycobiology 2004. Honolulu, HI. November 17-20, 2004.

Johnson, T. R. and B. S. Graham. TLR7/8 and TLR9 agonists administered during FI-RSV immunization modulate vaccine-enhanced disease severity, but increase disease severity during primary RSV infection. RSV 2005 International Symposium. Oxford, England. September 15-18, 2005.

Johnson, C. N., C. Du, B. S. Graham, and **T. R. Johnson**. Human plasmacytoid and myeloid dendritic cells are infected and activated by respiratory syncytial virus (RSV) in a calcium-dependent manner. 2nd International Conference on Dendritic Cells at the Host-Pathogen Interface. Warrenton, VA. September 26-29, 2005.

Johnson, C. N., C. Du, B. S. Graham, and **T. R. Johnson**. Human plasmacytoid and myeloid dendritic cells are infected and activated by respiratory syncytial virus (RSV) in a calcium-dependent manner. Keystone Symposium on Viral Immunity, Steamboat Springs, CO. March 28-April 2, 2006.

Corbett, K. S., G. Edwards, **T. R. Johnson**, C. N. Johnson, B. S. Graham. The effects of respiratory syncytial virus infection on dendritic cell maturation by Toll-like receptor agonists. Undergraduate Scholarship Program Research Festival, Bethesda, MD. August 3, 2006.

T. R. Johnson, C. N. Johnson, P. L. Collins, M. E. Peeples, and B. S. Graham. Infection and maturation of dendritic cells induced by respiratory syncytial virus (RSV) and its attachment glycoprotein. 9th International Conference on Dendritic Cells. Edinburgh, Scotland. September 16-20, 2006.

Nicewonger, J., **T. R. Johnson**, J. Liu, M. Chen, and B. S. Graham. Preclinical evaluation of gene-based vaccine vectors for respiratory syncytial virus. Tenth Annual Conference on Vaccine Research. Baltimore, MD. April 30-May 2, 2007.

Johnson, T. R., Snyder, G. A., Johnson, C. N., Pierson, T. C., Sun, P. D., and Graham, B. S. RSV G glycoprotein binds DC-SIGN/R, but this interaction is not required for RSV infection. RSV2007 Symposium, Marco Island, FL. October 25-28, 2007.

Corbett, K. S., **Johnson, T. R.**, Johnson, C. N., Morrison, B. J., Edwards, G. C., Peeples, M. E., Collins, P. L., and Graham, B. S. Respiratory syncytial virus infects and matures primary myeloid and plasmacytoid dendritic cells. RSV2007 Symposium, Marco Island, FL. October 25-28, 2007.

Liu, J., **Johnson, T. R.**, Ruckwardt, T., Bonaparte, K., Nicewonger, J., Chen, M., and Graham, B. S. Identification of two novel murine CD4+ T cell epitopes in RSV M and M2 protein. RSV2007 Symposium, Marco Island, FL. October 25-28, 2007.

Johnson, T. R., C. N. Johnson, K. S. Corbett, G. A. Snyder, T. C. Pierson, P. D. Sun, M. E. Peeples, P. L. Collins, and B. S. Graham. Respiratory syncytial virus (RSV) infects and matures primary dendritic cells and DC-SIGN binds RSV attachment glycoprotein but is not required for infection. Keystone Viral Immunity Symposium, Keystone, CO. January 20-25, 2008.

Graham, B. S., J. Nicewonger, **T. R. Johnson,** M. Chen, J. N. Roberts, R. Kines, J. T. Schiller, and C. B. Buck. Papillomavirus-based mucosal delivery of DNA vaccine plasmids expressing respiratory syncytial virus antigens. Keystone Viral Immunity Symposium, Keystone, CO. January 20-25, 2008.

Johnson, T. R., C. N. Johnson, K. S. Corbett, G. Edward, and Graham, B. S. Comparative Infection and Activation of Primary Human Dendritic Cell (DC) Subsets by Respiratory Syncytial Virus (RSV). Keystone Viral Immunity Symposium, Banff, Alberta, Canada. March 21-26, 2010.

Liu, J., A. J. Pagan, T. J. Ruckwardt, M. Chen, J. D. Nicewonger, **T. R. Johnson**, M. K. Jenkins, and B. S. Graham. Epitope-Specific Regulatory CD4 T Cell Modulation of Dominant CD8 Effector Function is Tissue-Specific and Determines Kinetics of Viral Clearance and Severity of Illness. Keystone Viral Immunity Symposium, Banff, Alberta, Canada. March 21-26, 2010.

