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### **PROFESSIONAL HISTORY**

Visiting Scientist and Fulbright Scholar, Faculte de Medecine, Institut Necker Enfants Malades, INSERM U570, Paris, FRANCE, 2002-2003  
Visiting International Professor, Universidade de Sao Paulo, Sao Paulo Brasil, 2001.  
Professor, University of Oklahoma, Department of Chemistry, Norman, Oklahoma, 9/01/98-PRESENT.  
Associate Professor, University of Oklahoma, Department of Chemistry, Norman, Oklahoma, 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 Microbiology, Milwaukee, Wisconsin, 1988-1993.  
Assistant Professor, University of Notre Dame, Department of Biological Sciences, Notre Dame, Indiana, 1984-1988.  
Post Doctoral, University of California, Berkeley, California, 1982-1984.  
Advisor: Dr. Hiroshi Nikaido - Microbiology and Immunology  
Post Doctoral, Stanford University Medical School, Stanford, California, 1981-1982.  
Advisor: Dr. Leon T. Rosenberg - Medical Microbiology

### **EDUCATION**

University of Notre Dame, Notre Dame, Indiana, **B.S.**, 1975  
University of California-Berkeley, California, **Ph.D.**, 1982; Advisor: 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, 2001, Universidade de Sao Paulo, Brasil  
Fulbright Research Scholar, Franco-American, US State Department, 2002-2003  
Chercheur de Institut Nationale de la Sante et la Recherche Medicale (INSERM), Institut Necker, 2002  
Member, Conseil Scientifique de Fulbright Commission et Commission Franco-Americaine, 2002-2003  
American Association for the Advancement of Science, Member  
American Society for Microbiology, 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.*  
Journal Reviewer: *Science, Nature, Proc. Nat. Acad. Sci. USA, Mol. Microbiol., J. Biol. Chem., J. Bacteriol., Gene, J. Gen. Microbiol., Res. Microbiology, Infect. Immun., J. Mol. Biol., Biophys. J.*  
Biochemistry Specialist, Council for Exchange of International Scholars (CIES - Fulbright)  
Grant Reviewer: National Science Foundation (Biochemistry & Molecular Structure & Function), National Institutes of Health (Microbial Physiology), US Dept. of Agriculture, US Dept. of State (Fulbright Scholar Program, Life Sciences)

## CURRENT GRANT SUPPORT

1. Ligand-Gated Transport through FepA. **Phillip E. Klebba, Ph. D., P.I.**, National Institutes of Health, 2R01-GM53836-10. 8/1/2006-7/31/2010. \$311,650/\$1,117,644
2. 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.

## 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. 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.
8. 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).
9. Enhancement of Physical Biochemistry in Oklahoma **Phillip E. Klebba, Ph. D., P.I., (Norman Campus), Paul H. Weigel, P.I (OU Health Sciences Center).** National Institutes of Health, 1P20RR11622-01, 9/30/96-8/31/99, \$95,856/\$215,000.
10. 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).
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.

19. Role of iron acquisition in the pathogenesis of *Listeria*. **Phillip E. Klebba, Ph. D., P.I.** Institute Nationale de la Sante et la Recherche Medicale (INSERM). 9/1/02-6/30/03. \$38,500.
20. 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.

### 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. 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.
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.
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. in: 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. Klug, C.S., W. Su, J. Liu, **P.E. Klebba** & J.B. Feix. 1995. Denaturant unfolding of the ferric enterobactin receptor and ligand induced stabilization studied by site-directed spin labeling. *Biochemistry* **34**:14230-14235.
23. 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.
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.
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.
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
31. Kuhn, S.E., A. Nardin, **P.E. Klebba** & R.P. Taylor. *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**. 1998. 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**. 1999. Effects of loop deletions on the binding and transport of ferric enterobactin and colicins B and D 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**:2895-2901
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. Microbiology* **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* in mice. *Microb. Path.* **28**:157-167.
40. Yun, C-W., M. Bauler, R. E. Moore, **P. E. Klebba** and C. C. Philpott. 2000. 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 *Escherichia 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.
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.
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.* Oct 20, 2006; [Epub ahead of print].
55. Rabsch, W., L. Ma, G. Wiley, W. Kaserer, F.Z. Najar, B. Beil, M. Schallmeyer, B. A. Roe, S. M. C. Newton and P. E. Klebba. H8: a T5-like coliphage that infects through the ferric enterobactin receptor, FepA. *Submitted*.
56. Scheurch, D, Z. Cao, R. Annamalai, S.M.C. Newton and **P.E. Klebba**. TonB and Energy Dependence of FepA. *In preparation*
57. Kaserer, W. D.C. Scott, Bauler, M, Annamalai, R., Newton, S. and **P.E. Klebba**, Biochemistry of the TonB C-terminus. *In preparation*.
58. Jin, B., X. Jiang, S.M. C. Newton and **P.E. Klebba**. Relationship of iron acquisition to bacterial pathogenesis. *In preparation*.
- 59 M.A. Payne, J. Liu and **P.E. Klebba**. A guide to site-directed spectroscopy in the bacterial cell

