

**BIOGRAPHICAL SKETCH**

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NAME Baseman, Joel B.		POSITION TITLE Professor and Chair	
eRA COMMONS USER NAME baseman			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Tufts Univ., Medford, Massachusetts	B.S.	1963	Biology-Chemistry
Univ. of Massachusetts, Amherst, Massachusetts	MS, PhD	1963-68	Microbiology
Harvard University Biological Laboratories	PD Fellowship	1968	Microbiology
Harvard Medical School, Boston, Massachusetts	PD Fellowship	1970	Microbiology
Stanford Univ. School of Business, Stanford, CA	Certificate	1991	Business

**A. Personal Statement**

We study the biology of pathogenic mycoplasmas and have related these studies to disease pathogenesis in humans and animal models. Our recent discovery of the Community Acquired Respiratory Distress Sndrome (CARDS) toxin of *Mycoplasma pneumoniae* (MPN) represents the first authentic toxin/virulence determinant found in MPN, as the toxin behaves as a *bona fide* ADP-ribosylating toxin (like the classical ADP-ribosylating toxins of pertussis and diphtheria) and vacuolating toxin (like VacA). CARDS TX is a remarkable, one-of-a-kind protein; no other toxin or virulence factor exhibits both ADP ribosylation and vacuolating activities and elicits such a distinctive host response, eliciting unusual pathologies, including unique inflammatory pathways and tissue injury. Based upon our clinical and animal model studies and *in vitro* observations, we have compelling evidence that CARDS TX represents a single molecule tightly linked to mediating acute and chronic airway diseases. Currently, I am Director of the SA-AADCRC (San Antonio-Asthma Allergy Diseases Cooperative Research Center) and have considerable experience as Director of past CRCs and Program Projects and as PI of R01s and T32s and Foundation grants. I have held the position of Chair of UTHSCSA Department of Microbiology and Immunology for 30 years and other positions, such as Associate Dean for Research for the UTHSCSA Graduate School of Biomedical Sciences and Director/Teacher of the Ethics in Research Course at UTHSCSA for 10 years, which I continue to coordinate and teach. Interestingly, I published on diphtheria toxin with A. Pappenheimer (postdoc mentor) at Harvard University (1969-70), discovered *Bordetella pertussis* tracheal cytotoxin with my graduate student, W. Goldman, while at UNC Chapel Hill, and now the CARDS TX—all very exciting. We also examine the sexually transmitted mycoplasma, *Mycoplasma genitalium* (MGN). We are clarifying MGN virulence determinants that mediate the dynamic interactions between MGN and human target cells, leading to overt clinical disease. Recently, we described the remarkable ability of MGN to exhibit perinuclear and intranucleolar localization, suggesting that this pathogen circumvents host defenses and navigates through host cell structures in order to establish and maintain viability and persistence. Specific gene products of MGN that contribute to this unique trafficking are being identified in order to understand how this pathogen elicits pathogenetic consequences and to determine what MGN molecules can be used as therapeutic targets to interrupt or prevent disease progression.

**B. Positions and Honors**

- 1964-1965 **Teaching Assistant** in the Department of Microbiology, University of Massachusetts
- 1965-1968 **NIH Predoctoral Fellow**, University of Massachusetts. Studied the aerobic spirochete, *Leptospira*, under C.D. Cox.
- 1968-1969 **NIH Postdoctoral Fellow**, The Biological Laboratories, Harvard University. Examined the mode of action of diphtheria toxin *in vivo* in the laboratory of A.M. Pappenheimer, Jr.
- 1969-1971 **NIH Postdoctoral Fellow**, Department of Microbiology and Molecular Genetics, Harvard Medical School. Studied hormonal regulation of animal cells in culture in the laboratory of H. Amos

