

7 Literaturverzeichnis

- Abrams,J.T., Vonderheid,E.C., Kolbe,S., Appelt,D.M., Arking,E.J., and Balin,B.J. (1999) Sezary T-cell activating factor is a Chlamydia pneumoniae-associated protein *Clin.Diagn.Lab Immunol.* **6**: 895-905.
- Airenne,S., Surcel,H.M., Alakarppa,H., Laitinen,K., Paavonen,J., Saikku,P., and Laurila,A. (1999) Chlamydia pneumoniae infection in human monocytes *Infect.Immun.* **67**: 1445-1449.
- Al Younes,H.M., Rudel,T., Brinkmann,V., Szczepek,A.J., and Meyer,T.F. (2001) Low iron availability modulates the course of Chlamydia pneumoniae infection *Cell Microbiol.* **3**: 427-437.
- Al Younes,H.M., Rudel,T., and Meyer,T.F. (1999) Characterization and intracellular trafficking pattern of vacuoles containing Chlamydia pneumoniae in human epithelial cells *Cell Microbiol.* **1**: 237-247.
- Alen,C., Sonenshein,A.L. (1999) Bacillus subtilis aconitase is an RNA-binding protein *Proc.Natl.Acad.Sci.U.S.A* **96**: 10412-10417.
- An,L.L., Hudson,A.P., Prendergast,R.A., O'Brien,T.P., Stuart,E.S., Whittum-Hudson,J.A., and MacDonald,A.B. (1997) Biochemical and functional antigenic mimicry by a polyclonal anti-idiotypic antibody for chlamydial exoglycolipid antigen *Pathobiology* **65**: 229-240.
- Andrews,S.C., Robinson,A.K., and Rodriguez-Quinones,F. (2003) Bacterial iron homeostasis *FEMS Microbiol.Rev.* **27**: 215-237.
- Beatty,W.L., Byrne,G.I., and Morrison,R.P. (1993) Morphologic and antigenic characterization of interferon gamma-mediated persistent Chlamydia trachomatis infection in vitro *Proc.Natl.Acad.Sci.U.S.A* **90**: 3998-4002.
- Beatty,W.L., Morrison,R.P., and Byrne,G.I. (1995) Reactivation of persistent Chlamydia trachomatis infection in cell culture *Infect.Immun.* **63**: 199-205.
- Beddek,A.J., Sheehan,B.J., Bosse,J.T., Rycroft,A.N., Kroll,J.S., and Langford,P.R. (2004) Two TonB systems in *Actinobacillus pleuropneumoniae*: their roles in iron acquisition and virulence *Infect.Immun.* **72**: 701-708.
- Belland,R.J., Nelson,D.E., Virok,D., Crane,D.D., Hogan,D., Sturdevant,D., Beatty,W.L., and Caldwell,H.D. (2003) Transcriptome analysis of chlamydial growth during IFN-{gamma}-mediated persistence and reactivation *Proc.Natl.Acad.Sci.U.S.A* **100**: 15971-15976.
- Belland,R.J., Scidmore,M.A., Crane,D.D., Hogan,D.M., Whitmire,W., McClarty,G., and Caldwell,H.D. (2001) Chlamydia trachomatis cytotoxicity associated with complete and partial cytotoxin genes *Proc.Natl.Acad.Sci.U.S.A* **98**: 13984-13989.
- Benz,I., Schmidt,M.A. (1992) Isolation and serologic characterization of AIDA-I, the adhesin mediating the diffuse adherence phenotype of the diarrhea-associated *Escherichia coli* strain 2787 (O126:H27) *Infect.Immun.* **60**: 13-18.
- Beswick,E.J., Travelstead,A., and Cooper,M.D. (2003) Comparative studies of glycosaminoglycan involvement in Chlamydia pneumoniae and *C. trachomatis* invasion of host cells *J.Infect.Dis.* **187**: 1291-1300.

