

8. References

- Adetifa, I. M., Antonio M., CA Okoromah C. A, Ebruke, C., Inem, V., Nsekpong, D., Bojang, A., and Adegbola R. A. (2012). "Pre-vaccination nasopharyngeal pneumococcal carriage in a Nigerian population: epidemiology and population in biology." *PLoS One* 7(1): e 30548.
- Adrian, P. V. and Klugman K. P. (1997). "Mutations in the dihydrofolate reductase gene of trimethoprim-resistant isolates of *Streptococcus pneumoniae*." *Antimicrob. Agents Chemother.* 41(11): 2406-2413.
- Albarracin Orio, A. G., Pinas ,G. E., Cortes, P. R , Cian, M. B, Echenique J. (2011). "Compensatory evolution of pbp mutations restores the fitness cost imposed by beta-lactam resistance in *Streptococcus pneumoniae*." *PLoS Pathog* 7(2): e1002000.
- Appelbaum, P. C. (1992). "Antimicrobial resistance in *Streptococcus pneumoniae*: an overview" *Clin Infect Dis* 15(1):77-83
- Austin, D. J., Kristinsson, K. G., Anderson, R. M. (1999) "The relationship between the volume of antimicrobial consumption in human communities and the frequency of resistance" *Proc Natl Acad Sci USA* 96(3):1152-1156.
- Barrett, J. C., Fry, B., Maller, J. and Daly, M. J. (2005). "Haploview: analysis and visualization of LD and haplotype maps." *Bioinformatics* 21(2): 263-265.
- Bek-Thomsen, M., Poulsen K., Kilian M. (2012). "Occurrence and evolution of the paralogous zinc metalloproteases IgA1 protease, *ZmpB*, *ZmpC*, and *ZmpD* in *Streptococcus pneumoniae* and related commensal species." *MBio* 3(5). pii e00303-00312
- Bellos, A., Mulholland, K., O'Brien, K. L., Qazi, S. A., Gayer, M., Checchi, F. (2010) "The burden of acute respiratory infections in crisis-affected populations: a systematic review." *Confi Health* 4:3.
- Bergelson, J., Dwyer, G., Emerson, J. J. (2001). "Models and data on plant-enemy coevolution." *Annu Rev Genet* 35: 469-499.
- Bogaert, D., De Groot, R., Hermans, P. W. (2004). "*Streptococcus pneumoniae* colonisation: the key to pneumococcal disease." *Lancet Infect Dis* 4(3),144–154(2004)

References

- Brock, S. C., McGraw, P. A., Wright, P. F., Crowe, J. E. (2002). "The human polymeric immunoglobulin receptor facilitates invasion of epithelial cells by *Streptococcus pneumoniae* in a strain-specific and cell type-specific manner." *Infect Immun* **70**(9): 5091-5095.
- Brueggemann, A. B., Griffiths, D. T., Meats, E., Peto, T., Crook, D. W., Spratt B. G. (2003) "Clonal relationships between invasive and carriage *Streptococcus pneumoniae* and serotype- and clone-specific differences in invasive disease potential" *J Infect Dis* **187**(9):1424-1432.
- Brueggemann, A. B., Muroki, B. M., Kulohoma, B. W., Karani, A., Wanjiru, E., Morpeth, S., Kamau, T., Sharif, S., Scott J. A. (2013). "Population genetic structure of *Streptococcus pneumoniae* in Kilifi, Kenya, prior to the introduction of pneumococcal conjugate vaccine." *PLoS One* **8**(11): e81539.
- Bryant, J. M., Grogono, D. M., Greaves, D., Foweraker, J., Roddick, I., Inns, T., Reacher, M., Haworth, C. S., Curran, M. D., Harris S. R. *et al.* (2013). "Whole-genome sequencing to identify transmission of *Mycobacterium abscessus* between patients with cystic fibrosis: a retrospective cohort study." *Lancet* **381**(9877): 1551-1560.
- Carratalà J., Alcaide, F., Fernàndez-Sevilla, A., Corbella, X., Liñares, J., Gudiol F. (1995) "Bacteremia due to viridans streptococci that are highly resistant to penicillin: increase among neutropenic patients with cancer." *Clin. Infect. Dis.* **20**,1169–1173
- Claverys, J. P., Lefevre, J. C., Sicard, A. M. (1980). "Transformation of *Streptococcus pneumoniae* with *S. pneumoniae*-lambda phage hybrid DNA: induction of deletions." *Proc Natl Acad Sci U S A* **77**(6): 3534-3538.
- Coffey, T. J., Dowson, C. G., Daniels, M., Spratt, B. G. (1995) "Genetic and molecular biology of beta-lactam-resistant pneumococci" *Microb Drug Resist* **1**(1):29-34
- Connor, T. R., Corander J., Hanage W. P. (2012). "Population subdivision and the detection of recombination in non-typable *Haemophilus influenzae*." *Microbiology* **158**(Pt 12): 2958-2964.
- Corander, J., Marttinen, P., Siren, J., Tang, J. (2008). "Enhanced Bayesian modelling in BAPS software for learning genetic structures of populations." *BMC bioinformatics* **9**: 539.
- Crook, D. W., Spratt, B. G. (1998) "Multiple antibiotic resistance in *Streptococcus pneumoniae*." *Br Med Bull* **54**(3):595-610.

