

# Kevin Mason, Ph.D.

## *Curriculum Vitae*

### PRESENT ADDRESS

The Research Institute at Nationwide Children's Hospital  
Center for Microbial Pathogenesis  
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### ACADEMIC BACKGROUND

1998 - Ph.D.            Immunology, Wright State University, Dayton, Ohio  
1992 - B.S.            Microbiology, The Ohio State University, Columbus, Ohio

### PROFESSIONAL BACKGROUND

2008-present            Assistant Professor of Pediatrics, The Ohio State University School of Medicine and The Research Institute at Nationwide Children's Hospital, Center for Microbial Pathogenesis, Columbus, Ohio.  
2006- 2008            Research Scientist, Center for Microbial Pathogenesis, The Research Institute at Nationwide Children's Hospital (f.k.a. Columbus Children's Research Institute), Columbus, Ohio.  
2000- 2006            Postdoctoral Researcher (Mentor: Dr. Lauren Bakaletz), Center for Microbial Pathogenesis, Columbus Children's Research Institute, Columbus, Ohio.  
1998-2000            Postdoctoral Researcher (Mentor: Dr. Meta Kuehn), Dept. of Biochemistry, Duke University, Durham, North Carolina.

### PROFESSIONAL SOCIETIES

- American Society for Microbiology
- American Association for the Advancement of Science

### AWARDS

- 2008 New Faculty Travel Award, International Pasteurellaceae Society Meeting, Sorrento, Italy
- 2007 Postdoctoral Fellow Award for Best Scientific Paper and Presentation, Annual Research Retreat, Columbus Children's Research Institute, Columbus, OH.
- 2006 Postdoctoral Fellow Award for Best Scientific Paper and Presentation, Annual Research Retreat, Columbus Children's Research Institute, Columbus, OH.
- 2005 Junior Researcher Award, 5<sup>th</sup> Extraordinary International Symposium on Recent Advances in Otitis Media, Amsterdam, The Netherlands.

- 2003 Ruth L. Kirschstein National Research Service Award

## INTERNAL COMMITTEES

2008 Member, The Research Institute at Nationwide Children's Hospital 2009 Research Day Planning committee

## EXTERNAL COMMITTEES

2007 Panel Member: Pathogenesis; Anatomy and Pathology, and Cell Biology.  
Post Symposium Research Conference on Recent Advances in Otitis Media, June 7- 8.

## SERVICE

2007 TBDBITL Mentoring Program, The Ohio State University - alumni mentoring program for students interested in research careers.

## REVIEW BOARDS – *ad hoc*

*Journal of Infectious Diseases*  
*Glycoconjugate Journal*  
*Canadian Cystic Fibrosis Foundation*

## STUDENTS DIRECTED

### PAST

Forrest Raffel, The Ohio State University, Integrated Biomedical Science Graduate Program, June-September 2008

Joanna Marshall, The Ohio State University, Integrated Biomedical Science Graduate Program, June-August 2008

## PRESENTATIONS

"The *Haemophilus influenzae* Sap proteins are essential for both antimicrobial peptide resistance and heme utilization." International Pasteurellaceae Society 2008 Meeting. Sorrento, Italy. October 14, 2008.

"The *Haemophilus influenzae* periplasmic Sap protein is essential for both antimicrobial peptide resistance and heme utilization." HINMAX 2008. 1st Intl. Workshop on *Haemophilus influenzae* and *Moraxella catarrhalis*. Beurs World Trade Center Rotterdam, The Netherlands, May 16-17, 2008.

"The nontypeable *Haemophilus influenzae* (NTHI) Sap transporter: equipping the commensal." Department of Neuroscience, Cell Biology and Physiology, Wright State University. February 29, 2008.

"The Sap transporter is critical for the commensal and pathogenic behavior of nontypeable *Haemophilus influenzae* (NTHi)." The 9<sup>th</sup> International Symposium on Recent Advances in Otitis Media. June 2007.

"The Sap Transporter: from commensal to opportunistic pathogen." Center for Microbial Interface Biology, The Ohio State University. May 24, 2007.

"The NTHI Sap transporter: A mechanism of antimicrobial peptide resistance." Center for Microbial Interface Biology, The Ohio State University. April 17, 2006.

