CURRICULUM VITAE

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Citizenship: --b(6)----------

Education: B.A. Colby College, Waterville ME --b(6)------
M.D. Northwestern University Medical School 1976-1980

Postgraduate Training and Professional Experiences:

2002-present	Professor of Microbiology, Dartmouth Medical School, Hanover, NH
1999- 2002	Associate Professor, Dartmouth Medical School, Hanover, N.H.
1996- 1999	Associate Professor, Rockefeller University, New York, N.Y.
1990 - 1995	Assistant Professor, Rockefeller University, New York. N.Y.
1986 - 1990	Research Associate, Rockefeller University, New York, N.Y.
1985 - 1986	Instructor, Harbor-UCLA Med. Ctr., UCLA School of Medicine, Los Angeles, CA
1983 - 1985	Fellow in Infectious Diseases, Harbor-UCLA Med. Ctr., UCLA School of Medicine, Los Angeles, CA.
1981 - 1983	Resident in Internal Medicine, Harbor-UCLA Med. Ctr., UCLA School of Medicine, Los Angeles, CA.
1980 - 1981	Intern, Harbor-UCLA Med. Ctr., UCLA School of Medicine, Los Angeles, CA.

Certification:

1986	Diplomate, American Board of Internal Medicine, Subspecialty in Infectious Diseases
1983	Diplomate, American Board of Internal Medicine

Honor Society:

-b(6)-	Phi Beta Kappa, Colby College
--b(6)-----	Dana Scholar, Colby College

Award and Honors:

-b(6)-	Departmental prize in Physics and Chemistry
1985 - 1986	National Research Service Award
1990	National Foundation For Infectious Diseases Young Investigator Matching Award
1990 - 1993	New York Heart Association Investigatorship

1994 - 1999	American Heart Association Established Investigatorship
1993 - 1998	Irma Hirschl Career Scientist Award
1993 - 1998	First Award from the National Institute of Health
2007-	Honorary Professor, Dept of Microbiology, Faculty of Medicine, University of Hong Kong
2007	AAAS Fellow

2009 Jun-Sept. Visiting Professor, Department of Medicine, University of Geneva. Switzerland.

Professional activities:

1991 - Pres.	Adhoc Member, Small Business Innovative Research Study Section, National Institute of Health
1986 - Pres.	Member, American Society for Microbiology
1991 - Pres.	Member of the Editorial Board, "Infection and Immunity"
1997 - 1999	Member of the Alumni Council, Colby College
1997	Member to selected Site Visit, NIH
1998	Adhoc member, MIDRC, NIAID, NIH
2001	Adhoc member, BM2 study section, NIH
2001 -2005	Regular Member, Study Section, Bacteriology and Mycology II, NIAID, NIH
2001	Member, site visit committee to National Institute of Child Health and Human Development, NIH
2004	Organizing committee of the ISSSI in Charleston, SC
2005-2006	Adhoc member, HIBP study section, NIH
2006	Adhoc member, DDR study section, NIH
2007	Adhoc member, AED, study section, NIH
2007	Adhoc member, ZRG study section, NIH
2008	Adhoc member, ZRG study section, NIH
2008	Associate Editor, PloS Pathogen
2009	Member of the Faculty 1000 Biology

Committee responsibilities:

2005-2007	DMS Admission Committee
2007-present	Academic Promotion Committee
2009	Member, search committee for the Chair of Pathology
2008	Member, search committee for recruitment of new immunology faculty member

Invited lectures:

May 1994	Convener and speaker at a symposium, "Global regulation and virulence determinants in *Staphylococcus aureus*: In vitro and in vivo correlations" at the Annual Meeting of the American Society for Microbiology.
Oct 1995	Invited speaker at the Gordon Conference on Staphylococci in Germany "The *sar* regulatory locus"
Jun 1996	Invited speaker at the "8th International Symposium on Staphylococci and Staphylococcal Infection" in Aix-Les-Bains, France on "The *sar* locus - a pleiotropic regulator of virulence determinants in *S. aureus*"
Spring 1997	Departmental Seminar at the Microbiology Department at the University of Kansas “Regulation of virulence determinants by the *sar* locus”

Spring 1997	Departmental Seminar at the Microbiology Department at the University of Illinois in Chicago. "Global regulatory locus *sar*"
May 1998	Invited speaker on Bacterial Pathogenesis Seminar, University of Alabama at Birmingham
October 1998	Invited speaker at the ASM regional meeting, Northeastern Branch, in Albany, New York.
March 1999	Invited speaker at the 11th SB Kurhaus Workshop on Infectious Diseases, Scheveningen, Holland
May 1999	Invited speaker at the Gordon Conference on Staphylococci in Barga, Italy "SarA binds to a consensus motif to activate target genes"
Dec 1999	Departmental Seminar at the Department of Medicine, Albert Einstein College of Medicine "Regulation of virulence determinants in *S. aureus*: In vitro and in vivo correlations"
Mar 2000	Departmental Seminar at the Department of Molecular Genetics and Microbiology at New Mexico School of Medicine, "Virulence determinants of *S. aureus*"
June 2000	Invited speaker at the Gordon Conference in Microbial Toxin, Proctor Academy, NH
Sep 2000	Invited speaker at the ICACC Conference on "The role of SigB in *S. aureus* infections" at Toronto, Canada
March 2001	Invited speaker at the Grand Round, Division of Infectious Disease, Dartmouth Hitchcock Medical Center, Hanover, NH.
April 2001	Invited Speaker at the 3rd Annual Conference on Gram-Positive Cocci Infections in Humans in New York, NY
April 2001	Departmental Seminar at the Microbiology Department, Wake Forrest University School of Medicine.
May 2001	Invited speaker at the symposium "Recent development in Gram+ pathogenesis" at the Annual Meeting for the American Society for Microbiology in Orland, FL
May 2001	Departmental Seminar at the Infectious Disease Division, Department of Medicine, Columbia College of Physicians and Surgeons.
June 2001	Invited speaker, at White River Junction VA hospital, at White River Junction, Vermont.
Oct 2001	Invited Speaker at the departmental seminar, Department of Microbiology, University of Vermont at Burlington