Johnson, T. R., C. N. Johnson, and B. S. Graham. Comparative Infection and Activation of Primary Human Dendritic Cell (DC) Subsets by Respiratory Syncytial Virus (RSV). Keystone Innate Immunity Symposium, Dublin, Ireland. June 7-12, 2010.

Johnson, T. R., J. O. Marceau, J. D. Nicewonger, and B. S. Graham. The Contribution of Toll-Like Receptor (TLR) 4 and CX3CR1 to Respiratory Syncytial Virus (RSV) Immunopathogenesis. 7th International Respiratory Syncytial Virus Symposium – RSV2010, Rotterdam, The Netherlands, December 2-5, 2010.

Chen, M., K. Graepel, J. Nicewonger, J. Liu, **T. R. Johnson**, D. Rangel, J. Gall, B. S. Graham. Respiratory Syncytial Virus Neutralizing Antibodies Induced by Recombinant Adenovirus Vectors. Viral Immunity Keystone Symposium. Keystone, CO. March 21-26, 2012.

Johnson, T. R., D. Rangel, G. Liao, E. M. Eastman, J. G. Gall. Induction of Broadly Neutralizing Humoral Responses by Immunization with Respiratory Syncytial Virus F-Expressing Adenovirus Vectors. 8th International Respiratory Syncytial Virus Symposium – RSV2012, Santa Fe, NM. September 27-October 1, 2013.

Gall, J. G., D. Rangel, D., **T. R. Johnson**, G. Liao, E. Eastman, B. S. Graham, D. E. Brough. Identification of Novel Genetic Vaccines for Prevention of RSV Disease. 8th International Respiratory Syncytial Virus Symposium – RSV2012, Santa Fe, NM. September 27-October 1, 2013.

Chen, M., K. Graepel, J. Nicewonger, J. Liu, **T. R. Johnson**, D. Rangel, J. G. Gall, B. S. Graham. Evaluation of Recombinant Adenovirus Candidate Vaccine Vectors Expressing RSV G in Rodents and Non-Human Primates. 8th International Respiratory Syncytial Virus Symposium – RSV2012, Santa Fe, NM. September 27-October 1, 2013.

Brough, D. E., J. Bruder, D. Ettyreddy, J. G. D. Gall, **T. R. Johnson**, C. Lazarski, D. McVey, V. Moore, and L. Wei. From Platform to Problems to Platform: Adenovirus Vectors to Meet the Product Needs for Molecular Therapeutics and Genetic Vaccines. Phacilitate 2013. Washington, DC. January 28-30, 2013.

T. R. Johnson, M. E. Peeples, P. L. Collins, and B. S. Graham. Respiratory Syncytial Virus Glycoproteins Activate Primary Human Dendritic Cells. 9th Annual VCOM Research Recognition Day. Blacksburg, VA. February 28, 2014.

T. R. Johnson, G. P. Lee, K. Tressler, D. Rangel, D. E. Brough, and J. G. Gall. Antibody-Mediated Protection from an Adenovirus-Vectored RSV Vaccine. 9th International Respiratory Syncytial Virus Symposium. Stellenbosch, South Africa. November 9-13, 2014.

T. R. Johnson, M. E. Peeples, P. L. Collins, and B. S. Graham. Respiratory Syncytial Virus Glycoproteins Activate Primary Human Dendritic Cells. 9th International Respiratory Syncytial Virus Symposium. Stellenbosch, South Africa. November 9-13, 2014.

T. R. Johnson, G. P. Lee, K. Tressler, D. Rangel, D. E. Brough, and J. G. Gall. Antibody-Mediated Protection from an Adenovirus-Vectored RSV Vaccine. 10th Annual VCOM Research Recognition Day. Blacksburg, VA. February 27, 2015.

B. Gutierrez, K. Walding, A. Norris, N. Sabzevari, S. Meacham, and **T. R. Johnson**. Effects of Boron on Immortalized Keratinocytes. 10th Annual VCOM Research Recognition Day. Blacksburg, VA. February 27, 2015.

