

## **Phillip E. Klebba, Ph. D.**

Professor and Head, Department of Biochemistry & Molecular Biophysics

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### **PROFESSIONAL HISTORY**

Professor and Head, Dept. Biochem & Mol Biophys, Kansas State University, 2012-present

Visiting Professor of Physiology, David Geffen UCLA School of Medicine, 2010-2011

Visiting Scientist and Fulbright Scholar, Faculte de Medecine

Institut Necker Enfants Malades, INSERM U570, Paris, FRANCE, 2002-2003

ASM Visiting International Professor, Universidade de Sao Paulo, Sao Paulo Brasil, 2001

Professor, University of Oklahoma, Department of Chemistry, Norman, OK, 9/01/98-06/01/12.

Associate Professor, University of Oklahoma, Department of Chemistry, Norman, OK, 9/01/93-1998.

Visiting Associate Scientist, Institute Pasteur

Unite de Programmation Moleculaire et Toxicologie Genetique, Paris, FRANCE, 1993-1994.

Assistant Professor, Medical College of Wisconsin, Dept. of Microbiol., Milwaukee, WI, 1988-1993.

Assistant Professor, University of Notre Dame, Dept. of Biol. Sci., Notre Dame, IN, 1984-1988.

Post Doctoral Scientist, University of California, Berkeley, California, 1982-1984.

Advisor: Dr. Hiroshi Nikaido - Dept. of Microbiol. and Immunol.

Post Doctoral Scientist, Stanford University Medical School, Stanford, California, 1981-1982.

Advisor: Dr. Leon T. Rosenberg - Dept. of Med. Microbiol.

### **EDUCATION**

University of Notre Dame, Notre Dame, IN, **B.S.** (Biology), 1975

University of California-Berkeley, CA, **Ph.D.** (Biochemistry), 1982; Adviser: Dr. J. B. Neilands

### **AWARDS, ORGANIZATIONS & PROFESSIONAL SERVICE**

Sigma Xi Research Award, 1975

Evelyn Neizer Post-Doctoral Research Award, Stanford University, 1981

Phillipe Foundation International Scholar, 1993, 2002

Chercheur de Centre Nationale Recherche Scientifique (CNRS), Institute Pasteur, Paris, 1993

American Society for Microbiology (ASM) International Professorship (Brasil), 2001

Fulbright Research Scholar, Franco-American, US State Department, 2002-2003

Chercheur, Institut Nationale de Sante et Recherche Medicale (INSERM), Institute Necker, 2002

Member, Conseil Scientifique de Fulbright Commission Franco-Americaine, 2002-2003

Fulbright National Screening Committee (Sciences), Institute of International Education (2008)

Burroughs-Wellcome Scholar, University of California, Los Angeles, 2011-2012

Member, graduate faculty of Diagnostic Medicine/Pathobiology, Kansas State University

AAAS, Member; ASM, Member

Director, 1989-1993 Nucleic acid and Protein Sequence Analysis Center (NAPSAC)

Cancer Center of the Medical College of Wisconsin, Milwaukee, WI

Director of Research and Operations, 1990-1993 Cell Culture Shared Resource Facility

Cancer Center of the Medical College of Wisconsin, Milwaukee, WI

Managing Editor, Bacterial Membrane Transport, *Front. Biosci.*

Editorial Boards, *J. Biomed. Biotech.*, *Adv. Biol. Chem.*

Journal Referee: *Science*, *Nature*, *Proc. Nat. Acad. Sci. USA*, *Mol. Microbiol.*, *J. Biol. Chem.*,

*Biochemistry*, *J. Bacteriol.*, *Gene*, *J. Gen. Microbiol.*, *Res. Microbiology*, *Infect. Immun.*, *J. Mol.*

*Biol.*, *Biophys. J.*, *Nat. Struct. Biol.*, *PLoS Pathogens*, *PLoS ONE*.

Biochemistry Specialist, Council for Exchange of International Scholars (CIES - Fulbright)

Ad hoc Reviewer: National Science Foundation (Biochemistry& Molecular Structure & Function),

National Institutes of Health (Microbial Physiology), US Dept. of Agriculture, US. Dept. of State

(National Fulbright Scholar Program, Life Sciences, 2008, 2014)

NIH Study sections:

Bacteriology and Mycology I, 1997, 1998;

Microbial physiology, 1999-2002;

Bacterial pathogenesis, 2005, 2006;

Biochemical and Biophysical sciences (F04B), 2007-, 2009, 2011

Special Emphasis Panel (SEP) 2008/01 ZRG1 IDM-A (02) on Prokaryotic Biology, 2008

Macromolecular Structure and Function A (MSFA), 2009,

Biological Chemistry and Macromolecular Biophysics (BCMB) Challenge Grant Panel, 2009.

Special Emphasis Panel/SRG 2009/10 ZRG1 BCMB-D (95) 2009

Major Instrumentation (ZRG1 IMST-G 30\_0510), 2010

Biological Chemistry and Macromolecular Biophysics (ZRG1 BCMB-B (02), 2010

Center of Excellence for Translational Research (CETR) 2014/01 ZAI1 LR-M (J1) 1), 2013

Special Emphasis Panel (SEP) 2015/01 ZRG1 VH C(80), 2014, 2016

Prokaryotic Cell and Molecular Biology, 2015

## **CURRENT GRANT SUPPORT**

1. High-throughput fluorescence screening for inhibitors of TonB-dependent iron transport. **P.E. Klebba, Ph. D., P.I., National Institutes of Health NIH1R21AI115187-01A1.** 07/15/15-06/15/17. \$150,000/\$250,000.