March 2002	Invited Speaker at the 3rd Annual NARSA meeting (Network on Antimicrobial Resistance in *Staphylococcus aureus*). Myrtle Beach, SC.
April 2002	Microbiology Departmental Seminar at University of Idaho, Moscow
Oct 2002	Invited speaker at the 10th ISSSI (International *S. aureus* meeting) meeting in Tsukaba, Japan
Nov 2002	Invited speaker at the Molecular Pathogenesis section, Yale School of Medicine
Nov 2002	Invited seminar speaker at Genome Therapeutic Corporation, Boston MA
May 2003	Convenor for an ASM symposium titled "Winged helix proteins of the prokaryotic and eukaryotic family"
Sept 2003	Discussion leader on "Virulence gene regulation in *S. aureus*" at the Gordon Conference in Oxford, England
Oct 2003	Invited speaker at the Departmental Seminar for Microbiology at Emory University
Oct 2003	Invited speaker at the Departmental Seminar for Microbiology at University of Minnesota
Nov 2003	Invited speaker at the Program for Microbiology at the University of Chicago
May 2004	Invited speaker at the Departmental Seminar of the Department of Microbiology and Molecular Genetics at University of Massachusetts Medical School at Worcester
Aug 2004	Invited speaker at the Departmental Seminar in the Department of Microbiology at the University of Hiroshima, Hiroshima, Japan
Aug 2004	Invited speaker at the International Forum on Infection and Immunity, at Awaji Island, near Osaka, Japan
Oct 2004	Keynote address at the 11th ISSSI in Charleston, SC, USA.
March 2005	Seminar speaker for NERCE, Harvard Medical School, Boston MA.
April 2005	Departmental seminar at National Jewish Hospital, Denver, CO.
Aug 2005	Invited speaker for the Gordon Conference on "Staphylococcal Diseases"
May 2006	Departmental Seminar, Microbiology Department, University of British Columbia, Canada
June 2006	Departmental Seminar, University of Basel Hospital, Basel, Switzerland
Sept 2006	Departmental Seminar, University of Tuebingen, Tuebingen, Germany

Nov 2006	Departmental Seminar, University of Muenster, Muenster, Germany
Dec 2006	Departmental Seminar, Division of Biological Sciences, Nanyang University, Singapore
April 2007	Departmental Seminar, University of Manchester, UK.
June 2007	Departmental Seminar, Department of Microbiology, Queen Mary Hospital, University of Hong Kong
July 2007	Departmental Seminar, Microbial Pathogenesis, Genentech, South San Francisco, CA.
Sept 2007	Departmental Seminar, Division of Infectious Diseases, University of Geneva Hospital, Geneva, Switzerland.
April 2008	Departmental Seminar, Department of Microbiology, University of Swansea, Swansea, Wales
Aug 2008	Departmental Seminar, Department of Molecular Genetics, University of Brussels, Belgium
Oct 2008	Convener of a mini-lecture at the ICAAC/IDSA meeting in Washington, DC.
Dec 2008	Infectious Diseases Grand Round, Hitchcock Medical Center, Lebanon, NH
June 2009	Seminar, Department of Medicine, University of Geneva, Switzerland.
Oct 2009	Speaker, ISDA Annual Meeting, Philadelphia, PA.
Sept 2010	Speaker, ISSSI (International Staphylococcal meeting), in Bath, England

Publications:

1. Cheung, A.L. and V. A. Fischetti. 1988. Variation in the expression of cell wall proteins of *Staphylococcus aureus* grown on solid and liquid media. *Infect. Immun.* 56:1061-1065.

2. Cheung, A.L., A. S. Bayer, J. Peters, and J. I. Ward. 1987. Analysis by gel electrophoresis, western blot and peptide mapping of protein A heterogeneity in *Staphylococcus aureus* strains. *Infect. Immun.* 55:843-847.

3. Cheung, A.L., A. S. Bayer, J. Peter, and J. I. Ward. 1988. Surface proteins of *Staphylococcus aureus*. *Rev. Infect. Dis.* 10 Suppl.2:S351-S355.

4. Greenberg, D.P., A. S. Bayer, A. L. Cheung, and J. I. Ward. 1989. Protective efficacy of protein A-specific antibody against bacteremic infection due to *Staphylococcus aureus* in an infant rat model. *Infect. Immun.* 57:1113-1118.

5. Cheung, A.L. and V. A. Fischetti. 1989. The role of surface proteins in staphylococcal adherence to fibers in vitro. *J. Clin. Invest.* 83:2041-2049.