B. Gutierrez, K. Walding, A. Gulati, M. R. Prater, and **T. R. Johnson**. Development of a Rapid Diagnostic Assay for Respiratory Tract Infection Using Differential Patterns of Pathogen-Induced Cytokine Expression. 11th Annual VCOM Research Recognition Day. Blacksburg, VA. February 26, 2016. (*NOTE: Awarded second place in student poster competition*)

K. Walding, B. Gutierrez, and **T. R. Johnson**. Development of Molecular Vaccines Against Common Nosocomial Pathogens. 11th Annual VCOM Research Recognition Day. Blacksburg, VA. February 26, 2016.

A. S. Grewal, M. R. Prater, and **T. R. Johnson**. Development of a Rapid Diagnostic Assay for Respiratory Infection: Pathogen-Induced Cytokine Expression in Cell Lines. 12th Annual VCOM Research Recognition Day. Blacksburg, VA. February 24, 2017.

T. R. Johnson and C. Chhoun. Expression of Potential Antigens for Development of Molecular Vaccines Against Common Nosocomial Pathogens. 12th Annual VCOM Research Recognition Day. Blacksburg, VA. February 24, 2017.

T. R. Johnson, S. Clark-Deener, A. S. Grewal, and M. R. Prater. Human Respiratory Syncytial Virus Infects and Activates Sheep Monocyte-Derived Dendritic Cells. 12th Annual VCOM Research Recognition Day. Blacksburg, VA. February 24, 2017.

<u>RECENT CONFERENCES ATTENDED (without presentations)</u>

17th Annual Conference on Vaccine Research, National Foundation of Infectious Diseases. Bethesda, MD. April 27-30, 2014.

9th International Respiratory Syncytial Virus Symposium. Stellenbosch, South Africa. November 9-13, 2014.

THRiVE 2015. Chantilly, VA. April 23, 2015.

Immunity in Health and Disease, the 48th Annual Meeting of the Society for Leukocyte Biology. Raleigh, NC. September 27-29, 2015.

American Society for Microbiology Conference on Antibacterial Development. Washington DC. December 11-14, 2016.

INVITED SEMINARS

October 23, 2003 – The Ohio State University/Children's Research Institute, Columbus, OH. "The Role of Respiratory Syncytial Virus G Glycoprotein in Vaccine-Enhanced Illness".

January 22, 2004 – Center for Biologics Evaluation and Research, The Food and Drug Administration, Bethesda, MD. "The Role of Respiratory Syncytial Virus G Glycoprotein in Vaccine-Enhanced Illness".

September 7, 2007 – William and Mary University, Williamsburg, VA. "The Effects of Respiratory Syncytial Virus and Its Attachment Glycoprotein on Human Dendritic Cell Function".

April 8, 2009 – Louisiana State University Health Sciences Center, New Orleans, LA. "Contributions of RSV F and G Glycoproteins to Respiratory Syncytial Virus Pathogenesis".

May 27, 2009 – National Institute for Environmental Health Sciences, Raleigh-Durham, NC. "Respiratory Syncytial Virus G Immunopathogenesis: A Case for Mis-Presentation?"

October 12, 2009 – University of Maryland Department of Veterinary Medicine, College Park, MD. "Respiratory Syncytial Virus G, Dendritic Cells, and Lectins: Friends or Foes in Viral Immunopathogenesis?".

September 18, 2013 – Via College of Osteopathic Medicine, Blacksburg, VA. "Respiratory Syncytial Virus Pathogenesis: Implications for Vaccine Development".

INVITED REVIEWS

Graham, B. S., **T. R. Johnson**, and R. S. Peebles. Immune-mediated disease pathogenesis in respiratory syncytial virus infection. *Immunopharmacology* 48:237-247, 2000. PMID: 10960663.

Graham, B. S., J. A. Rutigliano, and **T. R. Johnson**. Respiratory syncytial virus immunobiology and pathogenesis. *Virology* 297:1-7, 2002. PMID: 12083830.

Johnson, T. R. and B. S. Graham. The contribution of respiratory syncytial virus (RSV) G antigenicity to vaccine-enhanced illness and the implications for severe disease during primary RSV infection. *Pediatric Infect. Dis. J.* 23:S46-57, 2004. PMID: 14730270.

Schmidt, A. C., **T. R. Johnson**, P. J. M. Openshaw, T. J. Braciale, A. R. Falsey, L. J. Anderson, G. W. Wertz, J. R. Groothuis, G. A. Prince, J. A. Melero, B. S. Graham. Respiratory syncytial virus and other pneumoviruses: a review of the international symposium—RSV 2003". *Virus Research* 106:1-13, 2004. PMID: 15522442.