## **PAST GRANT SUPPORT**

1. Structure/Function of the ferric enterobactin receptor. **P.E. Klebba, P.I., National Institutes of Health 1R01AI22608.** 1986-1990. \$94,570/283,557 (Direct costs).
2. Immunological detection of organophosphate herbicides. **P.E. Klebba, P.I. Chevron Chemical Co.** 1986-1988. \$40,000/\$87,000.
3. Monoclonal antibodies to colicin B. **P.E. Klebba, P.I. Basic Research Grant, University of Notre Dame. 1986.** \$10,000.
4. Monoclonal antibodies to Benzene, Xylene, and Toluene. **P.E. Klebba, P.I. EnSys Corp., Research Triangle Park, N.C.** 1989-1991. \$30,000/\$60,000.
5. FepA::GP120 vaccine chimeras. **P.E. Klebba, P.I. Basic Research Grant, Medical College of Wisconsin.** 1991. \$10,000.
6. Mechanism of ferric enterobactin uptake through FepA. **P.E. Klebba, P.I. National Science Foundation MCB9212070.** 1992-1994. \$50,000/\$100,000.
7. Mechanism of maltodextrin transport through LamB.. **Phillip E. Klebba, Ph. D., P.I. Philippe Foundation Inc., New York, Paris.** 9/1/93-8/31/94. \$10,200.
8. An ESR spectrometer for protein and metal analyses. **Phillip E. Klebba, P.I. National Science Foundation Multi-User Biological Instrumentation grant.** 11/1/95-10/31/96. \$319,750.
9. Mechanism of ferric enterobactin uptake through FepA. **P.E. Klebba, P.I. National Science Foundation MCB9408737.** 9/1/94 - 8/31/97. \$90,000/\$270,000 (total costs).
10. Enhancement of Physical Biochemistry in Oklahoma **Phillip E. Klebba, Ph. D., P.I., (OU), Paul H. Weigel, P.I., (OUHSC) National Institutes of Health, 1P20RR11622-01, 9/30/96-8/31/99,** \$95,856/\$215,000.
11. Loop-deletion mutagenesis of Fep. **Phillip E. Klebba, Ph. D., P.I., National Institutes of Health, 1R01GM53836-05.** 9/1/95-8/31/00. \$171,842/\$1,003,247 (total costs).
13. Mechanism of ferric enterobactin uptake through FepA. **Phillip E. Klebba, Ph. D., P.I., National Science Foundation, MCB9709418.** 9/1/97 - 8/31/00. \$95,000/\$285,000.
14. Mechanism of ferric enterobactin uptake through FepA. **Phillip E. Klebba, Ph. D., P.I., National Science Foundation, MCB9709418 (Supplement).** 12/1/97 - 11/31/00. \$45,684.
15. Research experience for undergraduates in Chemistry and Biochemistry at the University of Oklahoma. **Phillip E. Klebba, Ph. D., Co-Investigator (Daniel T. Glatzhofer, P.I.), National Science Foundation, 6/1/98 - 5/31/01.** \$180,375.
16. Cytofluorimetry of vaccine epitope exposure in bacteria. **Phillip E. Klebba, Ph. D., Co-Investigator (S. M. C. Netwon, Ph.D., P.I.), Oklahoma Center for Advancement of Science and Technology (OCAST).** 000072, 9/1/99-8/31/02, \$44,977/\$144,027.
17. Ligand-gated transport through FepA.. **Phillip E. Klebba, Ph. D., P.I., National Institutes of Health, 1R01GM53836-05.** 9/1/00-8/31/04. \$271,771/\$1,202,371.
18. Molecular Biological approaches to bacterial cell wall biochemistry. **Phillip E. Klebba, Ph. D., P.I. American Society for Microbiology (ASM).** 10/1/2001 - 9/31/2002. \$4000.
19. Role of iron acquisition in the pathogenesis of *Listeria*. **Phillip E. Klebba, Ph. D., P.I. Council for the International Exchange of Scholars (CIES) and the Fulbright Commission of the United States Department of State.** 9/1/02-6/30/03. \$11,200.
20. Role of iron acquisition in the pathogenesis of *Listeria*. **Phillip E. Klebba, Ph. D., P.I. Philippe Foundation Inc., New York, Paris.** 9/1/02-6/30/03. \$10,200.
21. Role of iron acquisition in the pathogenesis of *Listeria*. **Institute Nationale de la Sante et la Recherche Medicale (INSERM).** 9/1/02-6/30/03. \$38,500.
22. Role of iron acquisition in the pathogenesis of *Listeria*. **Phillip E. Klebba, Ph. D., P.I. Oklahoma Center for Advancement of Science and Technology (OCAST).** 000367, 9/1/02-8/31/05, \$44,965/\$145,000.
23. Mechanism of Ferric Enterobactin Uptake by FepA. **Phillip E. Klebba, Ph. D., P.I., National Science Foundation, MCB-0417694.** 9/1/00-8/31/07. \$90,000/\$270,000.
24. Ligand-Gated Transport through FepA. **Phillip E. Klebba, Ph. D., P.I, National Institutes of Health, 2R01-GM53836-14. Administrative Supplement 9/1/2009-8/31/2010.** \$123,535.
25. Ligand-Gated Transport through FepA. **Phillip E. Klebba, Ph. D., P.I, National Institutes of Health, 2R01-GM53836-14.** 8/1/2006-7/31/2010. \$311,650/\$1,117,644
26. Human monoclonal antibodies to listerial and staphylococcal heme binding proteins. **Phillip E. Klebba, Ph. D., P.I., Trellis Biosciences.** 1/1/2012-12/31/14. \$21,000.
27. TonB, peptidoglycan and bacterial iron acquisition. **Phillip E. Klebba, Ph. D., P.I. National Science Foundation.** 3/1/2010 - 2-28, 2015. \$205,000/\$615,000.