- Bignell,C., Thomas,C.M. (2001) The bacterial ParA-ParB partitioning proteins *J.Biotechnol.* **91**: 1-34.
- Brandon,L.D., Goldberg,M.B. (2001) Periplasmic transit and disulfide bond formation of the autotransported Shigella protein IcsA *J.Bacteriol.* **183**: 951-958.
- Bulut,Y., Faure,E., Thomas,L., Karahashi,H., Michelsen,K.S., Equils,O., Morrison,S.G., Morrison,R.P., and Arditi,M. (2002) Chlamydial heat shock protein 60 activates macrophages and endothelial cells through Toll-like receptor 4 and MD2 in a MyD88-dependent pathway *J.Immunol.* **168**: 1435-1440.
- Bush,R.M., Everett,K.D. (2001) Molecular evolution of the Chlamydiaceae *Int.J.Syst.Evol.Microbiol.* **51**: 203-220.
- Byrd,T.F., Horwitz,M.A. (1993) Regulation of transferrin receptor expression and ferritin content in human mononuclear phagocytes. Coordinate upregulation by iron transferrin and downregulation by interferon gamma *J.Clin.Invest* **91**: 969-976.
- Byrne,G.I., Lehmann,L.K., and Landry,G.J. (1986) Induction of tryptophan catabolism is the mechanism for gamma-interferon-mediated inhibition of intracellular Chlamydia psittaci replication in T24 cells *Infect.Immun.* **53**: 347-351.
- Byrne,G.I., Moulder,J.W. (1978) Parasite-specified phagocytosis of Chlamydia psittaci and Chlamydia trachomatis by L and HeLa cells *Infect.Immun.* **19**: 598-606.
- Byrne,G.I., Ouellette,S.P., Wang,Z., Rao,J.P., Lu,L., Beatty,W.L., and Hudson,A.P. (2001) Chlamydia pneumoniae expresses genes required for DNA replication but not cytokinesis during persistent infection of HEp-2 cells *Infect.Immun.* **69**: 5423-5429.
- Caffrey,P., Owen,P. (1989) Purification and N-terminal sequence of the alpha subunit of antigen 43, a unique protein complex associated with the outer membrane of Escherichia coli *J.Bacteriol.* **171**: 3634-3640.
- Caldwell,H.D., Kromhout,J., and Schachter,J. (1981) Purification and partial characterization of the major outer membrane protein of Chlamydia trachomatis *Infect.Immun.* **31**: 1161-1176.
- Caldwell,H.D., Perry,L.J. (1982) Neutralization of Chlamydia trachomatis infectivity with antibodies to the major outer membrane protein *Infect.Immun.* **38**: 745-754.
- Cheshire,J.L., Baldwin,A.S., Jr. (1997) Synergistic activation of NF-kappaB by tumor necrosis factor alpha and gamma interferon via enhanced I kappaB alpha degradation and de novo I kappaBbeta degradation *Mol.Cell Biol.* **17**: 6746-6754.
- Christiansen,G., Boesen,T., Hjerno,K., Daugaard,L., Mygind,P., Madsen,A.S., Knudsen,K., Falk,E., and Birkelund,S. (1999) Molecular biology of Chlamydia pneumoniae surface proteins and their role in immunopathogenicity *Am.Heart J.* **138**: S491-S495.
- Davis,C.H., Raulston,J.E., and Wyrick,P.B. (2002) Protein disulfide isomerase, a component of the estrogen receptor complex, is associated with Chlamydia trachomatis serovar E attached to human endometrial epithelial cells *Infect.Immun.* **70**: 3413-3418.
- Dehio,C., Gray-Owen,S.D., and Meyer,T.F. (1998) The role of neisserial Opa proteins in interactions with host cells *Trends Microbiol.* **6**: 489-495.
- Dobrindt,U., Hacker,J. (2001) Whole genome plasticity in pathogenic bacteria *Curr.Opin.Microbiol.* **4**: 550-557.

- Doherty,N.S., Littman,B.H., Reilly,K., Swindell,A.C., Buss,J.M., and Anderson,N.L. (1998) Analysis of changes in acute-phase plasma proteins in an acute inflammatory response and in rheumatoid arthritis using two-dimensional gel electrophoresis *Electrophoresis* **19**: 355-363.
- Drapier,J.C., Hirling,H., Wietzerbin,J., Kaldy,P., and Kuhn,L.C. (1993) Biosynthesis of nitric oxide activates iron regulatory factor in macrophages *EMBO J.* **12**: 3643-3649.
- Drees-Werringloer,U., Padubrin,I., Jurgens-Saathoff,B., Hudson,A.P., Zeidler,H., and Kohler,L. (2000) Persistence of Chlamydia trachomatis is induced by ciprofloxacin and ofloxacin in vitro *Antimicrob.Aagents Chemother.* **44**: 3288-3297.
- Everett,K.D., Bush,R.M., and Andersen,A.A. (1999) Emended description of the order Chlamydiales, proposal of Parachlamydiaceae fam. nov. and Simkaniaceae fam. nov., each containing one monotypic genus, revised taxonomy of the family Chlamydiaceae, including a new genus and five new species, and standards for the identification of organisms *Int.J.Syst.Bacteriol.* **49 Pt 2**: 415-440.
- Everett,K.D., Hatch,T.P. (1995) Architecture of the cell envelope of Chlamydia psittaci 6BC *J.Bacteriol.* **177**: 877-882.
- Fehlner-Gardiner,C., Roshick,C., Carlson,J.H., Hughes,S., Belland,R.J., Caldwell,H.D., and McClarty,G. (2002) Molecular basis defining human Chlamydia trachomatis tissue tropism. A possible role for tryptophan synthase *J.Biol.Chem.* **277**: 26893-26903.
- Fields,K.A., Mead,D.J., Dooley,C.A., and Hackstadt,T. (2003) Chlamydia trachomatis type III secretion: evidence for a functional apparatus during early-cycle development *Mol.Microbiol.* **48**: 671-683.
- Flohr,T., Bange,F.C., von Euch,A., Kiekenbeck,M., and Bottger,E.C. (1992) Depletion of tryptophan is not involved in expression of tryptophanyl-tRNA synthetase mediated by interferon *Infect.Immun.* **60**: 4418-4421.
- Freidank,H.M., Billing,H., and Wiedmann-Al-Ahmad,M. (2001) Influence of iron restriction on Chlamydia pneumoniae and C. trachomatis *J.Med.Microbiol.* **50**: 223-227.
- Gerard,H.C., Branigan,P.J., Schumacher,H.R., Jr., and Hudson,A.P. (1998) Synovial Chlamydia trachomatis in patients with reactive arthritis/Reiter's syndrome are viable but show aberrant gene expression *J.Rheumatol.* **25**: 734-742.
- Gerard,H.C., Freise,J., Wang,Z., Roberts,G., Rudy,D., Krauss-Opatz,B., Kohler,L., Zeidler,H., Schumacher,H.R., Whittum-Hudson,J.A., and Hudson,A.P. (2002) Chlamydia trachomatis genes whose products are related to energy metabolism are expressed differentially in active vs. persistent infection *Microbes.Infect.* **4**: 13-22.
- Gerard,H.C., Krausse-Opatz,B., Wang,Z., Rudy,D., Rao,J.P., Zeidler,H., Schumacher,H.R., Whittum-Hudson,J.A., Kohler,L., and Hudson,A.P. (2001) Expression of Chlamydia trachomatis genes encoding products required for DNA synthesis and cell division during active versus persistent infection *Mol.Microbiol.* **41**: 731-741.
- Girjes,A.A., Ellis,W.A., Carrick,F.N., and Lavin,M.F. (1993) Some aspects of the immune response of koalas (*Phascolarctos cinereus*) and in vitro neutralization of Chlamydia psittaci (koala strains) *FEMS Immunol.Med.Microbiol.* **6**: 21-30.