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- 1971-1976 **Assistant Professor**, Department of Bacteriology and Immunology, The School of Medicine, The University of North Carolina at Chapel Hill
- 1976-1980 **Associate Professor**, Department of Bacteriology and Immunology, The School of Medicine, The University of North Carolina at Chapel Hill
- 1981-Present **Professor and Chairman**, Department of Microbiology & Immunology, The University of Texas Health Science Center at San Antonio, San Antonio, Texas
- 2006-Present **Professor Cross Appointment**, Department of Surgery, The University of Texas Health Science Center at San Antonio, San Antonio, Texas

NIH Research Career Development Award; Member, Microbiology and Infectious Diseases Advisory Committee, NIAID; Editorial Board, *Infection and Immunity*; Member, Committee on Medical Microbiology and Immunology of the Public and Scientific Affairs Board, American Society for Microbiology (ASM); Chairman, ASM President's Fellowship Committee; Director, Microbiology for Public School Science Teachers in South Texas, Carnegie Corporation; ASM Foundation for Microbiology Lecture Program; Member, NIAID Bacteriology and Mycology 2 Study Section; President, Association of Medical School Microbiology & Immunology Chairs; Member, Board of Directors, International Organization for Mycoplasma; Member, Molecular Immunology and Vaccine Development, NIH Strategic Plan, Bethesda, Maryland; Stuart Mudd Memorial Lecturer, University of Pennsylvania and ASM; Member, NIH Intramural Program Review, Rocky Mountain Laboratories; Senior Editor, Federation of European Microbiological Societies (FEMS) Immunology and Medical Microbiology; Member, NIH/NIAID Acquired Immunodeficiency Syndrome Research Review Committee; Consultant, Department of Veterans Affairs, Study on Mycoplasmas and Gulf War Syndrome; Member, Scientific Advisory Board, Canadian Bacterial Diseases Network, Canada; Elected Fellow of the American Association for the Advancement of Science

**C. Selected peer-reviewed publications (in chronological order since 1999).**

- Dhandayuthapani, S., W. Rasmussen, **J.B. Baseman**. 1999. Disruption of gene *mg218* of *Mycoplasma genitalium* through homologous recombination leads to an adherence-deficient phenotype. *PNAS* 96:5227-5232.
- Kannan, T.R. and **J.B. Baseman**. 2000. Expression of UGA-containing mycoplasma genes in *Bacillus subtilis*. *J. Bact.* 182:2664-2667.
- Kannan, T.R. and **J.B. Baseman**. 2000. Hemolytic and hemoxidative activities in *Mycoplasma penetrans*. *Infect. Immun.* 68:6419-6422.
- Dallo, S.F. and **J.B. Baseman**. 2000. Intracellular DNA replication and long-term survival of pathogenic mycoplasmas. *Micro. Pathog.* 29:301-309.
- Dhandayuthapani, S., M.W. Blaylock, C.M. Bebear, W.G. Rasmussen and **J.B. Baseman**. 2001. Peptide methionine sulfoxide reductase (MsrA) is a virulence determinant in *Mycoplasma genitalium*. *J. Bact.* 183:5645-5650.
- Dhandayuthapani, S., W.G. Rasmussen and **J.B. Baseman**. 2001. Stability of cytoadherence-related proteins P140/P110 in *Mycoplasma genitalium* requires *mg218* and unidentified factors. *Arch. Med. Res.* 33:1-5
- Collins, J.F., S.T. Donta, C.C. Engel, **J.B. Baseman**, L.L. Dever, T. Taylor, et al. 2002. The antibiotic treatment trial of Gulf War Veterans illnesses: issues, design, screening, and baseline characteristics. *Control Clin Trials* 23:333-353.
- Dallo, S.F., T.R. Kannan, M.W. Blaylock and **J.B. Baseman**. 2002. Elongation factor Tu and E1  $\beta$  subunit of pyruvate dehydrogenase complex act as fibronectin binding proteins in *Mycoplasma pneumoniae*. *Molec. Micro.* 46:1041-1051.
- Alvarez, R.A., Blaylock, M.W. and **J.B. Baseman**. 2003. Surface localized glyceraldehyde-3-phosphate dehydrogenase of *Mycoplasma genitalium* binds mucin. *Molec. Micro.* 48(5):1417-1425.
- Musatovova, O., Dhandayuthapani, S. and **J.B. Baseman**. 2003. Transcriptional starts for cytoadherence-related operons of *Mycoplasma genitalium*. *FEMS Micro. Letters* 229:73-81.
- Baseman, J.B.**, M. Cagle, J.E. Korte, C. Herrera, W.G. Rasmussen, J.G. Baseman, R. Shain and J.M. Piper. 2004. Diagnostic assessment of *Mycoplasma genitalium* in culture-positive women. *J. Clin. Micro.* 42:203-211.
- Blaylock, M.W., O. Musatovova, J.G. Baseman and **J.B. Baseman**. 2004. Determination of infectious load of *Mycoplasma genitalium* in clinical samples of human vaginal cells. *J. Clin. Micro.* 42:746-752.
- Donta, S.T., C.C. Engel, J.F. Collins, **J.B. Baseman**, etc. 2004. Benefits and harms of doxycycline treatment for Gulf War Veterans' illnesses. A randomized, double-blind, placebo-controlled trial. *Ann. Intern. Med.* 141:85-92.