“The NTHI Sap transporter: A mechanism of antimicrobial peptide resistance.” Columbus Children’s Research Institute Annual Retreat Award Presentation. April 4, 2006.

“The *sap* operon is a major virulence determinant of NTHI-induced acute otitis media and is differentially regulated by antimicrobial peptides.” 5<sup>th</sup> Extraordinary International Symposium on Recent Advances in Otitis Media. Amsterdam, The Netherlands, April, 2005.

“NTHI gene expression in a chinchilla model of otitis media as assessed by differential fluorescence induction.” Center for Microbial Interface Biology, The Ohio State University. July 14, 2003.

“Use of differential fluorescence induction to identify site-specific nontypeable *Haemophilus influenzae* (NTHI) survival in a chinchilla model of otitis media.” 8<sup>th</sup> International Symposium on Recent Advances in Otitis Media. June, 2003.

## COURSES AND WORKSHOPS ATTENDED

- Nationwide Children’s Research Institute Leadership Training: Tools to Become an Effective Manager. 3-Part course: Effective Interpersonal Skills for Leaders, Conflict Management in the Workplace, Foundations in Performance Management. September 12, October 10, November 14, 2007.
- BIA Basics for BIACORE<sup>®</sup> 3000 training course. Piscataway, NJ, September 28-29, 2004.

## RESEARCH SUPPORT

### ACTIVE

R21 (A1070825)

8/15/07 - 7/31/09

PI: Kevin M. Mason, Ph.D.

Agency: NIH/NIAID

Direct Costs: \$275,000

“The NTHI Sap Transporter: A Mechanism of Antimicrobial Peptide Resistance”

The major goals of this project are to determine whether antimicrobial peptides (APs) are transported for degradation in a Sap-dependent manner and define whether the SapD ATPase confers ATP dependence upon a potassium transport system. This work will, for the first time, define a molecular mechanism by which NTHI resist killing by APs, and expand our understanding of NTHI pathogenesis.

### COMPLETED

F32 (DC06320) Kevin M. Mason, Ph.D.

9/1/03 – 8/31/06

Agency: NIH/NIDCD

“Expression of *sap* Operon in NTHI-induced Otitis Media”

The major goals of this project were to determine the expression of the *sap* operon during the disease course of otitis media, determine the effect on NTHI virulence of strains harboring mutations in the *sap* operon and determine whether the *sap* operon plays a role in activation of peptide resistance determinants when exposed to antimicrobial peptides.

## MANUSCRIPTS

1. Curiel, R.E., **Mason, K.M.**, Dryden, T.D., Bigley, N.J. (1998). Cytokines produced early in picornavirus infection reflect resistance or susceptibility to disease. J Interferon Cyt Res. 18(8):587.
2. **Mason, K.M.**, Bigley, N.J., Fink, P.S. (1998). Development of a novel *in vitro* co-culture system for studying host response to native bacterial antigens. J Immunol Meth, 211(1-2):147.