## **PUBLICATIONS**

1. **Klebba, P.E.**, McIntosh, M.A., and Neilands, J.B., 1982. Kinetics of biosynthesis of the iron-regulated membrane proteins in *Escherichia coli* K12. *J. Bacteriol.* **149**(3): 880-888.
2. **Klebba, P.E.**, McIntosh, M.A., and Neilands, J.B., 1983. Continuous synthesis of the iron-regulated membrane proteins during the *Escherichia coli* K12 division cycle. *Chimica Scripta* **21**:123-126.
3. Tidmarsh, G.F., **Klebba, P.E.**, and Rosenberg, L.T., 1983. Rapid release of iron from ferritin by siderophores. *J. Inorganic Biochem.* **18**, 161-168.
4. Murphy, C.K., Porter, G.A., and Klebba, P.E., 1987. Heat modifiability of the *Escherichia coli* iron regulated membrane proteins. In: S.C. Goheen (ed) Membrane proteins . pp. 149-160, BioRad Publications, Reichmond, CA.
5. Bentley, A.T., and **Klebba, P.E.**, 1988. Effect of lipopolysaccharide structure on the reactivity of anti-porin monoclonal antibodies with the bacterial cell surface. *J. Bacteriol.* **170**(3): 1063-1068.
6. Reid, J., Fung, H., Gehring, K., **P.E. Klebba.**, and Nikaido, H., 1988. Targeting of porin to the outer membrane of *Escherichia coli*: rate of trimer assembly and identification of a dimer intermediate. *J. Biol. Chem.* **263**: 7753-7759.
7. Murphy, C.K., and **Klebba, P.E.**, 1989. Export of FepA:PhoA fusion proteins to the outer membrane of *Escherichia coli* K-12. *J. Bacteriol.* **171**: 5894-5900.
8. **Klebba, P.E.**, Benson, S.A., Bala, S., Abdullah, T., Reid, J., Singh, S.P., and Nikaido, H. 1990. Determinants of OmpF porin antigenicity and structure. *J. Biol. Chem.* **265**: 6800-6810.
9. Murphy, C.K., Kalve, V.I., and **Klebba, P.E.** 1990. Surface topology of the *Escherichia coli* ferric enterobactin receptor. *J. Bacteriol.* **172**: 2736-2746.
10. Kerppola, R.E., Shyamala, V., **Klebba, P.E.**, and Ames, G.F.L., 1991. The membrane-bound proteins of periplasmic permeases form a complex: identification of the histidine permease HisQMP complex. *J. Biol. Chem.* **266**: 9857-9865.
11. Rutz, J.M., Abdullah, T., Singh, S.P. and **Klebba, P.E.**, 1991. Evolution of the ferric enterobactin receptor in gram negative bacteria. *J. Bacteriol.* **173**: 5964-5974.
12. Singh, S.P., Upshaw, Y., Abdullah, T. and **Klebba, P.E.**, 1992. Structural relatedness of enterobacterial porins assessed with monoclonal antibodies to the OmpC and OmpD porins of *Salmonella typhimurium*. *J. Bacteriol.* **174**: 1965-1973.
13. Rutz, J.M., J. Liu, J.A. Lyons, J.A. Goranson, S.K. Armstrong, M.A. McIntosh, J.B. Feix, and **P.E. Klebba.**, 1992. Formation of a gated channel by a ligand-specific transport protein in the bacterial outer membrane. *Science* **258**: 471-475. PMID: 1411544
14. Ma, S-W., Corsaro, B.G., **Klebba, P.E.**, and Fraser, M.J., 1992. Cloning and analysis of a P40 structural protein gene of Helicoverpa zea nuclear polyhedrosis virus. *Virology* **192**: 224-233.
15. **Klebba, P.E.**, 1993. Conformational change in TonB-dependent outer membrane proteins. *Trends Microbiol.* **1**:7-8.
16. Liu, J., Rutz, J., Feix, J.B. and **Klebba, P.E.**, 1993. Permeability properties of the channel domain within the ferric enterobactin receptor, FepA. *Proc. Nat. Acad. Sci. USA* **90**: 10653-10657. PMID: 7504275
17. **Klebba, P.E.**, Rutz, J.M., Liu, J. and Murphy, C.K., 1993. Mechanisms of TonB-mediated iron transport through the bacterial outer membrane. *J. Bioenerg. and Biomem.* **25**: 603-611.
18. Charbit, A., Werts, C., Michel, V., **P.E. Klebba**, Quillardet, P. and Hofnung, M., 1994. A role for residue 151 of LamB in Bacteriophage Lambda adsorption: possible steric effect of amino acid substitutions. *J. Bacteriol.* **176**: 3204-3209.
19. Charbit, A., **Klebba, P.E.**, and Hofnung, M., 1994. Sites permissifs et proteines exportees. *les Cahiers IMABIO* **11**:37-43.
20. **Klebba, P.E.**, Hofnung, M. and Charbit., A., 1994. Model of maltodextrin transport through the sugar-specific porin, LamB. *EMBO J.* **13**:4670-4675.
21. Liu, J., Rutz, J., **Klebba, P.E.**, and Feix, J., 1994. A spin labeling study of ligand-induced conformational change in the ferric enterobactin receptor, FepA. *Biochemistry* **33**:13274-13283.
22. Newton, S.M.C., **Klebba, P.E.**, Hofnung, M. and Charbit, A. 1995. Studies on the anaerobically induced promoter *nirB* and the improved expression of bacterial antigens. *Res. Microbiology* **146**:193-202.
23. Klug, C., W. Su, J. Liu, **P.E. Klebba** and J.B. Feix. 1995. Denaturant Unfolding of the ferric enterobactin receptor and ligand-induced stabilization studied by site-directed spin labeling. *Biochemistry* **34**: 14230-14236.
24. Newton, S.M.C., **Klebba, P.E.**, Hofnung, M. and Charbit, A. 1996. Topology of the membrane protein LamB by epitope tagging and a comparison with the X-ray model *J. Bacteriol.***178**:3447-3456.
25. Singh, S.P., Y.U. Williams, W.H. Benjamin, **P.E. Klebba**, & D. Boyd. 1996. Immunoprotection by monoclonal antibodies to the porins and lipopolysaccharide of *Salmonella typhimurium*. *Microbial Pathogenesis* **21**:249-263.
26. **Klebba, P.E.**, Newton, S.M.C, Hofnung, M. and Charbit, A. 1996. Further genetic analysis of the C-terminal external loop region in *Escherichia coli* maltoporin. *Res. Microbiol.* **148**: 375-387.

27. Charbit, A, S.M.C. Newton, P.E. Klebba, J.M. Clement, C. Fayolle, R. Lo-Man, C. LeClerc, & M. Hofnung. 1997. Expression and Immune response to foreign epitopes in bacteria. Perspectives for live vaccine development. *Behring Inst. Mitt.* **98**: 135-142.
28. Newton, S.M.C., J.S. Allen, Z. Cao, Z. Qi, X. Jiang, c. Sprencel, J.D. Igo, S.B. Foster, M.A. Payne, & **P.E. Klebba**. 1997. Double mutagenesis of a positive charge cluster in the ligand-binding site of the ferric enterobactin receptor, FepA. *Proc. Nat. Acad. Sci. USA* **94**: 4560-4565. PMID: 9114029
29. Jiang, X., M.A. Payne, Z. Cao, S.B. Foster, J.B. Feix, S.M.C. Newton & **P.E. Klebba**. 1997. Ligand-specific opening of a gated-porin channel in the outer membrane of living bacteria. *Science* **276**:1261-1264. PMID: 9157886
30. Payne, M.A., J.D. Igo, Z. Cao, S.B. Foster, S.M.C. Newton & **P.E. Klebba**. 1997. Biphasic binding kinetics between FepA and its ligands. *J. Biol. Chem.* **272**:21950-21955 PMID: 9268330
31. Kuhn, S.E., A. Nardin, **P.E. Klebba** & R.P. Taylor. 1998. *E. coli* bound to the primate erythrocyte complement receptor *via* bispecific monoclonal antibodies are transferred to and phagocytosed by human monocytes in an *in vitro* model. *J. Immunol*, **160**: 5088-97.
32. **Klebba, P.E.**, & S.M.C. Newton. 1998. Mechanisms of solute transport through outer membrane porins. *Curr. Opin. Microbiol.* **1**: 238-247,
33. Thulasiraman, P., J. Xu, K.N. Raymond, S.M.C. Newton & **P.E. Klebba**. Selectivity of Ferric enterobactin binding and cooperativity of transport in Gram-negative bacteria. *J. Bacteriol.* **180**: 6689-6696.
34. Newton, S.M.C., J.D. Igo, D. Scott & **P.E. Klebba**. Effects of loop deletions on the binding and transport of ferric by FepA. *Mol. Microbiol.* **32**: 1153-1165.
35. Carson, S.D.B., **P.E. Klebba**, S.M.C. Newton and P.F. Sparling. 1999. Ferric enterobactin binding and utilization by gonococcal FetA (FrpB). *J. Bacteriol.* **181**: 2890-2895-21.
36. Miller, S., Upshaw, Y.U., Macchia, P., Marshall, N., Newton, S.M.C., Klebba, P.E. & S.P. Singh. 1999. Recognition specificity of monoclonal antibodies that protect mice against infection by *Salmonella typhimurium*. *Res. Microbiol.* **150**: 385-394.
37. Sprencel, C., Z. Cao, Z. Qi, D. C. Scott, M. A. Montague, N. Ivanoff, J. Xu, K.M. Raymond, S.M. C. Newton, and **P.E. Klebba**. 2000. Binding of ferric enterobactin by the *Escherichia coli* periplasmic protein, FepB. *J. Bacteriol.* **182**:5359-5364.
38. Cao, Z., Sprencel, C., Qi, Z., Newton, S.M.C., and **P.E. Klebba**. 2000. Aromatic components of two ferric enterobactin binding sites in FepA. *Mol. Microbiol.* **37**:1306-1317.
39. Singh, S.P., Y.U. Williams, **P.E. Klebba**, P. Macchia & S. Miller. 2000. Immune recognition of porin and lipopolysaccharide epitopes of *Salmonella typhimurium*. *Microb. Path.* **28** :157-167.
40. Yun, C-W., M. Bauler, R. E. Moore, **P.E. Klebba** and C. C. Philpott. 2001. The role of the FRE family of plasma membrane reductases in the uptake of siderophore-iron in *Saccharomyces cerevisiae*. *J. Biol. Chem.* **276**: 10218-10223.
41. Scott, D.C., Z. Cao, Z. Qi, M. Bauler, J.D. Igo, S.M.C. Newton and **P.E. Klebba**. 2001. Exchangeability of N-termini in the ligand gated porins of *E. coli*. *J. Biol. Chem* **276**:13025-13033.
42. Scott, D.C., S.M.C. Newton, & **P.E. Klebba**. 2002. Surface loop motion in FepA. *J. Bacteriol.* **184**:4906-4911.
43. **Klebba, P.E.** 2002. Mechanism of maltodextrin transport through LamB. *Res. Microbiol.* **153** : 417-424
44. Cao, Z., and **P. E. Klebba**. 2002. Mechanisms of colicin binding and transport through outer membrane porins. *Biochimie* **84**: 399-412.
45. Cao, Z., Warfel, P., Newton, S. M. & **Klebba, P. E.** 2003. Spectroscopic observations of ferric enterobactin transport. *J. Biol. Chem.* **278**: 29-38. PMID: 12409288
46. Chakraborty, R., E. A. Lemke, Z. Cao, **P. E. Klebba**, and D. van der Helm. 2003. Identification and Mutational Studies of Conserved Amino Acids in the Outer Membrane Receptor Protein, FepA, which Affect Transport but not Binding of Ferric-enterobactin in *Escherichia coli*. *BioMetals* **11**: 774-785.
47. **Klebba, P.E.** 2003. Three paradoxes of ferric enterobactin uptake. *Front Biosci.* **8**:1422-36.
48. Annamalai, R., B. Jin, Z. Cao, S.M. Newton and **P.E. Klebba**. 2004. Recognition of ferric catecholates by FepA. *J. Bacteriol.* **186**: 3578-3589.
49. Grass G, Thakali K, **Klebba P. E.**, Thieme D, Muller A, Wildner GF, Rensing C. 2004. Linkage between catecholate siderophores and the multicopper oxidase CueO in *Escherichia coli*. *J. Bacteriol.* **186**:5826-33.
50. **Klebba, P.E.** 2004. Transport Biochemistry of FepA. "Iron Transport in Bacteria: Molecular Genetics, Biochemistry, Microbial Pathogenesis and Ecology," Jorge H. Crosa and Shelley M. Payne, eds., ASM Press.
51. Newton, S. M. C., **P.E. Klebba**, C. Raynaud, Y. Shao,, X. Jiang, I. Dubail, C. Archer, C. Frehel, and A. Charbit. 2005. The *svpA-srtB* locus of *Listeria monocytogenes*: Fur-mediated iron regulation and effect on virulence. *Mol. Microbiol.* **55**:927-40
52. **Klebba, P. E.** 2005. The porinologist. *J. Bacteriol.* **187**:8232-6.