6. Cheung, A.L., P. Ying, and V. A. Fischetti. 1991. A method to detect proteinase activity using unprocessed X-ray films. *Anal. Biochem.* 193:20-23.

7. Cheung, A.L. and V. A. Fischetti. 1991. The role of fibrinogen in mediating staphylococcal adherence to fibers. *J. Surg. Res.* 50:150-155.

8. Cheung, A.L. and V. A. Fischetti. 1990. The role of fibrinogen in staphylococcal adherence to catheters in vitro. *J. Infect. Dis.* 161:1177-1186.

9. Cheung, A.L., M. Krishnan, E. A. Jaffe, and V. A. Fischetti. 1991. Fibrinogen acts as a bridging molecule in the adherence of *Staphylococcus aureus* to cultured human endothelial cells. *J. Clin. Invest.* 87:2236-2245.

10. Cheung, A.L., J. M. Koomey, S. Lee, E. A. Jaffe, and V. A. Fischetti. 1991. Recombinant human tumor necrosis factor alpha promotes adherence of *Staphylococcus aureus* to endothelial cells. *Infect. Immun.* 59:3827-3831.

11. Cheung, A.L., J. M. Koomey, C. A. Butler, S. J. Projan, and V. A. Fischetti. 1992. Regulation of exoprotein expression in *Staphylococcus aureus* by a locus (*sar*) distinct from *agr*. *Proc. Natl. Acad. Sci. USA.* 89:6462-6466.

12. Cheung, A.L., M. Yeaman, and A. S. Bayer. 1994. The role of the *sar* locus in the induction of experimental endocarditis in rabbits. *Infect. Immun.* 62:1719-1725.

13. Cheung, A.L. and P. Ying. 1994. Regulation of and hemolysins by the *sar* locus of *S. aureus*. *J. Bacteriol.* 176:580-585.

14. Cheung, A.L. and S. J. Projan. 1994. Cloning and sequencing of *sar*A: a gene required for the expression of *agr*. *J. Bacteriol.* 176:4168-4172.

15. Ren, K., J. D. Bannan, V. Pancholi, A. L. Cheung, J. C. Robbins, V. A. Fischetti, and J. B. Zabriskie. 1994. Purification, characterization and biological properties of a new toxin from *S. aureus* inducing TSS-like illness in rabbits - *J. Exp. Med.* 180:1675-1683.

16. Cheung, A.L., K. Eberhardt, E. Chung, M. Yeaman, P. Sullam, M. Ramos, and A. S. Bayer. 1994. Diminished virulence of a *sar*$^-$/*agr*$^-$ mutant of *Staphylococcus aureus* in the rabbit model of endocarditis. *J. Clin. Invest.* 94:1815-1822.

17. Cheung, A. L., K. Eberhardt and V. A. Fischetti. 1994. A method to isolate RNA from gram-positive bacteria and mycobacteria. *Anal. Biochem.* 222:511-514.

18. Lo, S. K., A. L. Cheung, Q. Zheng, and R. L. Silverstein. 1995. Induction of tissue factor on monocytes by adhesion to endothelial cells. *J. Immunol.* 154:4768-4777.

19. Cheung, A. L., C. Wolz, M. R. Yeaman, A. S. Bayer. 1995. Insertional inactivation of a chromosomal locus that modulates expression of potential virulence determinants in *Staphylococcus aureus*. *J. Bacteriol.* 177:3220-3226.

20. Cheung, A.L., S. J. Projan, R. Edelstein, and V. A. Fischetti. 1995. Cloning, expression and nucleotide sequencing of a *S. aureus* gene (*fbp*A) encoding a fibrinogen binding protein. *Infect. Immun.* 63:1914-1920.

21. Dana, R.C., M. Saghbini, D. Lippman, and A. L. Cheung. 1995. Isolating RNA using the new FastPrep system. *J. NIH Res.* 7:61.

22. Bayer, A. S., P. M. Sullam, M. Ramos, C. Li, A. L. Cheung, and M. R. Yeaman. 1995. *Staphylococcus aureus* induces platelet aggregation via a fibrinogen-dependent mechanism which is independent of principal platelet GP IIb/IIIa fibrinogen-binding domains. *Infect. Immun.* 63:3634-3641.

23. Heinrich, J. H., M. G. Bayer, and A.L. Cheung. 1996. Characterization of the *sar* locus and its interaction with *agr* in *S. aureus*. *J. Bacteriol.* 178:418-423.

24. Bayer, M. G., J. H. Heinrichs, and A. L. Cheung. 1996. Molecular architecture of the *sar* locus.
J. Bacteriol. 178:4563-4570.

25. Wolz, C., D. McDevitt, T. J. Foster, and A. L. Cheung. 1996. The influence of *agr* on fibrinogen binding in *S. arueus* Newman. *Infect. Immun.* 64:3142-3147.

26. Sullam, P.S., A. S. Bayer, W. M. Foss, and A. L. Cheung. 1996. Diminished platelet binding *in vitro* by *S. aureus* is assocaited with reduced virulence in a rabbit model of infective endocarditis. *Infect. Immun.* 64:4915-4921.

27. Nilsson,I., T. Bremell, C. Rydén, A. L. Cheung, and A. Tarkowski. 1996. The role of staphylococcal accessory regulator (sar) in septic arthritis. *Infect. Immun.* 64:4438-4443.