- Croucher, N. J., Chewapreecha, C, Hanage, W. P., Harris, S. R. , McGee, L., van der Linden, M., Song, J. H., Ko, K. S. , de Lencastre, H. , Turner, C. *et al.* (2014). "Evidence for soft selective sweeps in the evolution of pneumococcal multidrug-resistance and vaccine escape." *Genome Biol Evol* 6(7):1589-1602.
- Croucher, N. J., Finkelstein, J. A., Pelton, S. I., Mitchell, P. K., Lee, G. M., Parkhill, J., Bentley, S. D., Hanage W. P. and Lipsitch M. (2013). "Population genomics of post-vaccine changes in pneumococcal epidemiology." *Nat Genet* 45(6): 656-663.
- Croucher, N. J., Harris, S. R., Barquist, L., Parkhill, J., Bentley, S. D. (2012). "A high-resolution view of genome-wide pneumococcal transformation." *PLoS pathog* 8(6): e1002745.
- Croucher, N. J., Harris, S. R., Fraser, C., Quail, M. A., Burton, J., van der Linden, M., McGee, L., von Gottberg, A., Song, J. H., Ko, K. S. *et al.* (2011). "Rapid pneumococcal evolution in response to clinical interventions." *Science* 331(6016): 430-434.
- Croucher, N. J., Walker, D., Romero, P., Lennard, N., Paterson, G. K., Bason, N. C., Mitchell, A. M., Quail, M. A., Andrew, P. W., Parkhill J. *et al.* (2009). "Role of conjugative elements in the evolution of the multidrug-resistant pandemic clone *Streptococcus pneumoniae* Spain23F ST81." *J Bacteriol* 191(5): 1480-1489.
- Dagan, R. (2009). "Impact of pneumococcal conjugate vaccine on infections caused by antibiotic-resistant *Streptococcus pneumoniae*." *Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases* 15 Suppl 3: 16-20.
- Dagan, R. and Klugman, K. P. (2008) " Impact of conjugate pneumococcal vaccines on antibiotic resistance" *Lancet Infect Dis* 8(2):785-795.
- Dave, S., Pangburn, M. K., Pruitt, C., McDaniel, L. S. (2004). "Interaction of human factor H with *PspC* of *Streptococcus pneumoniae*." *Indian J Med Res* 119 Suppl: 66-73.
- Dawkins, R., Krebs J. R. (1979). "Arms races between and within species." *Proc R Soc Lond B Biol Sci* 205(1161): 489-511.
- DePestel, D. D., Benninger, M. S., Danziger, L., LaPlante, K. L., May, C., Luskin, A., Pichichero, M., Hadley, J. A. (2008). "Cephalosporin use in treatment of patients with penicillin allergies." *J Am Pharm Assoc* 48(4): 530-540.

References

- Dessen A., Mouz, N., Gordon, E., Hopkins, J., Dideberg, O. (2001). "Crystal structure of PBP2x from a highly penicillin-resistant *Streptococcus pneumoniae* clinical isolate: a mosaic framework containing 83 mutations." *J Biol Chem* 276,45105–45112
- Devlin, B., Roeder, K. (1999). "Genomic control for association studies." *Biometrics* 55(4): 997-1004.
- Doern, G. V., Ferraro, M. J., Brueggemann, A. B., Ruoff, K. L. (1996). "Emergence of high rates of antimicrobial resistance among viridans group streptococci in the United States. *Antimicrob Agents Chemother* 40, 891-894.
- Donkor, E. S., Bishop, C. J., Gould, K., Hinds, J., Antonio, M., Wren, B., Hanage, W. P. (2011) "High levels of recombination among *Streptococcus pneumoniae* isolates from the Gambia." *mBio* 2(3): e00040-00011.
- Dowson, C. G., Hutchison, A., Brannigan J. A., George, R. C., Hansman, D., Liñares, J., Tomasz, A., Smith, J. M., Spratt, B. G. (1989) "Horizontal transfer of penicillin-binding protein genes in penicillin-resistant clinical isolates of *Streptococcus pneumoniae*." *Proc. Natl Acad. Sci. USA* 86,8842-8846.
- Dowson, C. G., Hutchison, A., Spratt, B. G. (1989). " Extensive re-modelling of the transpeptidase domain of penicillin-binding protein 2b of a penicillin-resistant South African isolate of *Streptococcus pneumoniae*." *Mol Microbiol* 3, 95-102
- Dutilh, B. E., Backus, L., Edwards, R. A., Wels, M., Bayjanov, J. R., van Hijum, S. A. (2013). "Explaining microbial phenotypes on a genomic scale: GWAS for microbes." *Brief Funct Genomics* 12(4): 366-380.
- Erchibengoa M., Arostegi, N., Marimón, J. M., Alonso, M., Pérez-Trallero, E. (2012) "Dynamics of pneumococcal nasopharyngeal carriage in healthy children attending a day care centre in northern Spain. Influence of detection techniques on the results" *BMC Infect Dis* 12:69
- Everett, D. B., Cornick, J., Denis, B., Chewapreecha, C., Croucher, N., Harris, S., Parkhill, J., Gordon, S., Carroll, E. D., French, N. *et al.* (2012). "Genetic characterisation of Malawian pneumococci prior to the roll-out of the PCV13 vaccine using a high-throughput whole genome sequencing approach." *PLoS One* 7(9): e44250.
- Falush, D., Bowden, R. (2006). "Genome-wide association mapping in bacteria?" *Trends Microbiol* 14(8): 353-355.