3. **Mason, K.M.**, Dryden, T.D., Bigley, N.J., Fink, P.S. (1998). Staphylococcal enterotoxin B (SEB) primes CD8<sup>+</sup> Interferon- $\gamma$  (INF- $\gamma$ ) secretion and cytotoxic effects in response to native bacterial antigens. Infect Immun, 66(11):5082.
4. **Mason, K.M.**, Munson, R.S., Bakaletz, L.O. (2003). Nontypeable *Haemophilus influenzae* gene expression induced *in vivo* in a chinchilla model of otitis media. Infect Immun, 71(6):3454.
5. Kesty, N.C\*, **Mason, K.M.**, Reedy, M., Miller, S.E., Kuehn, M.J. (2004). Enterotoxigenic *Escherichia coli* vesicles target toxin delivery into mammalian cells. EMBO J, 23(23):4538.  
**\*Equal contribution**
6. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2005). A mutation in the *sap* operon attenuates survival of NTHI in a chinchilla model of otitis media. Infect Immun, 73(1):599.
7. Novotny LA, **Mason, K.M.**, Bakaletz, L.O.) (2005). Development of a chinchilla model to allow direct continuous biophotonic imaging of bioluminescent NTHI during experimental otitis media. Infect Immun, 73(1):609.
8. **Mason, K.M.**, Bruggeman, M.E., Munson Jr., R.S., Bakaletz, L.O. (2006). The nontypeable *Haemophilus influenzae* Sap transporter provides a mechanism of antimicrobial peptide resistance and SapD-dependent potassium acquisition. Mol Micro. 62(5):1357-1372.
9. Hong, W\*, **Mason, K.M.\***, Jurcisek, J.A., Novotny, L.A., Bakaletz, L.O., Swords, W.E. (2007). Phosphorylcholine decreases early inflammation and promotes establishment of stable biofilm communities of NTHI strain 86-028NP in the chinchilla models of otitis media. Infect Immun, 75(2):958-965.  
**\*Equal contribution**
10. McGillivray, G., **Mason, K.M.**, Jurcisek, J.A., Peeples, M.E., Bakaletz, L.O. (2008). RSV-induced dysregulation of expression of a mucosal  $\beta$ -defensin augments colonization of the upper airway by nontypeable *Haemophilus influenzae*. Cell. Micro. (submitted).
11. **Mason, K.M.** and Bakaletz, L.O. (in preparation) The periplasmic Sap protein binds heme and is required for iron utilization by nontypeable *Haemophilus influenzae* yet is displaced by the binding of an antimicrobial peptide.

## ABSTRACTS

1. **Mason, K.M.**, Raffel FK and Szelestey BR. (2008). The *Haemophilus influenzae* Sap proteins are essential for both antimicrobial peptide resistance and heme utilization. Abst. International Pasteurellaceae Society 2008 Meeting. Sorrento, Italy.
2. **Mason, K.M.**, and Bakaletz, L.O. (2008). The Sap transporter is critical to survival strategies by nontypeable *Haemophilus influenzae* (NTHi). Abst. 108<sup>th</sup> General Mtg., Am. Soc. for Microbiol.
3. **Mason, K.M.**, and Bakaletz, L.O. (2008). The *Haemophilus influenzae* periplasmic Sap protein is essential for both antimicrobial peptide resistance and heme utilization. Abst. HINMAX 2008. 1st Intl. Workshop on *Haemophilus influenzae* and *Moraxella catarrhalis*. Beurs World Trade Center Rotterdam, The Netherlands.
4. Jurcisek, J.A., **Mason, K.M.**, and Bakaletz, L.O. (2008). Sub-lethal concentrations of antimicrobial peptides alter biofilm formation by nontypeable *Haemophilus influenzae* (NTHi). Abst. 108<sup>th</sup> General Mtg., Am. Soc. for Microbiol.
5. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2008). The Sap transporter is critical to survival strategies by nontypeable *Haemophilus influenzae* (NTHi). Abst. The Research Institute at Nationwide Children's Hospital, Annual Research Conference.
6. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2007). The Sap transporter is critical for the commensal and pathogenic behavior of nontypeable *Haemophilus influenzae* (NTHi). Abst. 9<sup>th</sup> Intl. Symp. Recent Adv. in Otitis Media.
7. Marshall, J.M., **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2007). The Sap transport system inner membrane permease of nontypeable *Haemophilus influenzae* (NTHi) mediates potassium acquisition in conjunction with antimicrobial peptide resistance. Abst. 107<sup>th</sup> General Mtg., Am. Soc. for Microbiol.
8. Bruggeman, M.E., McGillivray, G., **Mason, K.M.**, Munson Jr., R.S. Bakaletz, L.O. (2007). Microbe-induced dysregulation of expression of mucosal antimicrobial peptides influences colonization of the chinchilla upper respiratory tract by nontypeable *Haemophilus influenzae*. Abst. 107<sup>th</sup>

General Mtg., Am. Soc. for Microbiol.

9. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2007). SapA, the *sap* operon periplasmic binding protein, binds heme and mediates iron homeostasis in nontypeable *Haemophilus influenzae* (NTHI). Abst. 107<sup>th</sup> General Mtg., Am. Soc. for Microbiol.
10. Hong, W., **Mason, K.M.**, Jurgisek, J.A., Novotny, L.A., Bakaletz, L.O., Swords, W.E. (2007). Role of lipooligosaccharides in establishment of stable biofilm communities of nontypeable *Haemophilus influenzae* strain 86-028NP in a chinchilla model of otitis media. Abst. 4<sup>th</sup> ASM Conference on Biofilms.
11. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2007). The Sap transporter is critical for the commensal and pathogenic behavior of nontypeable (NTHI). Abst. Columbus Children's Research Institute, Annual Research Conference.
12. **Mason, K.M.**, Marshall, J.M., Munson Jr., R.S., Bakaletz, L.O. (2007). The Sap transporter system inner membrane permease of nontypeable *Haemophilus influenzae* (NTHI) mediates potassium acquisition in conjunction with antimicrobial peptide resistance. Abst. 6<sup>th</sup> annual OSUMC Graduate and Postgraduate Research Day.
13. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2006). The nontypeable *Haemophilus influenzae* Sap transporter provides a mechanism of antimicrobial peptide resistance. Abst. 13<sup>th</sup> Ann. Midwest Microbial Pathogenesis Mtg.
14. **Mason, K.M.**, Hill, S.R., Munson Jr., R.S., R.S. Jr., Bakaletz, L.O. (2006). Exposure of nontypeable *Haemophilus influenzae* (NTHI) to antimicrobial peptides results in rapid development of a resistant phenotype that is dependent upon the sap transporter. Abst. 106<sup>th</sup> General Mtg., Am. Soc. for Microbiol., p. 200.
15. **Mason, K.M.**, Hill, S.R., Munson Jr., R.S., Bakaletz, L.O. (2006). Exposure of nontypeable *Haemophilus influenzae* (NTHI) to antimicrobial peptides results in rapid development of a resistant phenotype that is dependent upon the Sap transporter. Abst. Columbus Children's Research Institute, Annual Research Conference.
16. **Mason K.M.**, Bruggeman, M.E., Munson Jr., R.S., Bakaletz, L.O. (2005). The *sap* system is required for resistance to antimicrobial peptides and is differentially regulated *in vivo* in a superinfection model of otitis media. Abst. 105<sup>th</sup> General Mtg., Am. Soc. for Microbiol.
17. Bruggeman, M.E., **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2005). Nontypeable *Haemophilus influenzae* respond to micro-environmental cues to mediate an antimicrobial peptide-resistant phenotype. Abst. Fifth Extraordinary Intl. Symp. Recent Adv. in Otitis Media.
18. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2005). The *sap* operon is a major virulence determinant of NTHI-induced acute otitis media and is differentially regulated by antimicrobial peptides. Abst. Fifth Extraordinary Intl. Symp. Recent Adv. in Otitis Media.
19. McGillivray, G., **Mason, K. M.**, Bevins, C.L., Munson Jr., R.S., Bakaletz, L.O. (2005). Characterization of two mucosal antimicrobial peptides in a chinchilla model of otitis media. Abst. Gordon Research Conference, Antimicrobial Peptides.
20. **Mason, K.M.**, Bruggeman, M.E., Munson Jr., R.S., Bakaletz, L.O. (2005). The *sap* system is required for resistance to antimicrobial peptides and is differentially regulated *in vivo* in a superinfection model of otitis media. Abst. Columbus Children's Research Institute, Annual Research Conference.
21. McGillivray, G., **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2005) Characterization of two mucosal antimicrobial peptides in a chinchilla model of Otitis Media. Abst. Columbus Children's Research Institute. Annual Research Conference.
22. McBroom, A., S. Bauman, N. Kesty, **K. Mason** and M. Kuehn. (2005). Bacterial outer membrane vesicles - Biogenesis and host cell interactions. Cold Spring Harbor Microbial Pathogenesis and Host Response, Cold Spring Harbor, NY
23. **Mason, K.M.**, Bruggeman, M.E., Munson Jr., R.S., Bakaletz, L.O. (2004). Heme regulates *sap* operon expression in nontypeable *Haemophilus influenzae* (NTHI) and confers resistance to antimicrobial peptides. Abst. 11<sup>th</sup> Ann. Midwest Microbial Pathogenesis Mtg.
24. Novotny, L.A., **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2004). Construction and evaluation of *lux*-expressing *Haemophilus influenzae* for use in chinchilla models of otitis media. Abst. 104<sup>th</sup> General Mtg., Am. Soc. for Microbiol., p. 243.
25. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2004). The *Sap* operon is required for nontypeable