envelope. *In preparation*

60. Key, P.N., Maymani, H., K.M. Raymond and P. E. Klebba. Specificity of CueO, the *Escherichia coli* multi-copper oxidase, for ferric catecholates. *In preparation*.

### MEETING ABSTRACTS

1. Rutz, J.M., M. Miller, and **P.E. Klebba**. Ligand-specific killing of gram-negative bacteria by siderophore-antibiotic conjugates. Annu. Meeting Amer. Soc. Microbiology, 1993, Atlanta, GA.
2. Liu, J. J.M. Rutz, M.A. J.B. Feix, and **P.E. Klebba**. Electron paramagnetic resonance analysis of ligand binding domains within the *Escherichia coli* ferric enterobactin receptor. Annu. Meeting Amer. Soc. Microbiology, 1993, Atlanta, GA.
3. **Klebba, P. E.**, S M. C. Newton, M. Hofnung, and A. Charbit. Function and organization of the transverse loop within the sugar-specific porin, LamB. **Gordon Research Conference on Bacterial Cell Surfaces**, July 9, 1994, Brewster Academy, New Hampshire.
4. **Klebba, P. E.** S. M. C. Newton, M. Hofnung, and A. Charbit. Mechanism of maltoextrin transport through the sugar-specific porin, LamB. **Gordon Research Conference on Bacterial Cell Surfaces**, July 9, 1994, Brewster Academy, New Hampshire.
5. Liu, J., J.M. Rutz, J. Feix, & **P. E. Klebba**. Conformational change in the ferric enterobactin receptor FepA: A spin-labeling study. **Gordon Research Conference on Bacterial Cell Surfaces**, July 9, 1994, Brewster Academy, New Hampshire.
6. Newton, S. M. C., **P.E. Klebba**, M. Hofnung, and A. Charbit. Site-directed insertion mutagenesis in LamB gene: implications for a folding model. **Gordon Research Conference on Bacterial Cell Surfaces**, July 9, 1994, Brewster Academy, New Hampshire.
7. Liu, J., J.M. Rutz, **P.E. Klebba**, and J. Feix. Site-directed spin labeling of the ferric enterobactin receptor, FepA. **American Society for Microbiology Annual Meeting**, May 23, 1994, Las Vegas, Nevada.
8. **Klebba, P.E.**, J. Liu, C.K. Murphy, and Jimmy B. Feix. Structural dynamics of the ferric enterobactin receptor, FepA, as studied by site-directed spin labeling. **Biophysical Society Annual Meeting**, February 16, 1995, San Francisco, CA.
9. Allen, J.A., S.M.C. Newton, Z. Qi, A. Shaw, J. Igo & **P.E. Klebba**. Charge clusters in the ligand binding site of the ferric enterobactin receptor, FepA. Annu. Meeting Amer. Soc. Microbiology, 1996, New Orleans, LA.
10. Newton, S.M.C., D. Dyer & **P.E. Klebba**. Molecular Evolution of bacterial outer membrane proteins. Annu. Meeting Amer. Soc. Microbiology, 1996, New Orleans, LA.
11. Newton, S.M.C., J.A. Allen, Z. Qi, A. Shaw, J. Igo & **P.E. Klebba**. Charge clusters in the ligand binding site of the ferric enterobactin receptor, FepA. **Gordon Research Conference on Bacterial Cell Surfaces**, June 30, 1996, New England College, Henniker, New Hampshire.
12. Newton, S. M. C., **P.E. Klebba**, M. Hofnung, and A. Charbit. Insertion of viral epitopes in the C-terminal loop of LamB: relationship between surface exposition and immunogenicity.
13. Allen, J.A., S.M.C. Newton, Z. Qi, A. Shaw, J. Igo & **P.E. Klebba**. Charge clusters in the ligand binding site of the ferric enterobactin receptor, FepA. Annu. Meeting Amer. Soc. Microbiology, 1996, New Orleans, LA.
14. Newton, S.M.C., D. Dyer & **P.E. Klebba**. Molecular Evolution of bacterial outer membrane proteins. Annu. Meeting Amer. Soc. Microbiology, 1996, New Orleans, LA.
15. Newton, S.M.C., J.A. Allen, Z. Qi, A. Shaw, J. Igo & **P.E. Klebba**. Charge clusters in the ligand binding site of the ferric enterobactin receptor, FepA. **Gordon Research Conference on Bacterial Cell Surfaces**, June 30, 1996, New England College, Henniker, New Hampshire.
16. Newton, S. M. C., **P.E. Klebba**, M. Hofnung, and A. Charbit. Insertion of viral epitopes in the C-terminal loop of LamB: relationship between surface exposition and immunogenicity. **Gordon Research Conference on Bacterial Cell Surfaces**, June 30, 1996, New England College,