Johnson, T. R. Respiratory syncytial virus and innate immunity – a complex interplay of exploitation and subversion. *Expert Review of Vaccines* 5:371-380, 2006. PMID: 16827621.

PUBLICATIONS

Johnson, T. R. Isotype-specific activation of the alternative complement pathway. Master's Thesis. 1990.

Johnson, T. R. The role of secreted respiratory syncytial virus G glycoprotein in RSV pathogenesis. PhD dissertation. 1999.

Johnson, T. R., J. S. Knisely, J.T. Christmas, S. H. Schnoll, and S. Ruddy. Changes in immunologic cell surface markers during cocaine withdrawal in pregnant women. *Brain, Behavior, and Immunity* 10:324-336, 1996. PMID: 9045748.

Fischer, J. E., R. Kuli-Zade, **T. R. Johnson**, and B. S. Graham. Overexpression of interleukin-4 delays virus clearance in mice infected with respiratory syncytial virus. *J. Virol.* 71:8672-8677, 1997. PMID: 9343225.

Johnson, T. R., S. R. Robinson, G. W. Wertz, and B. S. Graham. Priming with secreted glycoprotein G of respiratory syncytial virus (RSV) augments interleukin-5 production and tissue eosinophilia after RSV challenge. *J. Virol.* 72:2871-2880, 1998. PMID: 9525607.

Johnson, T. R. and B.S. Graham. Secreted respiratory syncytial virus (RSV) G protein induces IL-5 and eosinophilia by an IL-4-independent mechanism. *J. Virol*. 73:8485-8495, 1999. PMID: 10482601.

Fischer, J. E., **T. R. Johnson**, R. S. Peebles, and B.S. Graham. Vaccination with pertussis toxin alters the antibody response to simultaneous respiratory syncytial virus challenge. *J. Infect. Dis.* 180:714-719, 1999. PMID: 10438359.

Fisher, R.G., J. E. Crowe, Jr., **T. R. Johnson**, Y.-W. Tang, and B. S. Graham. Passive IgA

monoclonal antibody is no more effective than IgG at protecting mice from mucosal challenge with respiratory syncytial virus. *J. Infect. Dis.* 180:1324-1327, 1999. PMID: 10479165.

Graham, B. S., **T. R. Johnson**, R. S. Peebles, and J. E. Fischer. Reply to "Filamentous hemagglutinin and pertussis toxin from *Bordetella pertussis* modulate immune responses to unrelated antigens". *J. Infect. Dis.* 182:1288-1289, 2000. PMID: 10979939.

Fischer, J. E. J. E. Johnson, **T. R. Johnson**, and B. S. Graham. Pertussis toxin sensitization alters the pathogenesis of subsequent respiratory syncytial virus infection. *J. Infect. Dis.* 182:1029-1038, 2000. PMID: 10979896.

Barr, F. E., H. Pedigo, **T. R. Johnson**, and V. L. Shepherd. Surfactant protein-A enhances uptake of respiratory syncytial virus by monocytes and U937 macrophages. *Am. J. Resp. Cell Mol. Biol.* 23:586-592, 2000. PMID: 11062136.

Johnson, T. R., J. E. Fischer, and B. S. Graham. Construction and characterization of recombinant vaccinia viruses co-expressing a respiratory syncytial virus protein and a cytokine. *J. Gen. Virol*. 82:2107-2116, 2001. PMID: 11514719.

Durbin, J. E., **T. R. Johnson**, R. S. Peebles, Jr., R. Kuli-Zade, and B. S. Graham. The role of IFN in respiratory syncytial virus pathogenesis. *J. Immunol.* 168:2944-2951, 2002. PMID: 11884466.

Johnson, T. R., J. E. Johnson, L. Van Kaer, S. Hong, and B. S. Graham. NK T cells contribute to expansion of CD8(+) T cells and amplification of antiviral immune responses to respiratory syncytial virus. *J Virol.* 76:4294-4303, 2002. PMID: 11932395.

Lee, C. G., R. J. Homer, L. Cohn, H. Link, S. Jung, J. E. Craft, B. S. Graham, **T. R. Johnson**, and J. A. Elias. Transgenic overexpression of interleukin (IL)-10 in the lung causes mucus metaplasia, tissue inflammation, and airway remodeling via IL-13-dependent and -independent pathways. *J. Biol. Chem.* 277:35466-35474, 2002. PMID: 12107190.

