

Biographical Sketch

Salete M. C. Newton, Ph. D.

Associate Research Professor of Chemistry and Biochemistry
University of Oklahoma, Norman, OK 73019

EDUCATION

Bachelor in Biology, Universidade de Sao Paulo, 1981

Ph. D. in Biochemistry, Universidade de Sao Paulo, 1986

POSITIONS HELD

Post-doctoral, Stanford University, Department of Microbiology and Immunology. Laboratory of Dr. Bruce Stocker. From July 1986 to July 1989.

Assistant Professor, Universidade de São Paulo, Departamento de Microbiologia, Instituto de Ciências Biomédicas, July 1985 to August 1997.

Visiting Associate Scientist, Institute Pasteur, Unite de Programmation Moleculaire et Toxicologie Genetique, Paris, FRANCE, December 1993 to August 1995.

Visiting Professor at the Department of Chemistry and Biochemistry, University of Oklahoma, Norman, OK , 73019, 1995-2000.

Research Professor of Biochemistry, Department of Chemistry and Biochemistry, University of Oklahoma, Norman, OK 73019, 2000-present.

Visiting Scientist, Faculte de Medecine, Institut Necker Enfants Malades, INSERM U570, Paris, FRANCE, 2002-2003

AWARDS, ORGANIZATIONS & PROFESSIONAL SERVICE

Chercheur de Fondation de Research Medcale (FRM), Institute Pasteur, Paris, 1993

American Society for Microbiology (ASM) International Professorship, 2001, Universidade de Sao Paulo, Brasil

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

American Society for Microbiology, Member

Journal Reviewer: Mol. Microbiol., J. Bacteriol., Infect. Immun.

CURRENT GRANT SUPPORT

1. Ligand-Gated Transport through FepA. **S.M. Newton, Co-Investigator**, (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
2. TonB, peptidoglycan and bacterial iron acquisition. **S.M. Newton, Co-Investigator**, (Phillip E. Klebba, Ph. D., P.I.) 3/1/2010 - 2-28, 2013. National Science Foundation. \$205,000/\$615,000.

PAST GRANT SUPPORT

1. Ligand-Gated Transport through FepA **S.M. Newton, Co-Investigator**, (Phillip E. Klebba, Ph. D., P.I.) National Institutes of Health, 2R01-GM53836-14. **Administrative Supplement** 9/1/09-8/31/10. \$123, 535.
2. Mechanism of Ferric Enterobactin Uptake by FepA. **S.M. Newton, Co-Investigator**, (Phillip E. Klebba, Ph. D., P.I.) National Science Foundation, MCB-0417694. 9/1/00-8/31/07. \$90,000/\$270,000.
3. Ligand-gating of transport through FepA **Salete M. C. Newton, Ph. D., Co-Investigator** (P.E. Klebba, Ph. D., P.I.), National Institutes of Health,. 2R01GM53836-06. 4/1/00-3/31/05. \$438,131/\$2,152,320.
4. Role of the secreted protein SvpA in the pathogenesis of *Listeria*. **Salete M. C. Newton, Ph. D., P.I.** Institute Nationale de la Sante et la Recherche Medicale (INSERM). 9/1/02-6/30/03. \$33,500.
5. Cytofluorimetry of vaccine epitope exposure in bacteria. (**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.
6. Molecular Biological approaches to bacterial cell wall biochemistry. **Salete M.C. Newton, Ph. D., Co-Investigator** (P.E. Klebba, Ph. D. P.I.). American Society for Microbiology (ASM). 10/1/2001 - 9/31/2002. \$4000.