Henniker, New Hampshire.

17. Qi, Z., A. Switalski, S.M.C. Newton **P.E. Klebba** & L.T. Rosenberg. Combinatory Vaccine against *Salmonella typhimurium*. Annu. Meeting Amer. Soc. Microbiology, 1997, Miami, FL.
18. Cao, Z., M.A. Payne, S.B. Foster & **P.E. Klebba**. Fluorescence measurement of ferric enterobactin binding to FepA. Annu. Meeting Amer. Soc. Microbiology, 1997, Miami, FL.
19. Payne, M.A., J.D. Igo, S.B. Foster, Z. Cao, J. Shaw, S.M.C. Newton & **P.E. Klebba**. Biphasic binding kinetics between the bacterial outer membrane protein FepA and its ligands. Annu. Meeting Amer. Soc. Microbiology, 1997, Miami, FL.
20. Sprencel, C.S. & **P.E. Klebba**. Filter assay of ferric enterobactin binding to overexpressed FepB. Annu. Meeting Amer. Soc. Microbiology, 1997, Miami, FL.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
29. **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.
27. 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.
28. 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.
29. Thulasiraman, P. Newton, S.M.C., and **Klebba, P.E.** Selectivity of ferric enterobactin binding and transport in Gram-negative bacteria. Annu. Meeting Amer. Soc. Microbiology, May 15-19, 1998, Atlanta, GA.
30. **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.
31. 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.
32. 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.
33. 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.
34. **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.

35. 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.
36. 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.
37. 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.
38. Scott, D.C., S. M.C. Newton & P.E. Klebba. Physical interaction of the TonB-C-terminal domain with FepA and Colicin B. Meeting Amer. Soc. Microbiology, May 21-25, 1999, Los Angeles, CA.
39. 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.
40. 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.
41. 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.
42. **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.
43. 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
44. **P.E. Klebba**, S.M. Newton and A. Charbit. "Iron acquisition by *Listeria*." 21 January, 2004. Hawaiian International Conference of the Sciences, Honolulu, Hawaii.
45. 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.
46. **P. E. Klebba, Ph. D.** "Iron Acquisition by *Listeria monocytogenes*." ASM Regional Meeting, Denton TX, Nov. 10-12, 2005: Division of Bacterial Cell Surfaces
47. S.M. C. Newton and **P.E. Klebba**, "Iron transport systems of *Listeria monocytogenes*," BioMetals 2006, Portland, OR, Aug. 2006