28. Booth, M.C., A. L. Cheung, H. Hatter, and M. S. Gilmore. 1997. *Sar* contributes to *Staphylococcus aureus* virulence in endophthalmitis only in conjunction with *agr*. *Infect. Immun.* 65:1550-1556.

29. Liu, S., S. Sela, G. Cohen, J. Jadoun, A. L. Cheung, and I. Ofek. 1997. Genetic evidence for co-regulation of Streptolysin S production and riboflavin biosynthesis in *S. pyogenes*. *Microbiol. Pathog.* 22:227-234.

30. Cheung, A.L., K. Eberhardt, and J. H. Heinrichs. 1997. Regulation of protein A by the *sar* and *agr* loci of *Staphylococcus aureus*. *Infect. Immun.* 65:2243-2249.

31. Cheung, A.L., M. G. Bayer, and J. H. Heinrichs. 1997. The genetic requirement of *sar* in the expression of RNAII and RNAIII in *Staphylococcus aureus*. *J. Bacteriol.* 197:3963-3971.

32. Dhawan, V., M. R. Yeaman, A. L. Cheung, E. Kim, P. A. Sullam, and A. S. Bayer. 1997. Phenotypic resistance to thrombin-induced platelet microbicidal protein in vitro is correlated with enhanced virulence in experimental endocarditis due to *Staphylococcus aureus*. *Infect. Immun.* 65:3293-3299.

33. Giraudo, A.T., A. L. Cheung and R. Nagel. 1997. The *sae* locus of *Staphylococcus aureus* controls exoprotein synthesis at the transcriptional level. *Arch. Microbiol.* 168:53-58.

34. Bayer, A. S., M. D. Ramos, B. Menzies, M. R. Yeamn, A. Shen and A. L. Cheung. 1997. Hyperproduction of alpha-toxin by *Staphylococcus aureus* results in paradoxically reduced virulence in experimental endocarditis: a host-defense role for platelet microbicidal proteins.

Infect. Immun. 65:4652-4660.

35. Chien Y. T., and A. L. Cheung. 1998. Molecular interactions between two global regulators, *sar* and *agr* in *Staphylococcus aureus*. *J. Biol. Chem.* 273:2645-2652

36. Manna, A., M. G. Bayer, and A. L. Cheung. 1998. Transcriptional analysis of different *sar* promoters in *Staphylococcus aureus*. *J. Bacteriol.* 180:3828-3836.

37. Gillaspy, A.F., C.Y. Lee, S. Sau, A. L. Cheung, and M. S. Smeltzer. 1998. Factors affecting the collagen binding capacity of *Staphylococcus aureus*. *Infect. Immun.* 66:3170-3178.

38. Fluckiger, U., and A. L. Cheung. 1998. Charcterization of a *sar* homolog of *S. epidermidis. Infect. Immun*. 66:2871-2878.

39. Chien, Y. T., and A. L. Cheung. 1998. SarA level is a determinant of *agr* activation in *Staphylococcus aureus*. *Mol. Microbiol.* 31:991-1011.

40. Cheung, A. L., C. C. Nast, and A. S. Bayer. 1998. Selective activation of *sar* promoters of *S. aureus* in the rabbit endocarditis model using Green Fluorescent Protein (gfp_{uv}) transcription fusion as a detection system. *Infect. Immun.* 66:5988-5993.

41. Cheung, A. L., Y.-T. Chien and A. S. Bayer. 1999. Hyperproduction of alpha hemolysin in a *sigB* mutant is associated with elevated SarA expression in *Staphylococcus aureus*. *Infect. Immun.* 67:1331-1337.

42. Y.T. Chien, A.C. Manna, S.J. Projan, and A.L. Cheung. 1999. SarA, a global regulator of virulence determinants in *Staphylococcus aureus*, binds to a conserved motif essential for *sar*-dependent gene regulation. *J. Biol.Chem.* 274:37169-37176.

43. Wolz, C., A. Steinhuber, P. Pöhlmann-Dietze, Y. T. Chien, A.C. Mann, W. Van Wamel and A.L. Cheung. 2000. Agr-independent regulation of fibronectin binding proteins by the regulatory locus *sar* in *Staphylococcus aureus*. *Mol. Microbiol.* 36:230-243.

44. Gresham, H. D., J. H. Lawrence, T. E. Caver, Bridget S. Wilson, A. L. Cheung, and F.P. Lindberg. 2000. Survival of *Staphylococcus aureus* inside neutrophils contributes to infection. *J. Immunol.* 164:3713-3722.

45. Kahl, B.C., M. Goulian, W. Van Wamel, M. Herrmann, S. Simon, G. Kaplan, G. Peters, and A.L. Cheung. 2000. *Staphylococcus aureus* RN6390 replicates and induces apoptosis in a pulmonary epithelial cell line derived from a cystic fibrosis patient. *Infect. Immun.* 68:5385-5392.

46. A.C. Manna, and A.L. Cheung. 2001. Characterization of *sarR*, a modulator of *sar* expression in *Staphylococcus aureus*. *Infect.Immun.* 69:885-896.

47. A. L. Cheung, K. Schmidt, B. Bateman, and A. C. Manna. 2001. SarS, a SarA homolog repressible by *agr*, is an activator of protein A synthesis in *Staphylococcus aureus*. *Infect.Immun.* 69:2448-2455.