- Feil, E. J., Maiden, M. C., Achtman, M., Spratt, B. G. (1999) "The relative contributions of recombination and mutation to the divergence of clones of *Neisseria meningitidis*." *Mol Biol Evol* **16**(11): 1496-1502.
- Francisco, A. P., Vaz, C., Monteiro, P. T., Melo-Cristino, J., Ramirez, M., Carrico, J. A. (2012) "PHYLOViZ: phylogenetic inference and data visualization for sequence based typing methods." *BMC Bioinformatics* **13**: 87.
- Contreras-Martel C., Job V., Di Guilmi A. M., Vernet T., Dideberg O., Dessen A. (2006). "Crystal structure of penicillin-binding protein 1a (PBP1a) reveals a mutational hotspot implicated in beta-lactam resistance in *Streptococcus pneumoniae*." *J Mol Biol* **355**, 648-696.
- Gabriel, S. B., Schaffner, S. F., Nguyen, H., Moore, J. M., Roy, J., Blumenstiel, B., Higgins, J., DeFelice, M., Lochner, A., Faggart, M. et al. (2002) "The structure of haplotype blocks in the human genome." *Science* **296**(5576): 2225-2229.
- Giraud, A., Matic, I., Tenaillon, O., Clara, A., Radman, M., Fons, M., Taddei, F. (2001) "Costs and benefits of high mutation rates: adaptive evolution of bacteria in the mouse gut." *Science* **291**(5513): 2606-2608.
- Goldblatt, D., Ramakrishnan, M., O'Brien, K. L. (2013) "Using the impact of pneumococcal vaccines on nasopharyngeal carriage to aid licensing and vaccine implementation; a PneumoCarr meeting report March 27-28, 2012, Geneva." *Vaccine* **32**(1): 146-152.
- Goldstein, D. B., Allen, A., Keebler, J., Margulies, E. H., Petrou, S., Petrovski, S., Sunyaev, S. (2013) "Sequencing studies in human genetics: design and interpretation." *Nat Rev Genet* **14**(7): 460-470.
- Gordon, E., Mouz, N., Duee, E., Dideberg, O. (2000) "The crystal structure of the penicillin-binding protein 2x from *Streptococcus pneumoniae* and its acyl-enzyme form: implication in drug resistance." *J Mol Biol* **299**, 477-485
- GPS. (2013). "20,000 Global pneumococcal project" from
http://news.emory.edu/stories/2013/03/video_pneumonia_genome/
- Grundman, H., Hori, S., Tanner, G. (2001) "Determining confidence intervals when measuring genetic diversity and the discriminatory abilities of typing methods for microorganisms." *J Clin Microbiol* **39**:4190-4192.
- Hakenbeck, R., Bruckner, R., Denapaite, D., Maurer, P. (2012) "Molecular mechanisms of beta-lactam resistance in *Streptococcus pneumoniae*." *Future Microbiol* **7**(3): 395-410.