### INVITED SEMINAR PRESENTATIONS

1. Gated Porin mechanism of ferric enterobactin transport through FepA. 15 May, 1992. Dept. of Molecular and Cell Biology, **University of California**, Berkeley, CA.
2. Gated Porin mechanism of ferric enterobactin transport through FepA. **Gordon Research Conference on Bacterial Cell Surfaces**, July, 1992, Brewster Academy, New Hampshire.
3. The ferric enterobactin receptor: molecular properties and relation to pathogenesis. 14 December, 1992. Dept. Molecular Genetics and Cell Biology, **Univ. Chicago**
4. Gated Porin mechanism of ferric enterobactin transport through FepA. 2 February, 1993. Department of Microbiology, **University of Illinois at Chicago**.
5. The ferric enterobactin receptor: molecular properties and relation to pathogenesis. 19 March, 1993. Dept. of Microbiology, **Colorado State Univ.**, Fort Collins, CO.
6. Gated porin mechanism of siderophore transport through the ferric enterobactin receptor, FepA. July 15, 1993. Department of Medicine, **University of North Carolina**, 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. February 15, 1994. TonB-dependent transport of ferric enterobactin through the gated porin, FepA.
10. TonB-dependent transport of ferric enterobactin through the gated porin, FepA. 16 March, 1993. Unite de Programmation Moleculaire et Toxicologie Genetique, **Institut Pasteur**, Paris, France.
11. Mechanism of maltodextrin transport through the sugar-specific porin, LamB. **Federation of European Biochemists colloquium on membrane transport**, April 2, 1994. Institut Pasteur, Paris France.
12. Conformational change in the ferric enterobactin receptor FepA: A spin-labeling study. **Gordon Research Conference on Bacterial Cell Surfaces**, July 9, 1994, Brewster Academy, New Hampshire.
13. Mechanism of maltodextrin transport through the sugar-specific porin, LamB. September 16. 1994. Department of Botany and Microbiology, **University of Oklahoma**, Norman, OK.
14. Bacterial outer membrane protein structure: application to vaccine chimeras. 12 1995. Dept. of Microbiology & Immunology, **Stanford University**, Stanford, CA.
15. Bacterial outer membrane protein structure: application to vaccine chimeras. 17 January, 1995. Dept. of Microbiology, **University of Washington**, Seattle WA.
16. Mechanism of maltodextrin transport through the sugar-specific porin, LamB. 18 January, 1995. Department of Biophysics, **Iowa State Univ.**
17. Bacterial Porin Structure. 17 February, 1995. Department of Molecular and Cellular Biology, **University of California, Berkeley**, CA.
18. Bacterial Porin Structure. 15 March, 1995, Department of Biochemistry, **University of Missouri**, Kansas City
19. Conformational change in the ferric enterobactin receptor of *Escherichia coli*. 20 March 1995. Department of Microbiology, **University of Oklahoma Health Sciences Center**, Oklahoma City, OK.
20. Conformational change in the ferric enterobactin receptor FepA: A spin-labeling study. 16 June, 1995. **Minisymposium on Protein Structure, Oklahoma State University**, Stillwater, OK.
21. Bacterial Porin Structure. October, 1995. Department of Microbiology, **University of Texas at Austin**.
22. "Double mutagenesis of a positive charge cluster in the ligand binding site of the ferric enterobactin receptor, FepA." **Departamento de Microbiologia, Universidade d Sao Paulo**, 13 December, 1996.
23. "Conformational dynamics *in vivo* in the *Escherichia coli* ferric enterobactin receptor, FepA". **Department of Microbiology, Escola Paulista de Medicina, Sao Paulo, Brazil**, 19 December, 1996.
24. ESR measurement of conformational dynamics during iron transport in living cells. August 5, 1997. **39<sup>th</sup> Rocky Mountain cConference on Analytical Chemistry**, Denver, CO.
25. Expression of Hybrid Vaccines in Bacteria, Children's Hospital of Oakland Research Institute, Oakland, CA, 9 October, 1997.
26. Immunochemical Analysis of Surface Epitopes on the Ferric Enterobactin Receptor, FepA, Abjenix Corporation, Fremont CA, October 10, 1997.
27. Bacterial Iron Transport: A Case of Open and Shut. Oklahoma State University, Stillwater, OK, 17 Nov., 1997.
28. Transport of proteins and peptides through the bacterial outer membrane. **Biophysical Society Annual Meeting**, Kansas City, MO, February 1998. Co-convener (invited by Dr. Alfred Esser).
29. Bacterial Ion Channels, **Biophysical Society Annual Meeting**, Kansas City, MO, February 1998
30. Mechanism of colicin import through the ferric enterobactin receptor, FepA, **EMBO Colicin Workshop**, Norwich, England, April, 1998 (invited by Dr. Richard James).
31. Outer membrane transport processes. **American Society of Microbiology, General Meeting**, Atlanta GA, May, 1998. Co-convener (invited by Dr. Robert Simons).