Johnson, T. R., R. A. Parker, J. E. Johnson, and B. S. Graham. IL-13 is sufficient for respiratory syncytial virus (RSV) G glycoprotein-induced eosinophilia following RSV challenge. *J. Immunol.*170:2037-2045, 2003. PMID: 12574374.

Rutigliano, J. A., **T. R. Johnson**, T. N. Hollinger, J. E. Fischer, S. Aung, and B. S. Graham. Treatment with anti-LFA-1 delays the CD8+ cytotoxic T-lymphocyte response and viral clearance in mice with primary respiratory syncytial virus infection. *J. Virol* 78:3014-3023, 2004. PMID: 14990720.

Johnson, T. R., P. L. Collins, M. N. Teng, and B. S. Graham. Immune responses to

respiratory syncytial virus (RSV) G glycoprotein are not required for formalin-inactivated RSV (FI-RSV) vaccine-enhanced disease. *J. Virol.* 78:6024-6032, 2004. PMID: 15141000.

Johnson, T. R., S. M. Varga, T. J. Braciale, and B. S. Graham. Vβ14+ T cells mediate the vaccine-enhanced disease induced by respiratory syncytial virus (RSV) G glycoprotein, but not with formalin-inactivated RSV. *J. Virol.* 78:8753-8760, 2004. PMID: 15280483.

McCurdy, L. H., J. A. Rutigliano, **T. R. Johnson**, M. Chen, and B. S. Graham. Modified vaccinia virus Ankara immunization protects against lethal challenge with recombinant vaccinia virus expressing murine interleukin-4. *J. Virol.* 78:12471-12479, 2004. PMID: 15507634.

Gower, T. L., M. K. Pastey, M. E. Peeples, P. L. Collins, McCurdy, T. K. Hart, A. Guth, **T. R. Johnson**, and B. S. Graham. RhoA signaling is required for respiratory syncytial virus-induced syncytium formation and filamentous virion morphology. *J. Virol.* 79:5326-5336, 2005. PMID: 15827147.

Johnson, T. R., S. E. Mertz, N. Gitiban, S. Hammond, R. LeGallo, R. K. Durbin, and J. E. Durbin. Role for innate IFNs in determining respiratory syncytial virus immunopathology. *J. Immunol.* 174:7234-7241, 2005. PMID: 15905569.

Johnson, T. R., M. E. Rothenberg, and B. S. Graham. Pulmonary eosinophilia requires interleukin-5, eotaxin, and CD4+ T cells in mice immunized with respiratory syncytial virus G glycoprotein. *J. Leuk. Biol.* 84:748-759, 2008. PMID: 18519743.

Liu, J., T. J. Ruckwardt, M. Chen, **T. R. Johnson**, and B. S. Graham. Characterization of respiratory syncytial virus M and M2-specific CD4+ T cell responses in a murine model. *J.Virol.* 83:4934-4941, 2009. PMID: 19264776.

Johnson, T. R., S. Rao, R. A. Seder, M. Chen, and B. S. Graham. TLR9 agonist, but not TLR7/8, functions as an adjuvant to diminish FI-RSV vaccine-enhanced disease, while either agonist used as therapy during primary RSV infection increases disease severity. *Vaccine* 27:3045-3052, 2009. PMID: 19428918.

Graham BS, R. C. Kines, K. S. Corbett, J. Nicewonger, **T. R. Johnson**, M. Chen, D. Lavigne, J. N. Roberts, N. Cuburu, J. T. Schiller, C. B. Buck. Mucosal delivery of human papillomavirus pseudovirus-encapsidated plasmids improves the potency of DNA vaccination. *Mucosal Immunol.* 3:475-486, 2010. PMID: 20555315.

Liu, J., T. J. Ruckwardt, M. Chen, J. D. Nicewonger, **T. R. Johnson**, and B. S. Graham. Epitope-specific regulatory CD4 T cells reduce virus-induced illness while preserving CD8 T cell effector function at the site of infection. *J. Virol.* 84:10501-10509, 2010. PMID: 20686045.

Johnson, T. R., C. N. Johnson, K. Corbett, G. C. Edwards, and B. S. Graham. Primary human mDC1, mDC2, and pDC dendritic cells are differentially infected and activated by respiratory syncytial virus. *PLoS ONE* 6:e16458. doi:10.1371/journal.pone.0016458, 2010. PMID: 21297989.