- Thomas, A, L. Annick, J. Mainil, I. Dizier, **J.B. Baseman**, T.R. Kannan, B. Fleury, J. Frey and E.M. Vilei. 2004. The *p40* adhesin pseudogene of *Mycoplasma bovis*. *Vet. Micro.* 104:213-217.
- Kannan, T.R., D. Provenzano, J.R. Wright and **J.B. Baseman**. 2005. Identification and characterization of human surfactant protein-A binding protein of *Mycoplasma pneumoniae*. *Infect. Immun.* 73:2828-2834.
- Burgos, R., O.Q. Pich, M. Ferrer-Navarro, **J.B. Baseman**, E. Querol and J. Piñol. 2006. *Mycoplasma genitalium* P140 and P110 cytoadhesins are reciprocally stabilized and required for cell adhesion and terminal-organelle development. *J. Bact.* 188:8627-8637.
- Musatovova, O., C. Herrera and **J.B. Baseman**. 2006. Proximal region of the gene encoding cytoadherence-related protein permits molecular typing of *Mycoplasma genitalium* clinical strains by PCR-restriction fragment length polymorphism. *J. Clin. Micro.* 44(2):598-603.
- Korte, J.E., **J.B. Baseman**, M.P. Cagle, C. Herrera, J.M. Piper, A.E.C. Holden, S.T. Perdue, J.D. Champion and R.N. Shain. 2006. Cervicitis and genitourinary symptoms in women culture positive for *Mycoplasma genitalium*. *Am. J. Reprod. Immunol.* 55:265-275.
- Stein, M.A. and **J.B. Baseman**. 2006. The Evolving Saga of *Mycoplasma genitalium*. *Clin. Micro. Newsletter.* 28(6):41-48.
- Musatovova, O., S. Dhandayuthapani and **J.B. Baseman**. 2006. Transcriptional heat shock response in the smallest known self-replicating cell, *Mycoplasma genitalium*. *J. Bact.* 188(8):2845-2855.
- Kannan, T.R. and J.B. Baseman. 2006. ADP-ribosylating and vacuolating cytotoxin of *Mycoplasma pneumoniae* represents unique virulence determinant among bacterial pathogens. *PNAS*, 103(17):6724-6729.
- Musatovova, O, T.R. Kannan and **J.B. Baseman**. 2008. Genomic analysis reveals RepMP1 mediated recombination in *Mycoplasma pneumoniae* clinical isolate. *Infect. Immun.* 76(4):1639-1648.
- Balasubramanian, S., T.R. Kannan and **J.B. Baseman**. 2008. The surface-exposed carboxyl region of *Mycoplasma pneumoniae* elongation factor Tu interactions with fibronectin. *Infect. Immun.* 76(7): 3116-3123.
- Ueno, P.M., J. Timenetsky, V.E. Centonze, J.J. Wewer, M. Cagle, M.A. Stein, M. Krishnan and **J.B. Baseman**. 2008. Interaction of *Mycoplasma genitalium* with host cells: evidence for nuclear localization. *Microbiology* 154:3033-3041.