32. Bacterial Iron transport into *Escherichia coli*. **American Society of Microbiology, General Meeting**, Atlanta GA, May, 1998 (invited by Dr. Robert Perry).
33. 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).
34. **Department of Chemistry, Wichita State University**. Iron transport in Gram-negative bacteria, a case of open and shut. 18 March, 1998.
35. **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.
36. **Oklahoma Medical Research Foundation, Oklahoma City ESR solutions to membrane transport problems, *in vitro* and *in vivo***. 23 April, 1998.
37. **Centre Nationale Recherche Scientifique, Marseille, France**. Effect loop deletions on the transport of ferric enterobactin through FepA. 10 Nov., 1998.
38. **Departamento de Microbiologia, Escola Paulista Medicina, Sao Paulo, Brazil**. Transport of ferric enterobactin through FepA. 30 Dec., 1998.
39. **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.
40. **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.
41. **Oklahoma State University, Stillwater, OK. Mini Symposium on Protein Biology**. “Deletion mutagenesis of an outer membrane protein.”, June 24-25, 1999.
42. **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.”
43. **Department of Molecular & Cell Biology, University of California, Berkeley, CA**. May 26, 2000. “Aromatic components of the ferric enterobactin binding site in FepA.”
44. **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.”.
45. **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.
46. **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.”
47. **Public Health Research Institute, New York, N.Y.** 2 October, 2001. “Mechanism of iron acquisition by Gram-negative bacterial pathogens.”
48. **Bob Deich memorial lecture, Wyeth-Lederle Vaccines, Rochester, N.Y.** 4 October, 2001. “Mechanism of iron acquisition by Gram-negative bacterial pathogens.”
49. **Departamento de Microbiologia, Universidade de Sao Paulo, Brasil**. 14 December, 2001. “Mechanism of iron acquisition by Gram-negative bacterial pathogens.”
50. **Los Alamos National Laboratory, Los Alamos, N.M.**. “Ball-and-Chain mechanism of iron acquisition by Gram-negative bacteria.” Mar. 13, 2002.
51. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil**. “The pathogenesis of bacteria.” Apr 21, 2002.
52. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil**. “Unique protein structures in the bacterial cell envelope” Apr 22, 2002.
53. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil**. “General porin transport in *Escherichia coli*.” Apr 23, 2002.
54. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil**. “Periplasmic

- binding protein systems: relatedness to eukaryotic iron binding proteins.” Apr 25, 2002.
55. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** “Iron transport in Gram-negative bacteria. Apr 26, 2002.
  56. **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.
  57. **Departamento de Microbiologia, Universidade Federale do Pernambuco, Recife, Brasil.** “Iron transport through Gram-negative bacterial outer membranes.” Departamento de Microbiologia,
  59. **Institut Necker Enfants Malades, 156 rue de Vaugirard, Paris 75015, France.** “Spectroscopic observations of ferric enterobactin transport in vivo.” Oct. 12, 2002.
  60. **Institut Pasteur, 25 rue du Dr. Roux, Paris 75015, France.** “Fluorescence Spectroscopy in vivo: TonB- and Energy-Dependence of FepA.” Dec 6, 2002.
  61. **Fulbright Annual Meeting, Ecole Normale Superior, Paris, France.** “Iron acquisition by *Listeria monocytogenes*”. 2 February, 2003.
  62. **Department of Microbiology, Universitat Wuerzburg, Wuerzburg, Germany.** “Spectroscopic observations of ferric enterobactin transport in vivo.” April 26, 2003.
  63. **Department of Vaccinology, Chiron Corporation, Siena, Italy.** “Fluorescence Spectroscopy in vivo: TonB- and Energy-Dependence of FepA.” 28 April, 2003.
  64. **Department of Microbiology, Universitat Tuebingen, Tuebingen, Germany.** “Fluorescence Spectroscopy in vivo: TonB- and Energy-Dependence of FepA.” 30 April, 2003.
  65. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** “Iron acquisition by *Listeria monocytogenes*.” 2 August, 2003.
  66. **Department of Chemistry, Wichita State University.** "Iron acquisition by Bacteria." 7 April, 2004.
  67. **Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, Brasil.** "Iron acquisition by *Listeria monocytogenes*." 3 Mar, 2004.
  68. **Department of Molecular and Cell Biology, University of California, Berkeley, Berkeley, CA,** "Iron acquisition by *Listeria monocytogenes*." 24 Mar, 2004.
  69. **Department of Chemistry, University of California, Berkeley, Berkeley, CA.** Mechanism of ferric enterobactin transport through FepA. 25 March, 2004.
  70. **P.E. Klebba.** “Iron acquisition by *Listeria monocytogenes*.” Dec. 7, 2005. Departamento de Quimica, Universidade de Sao Paulo, Sao Paulo, Brasil.
  71. **P. E. Klebba, Ph. D.** “Iron Acquisition by *Listeria monocytogenes*.” Texas Women’s University, Denton TX, Nov, 2005
  72. **P.E. Klebba.** “Ball-and-Chain mechanism of ferric enterobactin uptake through FepA. BioMetals 2006, Portland, OR, Aug. 3, 2006
  73. **P.E. Klebba,** “Biochemistry of the heme/hemoglobin uptake system of *Listeria monocytogenes*.” Departamento de Microbiologia e Instituta de Ciencias Biomedicas, Universidade de Sao Paulo, Sao Paulo, Brasil, 17 Dec., 2006