- Goldberg,M.B., Barzu,O., Parsot,C., and Sansonetti,P.J. (1993) Unipolar localization and ATPase activity of IcsA, a *Shigella flexneri* protein involved in intracellular movement *J.Bacteriol.* **175**: 2189-2196.
- Gran,J.T., Hjetland,R., and Andreassen,A.H. (1993) Pneumonia, myocarditis and reactive arthritis due to Chlamydia pneumoniae *Scand.J.Rheumatol.* **22**: 43-44.
- Greene,W., Xiao,Y., Huang,Y., McClarty,G., and Zhong,G. (2004) Chlamydia-infected cells continue to undergo mitosis and resist induction of apoptosis *Infect.Immun.* **72**: 451-460.
- Greene,W., Zhong,G. (2003) Inhibition of host cell cytokinesis by Chlamydia trachomatis infection *J.Infect.* **47**: 45-51.
- Grimwood,J., Olinger,L., and Stephens,R.S. (2001) Expression of Chlamydia pneumoniae polymorphic membrane protein family genes *Infect.Immun.* **69**: 2383-2389.
- Grimwood,J., Stephens,R.S. (1999) Computational analysis of the polymorphic membrane protein superfamily of Chlamydia trachomatis and Chlamydia pneumoniae *Microb.Comp Genomics* **4**: 187-201.
- Hackstadt,T., Scidmore,M.A., and Rockey,D.D. (1995) Lipid metabolism in Chlamydia trachomatis-infected cells: directed trafficking of Golgi-derived sphingolipids to the chlamydial inclusion *Proc.Natl.Acad.Sci.U.S.A* **92**: 4877-4881.
- Hammerschlag,M.R. (2002) The intracellular life of chlamydiae *Semin.Pediatr.Infect.Dis.* **13**: 239-248.
- Hantke,K. (2001) Iron and metal regulation in bacteria *Curr.Opin.Microbiol.* **4**: 172-177.
- Harper,A., Pogson,C.I., Jones,M.L., and Pearce,J.H. (2000) Chlamydial development is adversely affected by minor changes in amino acid supply, blood plasma amino acid levels, and glucose deprivation *Infect.Immun.* **68**: 1457-1464.
- Hatch,T.P., Vance,D.W., Jr., and Al Hossainy,E. (1981) Identification of a major envelope protein in Chlamydia spp *J.Bacteriol.* **146**: 426-429.
- Heinemann,M., Susa,M., Simnacher,U., Marre,R., and Essig,A. (1996) Growth of Chlamydia pneumoniae induces cytokine production and expression of CD14 in a human monocytic cell line *Infect.Immun.* **64**: 4872-4875.
- Henderson,I.R., Lam,A.C. (2001) Polymorphic proteins of Chlamydia spp.--autotransporters beyond the Proteobacteria *Trends Microbiol.* **9**: 573-578.
- Henderson,I.R., Navarro-Garcia,F., and Nataro,J.P. (1998) The great escape: structure and function of the autotransporter proteins *Trends Microbiol.* **6**: 370-378.
- Hendrixson,D.R., St.Geme,J., III (1998) The *Haemophilus influenzae* Hap serine protease promotes adherence and microcolony formation, potentiated by a soluble host protein *Mol.Cell* **2**: 841-850.
- Heuer,D., Brinkmann,V., Meyer,T.F., and Szczepek,A.J. (2003) Expression and translocation of chlamydial protease during acute and persistent infection of the epithelial HEp-2 cells with Chlamydophila (Chlamydia) pneumoniae *Cell Microbiol.* **5**: 315-322.

Hogan,R.J., Mathews,S.A., Kutlin,A., Hammerschlag,M.R., and Timms,P. (2003) Differential expression of genes encoding membrane proteins between acute and continuous Chlamydia pneumoniae infections *Microb.Pathog.* **34**: 11-16.

Horsburgh,M.J., Clements,M.O., Crossley,H., Ingham,E., and Foster,S.J. (2001) PerR controls oxidative stress resistance and iron storage proteins and is required for virulence in *Staphylococcus aureus* *Infect.Immun.* **69**: 3744-3754.