53. Jin, B., Y. Shao, X. Jiang, S.M. C. Newton, A. Charbit and **P.E. Klebba**. 2006. Iron acquisition systems of *Listeria*: ferric hydroxamates, hemin and hemoglobin. *Mol Microbiol.* **59** (3): 855-61. PMID: 16430693
54. Ma L, Kaserer WA, Annamalai R, Scott DC, Jin B, Jiang X, Xiao Q, Maymani H, Massia LM, Ferreira LC, Newton SM, & **P. E. Klebba**. 2006. Evidence of Ball-and-Chain transport of ferric enterobactin through FepA. *J Biol Chem.* **282**:397-406. PMID: 17056600
55. Rabsch, W., L. Ma, G. Wiley, WA. Kaserer, F.Z. Najar, B. Beil, M. Schallmeyer, B. A. Roe, S. M. C. Newton and **P. E. Klebba**. 2007. FepA- and TonB-dependent Bacteriophage H8: Receptor Binding and Genomic Sequence. *J Bacteriol.* **189**:5658-74.
56. Kaserer, WA., Daniel C. Scott, Qiaobin Xiao, Xiaoxu Jiang, Matthew Bauler, Salette M. C. Newton & **P. E. Klebba**. 2008. Insight from TonB hybrid proteins into the mechanism of iron transport through the outer membrane. *J Bacteriol.* **190**:4001-16. PMID: 18390658
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58. Smallwood, C., A.M. Gala, A., V. Trinh, S.M.C. Newton & **P. E. Klebba**. 2009. Fluoresceination of FepA during colicin B killing: effects of temperature, toxin and TonB. *Mol. Microbiol.* **72**:1171-80.
59. Ngweniform, P., D. Li, S. M. Newton, **P. E. Klebba**, and C.B. Mao. 2009. Self-assembly of drug-loaded liposomes on genetically engineered protein nanotubes: a potential anti-cancer drug delivery vector. *Soft Matter* **5**: 954 - 956.
60. Garimella, R., Hayle, J.L., Harrison, W., **Klebba, P.E.**, Rice, C.V. 2009. Conformation of the phosphate D-alanine zwitterion in bacterial teichoic acid from nuclear magnetic resonance spectroscopy. *Biochemistry* **48**:9242-9
61. Wang, F., D. Li, S.M. Newton, **P.E. Klebba** & C. Mao. 2009. Genetically Modifiable Flagella as Templates for Silica Fibers: From Hybrid Nanotubes to 1D Periodic Nanohole Arrays. *Adv. Funct. Mater.* **18**: 4007-4013.
62. Udho, E., K.S. Jakes, S.K. Buchanan, K. James, X. Jiang, **P.E. Klebba** & A. Finkelstein. 2009. Reconstitution of Bacterial Outer Membrane TonB-dependent Transporters in Planar Lipid Bilayer Membranes. *Proc. Nat. Acad. Sci. USA* **106**:21990-5. PMID: 19959664
63. Newton, SM., V. Trinh, H. Pi and **P.E. Klebba**. 2010. Direct measurement of the outer membrane stage of ferric enterobactin transport: post-uptake binding. *J Biol Chem.* **285**:17488-97. PMID: 20335169
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### **MEETING ABSTRACTS**