PUBLICATIONS

1. **Newton, S.M.C.**; Jacob, C.O. & Stocker, B.A.D. Immune response to a cholera toxin epitope inserted in *Salmonella* flagellin. *Science* **244**:70-72 (1989).
2. Wu, J.; **Newton, S.M.C.**; Judd, A.; Stocker, B.A.D. & Robinson, W.S. Expression of immunogenic epitopes of hepatitis B surface antigen within hybrid flagellin molecules by a vaccine strain of *Salmonella*. *Proc. Natl. Acad. Sci. USA* **86**:4726-4730 (1989).
3. Frankel, G.; **Newton, S.M.C.**; Schoolnik, G.K. & Stocker, B.A.D. Intragenic recombination in a flagellin gene: characterization of the H1-j gene of *Salmonella typhi*. *EMBO J.* **8**:3149-3152 (1989).
4. Frankel, G.; **Newton, S.M.C.**; Schoolnik, G.K. & Stocker, B.A.D. Unique sequences in region IV of the flagellin gene of *Salmonella typhi*. *Molec. Microbiol.* **3**:1379-1383 (1989).
5. Nnalue, N.A.; **Newton, S.M.C.** & Stocker, B.A.D. - Lysogenization of *Salmonella choleraesuis* by phage 14 increases average length of O-antigen chains, serum resistance and intraperitoneal mouse virulence. *Microb. Pathog.* **8**:393-402 (1990).
6. **Newton, S.M.C.**; Manning, W.C.; Hovi, M. & Stocker, B.A.D. Aromatic-dependent *Salmonella* with foreign epitope insert in flagellin as live-vaccines. *Vaccines 90*, Cold Spring Harbor, pp. 439-445 (1990).
7. **Newton, S.M.C.**; Miller, J.; Wasley, R.; Wilson, A.; Rosenberg, L.T. & Stocker, B.A.D. Region IV of a *Salmonella* flagellin gene specifies flagellar antigenic epitopes. *Molec. Microbiol.* **5**:419-425 (1991).
8. **Newton, S.M.C.**; Kotb, M.; Poirier, T.P.; Stocker, B.A.D. & Beachey, E.H. - Expression and immunogenicity of a Streptococcal M protein epitope inserted in *Salmonella* flagellin. *Infec. Immun.* **59**:2158-2165 (1991)
9. **Newton, S.M.C.** & Stocker, B.A.D. Insertion of heterologous epitopes in *Salmonella* flagellin. *Mem. Inst. But.* **53**:53-58 (1991).
10. Honore, N.; Chanteau, S.; Doucet-Populaire, F.; Eiglemeier, K.; Garnier, T.; Georges, C.; Launois, P.; Limpaboon, P.; **Newton, S.M.C.**; Nyang, K.; del Portillo, P.; Ramesh, G.K.; Reddy, T.; Riedel, J.P. ; Sittisombut, N.; Wu-Hunter, S. & Cole, S.T. Nucleotide sequence of the first cosmid from the *Mycobacterium leprae* Genome Project: structure and function of the rif-str regions. *Molec. Microbiol.* **7**:207-214 (1993).
11. Beckers, W.; Villa, L.; Gonfloni, S.; Castagnoli, L.; **Newton, S.M.C.**; Cesareni, G. & Ghiara, P. Increasing the immunogenicity of protein antigens through the genetic insertion of VQGEESNDK sequence of human IL-1B into their sequence. *J. Immunol.* **151**:1757-1764 (1993).
12. Stocker, B.A.D. & **Newton, S.M.C.** Insertion of heterologous epitopes in *Salmonella* flagellin. *Int. Rev. Immunol.* **11**:133-154 (1994).
13. **Newton, S.M.C.**, Klebba, P.E.; Hofnung, M. & Charbit, A. Studies on the anaerobically induced promoter nirB and the improved expression of bacterial antigens. *Res. Microbiol.* **146**:193-202 (1995).
14. **Newton, S.M.C.**; Joys, T.M.; Anderson, S.A.; Kennedy, R.C.; Hovi, M. & Stocker, B.A.D. Expression and immunogenicity of an 18-residue epitope of HIV1- gp41 as insert in the flagellar protein of a *Salmonella* live vaccine. *Res. Microbiol.* **146**:203-216 (1995).
15. **Newton, S.M.C.**; Klebba, P.E.K.; Michel, V.; Hofnung, M. & Charbit, A. Topology of the membrane protein LamB by epitope tagging and a comparison with the X-ray model. *J. Bacteriol.* **178**:3447-3456 (1996)
16. Lo-Man, R.; Martineau, P.; Deriaud, E.; **Newton, S.M.C.**; Jehanno, M.; Clement, J.M.; Fayolle, C.; Hofnung, M. & Leclerc, C. - Control by H-2 Genes of the Th1 Response induced against a foreign antigen expressed by attenuated *Salmonella typhimurium*. *Infect. Immun.* **64**:4424-4432 (1996).
17. Charbit, A., **Newton, S.M.C.**, Klebba, P.E., Clement, J.M., Fayolle, C., Lo-Man, R., Leclerc, C. & Hofnung, M. Expression and Immune response to foreign epitopes in Bacteria. Perspectives for live vaccine development. *Boehring. Inst.Mitt.* **98**:135-142 (1997).
18. Klebba, P.E.K., **Newton, S.M.C.**, Michel, V.; Hofnung, M. & Charbit, A. Further genetic analysis of the C-terminal external loop region in *Escherichia coli* maltoporin. *Res.Microbiol.* **148**: 375-387 (1997).
19. **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.
20. 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.
21. 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
22. Chen, I.; Pizza, M., Rappuoli, R. & **Newton, S.M.C.** 1998. Effects of the insertion of a nonapeptide from murine IL-1B on the immunogenicity of carrier proteins delivered by live attenuated *Salmonella*. *Arch. Microbiol.* **169**:113-119.