Hossain,A. (1989) Chlamydia trachomatis infections *Int.J.Gynaecol.Obstet.* **29**: 107-115.

Igietseme,J.U. (1996) Molecular mechanism of T-cell control of Chlamydia in mice: role of nitric oxide in vivo *Immunology* **88**: 1-5.

Igietseme,J.U., Ananaba,G.A., Candal,D.H., Lyn,D., and Black,C.M. (1998) Immune control of Chlamydial growth in the human epithelial cell line RT4 involves multiple mechanisms that include nitric oxide induction, tryptophan catabolism and iron deprivation *Microbiol.Immunol.* **42**: 617-625.

Jahnig,F. (1990) Structure predictions of membrane proteins are not that bad *Trends Biochem.Sci.* **15**: 93-95.

Jones,M.L., Gaston,J.S., and Pearce,J.H. (2001) Induction of abnormal Chlamydia trachomatis by exposure to interferon-gamma or amino acid deprivation and comparative antigenic analysis *Microb.Pathog.* **30**: 299-309.

Jose,J., Kramer,J., Klauser,T., Pohlner,J., and Meyer,T.F. (1996) Absence of periplasmic DsbA oxidoreductase facilitates export of cysteine-containing passenger proteins to the *Escherichia coli* cell surface via the Iga beta autotransporter pathway *Gene* **178**: 107-110.

Jungblut,P.R., Seifert,R. (1990) Analysis by high-resolution two-dimensional electrophoresis of differentiation-dependent alterations in cytosolic protein pattern of HL-60 leukemic cells *J.Biochem.Biophys.Methods* **21**: 47-58.

Kalman,S., Mitchell,W., Marathe,R., Lammel,C., Fan,J., Hyman,R.W., Olinger,L., Grimwood,J., Davis,R.W., and Stephens,R.S. (1999) Comparative genomes of Chlamydia pneumoniae and *C. trachomatis* *Nat.Genet.* **21**: 385-389.

Kaltenboeck,B., Kousoulas,K.G., and Storz,J. (1993a) Structures of and allelic diversity and relationships among the major outer membrane protein (ompA) genes of the four chlamydial species *J.Bacteriol.* **175**: 487-502.

Kaltenboeck,B., Kousoulas,K.G., and Storz,J. (1993b) Structures of and allelic diversity and relationships among the major outer membrane protein (ompA) genes of the four chlamydial species *J.Bacteriol.* **175**: 487-502.

Kaukoranta-Tolvanen,S.S., Teppo,A.M., Laitinen,K., Saikku,P., Linnavuori,K., and Leinonen,M. (1996) Growth of Chlamydia pneumoniae in cultured human peripheral blood mononuclear cells and induction of a cytokine response *Microb.Pathog.* **21**: 215-221.

Kawa,D.E., Stephens,R.S. (2002) Antigenic topology of chlamydial PorB protein and identification of targets for immune neutralization of infectivity *J.Immunol.* **168**: 5184-5191.

Klauser,T., Pohlner,J., and Meyer,T.F. (1992) Selective extracellular release of cholera toxin B subunit by *Escherichia coli*: dissection of Neisseria Iga beta-mediated outer membrane transport *EMBO J.* **11**: 2327-2335.

- Klose,J., Kobalz,U. (1995) Two-dimensional electrophoresis of proteins: an updated protocol and implications for a functional analysis of the genome *Electrophoresis* **16**: 1034-1059.
- Knudsen,K., Madsen,A.S., Mygind,P., Christiansen,G., and Birkelund,S. (1999) Identification of two novel genes encoding 97- to 99-kilodalton outer membrane proteins of Chlamydia pneumoniae *Infect.Immun.* **67**: 375-383.
- Koehler,L., Nettelnbreker,E., Hudson,A.P., Ott,N., Gerard,H.C., Branigan,P.J., Schumacher,H.R., Drommer,W., and Zeidler,H. (1997) Ultrastructural and molecular analyses of the persistence of Chlamydia trachomatis (serovar K) in human monocytes *Microb.Pathog.* **22**: 133-142.
- Kuo,C., Takahashi,N., Swanson,A.F., Ozeki,Y., and Hakomori,S. (1996) An N-linked high-mannose type oligosaccharide, expressed at the major outer membrane protein of Chlamydia trachomatis, mediates attachment and infectivity of the microorganism to HeLa cells *J.Clin.Invest* **98**: 2813-2818.
- Kuo,C.C., Grayston,T. (1976) Interaction of Chlamydia trachomatis organisms and HeLa 229 cells *Infect.Immun.* **13**: 1103-1109.
- Kuo,C.C., Jackson,L.A., Campbell,L.A., and Grayston,J.T. (1995) Chlamydia pneumoniae (TWAR) *Clin.Microbiol.Rev.* **8**: 451-461.
- Kuo,C.C., Puolakkainen,M., Lin,T.M., Witte,M., and Campbell,L.A. (2002) Mannose-receptor positive and negative mouse macrophages differ in their susceptibility to infection by Chlamydia species *Microb.Pathog.* **32**: 43-48.
- Kutlin,A., Flegg,C., Stenzel,D., Reznik,T., Roblin,P.M., Mathews,S., Timms,P., and Hammerschlag,M.R. (2001) Ultrastructural study of Chlamydia pneumoniae in a continuous-infection model *J.Clin.Microbiol.* **39**: 3721-3723.
- Laarmann,S., Cutter,D., Juehne,T., Barenkamp,S.J., and St Geme,J.W. (2002) The Haemophilus influenzae Hia autotransporter harbours two adhesive pockets that reside in the passenger domain and recognize the same host cell receptor *Mol.Microbiol.* **46**: 731-743.
- Lamer,S., Jungblut,P.R. (2001) Matrix-assisted laser desorption-ionization mass spectrometry peptide mass fingerprinting for proteome analysis: identification efficiency after on-blot or in-gel digestion with and without desalting procedures *J.Chromatogr.B Biomed.Sci.Appl.* **752**: 311-322.
- Lenz,D.C., Lu,L., Conant,S.B., Wolf,N.A., Gerard,H.C., Whittum-Hudson,J.A., Hudson,A.P., and Swanborg,R.H. (2001) A Chlamydia pneumoniae-specific peptide induces experimental autoimmune encephalomyelitis in rats *J.Immunol.* **167**: 1803-1808.
- Litwin,C.M., Calderwood,S.B. (1993) Role of iron in regulation of virulence genes *Clin.Microbiol.Rev.* **6**: 137-149.
- Longbottom,D., Findlay,J., Vretou,E., and Dunbar,S.M. (1998) Immunoelectron microscopic localisation of the OMP90 family on the outer membrane surface of Chlamydia psittaci *FEMS Microbiol.Lett.* **164**: 111-117.
- Lorenzen,D.R., Dux,F., Wolk,U., Tsirouchtsidis,A., Haas,G., and Meyer,T.F. (1999) Immunoglobulin A1 protease, an exoenzyme of pathogenic Neisseriae, is a potent inducer of proinflammatory cytokines *J.Exp.Med.* **190**: 1049-1058.