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31. Jiang, X., Z.C. Cao, S.B. Foster, J.B. Feix, S.M.C. Newton & **P.E. Klebba**. Membrane protein conformational dynamics *in vivo*, during ligand transport through the ferric enterobactin receptor, FepA. Annu. Meeting Amer. Soc. Microbiology, 1997, Miami, FL.
32. Newton, S.M.C., J.S. Allen, M.A. Payne, J.D. Igo, S.B. Foster, Z. Cao, J. Shaw, C. Sprencel, & **P.E. Klebba**. Binding of multiple ligands in a positive charge cluster of the ferric enterobactin receptor, FepA. Annu. Meeting Amer. Soc. Microbiology, 1997, Miami, FL.
33. Jiang, X., M.A. Payne, z. Cao, S.M.C. Newton & **P.E. Klebba**. Ligand-specific operation of the ferric enterobactin receptor in live *E. coli*. Biophysical Society Annual Meeting, Feb. 21 - 24, 1998, Kansas City, MO.
34. Jiang, X., M. Bauler, D. Scott, Z. Cao, C. Sprencel, S.M.C. Newton, & **P.E. Klebba**. Localization of the TonB-Box within the gated porin, FepA, by site-directed spin labeling. EMBO Colicin Workshop, University of East Anglia, UK, April 1-4, 1998.
35. Jiang, X., M. Bauler, D. Scott, Z. Cao, C. Sprencel, S.M.C. Newton, & **P.E. Klebba**. Localization of the TonB-Box within the gated porin, FepA, by site-directed spin labeling. Annu. Meeting Amer. Soc. Microbiology, May 15-19, 1998, Atlanta, GA.
36. Newton, S.M.C., & **P.E. Klebba**. Nature of the ferric enterobactin binding site in FepA. Annu. Meeting Amer. Soc. Microbiology, May 15-19, 1998, Atlanta, GA.
37. **Klebba, P.E.** Mechanisms of siderophore transport through ligand-gated porins. Gordon Research Conference on Bacterial Cell Surfaces, Colby-Sawyer College, NH, June 21-26, 1998.
38. Newton, S.M.C., J.D. Igo, Z. Cao, M.A. Payne, S.B. Foster, G. Abel, and **P.E. Klebba** Physical and Genetic Characterization of the Colicin Binding Site in the Ferric Enterobactin Porin, FepA. Colicin Workshop, University of East Anglia, UK, April 1-4, 1998.
39. Qi, Z., T. Robeson, S.M.C. Newton & **P.E. Klebba** & L.T. Rosenberg. Exposition and immunogenicity of the HIV V3 loop on the surface of Gram-negative bacteria. Annu. Meeting Amer. Soc. Microbiology, May 15-19, 1998, Atlanta, GA.
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41. **Klebba, P.E.**, J.D. Igo, & S.M.C. Newton. Deletion mutagenesis of the *E. coli* ferric enterobactin receptor, FepA. Annu. Meeting Amer. Soc. Microbiology, May 15-19, 1998, Atlanta, GA.
42. Newton, S.M.; Cao, Z.; Sprencel, C.; Igo, J.D. & **Klebba, P.E.** Aromatic component of the ligand binding site on the surface of the ferric enterobactin receptor, FepA. Gordon Research Conference on Bacterial Cell Surfaces, Colby-Sawyer College, NH, June 21-26, 1998.

43. Newton, S.M.C., Thulasiraman, P.; Carson, S.B.; Sparling, P.F., and **Klebba, P.E.** Selectivity of Ferric Enterobactin Binding and Transport in Gram-negative Bacteria. 11<sup>th</sup> International Pathogenic Neisseria Conference, Nov. 1-6, 1998, Nice, France.
44. J.D. Igo, Z. Cao, M.A. Payne, S.B. Foster, G. Abel, and **P.E. Klebba**. 1999. Physical and Genetic Characterization of the Colicin Binding Site in the Ferric Enterobactin Porin, FepA. Annu. Meeting Amer. Soc. Microbiology, May 20-25, 1999, Chicago, IL.
45. **Klebba, P.E.**, J.D. Igo, & S.M.C. Newton. Deletion mutagenesis of the *E. coli* ferric enterobactin receptor, FepA. Annu. Meeting Amer. Soc. Microbiology, May 20-25, 1999, Chicago, IL.
46. Cao, Z.; Sprencel, C.; Igo, J.D. & **Klebba, P.E.** Aromatic component of the ferric enterobactin binding site within *Escherichia coli* FepA. Annu. Meeting Amer. Soc. Microbiology, May 20-25, 1999, Chicago, IL.
47. Sprencel, C., Z. Cao, M. A. Montague, N. R. Ivanoff, and **P. E. Klebba**. 1999. Binding of ferric enterobactin by the *Escherichia coli* periplasmic protein, FepB. Annu. Meeting Amer. Soc. Microbiology, May 20-25, 1999, Chicago, IL.
48. Qi, Z., S.P. Singh, P. Macchia, T. Robeson, G. Harris, **P.E. Klebba & S. M. C. Newton**. Cell surface exposure and immunogenicity of an HIV epitope in *Escherichia coli* LamB. Annu. Meeting Amer. Soc. Microbiology, May 20-25, 1999, Chicago, IL.
49. Scott, D.C., S. M.C. Newton & P.E. Klebba. Physical interaction of the TonB-C-terminal domain with FepA and Colicin B. Ann. Meeting Amer. Soc. Microbiology, May 21-25, 1999, Los Angeles, CA.
50. Cao, Z. S.M.C. Newton & **Klebba, P.E.** Ferric enterobactin transport through FepA in *Escherichia coli*: from hydrophobic stacking to charge interactions. Meeting Amer. Soc. Microbiology, May 21-25, 1999, Los Angeles, CA.
51. Qi, Z., G. Harris, **P.E. Klebba & S. M. C. Newton**. Relationship between cell surface exposure and immunogenicity for epitopes inserted in *E. coli* LamB and OmpA. Annu. Meeting Amer. Soc. Microbiology, May 21-25, 1999, Los Angeles, CA.
52. Z. Cao & **P.E. Klebba**. Aromatic components of the ferric enterobactin binding site in FepA. Gordon Research conference on bacterial cell surfaces, June 25-30, Colby-Sawyer College, New London, NH.
53. **P.E. Klebba**. "Mechanism of maltodextrin transport through LamB." Feb. 17, 2002. Colloquium for Maurice Hofnung: Portrait of an Enlightened Scientist. Institut Pasteur, Paris, France.
54. R. Annamalai, B. Jin, Z. Cao, S. M. C. Newton & **P. E. Klebba**. Recognition of ferric catecholates by FepA. Annu. Meeting Amer. Soc. Microbiology, May 21-25, 2002, Salt Lake City, Utah
55. P.E. Klebba, S.M. Newton and A. Charbit. "Iron acquisition by *Listeria*." 21 January, 2004. Hawaiian International Conference of the Sciences, Honolulu, Hawaii.
56. S.M. Newton, **P.E. Klebba**, and A. Charbit. "The *svpA-srtB* locus of *Listeria monocytogenes*." 22 January, 2004. Hawaiian International Conference of the Sciences, Honolulu, Hawaii.
57. **P. E. Klebba**, "Iron Acquisition by *Listeria monocytogenes*." ASM Regional Meeting, Denton TX, Nov. 10-12, 2005: Division of Bacterial Cell Surfaces
58. S.M. C. Newton and **P.E. Klebba**, "Iron transport systems of *Listeria monocytogenes*," BioMetals 2006, Portland, OR, Aug. 2006.
59. **P.E. Klebba**. "Competition and Selection in the Bacterial Cell Envelope," at Darwinathon 2009: 12 continuous hours of modern evolutionary research. Section of Integrative Biology #C0930, University of Texas Austin, TX, Nov. 2, 2009.
60. C.R. Smallwood, A.M. Gala, A., V. Trinh, S.M.C. Newton & **P. E. Klebba**. Fluoresceination of FepA during colicin B killing: effects of temperature, toxin and TonB. *ASBMB Annual Meeting, Anaheim CA April, 2010*.
61. K.J. Moore, S. M. Newton and **P. E. Klebba**. 2012. Site-directed disulfide bonding reveals mechanistic aspects of ferric enterobactin transport through FepA. Biophysical Society Annual Meeting, San Diego, CA. Feb. 24-29, 2012
62. L. Jordan, Y. Zhou, C. R. Smallwood, Y. Lill, K. Ritchie, W.T. Yip, S. M. Newton & **P. E. Klebba**, Energy-dependent motion of TonB in the Gram-negative bacterial inner membrane. *ASBMB Annual Meeting, Boston, MA, April 20-24, 2013*
63. Y. Shipelskiy, J.S. Rosinski, D. Mahale, T.R. Buckles, S.M. Newton & **P.E. Klebba**. Heme and hemoglobin uptake systems of *Listeria monocytogenes*. *ASBMB Annual Meeting, Boston, MA, April 20-24, 2013*
64. **P.E. Klebba**. Active ion transport through an unenergized membrane. . Gordon Research Conference on Mechanisms of Membrane Transport, Mt. Holyoke College, South Hadley, MA. June 16-23, 2013
65. S.M. Newton, V. Trinh, K.J. Moore, C.R. Smallwood & **P.E. Klebba**. Evidence against Ball-and-Chain transport of ferric enterobactin through FepA. Gordon Research Conference Mechanisms of Membrane Transport, Mt. Holyoke College, South Hadley, MA. June 16-23, 2013.
66. Hanson, M. S.M. Newton and **P.E. Klebba**. High-throughput fluorescence screening for inhibitors of TonB-dependent transport. *ASBMB Annual Meeting, San Diego, CA, April 26-30, 2014*.