References

- Hakenbeck R., Martin, C., Dowson, C., Grebe, T. (1994) "Penicillin-binding protein 2b of *Streptococcus pneumoniae* in piperacillin-resistant laboratory mutants." *J Bacteriol* 176, 5574-5577
- Hanage, W. P., Bishop, C. J., Lee, G. M., Lipsitch, M., Stevenson, A., Rifas-Shiman, S. L., Pelton, S. I., Huang, S. S., Finkelstein, J. A. (2011) "Clonal replacement among 19A *Streptococcus pneumoniae* in Massachusetts, prior to 13 valent conjugate vaccination." *Vaccine* 29(48): 8877-8881.
- Hanage, W. P., Fraser, C., Tang, J., Connor, T. R., Corander, J. (2009) "Hyper-recombination, diversity, and antibiotic resistance in pneumococcus." *Science* 324(5933): 1454-1457.
- Hanage, W. P., Huang, S. S., Lipsitch, M., Bishop, C. J., Godoy, D., Pelton, S. I., Goldstein, R., Huot, H., Finkelstein, J. A. (2007). "Diversity and antibiotic resistance among nonvaccine serotypes of *Streptococcus pneumoniae* carriage isolates in the post-heptavalent conjugate vaccine era." *J Infect Dis* 195(3): 347-352.
- Hanage, W. P., Kaijalainen, T., Saukkoriipi, A., Rickcord, J. L., Spratt, B. G. (2006) "A successful, diverse disease-associated lineage of nontypeable pneumococci that has lost the capsular biosynthesis locus." *J Clin Microbiol* 44(3): 743-749.
- Hanage, W. P., Kaijalainen, T., Syrjanen, R. K., Auranen, K., Leinonen, M., Makela, P. H., Spratt, B. G. (2005) "Invasiveness of serotypes and clones of *Streptococcus pneumoniae* among children in Finland." *Infect Immun* 73(1): 431-435.
- Hanieh S., Hamaluba, M., Kelly, D. F., Metz, J. A., Wyres, K. L., Fisher, R., Pradhan, R., Shakya, D., Shrestha, L., Shrestha, A. *et al.* (2014) " *Streptococcus pneumoniae* carriage prevalence in Nepal: Evaluation of a method for delayed transport of samples from remote regions and implications for vaccine implementation" *PLoS One* 9(6):e98739.
- Hansman D. (1975) "Antibiotic sensitivity pattern of pneumococci relatively insensitive to penicillin and cephalosporin antibiotics." *Med J Aust* 2, 740-742
- Hathaway, L. J., Stutzmann Meier, P., Battig, P., Aebi, S., Muhlemann, K. (2004) "A homologue of *aliB* is found in the capsule region of nonencapsulated *Streptococcus pneumoniae*." *J Bacteriol* 186(12): 3721-3729.
- Hiller, N. L., Ahmed, A., Powell, E., Martin, D. P., Eutsey, R., Earl, J., Janto, B., Boissy, R. J., Hogg, J., Barbadora, K. *et al.* (2010). "Generation of genic diversity among *Streptococcus pneumoniae* strains via horizontal gene transfer during a chronic polyclonal pediatric infection." *PLoS pathog* 6(9): e1001108.

- Hoge, C. W., Gambel, J. M., Srijan, A., Pitarangsi, C., Echeverria, P. (1998) "Trends in antibiotic resistance among diarrheal pathogens isolated in Thailand over 15 years." *Clin Infect Dis* 26(2): 341-345.
- Hollingshead, S. K., Becker, R., Briles, D. E. (2000) "Diversity of *PspA*: mosaic genes and evidence for past recombination in *Streptococcus pneumoniae*." *Infect Immun* 68(10): 5889-5900.
- Hsieh, Y. C., Wang, J. T., Lee, W. S., Hsueh, P. R., Shao, P. L., Chang, L. Y., Lu, C. Y., Lee, C. Y., Huang, F. Y., Huang, L. M. (2006) "Serotype competence and penicillin resistance in *Streptococcus pneumoniae*." *Emerging Infect Dis* 12(11): 1709-1714.
- Huang, S. S., Hinrichsen, V. L., Stevenson, A. E., Rifas-Shiman, S. L., Kleinman, K., Pelton, S. I., Lipsitch, M., Hanage, W. P., Lee, G. M., Finkelstein, J. A. (2009) "Continued impact of pneumococcal conjugate vaccine on carriage in young children." *Pediatrics* 124(1): e1-11.
- Huang, S. S., Platt, R., Rifas-Shiman, S. L., Pelton, S. I., Goldmann, D., Finkelstein, J. A. (2005) "Post-PCV7 changes in colonizing pneumococcal serotypes in 16 Massachusetts communities, 2001 and 2004." *Pediatrics* 116(3): e408-413.
- Hunter, P. R., Gaston, M. A. (1988) "Numerical index of the discriminatory ability of typing systems: an application of Simpson's index of diversity." *J Clin Microbiol* 26(11): 2465-2466.
- Ip, M., Lyon, D. J., Yung, R. W., Tsang, L., Cheng, A. F. (2002) "Introduction of new clones of penicillin-nonsusceptible *Streptococcus pneumoniae* in Hong Kong." *J Clin Microbiol* 40(4): 1522-1525.
- Jauneikaite, E., Jefferies, J. M., Hibberd, M. L., Clarke, S. C. (2012) "Prevalence of *Streptococcus pneumoniae* serotypes causing invasive and non-invasive disease in South East Asia: a review." *Vaccine* 30(24): 3503-3514.
- Job, V., Carapito, R., Vernet, T., Dessen, A., Zapun, A. (2008) "Common alterations in PBP1a from resistant *Streptococcus pneumoniae* decrease its reactivity toward beta-lactams: structural insights." *J Biol Chem* 283(8): 4886-4894.
- Job V., Di Guilmi A. M., Martin L., Vernet T., Dideberg O, Dessen A (2003). "Structural studies of the transpeptidase domain of PBP1a from *Streptococcus pneumoniae*." *Acta Crystallogr D Biol Crystallogr* 59,1067-1069.