Thakur, S. A., Z. Zalinger, **T. R. Johnson**, B. S. Graham, and F. Imani. PKR is a novel mediator of CD40 signaling and plays a critical role in modulating RSV-specific immunoglobulin expression. *Clinical and Vaccine Immunity* 18:2060-2066, 2011. PMID: 21994357.

Johnson, T. R., J. S. McLellan, and B. S. Graham. Respiratory syncytial virus glycoprotein G interacts with DC-SIGN and L-SIGN to activate ERK1 and ERK2. *J. Virol.* 86:1339-1347, 2012. PMID: 22090124.

Hillyer. P., N. Raviv, D. M. Gold, D. Dougherty, J. Liu, **T. R. Johnson**, B. S. Graham, R. L. Rabin. Subtypes of type I IFN enhance cytokine expression by suboptimally stimulated CD4+ T cells. *Eur. J. Immuno.* 43:3197-208, 2013. PMID: 24030809.

Quinn, K. M., A. Yamamoto, A. Costa, P. A. Darrah, R. W. B. Lindsay, S. Hegde, **T. R. Johnson**, B. Flynn, K. Lore, and R. A. Seder. Co-Administration of poly I:C and ISCOMs modifies antigen processing in DC subsets and enhances HIV gag-specific T cell immunity. *J. Immunol.* 191:5085-5096, 2013. PMID: 24089189.

Johnson, T. R., D. Rangel, B. S. Graham, D. E. Brough, and J. G. Gall. Genetic vaccine for respiratory syncytial virus provides protection without disease potentiation. *Molecular Therapy*, 22:196-205, 2014. epublished June 10, 2013, doi: 10.1038/mt.2013.142. PMID: 23752342.

Kines, R., V. Zarnitsyn, **T. R. Johnson**, Y.-Y. Pang, K. Corbett, J. Nicewonger, A. Gangopadhyay, M. Chen, J. Liu, M. Prausnitz, J. T. Schiller, and B. S. Graham. Vaccination with human papillomavirus pseudovirus-encapsidated plasmids targeted to skin using microneedles. *PLoS One*, 10: e0120797, 2015, doi:10.1371/journal.pone.0120797.

Prater, M. R., **T. R. Johnson**, A. M. Stoner, M. D. Cannon, and N. Sriranganathan. Animals, Humans, and the Environment in the Epidemiology of Chikungunya Virus [case study] AAVMC/APTR 2015: http://www.aavmc.org/One-Health/Case-Studies.aspx. (Note: this was a competitive submission for multidisciplinary educational modules and placed in the top 5.)

AWARDS

Vanderbilt University Graduate School Dissertation Enhancement Award, 1998
Sidney P. Colowick Award for Scientific Achievement, Vanderbilt Department of Microbiology and Immunology, January 1999
AAI-Huang Foundation Trainee Achievement Award, FASEB '99, 1999
Vanderbilt University Graduate School Travel Grant, March 1999
NIH Distinguished Service Award 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011
9th International Respiratory Syncytial Virus Symposium Travel Grant, 2014
VCOM Research Recognition Day, First Place Poster in Biomedical Research – Faculty category, February 2017

TEACHING RESPONSIBILITIES

Virginia Commonwealth University/Medical College of Virginia
- Dental Hygiene Student Microbiology Laboratory (1988)
- Pharmacy Student Microbiology Laboratory (1989-1990)
- Medical Student Microbiology Laboratory (1989-1990)
- "Substitute" microbiology lectures (1987)

Vanderbilt University School of Medicine
- Medical Student Microbiology Laboratory (1996-1998)
- Microbes and Defense Academic Society (1997-2000)