- Kannan, T.R., O. Musatovova and **J.B. Baseman**. 2008. Characterization of unique ClpB protein of *Mycoplasma pneumoniae* and its impact on growth. *Infect. Immun.* 76(11):
- Musatovova, O. and **J.B. Baseman**. 2009. Analysis identifying common and distinct sequences among Texas clinical strains of *Mycoplasma genitalium*. *J. Clin. Micro.* 47(5):1469-1475.
- Berg, C.P., T.R. Kannan, R. Klein, M. Gregor, **J.B. Baseman**, S. Wasselborg, K. Lauber, and G.M. Stein. 2009. *Mycoplasma* antigens as a possible trigger for the induction of anti-mitochondrial antibodies in primary biliary cirrhosis. *Liver International* ISSN 1478-3223:797-809.
- Wang J., L. Chen, F. Chen, X. Zhang, Y. Zhang, **J.B. Baseman**, S. Perdue, I.T. Yeh, R. Shain, M. Holland, R. Bailey, D. Mabey, P. Yu and G. Zhong. 2009. A chlamydial type III-secreted effector protein (Tarp) is predominantly recognized by antibodies from humans infected with *Chlamydia trachomatis* and induces protective immunity against upper genital tract pathologies in mice. *Vaccine.* 27(22):2967-80.
- Balasubramanian, S., T.R. Kannan, P.J. Hart and **J.B. Baseman**. 2009. Amino acid changes in elongation factor-Tu of *Mycoplasma pneumoniae* and *Mycoplasma genitalium* influence fibronectin binding. 2009. *Infect. Immun.* 77(9):3533-3541.
- Johnson, C., T.R. Kannan and **J.B. Baseman**. 2009. Characterization of a unique ADP-ribosyltransferase of *Mycoplasma penetrans*. *Infect. Immun.* 77(10):4362-4370.
- Saikolappan, S., S.J. Sasindran, H.D. Yu, **J.B. Baseman** and S. Dhandayuthapani. 2009 *Mycoplasma genitalium* mg454 gene product resists killing by organic hydroperoxides. *J. Bact.* 191(21):6675-6682.
- Thurman, A.R; O. Musatovova; S. Perdue; R.N. Shain; **J.B. Baseman**. 2010. *Mycoplasma genitalium* symptoms, concordance and treatment in high-risk sexual dyads. *Int J STD AIDS* 21:177-183.
- Kannan, T.R., O. Musatovova, S. Balasubramanian, M. Cagle, J.L. Jordan, T.M. Krunkosky, A. Davis, R.D. Hardy and **J.B. Baseman**. 2010. *Mycoplasma pneumoniae* CARDS toxin expression reveals growth phase and infection-dependent regulation. *Molec. Micro.* 76(5):1127-1141.
- Pakhamova, O.N., A.B. Taylor, A. Becker, S.P. Holloway, T.R. Kannan, **J.B. Baseman** and P.J. Hart 2010. Crystallization of community acquired respiratory distress syndrome toxin from *Mycoplasma pneumoniae*. *Acta Cryst.* F66;294-296.