References

- Johnston, C., Martin, B., Granadel, C., Polard, P., Claverys, J. P. (2013) "Programmed protection of foreign DNA from restriction allows pathogenicity island exchange during pneumococcal transformation." *PLoS pathog* 9(2): e1003178.
- Keenan J. D., Klugman, K., McGee, P. L., Vidal, J. E., Chochua, S., Hawkins, P., Cevallos, V., Gebre, T., Tadesse, Z., Emerson, P. M. *et al.* (2014). "Evidence for clonal expansion after antibiotic selection pressure: pneumococcal multilocus sequence types before and after mass azithromycin treatments." *J Infect Dis* pii: jiu552
- Kislak, J. W., Razavi, L. M., Daly, A. K., Finland, M. (1968), "Susceptibility of pneumococci to nine antibiotics." *AM J Med Sci* 250, 261-268.
- Klugman, K. P. (1990) "Pneumococcal resistance to antibiotics" *Clin Microbiol Rev* 3(2), 171-196
- Ku, C. S., Loy, E. Y., Pawitan, Y., Chia, K. S. (2010) "The pursuit of genome-wide association studies: where are we now?" *J Hum Genet* 55(4): 195-206.
- Laabei, M., Recker, M., Rudkin, J. K., Aldeljawi, M., Gulay, Z., Sloan, T. J., Williams, P., Endres, J. L., Bayles, K. W., Fey, P. D. *et al.* (2014). "Predicting the virulence of MRSA from its genome sequence." *Genome Res* 24(5):839-849.
- Laible, G., Hakenbeck, R. (1991) "Five independent combinations of mutations can result in low-affinity penicillin-binding protein 2x of *Streptococcus pneumoniae*." *J Bacteriol* 173, 6986-6990
- Laible, G., Spratt, B. G., Hakenbeck, R. (1991) "Inter-species recombinational events during the evolution of altered PBP 2x genes in penicillin-resistant clinical isolates of *Streptococcus pneumoniae*." *Mol Microbiol* 5. 1993-2001.
- Land, A. D., Tsui, H. C., Kocaoglu, O., Vella, S. A., Shaw, S. L., Keen, S. K., Sham, L. T., Carlson, E. E., Winkler, M. E. (2013). "Requirement of essential *Pbp2x* and *GpsB* for septal ring closure in *Streptococcus pneumoniae* D39." *Mol Microbiol* 90(5): 939-955.
- Lefevre, J. C., Mostachfi, P., Gasc, A. M., Guillot, E., Pasta, F., Sicard, M. (1989) "Conversion of deletions during recombination in pneumococcal transformation." *Genetics* 123(3): 455-464.
- Levine, O. S., O'Brien, K. L., Deloria-Knoll, M., Murdoch, D. R., Feikin, D. R., DeLuca, A. N., Driscoll, A. J., Baggett, H. C., Brooks, W. A., Howie, S. R. *et al.* (2012) "The Pneumonia Etiology Research for Child Health Project: a 21st century childhood pneumonia etiology study." *Clin Infect Dis* 54 Suppl 2: S93-101.

- Lipsitch M. (2001). "Measuring and interpreting associations between antibiotic use and penicillin resistance in *Streptococcus pneumoniae*" *Clin Infect Dis* 32(7):1044-1054.
- Manolio, T. A. (2010) "Genomewide association studies and assessment of the risk of disease." *N Engl J Med* 363(2): 166-176.
- Marttinen, P., Hanage, W. P., Croucher, N. J., Connor, T. R., Harris, S. R., Bentley, S. D., Corander, J. (2012) "Detection of recombination events in bacterial genomes from large population samples." *Nucleic Acids Res* 40(1): e6.
- Maskell, J. P., Sefton, A. M., Hall, L. M. (2001). "Multiple mutations modulate the function of dihydrofolate reductase in trimethoprim-resistant *Streptococcus pneumoniae*." *Antimicrob Agents Chemother* 45(4): 1104-1108.
- McCarthy, M. I., Abecasis, G. R., Cardon, L. R., Goldstein, D. B., Little, J., Ioannidis, J. P., Hirschhorn, J. N. (2008) "Genome-wide association studies for complex traits: consensus, uncertainty and challenges." *Nat Rev Genet* 9(5): 356-369.
- McCool, T. L., Cate, T. R., Moy, G., Weiser, J. N. (2002) "The immune response to pneumococcal proteins during experimental human carriage." *J Exp Med* 195(3): 359-365.
- McDougal, L. K., Rasheed, J. K., Biddle, J. W., Tenover, F. C. (1995) "Identification of multiple clones of extended-spectrum cephalosporin-resistant *Streptococcus pneumoniae* isolates in the United States." *Antimicrob Agents Chemother* 39, 2282-2288.
- McGee, L., Klugman, K. P., Wasas, A., Capper, T., Brink, A. (2001) "Serotype 19F multiresistant pneumococcal clone harboring two erythromycin resistance determinants (*erm(B)* and *mef(A)*) in South Africa." *Antimicrob Agents Chemother* 45(5): 1595-1598.
- McGee, L., McDougal, L., Zhou, J., Spratt, B. G., Tenover, F. C., George, R., Hakenbeck, R., Hryniwicz, W., Lefevre, J. C., Tomasz, A., Klugman, K. P. (2001) "Nomenclature of major antimicrobial-resistant clones of *Streptococcus pneumoniae* defined by the pneumococcal molecular epidemiology network." *J Clin Microbiol* 39(7): 2565-2571.
- Medscape. (2014). "Bactrim, Bactrim DS (trimethoprim/sulfamethoxazole) dosing, indications, interactions, adverse effects, and more." from <http://reference.medscape.com/drug/bactrim-trimethoprim-sulfamethoxazole-342543#showall>.