67. Jordan, LD., C.R. Smallwood, V. Trinh, S.M. Newton and P.E. Klebba. Induced fit binding of FepA to ferric enterobactin. ASBMB Annual Meeting, San Diego, CA, April 26-30, 2014.
68. **Klebba, P.E.** Spectroscopic analyses of Gram-negative bacterial iron transport reactions. 2<sup>nd</sup> International Congress on Bacteriology and Infectious Diseases, Nov. 17-19, 2014, Chicago, USA
69. Majumdar, A., S. M. Newton and **P. E. Klebba.** Dependence of TonB action on the integrity of peptidoglycan. ASBMB Annual Meeting, April 2 - 6, 2016, San Diego, CA.
70. Nairn, B., O. Eliasson, D. Hyder, A. Roy, S.M. Newton and **P.E. Klebba.** High-throughput screening for inhibitors of Gram-negative bacterial TonB-dependent transport. World Congress of Infectious Diseases, San Diego, CA June 1-3, 2016.

### **INVITED SEMINAR PRESENTATIONS**

1. **Dept. of Molecular and Cell Biology, University of California, Berkeley, CA.** Gated Porin mechanism of ferric enterobactin transport through FepA. 15 May, 1992.
2. **Gordon Research Conference on Bacterial Cell Surfaces,** Gated Porin mechanism of ferric enterobactin transport through FepA. July, 1992, Brewster Academy, New Hampshire.
3. **Dept. Molecular Genetics and Cell Biology, Univ. Chicago** The ferric enterobactin receptor: molecular properties and relation to pathogenesis. 14 December, 1993
4. **Department of Microbiology, University of Illinois at Chicago.** Gated Porin mechanism of ferric enterobactin transport through FepA. 2 February, 1993.
5. **Dept. of Microbiology, Colorado State Univ., Fort Collins, CO.** The ferric enterobactin receptor: molecular properties and relation to pathogenesis. 19 March, 1993.
6. **Department of Medicine, University of North Carolina.** Gated porin mechanism of siderophore transport through the ferric enterobactin receptor, FepA. July 15, 1993. Chapel Hill, NC.
7. **Department of Microbiology, Universitat Tuebingen,** Tuebingen, Germany. January 17, 1994. Mechanisms of siderophore transport through the bacterial outer membrane.
8. **Department of Biochemistry, University of Leeds,** Leeds, England. January 25, 1994. Turn prediction in bacterial outer membrane proteins.
9. **Department of Microbiology, Biozentrum, University of Basel,** Basel, Switzerland. TonB-dependent transport of ferric enterobactin through the gated porin, FepA. February 15, 1994
10. **Unite de Programmation Moleculaire et Toxicologie Genetique, Institut Pasteur,** Paris, France. TonB-dependent transport of ferric enterobactin through the gated porin, FepA. 16 March, 1993.
11. **Unite de Programmation Moleculaire et Toxicologie Genetique, Institut Pasteur,** Paris, France. Mechanism of maltodextrin transport through the sugar-specific porin, LamB. 21 Mar, 1994
12. **Federation of European Biochemists colloquium on membrane transport,** April 2, 1994. Institut Pasteur, Paris France.
13. **Gordon Research Conference on Bacterial Cell Surfaces,** Conformational change in the ferric enterobactin receptor FepA: A spin-labeling study. July 9, 1994, Brewster Academy, N.H.
14. **Department of Botany and Microbiology, University of Oklahoma, Norman, OK.** Mechanism of maltodextrin transport through the sugar-specific porin, LamB. Sept. 16, 1994.
15. **Microbiology & Immunology, Stanford University, Stanford, CA.** Bacterial outer membrane protein structure: application to vaccine chimeras. 12 1995. Dept. of
16. **Dept. of Microbiology, University of Washington, Seattle WA.** Bacterial outer membrane protein structure: application to vaccine chimeras. 17 January, 1995.
17. **Department of Biophysics, Iowa State Univ.** Mechanism of maltodextrin transport through the sugar-specific porin, LamB. 18 January, 1995.
18. **Department of Molecular and Cellular Biology, University of California, Berkeley, CA.** Bacterial Porin Structure. 17 February, 1995.
19. **University of Missouri, Kansas City.** Bacterial Porin Structure. 15 March, 1995, Department of Biochemistry, Conformational change in the ferric enterobactin receptor of *Escherichia coli*. 20 March 1995.
21. **Department of Microbiology, University of Oklahoma Health Sciences Center,** Oklahoma City, OK. Conformational change in the ferric enterobactin receptor FepA: A spin-labeling study. 16 June, 1995
22. **Minisymposium on Protein Structure, Oklahoma State University,** Stillwater, OK. Bacterial Porin Structure. October, 1995.
23. **Department of Microbiology, University of Texas at Austin.** Mechanism of ferric enterobactin transport through FepA. April 7, 1996.
23. **Departamento de Microbiologia, Universidade d Sao Paulo.** " Double mutagenesis of a positive charge cluster in the ligand binding site of the ferric enterobactin receptor, FepA.", 13 Dec, 1996.