- H. influenzae* (NTHI) survival in a chinchilla model of otitis media. Abst. 104<sup>th</sup> General Mtg., Am. Soc. Microbiol., p. 116.
26. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2004). The *sap* operon is required for nontypeable *Haemophilus influenzae* (NTHI) survival in a chinchilla model of otitis media. Abst. Columbus Children's Research Institute, Annual Research Conference.
  27. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2003). The *sap* operon confers resistance to antimicrobial peptides and is required for nontypeable *Haemophilus influenzae* (NTHI) survival in a chinchilla model of otitis media. Abst. 10<sup>th</sup> Ann. Midwest Microbial Pathogenesis Mtg.
  28. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2003). Use of differential fluorescence induction to identify site-specific nontypeable *Haemophilus influenzae* (NTHI) gene expression in a chinchilla model of otitis media. Abst. 8<sup>th</sup> Intl. Symp. Recent Adv. in Otitis Media, p.111.
  29. **Mason, K.M.**, Zhang, Y., Munson Jr., R.S., Bakaletz, L.O. (2003). A mutation in the *sap* operon attenuates nontypeable *Haemophilus influenzae* (NTHI) survival in a chinchilla model of otitis media. Abst. 103<sup>rd</sup> General Mtg., Am. Soc. Microbiol., p. 83.
  30. Kesty, N., **K. Mason** and M. Kuehn. (2003). Heat labile enterotoxin acts as an adhesin and entry mechanism for outer membrane vesicles produced by Enterotoxigenic *E. coli* Gordon Research Conference: Microbial Adherence and Signal Transduction, Salve Regina.
  31. **Mason, K.M.**, Munson Jr., R.S., Bakaletz, L.O. (2002). Identification of nontypeable *Haemophilus influenzae* (NTHi) genes induced in vivo by differential fluorescence induction in a chinchilla model of otitis media. Abst. 102<sup>nd</sup> General Mtg., Am. Soc. Microbiol., p. 52.
  32. Kesty, N.C., **K.M. Mason** and M.J. Kuehn. (2001). Enterotoxigenic *Escherichia coli* (ETEC) heat-labile enterotoxin (LT) mediates binding and internalization of outer-membrane vesicles by host cells. Abst. 101<sup>st</sup> General Mtg., Am. Soc. Microbiol.
  33. **Mason, K.** Kesty, N., Vemulapalli, S., Horstman, A., Kuehn, M. (2001). Enterotoxigenic *E. coli* vesicles deliver toxin into epithelial cells. Cold Spring Harbor Microbial Pathogenesis and Host Response, Oct. 2001 Cold Spring Harbor, NY.
  34. Kuehn, M., **K. Mason**, N. Kesty and A. Horstman. (2000). Toxic Outer Membrane Vesicles Secreted by Enterotoxigenic *E. coli*. Gordon Research Conference: Bacterial Cell Surfaces. New London, NH
  35. **Mason, K.M.**, N.J. Bigley and P.S. Fink. (1997). Staphylococcal enterotoxin B (SEB) primes CD8+ interferon- $\gamma$  (IFN- $\gamma$ ) secretion in response to bacteria. Abst. 97<sup>th</sup> General Mtg., Am. Soc. Microbiol., p. 240.
  36. **Mason, K.M.**, N.J. Bigley and P.S. Fink. (1997). Staphylococcal enterotoxin B (SEB) primes CD8+ interferon- $\gamma$  (IFN- $\gamma$ ) secretion in response to native bacterial antigens. Abst. Cold Spring Harbor Lab. Mtg. On Microbial Pathogenesis and Host Response, p. 183.
  37. **Mason, K.M.**, N.J. Bigley and P.S. Fink. (1996). Superantigen pretreatment alters host immune response to oral microflora. FASEB J. 10:#1043, A1180.