References

- Millar, E. V., O'Brien, K. L., Zell, M., Bronsdon, A., Reid, R., Santosham, M. (2009) "Nasopharyngeal carriage of *Streptococcus pneumoniae* in Navajo and White Mountain Apache children before the introduction of pneumococcal conjugate vaccine." *Pediatr Infect Dis J* 28(8): 711-716.
- Moore, M. R., Gertz, R. E., Woodbury, R. L., Barkocy-Gallagher, G. A., Schaffner, W., Lexau, C., Gershman, K., Reingold, A., Farley, M., Harrison, L. H. et al. (2008) "Population snapshot of emergent *Streptococcus pneumoniae* serotype 19A in the United States, 2005." *J Infect Dis.* 197(7):1016-1027
- Mosser, J. F., Grant, L. R., Millar, E. V., Weatherholtz, R. C., Jackson, D. M., Beall, B., Craig, M. J., Reid, R., Santosham, M., O'Brien, K. L. (2014) "Nasopharyngeal carriage and transmission of *Streptococcus pneumoniae* in American Indian households after a decade of pneumococcal conjugate vaccine use." *PLoS One* 9(1): e79578.
- Muller, M., Marx, P., Hakenbeck, R., Bruckner, R. (2011) "Effect of new alleles of the histidine kinase gene *ciaH* on the activity of the response regulator *CiaR* in *Streptococcus pneumoniae* R6." *Microbiology* 157(Pt 11): 3104-3112.
- O'Brien, K. L., Santosham, M. (2004) "Potential impact of conjugate pneumococcal vaccines on pediatric pneumococcal diseases" *Am J Epidemiol* 159(7):634-644
- Osaka, R., Nanakorn, S. (1996) "Health care of villagers in northeast Thailand--a health diary study." *Kurume Med J* 43(1): 49-54.
- Padayachee, T., Klugman, K. P. (1999) "Novel expansions of the gene encoding dihydropteroate synthase in trimethoprim-sulfamethoxazole-resistant *Streptococcus pneumoniae*." *Antimicrob Agents Chemother* 43(9): 2225-2230.
- Pasta, F., Sicard, M. A. (1996) "Exclusion of long heterologous insertions and deletions from the pairing synapsis in pneumococcal transformation." *Microbiology* 142 (Pt 3): 695-705.
- Peacock, S. (2014) "Health care: Bring microbial sequencing to hospitals." *Nature* 509(7502): 557-559.
- Pearce, B. J., Iannelli, F., Pozzi, G. (2002) "Construction of new unencapsulated (rough) strains of *Streptococcus pneumoniae*." *Res Microbiol* 153(4): 243-247.
- Phan, N. B., Wilkinson, R. (2006) "Understanding the relationship of information need specificity to search query length." SIGIR '07 Proceedings of the 30th annual international ACM SIGIR conference on Research and development in information retrieval: 709-710.