24. **Department of Microbiology, Escola Paulista de Medicina, Sao Paulo, Brazil** "Conformational dynamics *in vivo* in the *Escherichia coli* ferric enterobactin receptor, FepA". 19 Dec, 1996.
25. **39<sup>th</sup> Rocky Mountain cConference on Analytical Chemistry, Denver, CO.** ESR measurement of conformational dynamics during iron transport in living cells. August 5, 1997.
26. **Children's Hospital of Oakland Research Institute, Oakland, CA.** Expression of Hybrid Vaccines in Bacteria, 9 October, 1997.
27. **Abjenix Corporation, Fremont CA.** Immunochemical Analysis of Surface Epitopes on the Ferric Enterobactin Receptor, FepA,, October 10, 1997.
28. **Oklahoma State University, Stillwater, OK.** Bacterial Iron Transport: A Case of Open and Shut. 17 Nov., 1997.
29. **Biophysical Society Annual Meeting, Kansas City, MO.** Transport of proteins and peptides through the bacterial outer membrane, February 1998. Co-convener (invited by Dr. Alfred Esser).
30. **Bacterial Ion Channels, Biophysical Society Annual Meeting, Kansas City, MO, February 1998**
31. Mechanism of colicin import through the ferric enterobactin receptor, FepA, **EMBO Colicin Workshop**, Norwich, England, April, 1998 (invited by Dr. Richard James).
32. Outer membrane transport processes. **American Society of Microbiology, General Meeting**, Atlanta GA, May, 1998. Co-convener (invited by Dr. Robert Simons).
33. Bacterial Iron transport into *Escherichia coli*. **American Society of Microbiology, General Meeting**, Atlanta GA, May, 1998 (invited by Dr. Robert Perry).
34. Mechanism of ligand transport through the ferric enterobactin receptor, FepA. **Gordon Research conference on Bacterial Cell Surfaces.** Henniker, New Hampshire, July, 1998 (invited by Dr. Anthony P. Pugsley, Institut Pasteur).
35. **Department of Chemistry, Wichita State University.** Iron transport in Gram-negative bacteria, a case of open and shut. 18 March, 1998.
36. **Department of Biotechnology, Institut Pasteur, Paris, France.** Localization of the TonB-Box within the gated porin, FepA, by site-directed spin labeling. 6 April, 1998.
37. **Oklahoma Medical Research Foundation, Oklahoma City ESR** solutions to membrane transport problems, *in vitro* and *in vivo*. 23 April, 1998.
38. **11<sup>th</sup> International Pathogenic Neisseria Conference**, Nov. 5, 1998, Nice, France. "Mechanism of iron transport through ligand-gated porins of Gram-negative bacteria."
39. **Centre Nationale Recherche Scientifique, Marseille, France.** Effect loop deletions on the transport of ferric enterobactin through FepA. 10 Nov., 1998.
40. **Departamento de Microbiologia, Escola Paulista Medicina, Sao Paulo, Brazil.** Transport of ferric enterobactin through FepA. 30 Dec., 1998.
41. **Canadian Bacterial Diseases Network and Alberta Heritage Foundation for Medical Research Guest Speaker:** University of Alberta, Edmonton, Alberta, CANADA. Effect of loop deletions on the binding and transport of ferric enterobactin by FepA," June 4, 1999.
42. **Canadian Bacterial Diseases Network and Alberta Heritage Foundation for Medical Research Guest Speaker: University of Calgary, Calgary, Alberta, CANADA.**"Siderophore- and protein-mediated iron transport into Gram-negative bacteria." June 7, 1999.
43. **Oklahoma State University, Stillwater, OK.** Mini Symposium on Protein Biology. "Deletion mutagenesis of an outer membrane protein.", June 24-25, 1999.
44. **Department of Microbiology and Immunology, Stanford University Medical School, Stanford, CA** May 25, 2000. "Siderophore and toxin uptake into Gram-negative bacteria: aromatic and electrostatic interactions in the ligand binding site of FepA."
45. **Department of Molecular & Cell Biology, University of California, Berkeley, CA.** May 26, 2000. "Aromatic components of the ferric enterobactin binding site in FepA."
46. **Department of Microbiology, Southwestern Medical Center at Dallas, Dallas, TX.** April 3, 2001. "Mechanism of iron transport through ligand-gated porins of Gram-negative bacteria."
47. **Department of Microbiology and Immunology, University of Oklahoma Health Sciences Center.** April 16, 2001. "Iron acquisition by bacterial pathogens: A ball and chain within a primordial venus flytrap.
48. **Departement de Microbiologie, Faculte de Medecine Necker Enfants Malades, Paris, FRANCE.** 26 July, 2001. "Mechanism of iron transport through ligand-gated porins of Gram-negative bacteria."
49. **Public Health Research Institute, New York, N.Y.** 2 October, 2001. "Mechanism of iron acquisition by Gram-negative bacterial pathogens."
50. **Bob Deich memorial lecture, Wyeth-Lederle Vaccines, Rochester, N.Y.** 4 October, 2001. "Mechanism of iron acquisition by Gram-negative bacterial pathogens."