Edward Via College of Osteopathic Medicine
- Early Clinical Experience Laboratories (2013 to present)
  - CLIA-waived tests (2013-2014)
  - Microbiology (2013-2014)
  - Microbiology Board Review (2015 to present)
- Osteopathic Medical Students (OMS) I – Foundations of Medicine (2014 to present)
  - MED 7016 Principles of Immunology, course director and lecturer
  - MED 7035 Principles of Microbiology, course director and lecturer
- Osteopathic Medical Students (OMS) I and II – Systems Blocks
  - MED 7277 Clinical Medicine Cardiology and Pulmonology (2014 to present)
  - MED 7308 Clinical Medicine Dermatology (2014 to present)
  - MED 7289 Clinical Medicine Gastroenterology (2015 to present)
  - MED 7304 Clinical Medicine Obstetrics and Gynecology (2015 to present)
  - MED 7315 Clinical Medicine Hematology (2015 to present)
  - MED 7321 Epidemiology II (2016 to present)
  - MED 7301 Clinical Medicine Musculoskeletal (2016 to present)
  - MED 7283 Clinical Medicine Nephrology (2016 to present)
  - MED 7271 Clinical Medicine Neurology (2017 to present)
- Premedical Graduate Certificate Immunology Course, course director and lecturer (2014 to present)
- Premedical Graduate Certificate Microbiology Laboratory (2014 to present)

DEPARTMENTAL COMMITTEES AND SERVICE

Vanderbilt University School of Medicine
- AIDS Outreach Program, Department of Microbiology and Immunology – 1996-1998
- Microbiology and Immunology Graduate Student Association – 1998-2000
- Chair and Graduate Education Committee Liaison, Microbiology and Immunology Graduate Student Association – 1998-1999

RSV2003 International Symposium Organizing Committee, Program Subcommittee

National Institutes of Health (NIH) Vaccine Research Center (VRC)
- VRC (NIAID NIH) Safety Committee – 2001-2011
- VRC (NIAID NIH) Radiation Safety Officer – 2001-2011
- VRC (NIAID NIH) Animal Care and Use Committee – 2002-2011
- VRC (NIAID NIH) Animal Emergency Preparedness Team – 2008-2011

National Institutes of Health (NIH)
- NIAID Biologists Promotions and Action Committee – 2004-2008
- NIH Staff Scientist Interest Group Steering Committee – 2005-2011

Edward Via College of Osteopathic Medicine
- Institutional Environmental and Biosafety Committee – 2014 to present
  - Serving as Institutional Biosafety Officer – December 2015 to present
- Curriculum and Assessment Block Sub-Committee – 2014 to present
- Promotion Board – 2015 to present
- Infectious Diseases Committee – 2016 to present
  - Virginia Campus (VC) policy subcommittee – 2016 to present
- "Bugs and Drugs" Review and Board Preparation Program – 2015 to present
  - Founder and Faculty Advisor
- Outreach and Missions – 2015 to present
  - High School Outreach Ambassador – 2015 to present
  - International Mission Outreach – Honduras, January 2016
- Microbiology and Immunology Faculty Search Committee – 2016 to present
- VCOM Biomedical Research Retreat Organizing Committee – 2016
- VCOM Faculty and Staff Development presentation "Our Overall Health – It Takes Many Villages" – November 17, 2016

CURRENT ACTIVE RESEARCH PROJECTS

Evaluation of Respiratory Syncytial Virus Pathogenesis: Immunity to RSV infection is short-lived and, in severe disease, dominated by type 2 T cell responses that are associated with the development of childhood asthma. These obstacles to RSV vaccine and drug development may be based upon the responses of dendritic cells (DCs) during initial exposure to RSV. The goals of this project are to understand the impact of RSV on DC activation and function, the influence of these interactions on induction of RSV-specific T and B cell responses, and these subsequent effects on disease pathogenesis. With elucidation of the molecular pathways, drugs may be developed which interrupt the hypothesized immunosuppressive response and vaccines may be formulated for increased safety and immunogenicity.

Development of a Nosocomial Bacterial Vaccine: Healthcare-associated infections (HAIs) are a major medical challenge with the emergence of multidrug resistance organisms further complicating the problem. While drug development for Gram-positive bacteria is progressing, very few new treatments or vaccines for Gram-negative bacteria are under development. Therefore, the goal of this project is to develop a vaccine that is effective against Gram-negative bacteria that are highly associated with nosocomial infections and that rapidly induce sufficient protective immunity to reduce disease severity, morbidity, and mortality.

Development of a Point-of-Care Diagnostic Kit for Bacterial and Viral Pneumonia: Pneumonia is the leading cause of mortality due to infection worldwide. The project is designed to identify biomarkers that will differentiate bacterial and viral infections using samples collected by minimally invasive techniques (e.g. saliva, nose wash) and which may be performed at the point-of-care with by any healthcare provider using no highly specialized equipment.