Program Director/Principal Investigator (Last, First, Middle): Baseman, Joel B.

- Techasaensiri, C., C. Tagliabue, M. Cagle, P. Iranpour, K. Katz, T.R. Kannan, J.J. Coalson, **J.B. Baseman** and R.D. Hardy. 2010. Variation in colonization, ADP-ribosylating cytotoxin, and pulmonary disease severity among *Mycoplasma pneumoniae* strains. *Am. J. Res. Crit. Care Med.* 182:797-804.
- Somarajan, S.R., T.R. Kannan and **J.B. Baseman**. 2010. *Mycoplasma pneumoniae* Mpn133 is a cytotoxic nuclease with a glutamic acid, lysine and serine rich region essential for binding and internalization but not enzymatic activity. *Cell Microbiol.* 12(12):1821-1831
- Li, Linbo, M. Krishnan, **J.B. Baseman**, and T.R. Kannan. 2010. Molecular cloning, expression and characterization of a Ca<sup>2+</sup> dependent, membrane associated nuclease of *Mycoplasma genitalium*. *J Bacteriol.* 192:4876-4884.
- Muir, M.T., S.M. Cohn, C. Loudon, T.R. Kannan and **J.B. Baseman**. 2011. Novel toxin assays implicate *Mycoplasma pneumoniae* in prolonged ventilator course and hypoxemia. *Chest* 139(2):305-310
- Johnson, C., Kannan T.R. and **J.B. Baseman**. 2011 Cellular Vacuoles Induced by *Mycoplasma pneumoniae* CARDS Toxin Originate from Rab9-Associated Compartments. *PLoS One.* 2011;6(7):e22877.
- Zhang, W. and **J.B. Baseman**. 2011. Transcriptional responses of *Mycoplasma genitalium* to osmotic stress. *Microbiol.* 157(2):548-56.
- Zhang, W. and **J.B. Baseman**. 2011. Transcriptional regulation of MG\_149, an osmoinducible lipoprotein gene from *Mycoplasma genitalium*. *Molec. Micro.* 81(2):327-339.
- Peters, J., H. Singh, E. Brooks, J. Diaz, T.R. Kannan, J.J. Coalson, M. Cagle and **J.B. Baseman**. 2011 Persistence of CARDS Toxin-producing *Mycoplasma pneumoniae* in Refractory Asthma. *Chest* 140(2):401-407.
- Kannan, T.R., J.J. Coalson, M. Cagle, O. Musatovova, R.D. Hardy and **J.B. Baseman**. 2011. Synthesis and distribution of CARDS toxin during *Mycoplasma pneumoniae* infection in a murine model. *J. Infect. Dis.* (in press)

#### D. Research Support

NIAID-NIH # U19AI070412-06

08/15/11-07/31/16 (Renewal)

Asthma and Allergic Diseases Cooperative Research Center (AADCRC) – Role of Unique ADP-ribosylating vacuolating *Mycoplasma pneumoniae* Toxin in Asthma, Director  
Project #2 – Biochemical, Molecular and Immunological Characterization of the *Mycoplasma pneumoniae* CARDS Toxin, PI

Administrative Core A, PI

Major goals: The Cooperative Research Center represents an integrative, collaborative and innovative multidisciplinary effort to investigate the role of a unique *Mycoplasma pneumoniae* toxin in asthma and related airway diseases. This toxin, designated **Community Acquired Respiratory Distress Syndrome Toxin (CARDS TX)** remarkably replicates the proinflammatory cytokine/chemokine profiles and histopathology that accompany *M. pneumoniae* infection. This consortium combines projects, which focus on basic, clinical and animal modeling strategies, with support cores to bring an integrative approach to defining the relationship between *M. pneumoniae* and the pathogenesis of asthma.

Kleberg Foundation Award

01/01/08-12/31/12

Chronic Airway Diseases – Building upon Research Excellence for a Cure

Major goals: This award is to study airway diseases, which will lead to landmark preventive and therapeutic interventions, greatly benefiting the health of South Texas populations and beyond.

National Trauma Institute (NTI)

07/01/10-09/18/12

*Mycoplasma pneumoniae* in the ICU

Major goals: This project is a multicenter study investigating the role of *Mycoplasma pneumoniae*, a frequent cause of community-acquired pneumonia, in ICU patients with suspected pneumonia developed while on a ventilator.

Health Resources and Services Administration

09/01/10-08/31/12 (1yr no cost ext)

(HRSA) U.S. Department of Health and Human Services, Research Focused Special Congressional Initiative Center for Innovation in Prevention and Treatment of Airway Diseases (CIPTAD)

Major goals: This award serves to further study acute and chronic airway diseases by establishing CIPTAD in order to create interdisciplinary translational research teams that aggressively work towards the development and implementation of rational and novel diagnostic probes, vaccines and small molecule drug candidates.