48. Y. Liu, R. Li, R. C. Murphy, A. L. Cheung and G. Zhang. 2001. Crystal structure of the SarR protein from *Staphylococcus aureus*. *PNAS*. 98:6877-6882.

49. I. Siboo, A. L. Cheung, A.S. Bayer and P. Sullam. 2001. Clumping factor mediates binding of *Staphylococcus aureus* to human platelets. *Infect.Immun.* 69:3120-3127.

50. A. Ratner, R Bryan, B. Nguyen, D. Barnes, A. Weber, A. Pitt, S. Gelber, A. Cheung, A. Prince. 2001. Cystic fibrosis pathogens activate epithelial cells through Ca^{2+}-dependent MAPK signaling pathways. *J.Biol. Chem.* 276:19267-19275

51. K. A. Schmidt, A. Manna, S. Gill, and A.L. Cheung. 2001. SarT: a repressor of -hemolysin synthesis in *S. aureus*. *Infect.Immun.* 69:4749-4758.

52. T. Kielian, A. Cheung, and W.F. Hickey. 2001. Diminished virulence of an alpha toxin mutant of *Staphylococcus aureus* in experimental brain abscesses. *Infect. Immun.* 69:6902-6911.

53. B. Shenkman, E. Rubenstein, A. L. Cheung, G.E. Brill, R. Darkik, I. Tamarin, N. Savion and D. Varon. 2001. Adherence properties of *Staphylococcus aureus* under static and flow conditions: role of *agr* and *sar* loci, platelets and plasma ligands. *Infect. Immun.*69:4473-4478.

54. A. L. Cheung, and Gongyi Zhang. 2001. Do SarA and SarR possess similar structures? Trends in Microbiology. 9:570-573.

55. M. Palma, and A. L. Cheung. 2001. B activity in *Staphylococcus aureus* is controlled by RsbU and additional factor(s) during growth. *Infect. Immun.*69:7858-7865.

56. B.Y. Bateman, N. Donegan, T. Jarry, M. Palma and A.L. Cheung. 2001. Evaluation of a tetracycline-inducible promoter in *Staphylococcus aureus in vitro* and *in vivo*, and its application in demonstrating the role of *sigB* in microcolony formation. *Infect. Immun.* 69:7851-7857

57. G. Heyer, A. Pitt, S. Saba, D. Barnes, A. Weber, W. Rush, S. Nguyen, R. Bryan, A. Cheung and A. Prince. 2002. Role of *agr* and *sar* dependent gene products in the pathogenesis of *Staphylococcus aureus* pulmonary infection. *Infect. Immun.*70:127-133.

58. Cheung, A.L. and Zhang, G. 2002. Global regulation of virulence determinants in *S. aureus* by the SarA protein family. *Front. Sci.* 7:d1825-1842.

59. W. Van Wamel, Y.-Q. Xiong, M.R. Yeaman, C.C. Nast, A.S. Bayer and A.L. Cheung. 2002. Regulation of *cap5* promoter activity *agr* and *sarA in vitro* and *in vivo*. *Microb. Pathog.* 33:73-79.

60. Y.-Q. Xiong, W. Van Wamel, C.C. Nast, M.R. Yeaman, A.L. Cheung and A.S. Bayer. 2002. Activation and transcriptional interaction between two *S. aureus agr* RNA molecules in an experimental endocarditis model. *J. Infect. Dis.* 186:668-77.

61. Cheung, A.L., S.J. Projan, and H. Gresham. 2002. The genomic aspect of virulence, sepsis and resistance to killing mechanisms in *S. aureus. Curr. Infect. Dis. Reports.* 4:400-410.

62. Manna, A.C. and A.L. Cheung. s*arU*, a gene repressible by *sarT*, is an activator of RNAIII in *S. aureus*. *Infect. Immun.* 2003. *Infect. Immun.* 71:343-353.

63. Kupferwasser, I. L., M.R. Yeaman, C. C. Nast, D. Kupferwasser, A. L. Cheung, A. S. Bayer. 2003. Salicylic Acid Attenuates Virulence in Endovascular Infections by Targeting Global Regulatory Pathways in *Staphylococcus aureus. J. Clin. Invest.* 110:222-233.

64. Ingavale, S.S., W. Van Wamel, and A.L. Cheung. 2003. Characterization of Rat, an important autolysis regulator in *Staphylococcus aureus*. *Mol. Microbiol.* 48:1451-1466.

65. Li, R., A.C. Manna, A.L. Cheung, and G. Zhang. 2003. The crystal structure of the SarS protein from *Staphylococcus aureus*. *J. Bacteriol.* 185:4219-4225.

66. K. A. Schmidt, A.C. Manna and A.L. Cheung. 2003. SarT influences *sarS* expression in *Staphylococcus aureus*. *Infect. Immun.* 71:5139-5148.

67. Jacob M. Rothfork. Sophie Dessus-Babus, Willem Van Wamel, Ambrose L. Cheung & Hattie D. Gresham. 2003. *J. Immunol.* Host potentiation of bacterial quorum sensing during *Staphylococcus aureus* infection. 171:5389-5395.