Malinvern, R., Kuo, C.C., Campbell, L.A., and Grayston, J.T. (1995) Reactivation of Chlamydia pneumoniae lung infection in mice by cortisone *J. Infect. Dis.* **172**: 593-594.

Mamelak et al (2001) Hsp70s contain a specific sulfogalactolipid binding site. Differential aglycone influence on sulfogalactosyl ceramide binding by recombinant prokaryotic and eukaryotic hsp70 family members *Biochemistry* **40**: 3572-3582.

Mamelak, D., Mylvaganam, M., Whetstone, H., Hartmann, E., Lennarz, W., Wyrick, P.B., Raulston, J., Han, H., Hoffman, P., and Lingwood, C.A. (2001) Hsp70s contain a specific sulfogalactolipid binding site. Differential aglycone influence on sulfogalactosyl ceramide binding by recombinant prokaryotic and eukaryotic hsp70 family members *Biochemistry* **40**: 3572-3582.

Mathews, S., George, C., Flegg, C., Stenzel, D., and Timms, P. (2001) Differential expression of ompA, ompB, pyk, nlpD and Cpn0585 genes between normal and interferon-gamma treated cultures of Chlamydia pneumoniae *Microb. Pathog.* **30**: 337-345.

Mattow, J., Schaible, U.E., Schmidt, F., Hagens, K., Siejak, F., Brestrich, G., Haeselbarth, G., Muller, E.C., Jungblut, P.R., and Kaufmann, S.H. (2003a) Comparative proteome analysis of culture supernatant proteins from virulent *Mycobacterium tuberculosis* H37Rv and attenuated *M. bovis* BCG Copenhagen *Electrophoresis* **24**: 3405-3420.

Mattow, J., Schaible, U.E., Schmidt, F., Hagens, K., Siejak, F., Brestrich, G., Haeselbarth, G., Muller, E.C., Jungblut, P.R., and Kaufmann, S.H. (2003b) Comparative proteome analysis of culture supernatant proteins from virulent *Mycobacterium tuberculosis* H37Rv and attenuated *M. bovis* BCG Copenhagen *Electrophoresis* **24**: 3405-3420.

Maurer, J., Jose, J., and Meyer, T.F. (1997) Autodisplay: one-component system for efficient surface display and release of soluble recombinant proteins from *Escherichia coli* *J. Bacteriol.* **179**: 794-804.

Maurer, J., Jose, J., and Meyer, T.F. (1999) Characterization of the essential transport function of the AIDA-I autotransporter and evidence supporting structural predictions *J. Bacteriol.* **181**: 7014-7020.

Mayer, J., Woods, M.L., Vavrin, Z., and Hibbs, J.B., Jr. (1993) Gamma interferon-induced nitric oxide production reduces Chlamydia trachomatis infectivity in McCoy cells *Infect. Immun.* **61**: 491-497.

McCafferty, M.C., Herring, A.J., Andersen, A.A., and Jones, G.E. (1995) Electrophoretic analysis of the major outer membrane protein of Chlamydia psittaci reveals multimers which are recognized by protective monoclonal antibodies *Infect. Immun.* **63**: 2387-2389.

Mehta, S.J., Miller, R.D., Ramirez, J.A., and Summersgill, J.T. (1998) Inhibition of Chlamydia pneumoniae replication in HEp-2 cells by interferon-gamma: role of tryptophan catabolism *J. Infect. Dis.* **177**: 1326-1331.

Meyer, T.F. (1999) Pathogenic neisseriae: complexity of pathogen-host cell interplay *Clin. Infect. Dis.* **28**: 433-441.