Establishment of the Lamb Model of Respiratory Syncytial Virus: This project is designed to complement the "Evaluation of RSV Pathogenesis" project described above. The goals of the project are to develop the lamb as a model to study respiratory syncytial virus (RSV) pathogenesis in young individuals such that this model may be used to understand the molecular basis for severe RSV disease *in vivo* and the inability of host immunity to make a long-lasting response against RSV, paralleling the above *in vitro* project. The ultimate goal is to establish the model and identify the pathogenic mechanisms for the design and testing of candidate drugs to treat severe RSV disease and vaccines to protect against RSV infection.

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Effects of Boron on UV-Induced Skin Cancer: While the incidence of many cancers are decreasing, those of skin cancer are not. Epidemiological studies have demonstrated significantly lower rates of cancer in geographic areas having high concentrations of boron in the environment. The goals of this project are to determine whether exposure to boron or its derivatives (e.g. boric acid) is able to protect against UVB-induced damage, a factor highly associated with skin cancer. The ability of boron to protect against or reverse the effects of UVB exposure will be tested *in vitro* using immortalized (but not transformed) keratinocytes (mouse and human), *ex vivo* using primary tissue explants, and *in vivo* in an established model of UVB-induced tumor formation.

FUNDING

Ongoing:

Vaccine Development for the Prevention of Gram Negative Bacterial Infections
Role: Principle investigator
Funding amount: $29,093
Funding source and period: VCOM; October 1, 2016 – June 30, 2017

Recent inactive grants and funding:

Establishing the Lamb Model of Respiratory Syncytial Virus Pathogenesis and Vaccine Development
Role: Co-Principal Investigator (with Drs. Renee Prater and Tanya LeRoith)
Funding amount: $60,000

Funding source and period: VMRCVM-VCOM Center for One Health Research; November 10, 2015 – June 30, 2016
Dr. Johnson currently has primary responsibility for designing *in vivo* and *in vitro* experiments conducted in the course of this project, for generating all RSV stocks, and for performing the assays to evaluate the virologic and immunologic endpoints of the *in vivo* animal experiments. Dr. Johnson also has the primary responsibility for isolating and differentiating the ovine DCs, infecting them with RSV, and evaluating the impact of RSV on DC activation and function.

Evaluation of a Novel Adenovirus as a Vaccine for Respiratory Syncytial Virus
Role: Key personnel (Principal Investigator – Dr. Jason Gall)
Funding Source and period: NIAID R1R3AI092917 (SBIR Phase I); 06/01/2012 - 05/31/2014
Providing the expertise in immunology and in vivo animal experimentation, Dr. Johnson worked with Dr. Gall, a molecular virologist, to design and implement preclinical studies required to select a lead respiratory syncytial virus vaccine candidate and to advance that product to a Phase I clinical trial. Dr. Johnson supervised the junior scientific staff and assisted (as needed) in execution of the research plan. As new immunological assays were implemented (e.g. ELISAs, flow cytometry T cell analyses), Dr. Johnson designed and performed the assays, trained junior staff until they were technically proficient in the assays, and wrote initial drafts of all internal research reports and peer-reviewed manuscripts.

Factors Contributing to Immune-Enhance Disease in the Pathogenesis of RSV
Role: Key personnel (Lab Chief – Dr. Barney Graham)
Funding source and period: NIH 1-Z01-AI005029 (NIAID intramural); 05/21/2001 - 05/18/2011
As senior scientist, Dr. Johnson independently designed and executed (directly or through supervision of junior scientists) the experiments constituting this project. Dr. Johnson also had primary responsibility for writing of all animal protocols, project reports, and multiple peer-reviewed papers (as lead and corresponding author). This was one of two major projects for Dr. Johnson working with 0-2 junior scientists during the course of the project.

Vectors and Methods to Increase Immunogenicity during DNA Vaccination
Role: Key personnel (Lab Chief – Dr. Barney Graham)
Funding Source and period: NIH 1-Z01-AI005061 (NIAID intramural); 05/21/2001 – 05/18/2011
Dr. Johnson designed experiments in conjunction with Dr. Graham, had primary responsibilities for day-to-day execution of all experiments (direct and supervisory), and had primary responsibility for writing of all animal protocols, project reports, and peer-reviewed manuscripts. As the major project for multiple lab staff (post-docs, technicians), Dr. Johnson supervised and coordinated the work of 2-4 junior scientists on this project.