51. **Departamento de Microbiologia, Universidade de Sao Paulo, Brasil.** 14 December, 2001. "Mechanism of iron acquisition by Gram-negative bacterial pathogens."
52. **Los Alamos National Laboratory, Los Alamos, N.M..** "Ball-and-Chain mechanism of iron acquisition by Gram-negative bacteria." Mar. 13, 2002.
53. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "The pathogenesis of bacteria." Apr 21, 2002.
54. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Unique protein structures in the bacterial cell envelope" Apr 22, 2002.
55. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "General porin transport in *Escherichia coli*." Apr 23, 2002.
56. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Periplasmic binding protein systems: relatedness to eukaryotic iron binding proteins." Apr 25, 2002.
57. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Iron transport in Gram-negative bacteria." Apr 26, 2002.
58. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Energetics of the bacterial cell envelope: TonB and its relationship to energy transduction." Apr 27, 2002.
59. **Departamento de Microbiologia, Universidade Federale do Pernambuco, Recife, Brasil.** "Iron transport through Gram-negative bacterial outer membranes." Departamento de Microbiologia,
60. **Institut Necker Enfants Malades, 156 rue de Vaugirard, Paris 75015, France.** "Spectroscopic observations of ferric enterobactin transport in vivo." Oct. 12, 2002.
61. **Institut Pasteur, 25 rue du Dr. Roux, Paris 75015, France.** "Fluorescence Spectroscopy in vivo: TonB- and Energy-Dependence of FepA." Dec 6, 2002.
62. **Fulbright Annual Meeting, Ecole Normale Superior, Paris, France.** "Iron acquisition by *Listeria monocytogenes*". 2 February, 2003.
63. **Department of Microbiology, Universitat Wuerzburg, Wuerzburg, Germany.** "Spectroscopic observations of ferric enterobactin transport in vivo." April 26, 2003.
64. **Department of Vaccinology, Chiron Corporation, Siena, Italy.** "Fluorescence Spectroscopy in vivo: TonB- and Energy-Dependence of FepA." 28 April, 2003.
65. **Department of Microbiology, Universitat Tuebingen, Tuebingen, Germany.** "Fluorescence Spectroscopy in vivo: TonB- and Energy-Dependence of FepA." 30 April, 2003.
66. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Iron acquisition by *Listeria monocytogenes*." 2 August, 2003.
67. **Department of Chemistry, Wichita State University.** "Iron acquisition by Bacteria." 7 April, 2004.
68. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Iron acquisition by *Listeria monocytogenes*." 3 Mar, 2004.
69. **Department of Molecular and Cell Biology, University of California, Berkeley, Berkeley, CA,** "Iron acquisition by *Listeria monocytogenes*." 24 Mar, 2004.
70. **Department of Chemistry, University of California, Berkeley, Berkeley, CA.** Mechanism of ferric enterobactin transport through FepA. 25 March, 2004.
71. **Departamento de Quimica, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Iron acquisition by *Listeria monocytogenes*." Dec. 7, 2005.
72. **Texas Women's University, Denton TX,** "Iron Acquisition by *Listeria monocytogenes*.", Nov, 2005
73. **Public Health Research Institute, New York, N.Y.** "Mechanism of iron acquisition by *Listeria monocytogenes*." Mar 5., 2006.
74. **Institut Necker Enfants Malades, 156 rue de Vaugirard, Paris 75015, France.** "Ball-and-Chain mechanism of ferric enterobactin uptake through FepA." Mar 7, 2006.
75. **Institut Pasteur, 25 rue du Dr. Roux, Paris 75015, France.** "Biochemistry of the iron uptake system of *Listeria monocytogenes*." Dec 6, 2002.
76. **BioMetals 2006, Portland, OR.** "Ball-and-Chain mechanism of ferric enterobactin uptake through FepA." Aug. 3, 2006
77. **Departamento de Microbiologia e Instituta de Ciencias Biomedicas, Universidade de Sao Paulo.** "Biochemistry of the heme/hemoglobin uptake system of *Listeria monocytogenes*.", Sao Paulo, Brasil, 17 Dec., 2006
78. **Departamento de Microbiologia, Universidade de Sao Paulo** "Recognition of ligands by FepA." Dec. 6, 2007., Sao Paulo, Brasil.

79. **Department of Physiology and Biophysics, Albert Einstein College of Medicine .**  
"Fluorescence measurements of conformational dynamics in E. coli FepA during its interaction with colicin B" Jan 10, 2008 , Bronx, NY.
80. **Department of Microbiology, Oklahoma State University, Stillwater, OK.**  
"Ball-and-Chain mechanism of ferric enterobactin uptake through FepA." Nov. 15, 2008.
81. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.**"Fluorescence measurements of conformational dynamics in E. coli FepA during its interaction with colicin B" Jan 14, 2009.
82. **Department of Molecular and Cell Biology, University of California, Berkeley.**  
"TonB-dependent Ligand Uptake through a Closed Channel," Nov. 6, 2009.
83. **Unite de Biotechnologie & Molecular Genetique, Institut Pasteur, Paris, FRANCE.** "Futile Cycle of Ferric Enterobactin Transport through the Outer Membrane" Mar. 16, 2010.
84. **Unité de Pathogénie des Infections Systémiques UMR 1002, Institut Necker, Paris, FRANCE.**  
"Biochemistry of Iron Uptake in Gram- positive and Gram-negative Bacteria" Mar. 17, 2010.
85. **Trellis Biosciences Inc., S. San Francisco, CA.** "Immunochemistry of Bacterial Cell Surface Proteins," May 27, 2010.
86. **Department of Physiology, David Geffen UCLA School of Medicine.** "Signal and Energy Transduction through Bacterial Cell Envelopes," Dec. 3, 2010.
87. **Molecular Biology Institute, UCLA.** "Iron Acquisition and Pathogenesis. Cell envelope architecture dictates divergent transport mechanisms in Gram-negative and Gram-positive bacteria." April 14, 2011.
88. **Department of Physiology, David Geffen UCLA School of Medicine.** Role of Murein in the Novel Mechanism of Heme/Hemoglobin Transport by Gram-positive Bacteria ,” May 17, 2011.
89. **Trellis Biosciences Inc., S. San Francisco, CA.** "Immune response to Listerial Cell Surface Proteins," July 7, 2011.
90. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Role of Murein in Iron Transport Systems of Bacteria." Aug 14, 2011.
91. **Department of Biochemistry, Kansas State University.** Role of Murein in the Novel Mechanism of Heme/Hemoglobin Transport by Gram-positive Bacteria. Feb. 7, 2012
92. **Department of Diagnostic Medicine/Pathobiology, School of Veterinary Medicine, Kansas State University.** Abrogation of Heme- and Hemoglobin-Mediated Iron Acquisition by Gram-Positive Bacterial Pathogens. Sept. 13, 2012
93. **Gordon Research Conference on Mechanisms of Membrane Transport, Mt. Holyoke College, South Hadley, MA.** Active ion transport through an unenergized membrane. June 18, 2013
94. **Departamento de Quimica, Universidade de Sao Paulo, Brazil** "Energy-Dependent Motion of TonB in the Gram-negative Bacterial InnerMembrane," 20 Mar., 2013.
95. **Trellis Biosciences, S. San Francisco, CA** "Role of Murein in the Novel Mechanism of Heme/Hemoglobin Transport by Gram-positive Bacteria" 28 Mar., 2013.
96. **Departamento de Microbiologia, Universidade de Sao Paulo, Brazil.** "Abrogation of Gram-positive Bacterial Heme/Hemoglobin Acquisition. 30 Aug., 2013.
97. **Dept. of Chemistry, Wichita State University, Wichita, KS.** "Energy-Dependent Motion of TonB in the Gram-negative Bacterial Inner Membrane," 15 Sept. 2013.
98. **Dept. of Mol. Biosciences, Univ. Of KS, Lawrence, KS.** "Energy-Dependent Motion of TonB in the Gram-negative Bacterial Inner Membrane," 15 Sept. 2013.
99. **UCLA Molecular Biology Institute., Los Angeles, CA.** "Fluorescence Spectroscopic Measurements of Membrane Transport Phenomena in vivo" Oct. 4, 2013,
100. **Trellis Biosciences, S. San Francisco, CA.** "Antibodies to Heme/Hemoglobin Transporters of Gram-positive Bacteria." 11 Oct., 2013.
101. **Department of Molecular and Cell Biology, University of California, Berkeley.** "Fluorescence Measurements of Active Membrane Transport in vivo," Sept 15, 2014.
102. **Department of Physiology, UCLA School of Medicine, Los Angeles, CA.** "Fluorescence Measurements of Active Membrane Transport in vivo," Sept. 19, 2014.
103. **2<sup>nd</sup> International Congress on Bacteriology and Infectious Diseases,** Nov. 17-19, 2014, Chicago, USA . Spectroscopic analyses of Gram-negative bacterial iron transport reactions.
104. **Departamento de Microbiologia, Universidade de Sao Paulo, Brazil,** "Fluorescence Measurements of Active Membrane Transport in vivo," Nov. 23, 2014.