68. Cheung, A.L., Bayer, A.S., Zhang, G., Gresham, H., and Xiong, Y.-Q. 2004. Regulation of virulence determinants in vitro and in vivo in *Staphylococcus aureus*. *FEMS Microbiology/Immunology*. 1649:1-9.

69. Bisognano, C., Kelley,W., Francois, P., Schrenzel, J., Li, D. Estoppey, T., Lew, D.P., Hooper, D.C., Cheung, A.L. and Vaudaux, P. A. 2004. RecA-dependent pathway mediates ciprofloxacin-induced fibronectin-binding proteins in *S. aureus. J. Biol. Chem*. 279:9064-9071

70. Y.-Q. Xiong, A.S. Bayer, M.R. Yeaman, W. Van Wamel, A.L. Cheung. 2004. Impacts of *sarA* and *agr* in *Staphylococcus aureus* upon Fibronectin-Binding Protein A gene expression and fibronectin adherence capacity in vitro and in experimental infective endocarditis. *Infect. Immun*. 72:1832-1836.

71. K. A. Schmidt, N. P. Donegan, W. A. Kwan, Jr. and A.L. Cheung. 2004. σB influences expression of staphylococcal enterotoxins B in *S. aureus*. *Can. J. Microbiol.* 50:351-360.

72. A. C. Manna, S.S. Ingavale, M. Maloney, W. van Wamel, and A.L. Cheung. 2004. Characterization of *sarV*, a transcriptional regulator of the *sarA* family, is repressed by SarA and Rat and regulates autolysis and virulence genes in *Staphylococcus aureus*. *J. Bacteriol.* 186:5267-5280

73. M. Gomez, A. Lee, B. Reddy, A. Muire, G. Soong, A. Pitt, A. L. Cheung, and A. Prince. 2004. *S. aureus* protein A induces airway epithelial inflammatory responses by triggering TNFR1 and mimicking TNF-α activity. *Nature Medicine*. 10:842-848.

74. J. M. Rothfork, G. Timmins, M. N. Harris, X. Chen, A. L. Lusis, M. Otto, A. L. Cheung and H. D. Hattie. 2004. Inactivation of a bacterial virulence pheromone by phagocyte-derived oxidants: new role for the NADPH oxidase in host defense. *PNAS*. 101:13867-13872.

75. Ingavale, S., van Wamel, W., Luong, T., Lee. C.Y., and Cheung, A.L. 2005. Rat/MgrA, a regulator of autolysis, is a regulator of virulence genes in *Staphylococcus aureus. Infect. Immun.* 73:1423-1431.

76. Tormo, M.A., Marti, M., Valle, J., Manna, A.C., Cheung, A.L., Lasa,I., and Penades, J.R. 2005. SarA is an essential positive regulator of *Staphylococcus epidermidis* biofilm development. *J. Bacteriol.* 187:2348-2356.

77. Cheung, A. L. and Manna, A.C. 2005. The role of the distal *sarA* promoters in SarA expression in *Staphylococcus aureus. Infect. Immun.* 73:4391-4394

78. G. Belling, A. L. Cheung, G. Peters, M. Herrmann and B. Kahl. 2005. Thymidine-dependent *Staphylococcus aureus* small colony variants (SCV) are associated with dramatic changes in regulator and virulence gene expression. *Infect. Immun.*. 734119-4126.

79. B. Haslinger-Löffler, Kahl, B.C., Strangfeld, K., Grundmeier, M., WagneR. B, Fischer. U., Cheung, A.L., Peters, G., Schulze-Osthoff, K., and Sinha, B. 2005. Multiple virulence factors are required for *Staphylococcus aureus*-induced apoptosis in endothelial cells. *Cell. Microbiol.* 7:1087-1097.

80. R. M. Shanks, N. P. Donegan, M. L. Graber, S. A. Buckingham, M. E, Zegans, A. L. Cheung, and G. A. O'Toole. 2005. Heparin stimulates *S. aureus* biofilm formation. *Infect. Immun.* 73:4596-4606.

81. M. P. Trotonda, A. C. Manna, A. L. Cheung, I. Lasa, J. R. Penades. 2005. SarA controls Bap-dependent biofilm formation in *Staphylococcus aureus. J. Bacteriol.* 187:5790-5798.

82. A. S. Bayer, P. McNamara, M. R. Yeaman, N. Lucindo, T. Jones, A. L. Cheung, H.-G. Sahl, and R. A. Proctor. 2006. Transposon Disruption of the Complex I NADH Oxido-Reductase Gene (*snoD*) in *Staphylococcus aureus* is Associated with Reduced Susceptibility to the Microbicidal Activity of Thrombin-induced Platelet Microbicidal Protein-1. *J. Bacteriol.* 188:211-222.

83. Y. Liu, A.C. Manna, C.-H. Pan, I. A. Kriksunov, D. J. Thiel, A. L. Cheung, and G. Zhang. 2006. Structure and function analyses of the global regulatory protein SarA from *S. aureus*. *PNAS.*103:2392-2397.

84. L. S. Miller, R. M. O'Connell, M. A. Gutierrez, A. Shahangian, C. E. Gross, J. Thirumala, A. L. Cheung, G. Cheng and R. L. Modlin. 2006. IL-1R/MyD88 signaling by resident skin cells is required for immunity against *Staphylococcus aureus*. Immunity. 24:79-91.