Molestina, R.E., Klein, J.B., Miller, R.D., Pierce, W.H., Ramirez, J.A., and Summersgill, J.T. (2002) Proteomic analysis of differentially expressed Chlamydia pneumoniae genes during persistent infection of HEp-2 cells *Infect. Immun.* **70**: 2976-2981.

- Morrison,R.P., Belland,R.J., Lyng,K., and Caldwell,H.D. (1989) Chlamydial disease pathogenesis. The 57-kD chlamydial hypersensitivity antigen is a stress response protein *J.Exp.Med.* **170**: 1271-1283.
- Moulder,J.W. (1991) Interaction of chlamydiae and host cells in vitro *Microbiol.Rev.* **55**: 143-190.
- Moulder,J.W. (1993) Why is Chlamydia sensitive to penicillin in the absence of peptidoglycan? *Infect.Agents Dis.* **2**: 87-99.
- Netea,M.G., Selzman,C.H., Kullberg,B.J., Galama,J.M., Weinberg,A., Stalenhoef,A.F., Van der Meer,J.W., and Dinarello,C.A. (2000) Acellular components of Chlamydia pneumoniae stimulate cytokine production in human blood mononuclear cells *Eur.J.Immunol.* **30**: 541-549.
- Niessner,A., Kaun,C., Zorn,G., Speidl,W., Turel,Z., Christiansen,G., Pedersen,A.S., Birkelund,S., Simon,S., Georgopoulos,A., Graninger,W., De Martin,R., Lipp,J., Binder,B.R., Maurer,G., Huber,K., and Wojta,J. (2003) Polymorphic Membrane Protein (PMP) 20 and PMP 21 of Chlamydia pneumoniae Induce Proinflammatory Mediators in Human Endothelial Cells In Vitro by Activation of the Nuclear Factor-kappaB Pathway *J.Infect.Dis.* **188**: 108-113.
- Okuno,K., Yabuta,M., Ohsuye,K., Ooi,T., and Kinoshita,S. (2002) An analysis of target preferences of Escherichia coli outer-membrane endoprotease OmpT for use in therapeutic peptide production: efficient cleavage of substrates with basic amino acids at the P4 and P6 positions *Biotechnol.Appl.Biochem.* **36**: 77-84.
- Pace,N.R. (1997) A molecular view of microbial diversity and the biosphere *Science* **276**: 734-740.
- Pantoja,L.G., Miller,R.D., Ramirez,J.A., Molestina,R.E., and Summersgill,J.T. (2000) Inhibition of Chlamydia pneumoniae replication in human aortic smooth muscle cells by gamma interferon-induced indoleamine 2, 3-dioxygenase activity *Infect.Immun.* **68**: 6478-6481.
- Pedersen,A.S., Christiansen,G., and Birkelund,S. (2001) Differential expression of Pmp10 in cell culture infected with Chlamydia pneumoniae CWL029 *FEMS Microbiol.Lett.* **203**: 153-159.
- Peeling,R.W., Brunham,R.C. (1996) Chlamydiae as pathogens: new species and new issues *Emerg.Infect.Dis.* **2**: 307-319.
- Peterson,E.M., de la Maza,L.M., Brade,L., and Brade,H. (1998) Characterization of a neutralizing monoclonal antibody directed at the lipopolysaccharide of Chlamydia pneumoniae *Infect.Immun.* **66**: 3848-3855.
- Pierre,J.L., Fontecave,M. (1999) Iron and activated oxygen species in biology: the basic chemistry *Biometals* **12**: 195-199.
- Pohlner,J., Halter,R., Beyreuther,K., and Meyer,T.F. (1987) Gene structure and extracellular secretion of Neisseria gonorrhoeae IgA protease *Nature* **325**: 458-462.
- Rajalingam,K., Al Younes,H., Muller,A., Meyer,T.F., Szczepek,A.J., and Rudel,T. (2001) Epithelial cells infected with Chlamydophila pneumoniae (Chlamydia pneumoniae) are resistant to apoptosis *Infect.Immun.* **69**: 7880-7888.