- Pharoah, P. D., Tsai, Y. Y., Ramus, S. J., Phelan, C. M., Goode, E. L., Lawrenson, K., Buckley, M., Fridley, B. L., Tyrer, J. P., Shen, H. *et al.* (2013) "GWAS meta-analysis and replication identifies three new susceptibility loci for ovarian cancer." *Nat Genet* 45(4): 362-370, 370e361-362.
- Posada, D., Crandall, K. A. (2002) "The effect of recombination on the accuracy of phylogeny estimation." *J Mol Evol* 54(3): 396-402.
- Potgieter, E., Carmichael, M., Koornhof, H. J., Chalkley, L. J. (1992) "In vitro antimicrobial susceptibility of viridans streptococci isolated from blood cultures." *Eur J Clin Microbiol Infect Dis* 11, 543-546.
- Price, J. R., Golubchik, T., Cole, K., Wilson, D. J., Crook, D. W., Thwaites, G. E., Bowden, R., Walker, A. S., Peto, T. E., Paul, J. *et al.* (2014) "Whole-genome sequencing shows that patient-to-patient transmission rarely accounts for acquisition of *Staphylococcus aureus* in an intensive care unit." *Clin Infect Dis* 58(5): 609-618.
- Price, M. N., Dehal, P. S., Arkin, A. P. (2009) "FastTree: computing large minimum evolution trees with profiles instead of a distance matrix." *Mol Biol Evol* 26(7): 1641-1650.
- Purcell, S., Neale, B., Todd-Brown, K., Thomas, L., Ferreira, M. A., Bender, D., Maller, J., Sklar, P., de Bakker, P. I., Daly, M. J. *et al.* (2007). "PLINK: a tool set for whole-genome association and population-based linkage analyses." *Am J Hum Gen* 81(3): 559-575.
- Quin, L. R., Onwubiko, C., Moore, Q. C., Mills, M. F., McDaniel, L. S., Carmicle, S. (2007) "Factor H binding to *PspC* of *Streptococcus pneumoniae* increases adherence to human cell lines *in vitro* and enhances invasion of mouse lungs *in vivo*." *Infect Immun* 75(8): 4082-4087.
- Ravin, A. W. (1959) "Reciprocal capsular transformations of pneumococci." *J Bacteriol* 77(3): 296-309.
- Robinson, D. A., Edwards, K. M., Waites, K. B., Briles, D. E., Crain, M. J., Hollingshead, S. K. (2001) "Clones of *Streptococcus pneumoniae* isolated from nasopharyngeal carriage and invasive disease in young children in central Tennessee." *J Infect Dis* 183(10): 1501-1507.
- Rolo, D., Domenech, A., Fenoll, A., Linares, J., de Lencastre, H., Ardanuy, C., Sa-Leao, R. (2013) "Disease isolates of *Streptococcus pseudopneumoniae* and non-typeable *S. pneumoniae* presumptively identified as atypical *S. pneumoniae* in Spain." *PLoS One* 8(2): e57047.

References

- Ruths, D., Nakhleh, L. (2005) "Recombination and phylogeny: effects and detection." *Int J Bioinform Res Appl* 1(2): 202-212.
- Salter, S. J., Hinds, J., Gould, K. A., Lambertsen, L., Hanage, W. P., Antonio, M., Turner, P., Hermans, P. W., Bootsma, H. J., O'Brien, K. L., Bentley, S. D. (2012) "Variation at the capsule locus, cps, of mistyped and non-typable *Streptococcus pneumoniae* isolates." *Microbiology* 158(Pt 6): 1560-1569.
- Scott, J. R., Hinds, J., Gould, K. A., Millar, E. V., Reid, R., Santosham, M., O'Brien, K. L., Hanage, W. P. (2012) "Nontypeable pneumococcal isolates among navajo and white mountain apache communities: are these really a cause of invasive disease?" *J Infect Dis* 206(1): 73-80.
- Scott, J. R., Millar, E. V., Lipsitch, M., Moulton, L. H., Weatherholtz, R., Perilla, M. J., Jackson, D. M., Beall, B., Craig, M. J., Reid, R. et al. (2012). "Impact of more than a decade of pneumococcal conjugate vaccine use on carriage and invasive potential in Native American communities." *J Infect Dis* 205(2): 280-288.
- Shaper, M., Hollingshead, S. K., Benjamin, W. H., Briles, D. E. (2004) "PspA protects *Streptococcus pneumoniae* from killing by apolactoferrin, and antibody to PspA enhances killing of pneumococci by apolactoferrin [corrected]." *Infect Immun* 72(9): 5031-5040.
- Shapiro, B. J., Friedman, J., Cordero, O. X., Preheim, S. P., Timberlake, S. C., Szabo, G., Polz, M. F., Alm, E. J. (2012) "Population genomics of early events in the ecological differentiation of bacteria." *Science* 336(6077): 48-51.
- Sheppard, S. K., Didelot, X., Meric, G., Torralbo, A., Jolley, K. A., Kelly, D. J., Bentley, S. D., Maiden, M. C., Parkhill, J., Falush, D. (2013) "Genome-wide association study identifies vitamin B5 biosynthesis as a host specificity factor in *Campylobacter*." *Proc Natl Acad Sci USA* 110(29): 11923-11927.
- Shi, Z. Y., Enright, M. C., Wilkinson, P., Griffiths, D., Spratt, B. G. (1998) "Identification of three major clones of multiply antibiotic-resistant *Streptococcus pneumoniae* in Taiwanese hospitals by multilocus sequence typing." *J Clin Microbiol* 36(12): 3514-3519.
- Shimada, J., Yamanaka, N., Hotomi, M., Suzumoto, M., Sakai, A., Ubukata, K., Mitsuda, T., Yokota, S., Faden, H. (2002) "Household transmission of *Streptococcus pneumoniae* among siblings with acute otitis media." *J Clin Microbiol* 40(5): 1851-1853.