23. **Newton, S.M.C.**, J.D. Igo, D. Scott & P.E. Klebba. Effects of loop deletions on the binding and transport of ferric enterobactin and colicins B and D by FepA., *Mol. Microbiol.* **32**: 1153-1165.
24. Carson, S.D.B., P.E. Klebba, **S.M.C. Newton** and P.F. Sparling. Ferric enterobactin binding and utilization by gonococcal FetA (FrpB). *J. Bacteriol.* **181**: 2890-2895-21.
25. Anderson, C., C. Bachmeyer, H. Tauber, R. Benz, J. Wang, V. Michel, **S.M.C. Newton**, M. Hofnung & A. Charbit. 1999. *In vivo* and *in vitro* studies of the major surface loop deletion mutants of the *Escherichia coli* K-12 maltoporin: contribution to maltose and maltooligosaccharide transport and binding. *Mol. Microbiol.* **32**:851-867.
26. De Almeida, M.E., **Newton, S.M.C** & Ferreira, L.C. Antibody responses against flagellin in mice orally immunized with attenuated *Salmonella* vaccine strains. *Arch Microbiol.* **172**(2): 102-108 (1999).
27. 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.
28. 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.
29. 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.
30. Scott, D.C., **S.M.C. Newton**, & P.E. Klebba. 2002. Surface loop motion in FepA. *J. Bacteriol.* **184**:4906-4911
31. Cao, Z., Warfel, P., **Newton, S. M.** & Klebba, P. E. 2003. Spectroscopic observations of ferric enterobactin transport. *J. Biol. Chem.* **278**: 29-38.
32. 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.
33. Bierne, H., Garandeau, C. Pucciralli, M. Sabet, C., **Newton, S.**, Portillo, F.G., Cossart, P. & Charbit, A. 2004. Sortase B, a new class of sortase in *Listeria monocytogenes*. *J.Bacteriology* **186** : 1972-1982.
34. **Newton, S. M. C.**, P.E. Klebba, C. Raynaud, Y. Shao., X. Jiang, I. Dubail, C. Archer, C. Frehel, and A. Charbit. The *svpA-srtB* locus of *Listeria monocytogenes*: Fur-mediated iron regulation and effect on virulence. *Mol. Microbiol.* **55**:927-40.
35. Jin, B., Y. Shao, X. Jiang, **S.M. C. Newton**, A. Charbit and P.E. Klebba. Iron acquisition systems of *Listeria*: ferric hydroxamates, hemin and hemoglobin. *Mol Microbiol.* **59** (3): 855-61.
36. 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.
37. 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.
38. Kaserer, WA., Daniel C. Scott, Qiaobin Xiao, Xiaoxu Jiang, Matthew Bauler, **Salete 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.
39. Massis, L., M.E. Sbrogio-Almeida, C.J.M Braga, **S. M. C. Newton**, P. E. Klebba & L.C.S. Ferreira. 2008. Anti- flagellin antibody responses elicited in mice orally immunized with attenuated *Salmonella enterica* serovar Typhimurium vaccine strains. *Mem Inst Oswaldo Cruz.* **103**:606-10.
39. 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.
40. 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.
41. Wang, F., D. Li, S.M. Newton, **P.E. Klebba** & C. Mao. Genetically Modifiable Flagella as Templates for Silica Fibers: From Hybrid Nanotubes to 1D Periodic Nanohole Arrays. *Adv. Funct. Mater.* **18**: 4007-4013.
42. 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.
43. Xiao, Q., Jiang, X, Y. Shao, Y., S.M.C. Newton & **P.E. Klebba**. Sortase dependent and independent transport systems for heme and hemoglobin in *Listeria monocytogenes*. *Submitted*.
44. Dong Li, S.M.C. Newton, **P.E. Klebba**, C. Mao. Biomimetic nucleation and growth of bone mineral on bone protein-derived peptides displayed on bacterial flagella. *Submitted*.

Recent Invited Lectures

1. "Cytofluorimetry of vaccine epitopes in bacteria." Mar. 12, 2002. Los Alamos National Laboratory, Los Alamos, N.M.
2. "Maltodextrin through LamB." Apr 23, 2002. Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, BRASIL.
3. "TonB and energy transfer in the *E. coli* cell envelope." Apr 24, 2002. Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, BRASIL.
4. "Use of cell surface exposure in biotechnology vaccines." Apr 26, 2002. Departamento de Microbiologia, Universidade de Sao Paulo, Sao Paulo, BRASIL.
5. "Surface loop motion in FepA." Oct. 1, 2002. Institut Necker Enfants Malades, 156 rue de Vaugirard, Paris 75015, FRANCE.
6. "Evidence for Ball-and-Chain transport of ferric enterobactin through FepA." Dec. 19, 2006, Departamento de Quimica, Universidade de Sao Paulo, Sao Paulo, Brasil.