- Rasmussen-Lathrop,S.J., Koshiyama,K., Phillips,N., and Stephens,R.S. (2000) Chlamydia-dependent biosynthesis of a heparan sulphate-like compound in eukaryotic cells *Cell Microbiol.* **2**: 137-144.
- Ratledge,C., Dover,L.G. (2000) Iron metabolism in pathogenic bacteria *Annu.Rev.Microbiol.* **54**: 881-941.
- Raulston,J.E. (1995) Chlamydial envelope components and pathogen-host cell interactions *Mol.Microbiol.* **15**: 607-616.
- Raulston,J.E. (1997) Response of Chlamydia trachomatis serovar E to iron restriction in vitro and evidence for iron-regulated chlamydial proteins *Infect.Immun.* **65**: 4539-4547.
- Raulston,J.E., Davis,C.H., Paul,T.R., Hobbs,J.D., and Wyrick,P.B. (2002) Surface accessibility of the 70-kilodalton Chlamydia trachomatis heat shock protein following reduction of outer membrane protein disulfide bonds *Infect.Immun.* **70**: 535-543.
- Read,T.D., Brunham,R.C., Shen,C., Gill,S.R., Heidelberg,J.F., White,O., Hickey,E.K., Peterson,J., Utterback,T., Berry,K., Bass,S., Linher,K., Weidman,J., Khouri,H., Craven,B., Bowman,C., Dodson,R., Gwinn,M., Nelson,W., DeBoy,R., Kolonay,J., McClarty,G., Salzberg,S.L., Eisen,J., and Fraser,C.M. (2000) Genome sequences of Chlamydia trachomatis MoPn and Chlamydia pneumoniae AR39 *Nucleic Acids Res.* **28**: 1397-1406.
- Redecke,V., Dalhoff,K., Bohnet,S., Braun,J., and Maass,M. (1998) Interaction of Chlamydia pneumoniae and human alveolar macrophages: infection and inflammatory response *Am.J.Respir.Cell Mol.Biol.* **19**: 721-727.
- Rhen,M., Eriksson,S., Clements,M., Bergstrom,S., and Normark,S.J. (2003) The basis of persistent bacterial infections *Trends Microbiol.* **11**: 80-86.
- Richmond,S.J., Stirling,P. (1981) Localization of chlamydial group Antigen in McCoy cell monolayers infected with Chlamydia trachomatis or Chlamydia psittaci *Infect.Immun.* **34**: 561-570.
- Rocha,E.P., Pradillon,O., Bui,H., Sayada,C., and Denamur,E. (2002) A new family of highly variable proteins in the Chlamydophila pneumoniae genome *Nucleic Acids Res.* **30**: 4351-4360.
- Schachter,J., Caldwell,H.D. (1980) Chlamydiae *Annu.Rev.Microbiol.* **34**: 285-309.
- Schachter,J., Stephens,R.S., Timms,P., Kuo,C., Bavoil,P.M., Birkelund,S., Boman,J., Caldwell,H., Campbell,L.A., Chernesky,M., Christiansen,G., Clarke,I.N., Gaydos,C., Grayston,J.T., Hackstadt,T., Hsia,R., Kaltenboeck,B., Leinonen,M., Ocius,D., McClarty,G., Orfila,J., Peeling,R., Puolakkainen,M., Quinn,T.C., Rank,R.G., Raulston,J., Ridgeway,G.L., Saikku,P., Stamm,W.E., Taylor-Robinson,D.T., Wang,S.P., and Wyrick,P.B. (2001) Radical changes to chlamydial taxonomy are not necessary just yet *Int.J.Syst.Evol.Microbiol.* **51**: 249, 251-249, 253.
- Scidmore,M.A., Rockey,D.D., Fischer,E.R., Heinzen,R.A., and Hackstadt,T. (1996) Vesicular interactions of the Chlamydia trachomatis inclusion are determined by chlamydial early protein synthesis rather than route of entry *Infect.Immun.* **64**: 5366-5372.
- Shemer-Avni,Y., Wallach,D., and Sarov,I. (1989) Reversion of the antichlamydial effect of tumor necrosis factor by tryptophan and antibodies to beta interferon *Infect.Immun.* **57**: 3484-3490.

- Shirai,M., Hirakawa,H., Ouchi,K., Tabuchi,M., Kishi,F., Kimoto,M., Takeuchi,H., Nishida,J., Shibata,K., Fujinaga,R., Yoneda,H., Matsushima,H., Tanaka,C., Furukawa,S., Miura,K., Nakazawa,A., Ishii,K., Shiba,T., Hattori,M., Kuhara,S., and Nakazawa,T. (2000) Comparison of outer membrane protein genes omp and pmp in the whole genome sequences of Chlamydia pneumoniae isolates from Japan and the United States *J.Infect.Dis.* **181 Suppl 3:S524-7.**: S524-S527.
- Stephens,R.S. (2003) The cellular paradigm of chlamydial pathogenesis *Trends Microbiol.* **11**: 44-51.
- Stephens,R.S., Koshiyama,K., Lewis,E., and Kubo,A. (2001) Heparin-binding outer membrane protein of chlamydiae *Mol.Microbiol.* **40**: 691-699.
- Su,H., Raymond,L., Rockey,D.D., Fischer,E., Hackstadt,T., and Caldwell,H.D. (1996) A recombinant Chlamydia trachomatis major outer membrane protein binds to heparan sulfate receptors on epithelial cells *Proc.Natl.Acad.Sci.U.S.A* **93**: 11143-11148.
- Su,H., Spangrude,G.J., and Caldwell,H.D. (1991) Expression of Fc gamma RIII on HeLa 229 cells: possible effect on in vitro neutralization of Chlamydia trachomatis *Infect.Immun.* **59**: 3811-3814.
- Su,H., Watkins,N.G., Zhang,Y.X., and Caldwell,H.D. (1990) Chlamydia trachomatis-host cell interactions: role of the chlamydial major outer membrane protein as an adhesin *Infect.Immun.* **58**: 1017-1025.
- Sugimura,K., Nishihara,T. (1988) Purification, characterization, and primary structure of Escherichia coli protease VII with specificity for paired basic residues: identity of protease VII and OmpT *J.Bacteriol.* **170**: 5625-5632.
- Summersgill,J.T., Sahney,N.N., Gaydos,C.A., Quinn,T.C., and Ramirez,J.A. (1995) Inhibition of Chlamydia pneumoniae growth in HEp-2 cells pretreated with gamma interferon and tumor necrosis factor alpha *Infect.Immun.* **63**: 2801-2803.
- Takikawa,O., Kuroiwa,T., Yamazaki,F., and Kido,R. (1988) Mechanism of interferon-gamma action. Characterization of indoleamine 2,3-dioxygenase in cultured human cells induced by interferon-gamma and evaluation of the enzyme-mediated tryptophan degradation in its anticellular activity *J.Biol.Chem.* **263**: 2041-2048.
- Tanzer,R.J., Hatch,T.P. (2001) Characterization of outer membrane proteins in Chlamydia trachomatis LGV serovar L2 *J.Bacteriol.* **183**: 2686-2690.
- Tanzer,R.J., Longbottom,D., and Hatch,T.P. (2001) Identification of polymorphic outer membrane proteins of Chlamydia psittaci 6BC *Infect.Immun.* **69**: 2428-2434.
- Taraktchoglou,M., Pacey,A.A., Turnbull,J.E., and Eley,A. (2001) Infectivity of Chlamydia trachomatis serovar LGV but not E is dependent on host cell heparan sulfate *Infect.Immun.* **69**: 968-976.
- Taraska,T., Ward,D.M., Ajioka,R.S., Wyrick,P.B., Davis-Kaplan,S.R., Davis,C.H., and Kaplan,J. (1996) The late chlamydial inclusion membrane is not derived from the endocytic pathway and is relatively deficient in host proteins *Infect.Immun.* **64**: 3713-3727.
- Vandahl,B.B., Birkelund,S., Demol,H., Hoorelbeke,B., Christiansen,G., Vandekerckhove,J., and Gevaert,K. (2001) Proteome analysis of the Chlamydia pneumoniae elementary body *Electrophoresis* **22**: 1204-1223.