- Shivshankar, P., Sanchez, C., Rose, L. F., Orihuela, C. J. (2009) "The *Streptococcus pneumoniae* adhesin *PsrP* binds to Keratin 10 on lung cells." *Mol Microbiol* 73(4): 663-679.
- Sifaoui F., Kitzis, M-D., Gutmann, L. (1996) "In vitro selection of one-step mutants of *Streptococcus pneumoniae* resistant to different oral β-lactam antibiotics is associated with alterations of PBP2x" *Antimicrob Agents Chemother* 40,152–156
- Silver, L. L. (2007) "Multi-targeting by monotherapeutic antibacterials." *Nat Rev Drug Discov* 6(1): 41-55.
- Simões A. S., Pereira, L., Nunes, S., Brito-Avô, A., de Lencastre, H., sá-Leão, R. (2011) "The widespread use of PCV7 led to an expansion of two PMEN clone ST63 (serotype 15A, and 19A) and Denmark ST230." *J Clin Microbiol* 49(8): 2810-2817.
- Simpson, E. (1949) "Measurement of diversity" *Nature* 163:688
- Smith, A. M., Botha, R. F., Koornhof, H. J., Klugman, K. P. (2001) "Emergence of a pneumococcal clone with cephalosporin resistance and penicillin susceptibility." *Antimicrob Agents Chemother* 45, 2648-2650.
- Smith, A. M., Klugman, K. P. (1998) "Alterations in PBP1a essential for high-level penicillin resistance in *Streptococcus pneumoniae*." *Antimicrob Agents Chemother* 42,1329–1333
- Smith, A. M., Klugman, K. P. (2003). "Site-specific mutagenesis analysis of PBP 1a from a penicillin-cephalosporin-resistant pneumococcal isolate." *Antimicrob Agents Chemother* 42,1329-1333
- Sullivan, P. F., Daly, M. J., O'Donovan, M. (2012) "Genetic architectures of psychiatric disorders: the emerging picture and its implications." *Nat Rev Genet* 13(8): 537-551.
- Tang, J., Hanage, W. P., Fraser, C., Corander, J. (2009) "Identifying currents in the gene pool for bacterial populations using an integrative approach." *PLoS Comput Biol* 5(8): e1000455.
- Thamlikitkul, V., Apisitwittaya, W. (2004) "Implementation of clinical practice guidelines for upper respiratory infection in Thailand." *Int J Infect Dis* 8(1): 47-51.
- The Border Consortium. (2012) "Camp and latest population." from <http://www.tbbc.org/camps/mst.htm#ml>.
- Tocheva, A. S., Jefferies, J. M., Christodoulides, M., Faust, S. N., Clarke, S. C. (2013) "Distribution of carried pneumococcal clones in UK children following the

References

- introduction of the 7-valent pneumococcal conjugate vaccine: a 3-year cross-sectional population based analysis." *Vaccine* 31(31): 3187-3190.
- Toft, C., Andersson, S. G. (2010) "Evolutionary microbial genomics: insights into bacterial host adaptation." *Nat Rev Genet* 11(7): 465-475.
- Turner, P., Turner, C., Jankhot, A., Helen, N., Lee, S. J., Day, N. P., White, N. J., Nosten, F., Goldblatt, D. (2012) "A longitudinal study of *Streptococcus pneumoniae* carriage in a cohort of infants and their mothers on the Thailand-Myanmar border." *PloS one* 7(5): e38271.
- Vestrheim D. F., Høiby, E. A., Aeberge, I. S., Caugant, D. A. (2010) "Impact of a Pneumococcal Conjugate Vaccination Program on Carriage among Children in Norway." *Clin Vaccine Immunol* 17(3):325-334.
- Weiser, J. N., Austrian, R., Sreenivasan, P. K., Masure, H. R. (1994) "Phase variation in pneumococcal opacity: relationship between colonial morphology and nasopharyngeal colonization." *Infect Immun* 62(6): 2582-2589.
- WHO (2014) World Health Organisation Antimicrobial Resistance: Global Report on Surveillance 2014.
- Wray, N. R., Yang, J., Hayes, B. J., Price, A. L., Goddard, M. E., Visscher, P. M. (2013) "Pitfalls of predicting complex traits from SNPs." *Nat Rev Genet* 14(7): 507-515.
- Wyres, K. L., Conway, T. C., Garg, S., Queiroz, C., Reumann, M., Holt, K., Rusu, L. I. (2014). "WGS Analysis and Interpretation in Clinical and Public Health Microbiology Laboratories: What Are the Requirements and How Do Existing Tools Compare?" *Pathogens* 3(2): 437-458.
- Wyres, K. L., Lambertsen, L. M., Croucher, N. J., McGee, L., von Gottberg, A., Liñares, J., Jacobs, M. R., Kristinsson, K. G., Beall, B. W., Klugman, K. P. et al. (2013) "Pneumococcal capsular switching: a historical perspective." *J Infect Dis* 207(3):439-449.
- Wang, S., Yao, X. (2009) "Diversity analysis on imbalanced data sets by using ensemble models." *IEEE Symposium on Computational Intelligence and Data Mining*.
- Yother, J., McDaniel, L. S., Briles, D. E. (1986) "Transformation of encapsulated *Streptococcus pneumoniae*." *J Bacteriol* 168(3): 1463-1465.