85. T. Jarry and A. L. Cheung. 2006. *Staphylococcus aureus* escapes more efficiently from the phagosome of a Cystic Fibrosis bronchial epithelial cell line than its normal counterpart. Infect. Immun. 74:2568-2577.

86. A. C. Manna and A. L. Cheung. 2006. Mutational analysis of SarR, a winged helix protein of the SarA protein family that is involved in the regulation of the *agr* locus. Mol. Microbiol. 60:1289-1901.

87. A. C. Manna and A. L. Cheung. 2006. Characterization of SarX, a negative regulator of *agr* and exoprotein synthesis, is activated by MgrA in *S. aureus*. J. Bacteriol. 188:4288-4299.

88. Yan Q. Xiong, Julie Willard, Cynthia C. Nast, Michael R. Yeaman, Ambrose L. Cheung and Arnold S. Bayer. 2006. Regulation of *Staphylococcus aureus* α-toxin protein and gene (*hla*) expression by *agr*, *sarA* and *sae in vitro* and in Experimental Infective Endocarditis. JID. 194: 1267-1275.

89. M. Palma, A. S. Bayer, L. I. Kupferwasser, T. Yoska, M. R. Yeaman and A.L. Cheung. 2006. Salicylic acid activates sigma factor B by *rsbU*-dependent and –independent mechanisms. J. Bacteriol. 188:5986-5903.

90. M. Sedlacek , Gemery, J.M., Cheung, A.L., Bayer, A.S. and Remillard, B.D. 2007. Lower Incidence of *Staphylococcus Aureus* Bacteremia in Patients with Tunneled Dialysis Catheters treated with Aspirin. Amer. J. Digest. Kidney Dis. 49:401-408.

91. M. Meehl, Herbert, S., Götz, F. and Cheung, A. L. 2007. Interaction of the GraRS two-component system with the VraFG ABC-transporter to support vancomycin-intermediate resistance in *Staphylococcus aureus*. Antimicrob. Agents. Chemo. 51:2679-2689.

92. T. Kielian, N. Esen, A. Haney, N.K. Phulwani, P.M. Hayes, A.L. Cheung and J.J. Ruhe. 2007. Minocycline modulates neuroinflammation independent of its antimicrobial activity in *S. aureus*-induced brain abscess. 2007. Amer. J. Path. 171:1199-1214.

93. Martina Ulrich, Mike Bastian, Katrin Ziegler, Sarah E. Cramton, Alexa A. Pragman, Alessandra Bragonzi, Guido Memmi, Christiane Wolz, Patrick M. Schlievert, Ambrose Cheung and Gerd Döring. 2007. The staphylococcal respiratory response regulator SrrAB induces *ica* gene transcription and PIA expression, protecting *Staphylococcus aureus* from neutrophil killing under anaerobic growth conditions. Mol. Microbiol. 65:1276-1287.

94. Silvia Herbert, Agnieszka Bera, Christiane Nerz, Dirk Kraus, Andreas Peschel, Christiane Goerke, Michael Meehl, Ambrose Cheung, Friedrich Götz. 2007. Molecular basis of resistance to lysozyme's muramidase and antimicrobial peptide activity in staphylococci. Plos Pathogens. 3:981-994.

95. Miller, L.S., Pietras, E.M., Uricchio, L. H., Hirano, K., Rao, S., Lin, H., O'Connell, R. M., Iwakura, Y., Cheung, A.L., Cheng, G., and Modlin, R.L. 2007. Inflammasone-mediated production of Il-1β is required for neutrophil recruitment against *Staphylococcus aureus*. J. Immunol. 179:6933-42

96. Zhibiao Fu, Niles Donegon, Guido Memmi and Ambrose L Cheung. 2007. Characterization of MazF-sa, an endoribonuclease from *Staphylococcus aureus. J. Bacteriol.* 189:8871-8879.

97. Cheung, A.L., K. Nishina, M. P. Trotonda and S. Tamber. 2008. Review of the SarA protein family. International Journal of Biochemistry and Cell Biology. 40:355-361.

98. Min-Ho Kim, Wei Liu, Dori L. Borjesson, Fitz-Roy E. Curry, Lloyd S. Miller, Ambrose L. Cheung, Fu-Tong Liu, R.R. Isseroff and Scott I Simon. 2008. Dynamics of neutrophil infiltration during cutaneous wound healing and infection using fluorescence imaging. J.Invest.Dermatol. 128:1812-20.

99. Dongmei Li and Cheung, A.L. 2008. The repression of *hla* by *rot* is dependent on *sae* in *Staphylococcus aureus*. Infect. Immun. 76:1068-1075.

100. Cheung, A.L., K. Nishina, and A. C. Manna. 2008. SarA binds to its own promoter to regulate gene expression. J. Bacteriol. 190:2239-2243.

101. Robert M. Q. Shanks, Michael Meehl, Kimberly M. Brothers, Raquel M. Martinez, Niles P. Donegan, Martha L. Graber, Ambrose L. Cheung and George A. O'Toole. 2008. The Alternative

citrate-dependent biofilm formation pathway of *Staphylococcus aureus* is dependent on fibronectin binding proteins and the GraRS two-component regulatory system. Infect. Immun. 76:2469-2477.