- Vandahl,B.B., Pedersen,A.S., Gevaert,K., Holm,A., Vandekerckhove,J., Christiansen,G., and Birkelund,S. (2002) The expression, processing and localization of polymorphic membrane proteins in Chlamydia pneumoniae strain CWL029 *BMC.Microbiol.* **2**: 36.
- Veiga,E., de,L., V, and Fernandez,L.A. (1999) Probing secretion and translocation of a beta-autotransporter using a reporter single-chain Fv as a cognate passenger domain *Mol.Microbiol.* **33**: 1232-1243.
- Vretou,E., Giannikopoulou,P., Longbottom,D., and Psarrou,E. (2003) Antigenic organization of the N-terminal part of the polymorphic outer membrane proteins 90, 91A, and 91B of Chlamydophila abortus *Infect.Immun.* **71**: 3240-3250.
- Vretou,E., Goswami,P.C., and Bose,S.K. (1989) Adherence of multiple serovars of Chlamydia trachomatis to a common receptor on HeLa and McCoy cells is mediated by thermolabile protein(s) *J.Gen.Microbiol.* **135**: 3229-3237.
- Ward,M.E. (1995) The immunobiology and immunopathology of chlamydial infections *APMIS* **103**: 769-796.
- Weinberg,E.D. (1984) Iron withholding: a defense against infection and neoplasia *Physiol Rev.* **64**: 65-102.
- Wiedmann-Al-Ahmad,M., Schuessler,P., and Freidank,H.M. (1997) Reactions of polyclonal and neutralizing anti-p54 monoclonal antibodies with an isolated, species-specific 54-kilodalton protein of Chlamydia pneumoniae *Clin.Diagn.Lab Immunol.* **4**: 700-704.
- Wolf,K., Fischer,E., and Hackstadt,T. (2000) Ultrastructural analysis of developmental events in Chlamydia pneumoniae-infected cells *Infect.Immun.* **68**: 2379-2385.
- Wolf,K., Fischer,E., Mead,D., Zhong,G., Peeling,R., Whitmire,B., and Caldwell,H.D. (2001) Chlamydia pneumoniae major outer membrane protein is a surface-exposed antigen that elicits antibodies primarily directed against conformation-dependent determinants *Infect.Immun.* **69**: 3082-3091.
- Wuppermann,F.N., Hegemann,J.H., and Jantos,C.A. (2001) Heparan sulfate-like glycosaminoglycan is a cellular receptor for Chlamydia pneumoniae *J.Infect.Dis.* **184**: 181-187.
- Wyllie,S., Raulston,J.E. (2001) Identifying regulators of transcription in an obligate intracellular pathogen: a metal-dependent repressor in Chlamydia trachomatis *Mol.Microbiol.* **40**: 1027-1036.
- Yang,Y.S., Kuo,C.C., and Chen,W.J. (1983) Reactivation of Chlamydia trachomatis lung infection in mice by cortisone *Infect.Immun.* **39**: 655-658.
- Yen,M.R., Peabody,C.R., Partovi,S.M., Zhai,Y., Tseng,Y.H., and Saier,M.H. (2002) Protein-translocating outer membrane porins of Gram-negative bacteria *Biochim.Biophys.Acta* **1562**: 6-31.
- Zhang,J.P., Stephens,R.S. (1992) Mechanism of C. trachomatis attachment to eukaryotic host cells *Cell* **69**: 861-869.
- Zhong,G., Fan,P., Ji,H., Dong,F., and Huang,Y. (2001) Identification of a chlamydial protease-like activity factor responsible for the degradation of host transcription factors *J.Exp.Med.* **193**: 935-942.