102. Jarry, T. and Cheung, A.L. 2008. The expression of alpha hemolysin is sufficient for *S. aureus* phagosomal escape after internalization in CFT-1 cells. Cellular Microbiology. 10:1801–1814

103. Guido Memmi, Sergio R. Filipe, Mariana G. Pinho, Ambrose Cheung. 2008. *Staphylococcus aureus* PBP4 is essential for β-lactams Resistance in Community Acquired Methicillin Resistant Strains. Antimicro. Agents Chemo. 52:3955-3966.

104. Maria P. Trotonda, Sandeep Tamber, Guido Memmi and Ambrose L. Cheung. 2008. MgrA represses biofilm formation in *Staphylococcus aureus*. Infect. Immun. 76: 5645–5654.

105. Maren von Köckritz-Blickwede, Manfred Rohde, Sonja Oehmcke, Lloyd S. Miller, Ambrose L. Cheung, Heiko Herwald, Simon Foster, and Eva Medina. 2008. Immunological Mechanisms Underlying the Genetic Predisposition to Severe *Staphylococcus aureus* Infection in the Mouse Model. American Journal of Pathology. 173(6):1657-68.

106. M. Michal Peterson, Jessica L. Mack, Anny A. Alsup, Susan M. Alexander, Youhanna S. Sawires, Aldons J. Lusis, Ambrose L. Cheung, and Hattie D. Gresham. 2008. Apolipoprotein B is an Innate Barrier Against Invasive *Staphylococcus aureus* Infection. Cell Host and Microbes. 4(6):555-566.

107. Tamber, S. and A. L. Cheung. 2009. SarZ promotes the expression of virulence factors and represses biofilm formation by modulating SarA and *agr* in *Staphylococcus aureus.* Infect. Immun. 77: 419–428

108. María Pilar Trotonda, Yan Q. Xiong, Arnold S. Bayer and Ambrose L. Cheung. 2009. The role of *mgrA* and *sarA* in autolysis and resistance to cell-wall active antibiotics in methicillin resistant *S. aureus*. J. Infect. Dis. 199:209-18.

109. Fu, Z., S. Tamber, G. Memmi, N. P. Donegan and A. L. Cheung. 2009. Over-expression of MazFsa induces bacteriostasis with essential mRNA protected in *Staphylococcus aureus*. J. Bacteriol. 191:2051-2059.

110. Niles P. Donegan and Ambrose L. Cheung. 2009. Regulation of the *mazEF* toxin-antitoxin module in *Staphylococcus aureus* and its impact on *sigB* expression. J. Bacteriol. 191:2795-2805.

111. Lauderdale, K. J., B. R. Boles, A. L. Cheung, and A. R. Horswill. 2009. Interconnection between Sigma B, *agr* and proteolytic activity in *Staphylococcus aureus* biofilm maturation. Infect. Immun. 77: 1623–1635.

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113. Ambrose L. Cheung, Soo-Jing Yang, Arnold S. Bayer and Yan Q. Xiong. 2009. Disparity In the *in vitro* vs. *in vivo* regulation of fibronectin-binding proteins (FnBPs) by *saeRS* and/or *sigB*, two global regulators of virulence determinants, in *Staphylococcus aureus.* JID. 200:1371-1374.

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Manuscripts submitted or in the process of submission:

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Book Chapter:

1. Global regulation of virulence determinants in *S. aureus*, in “Staphylococcal Disease and Infection” edited by A. Honeyman, H. Friedman and M. Bendinelli, Kluwer Academic/Plenum Publisher, New York. 2001

2. Regulatory of virulence determinants by the SarA protein family in *S. aureus*. Edited by Peter Zuber. In Frontiers in Bioscience. 2002.

3. Tissue culture assays used to analyze invasion by *Staphylococcus aureus*, in “Current Protocol in Microbiology” edited by , John Wiley & Sons, Inc, New York. p. 9C.4.1-9C.4.7, 2007.

4. Isolation and culture of human umbilical vein endothelial cells (HUVEC), in “Current Protocol

in Microbiology" edited by , John Wiley & Sons, Inc, New York. p. A.4B.1-A.4B.8, 2007.

Teaching

Course director	Molecular Pathogenesis Journal Club MI265
Instructor	Medical Microbiology Course for Medical Students at Dartmouth Med School
Course director	Microbiology/Immunology 148 - Courses in Advanced Molecular Pathogenesis
Instructor	Core lecture for the MCB program (Microbiology/Immunology) MI102

Mentoring for undergraduates

[b(6)]

Former graduate students who matriculated with Ph.D.

[b(6)]

Current graduate students

[b(6)]

Former postdoctoral fellows

[b(6)]

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Active Grants

Agency	Title	Direct amount	Beginning/end dates
1. NIH RO1	"Characterization of *sar*/*agr* interactions in *S. aureus*	$200,000/yr	7/06 to 6/11
2. R21	Defining resistance determinants of CA-MRSA	$125,000	2/1/09-1/31/11
3. 2 year ARRA award	The toxin-antitoxin system of *Staphylococcus aureus*	$200,000	7/1/09 – 6/30/2011

Patents:

1. Process for isolating cellular components including RNA: US patent 5643767

2. Compositions and methods for affecting virulence determinants in bacteria: US patent 7285995

3. Regulation of exoproteins in *S. aureus*: US patent 5976792

4. Compositions and methods for regulating autolytic processes in bacteria: US patent 6929913

Pending:

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