

Supplementary Table S2: A summary of *Clostridium perfringens* antimicrobial resistance (both pheno- and genotypic) based on available literature. *High-prevalence antibiotic resistance reported.

| Antibiotic class | Inhibitory mechanism | High susceptibility | Moderate resistance | High resistance | Refs |
|------------------|------------------------|-----------------------------|---|---|------------|
| Penicillin | Cell wall synthesis | Penicillin G Amoxicillin | Ampicillin | | 1-6 |
| Glycopeptides | Cell wall synthesis | Vancomycin Daptomycin | | | 3,7 |
| Imidazoles | Nucleic acid synthesis | Metronidazole | | | 3,4 |
| Cephalosporins | Cell wall synthesis | Cefotaxime | Ceftazidime Ceftriaxone Ceftiofur | | 3,5,6 |
| Amphenicols | Protein synthesis | Chloramphenicol | | | 1,3,4 |
| Carbapenems | Cell wall synthesis | | Imipenem | | 4 |
| Tetracyclines | Protein synthesis | | | Tetracycline* Minocycline Doxycycline | 1,5,8-11 |
| Lincosamides | Protein synthesis | | | Lincomycin* Clindamycin* | 4,8,12 |
| Macrolides | Protein synthesis | | | Erythromycin* Tylosin | 1,2,8,9,12 |
| Quinolones | Nucleic acid synthesis | | | Norfloxacin Enrofloxacin Nalidixic acid | 3 |
| Aminoglycosides | Protein synthesis | | | Gentamycin Streptomycin | 2,6 |
| Polypeptides | Cell wall synthesis | | | Bacitracin Colistin | 2,6 |

References

- 1 Rood, J. I., Maher, E. A., Somers, E. B., Campos, E. & Duncan, C. L. Isolation and characterization of multiply antibiotic-resistant *Clostridium perfringens* strains from porcine feces. *Antimicrob. Agents Chemother.* **13**, 871-880 (1978).
- 2 Osman, K. M. & Elhariri, M. Antibiotic resistance of *Clostridium perfringens* isolates from broiler chickens in Egypt. *Rev Sci Tech* **32**, 841-850 (2013).
- 3 Kouassi, K. A., Dadie, A. T., N'Guessan, K. F., Dje, K. M. & Loukou, Y. G. *Clostridium perfringens* and *Clostridium difficile* in cooked beef sold in Cote d'Ivoire and their antimicrobial susceptibility. *Anaerobe* **28**, 90-94, doi:10.1016/j.anaerobe.2014.05.012 (2014).
- 4 Akhi, M. T. *et al.* Antibiotic Sensitivity of *Clostridium perfringens* Isolated From Faeces in Tabriz, Iran. *Jundishapur J Microbiol* **8**, e20863, doi:10.5812/jjm.20863v2 (2015).
- 5 Yadav, J. P. *et al.* Molecular characterization and antimicrobial resistance profile of *Clostridium perfringens* type A isolates from humans, animals, fish and their environment. *Anaerobe* **47**, 120-124, doi:10.1016/j.anaerobe.2017.05.009 (2017).
- 6 Park, J. Y. *et al.* Characterization of *Clostridium perfringens* isolates obtained from 2010 to 2012 from chickens with necrotic enteritis in Korea. *Poultry Science* **94**, 1158-1164, doi:10.3382/ps/pev037 (2015).
- 7 Tyrrell, K. L. *et al.* In vitro activities of daptomycin, vancomycin, and penicillin against *Clostridium difficile*, *C. perfringens*, *Fingoldia magna*, and *Propionibacterium acnes*. *Antimicrobial Agents and Chemotherapy* **50**, 2728-2731, doi:10.1128/Aac.00357-06 (2006).
- 8 Slavic, D. *et al.* Antimicrobial susceptibility of *Clostridium perfringens* isolates of bovine, chicken, porcine, and turkey origin from Ontario. *Can J Vet Res* **75**, 89-97 (2011).
- 9 Soge, O. O., Tivoli, L. D., Meschke, J. S. & Roberts, M. C. A conjugative macrolide resistance gene, *mef(A)*, in environmental *Clostridium perfringens* carrying multiple macrolide and/or tetracycline resistance genes. *J. Appl. Microbiol.* **106**, 34-40, doi:10.1111/j.1365-2672.2008.03960.x (2009).
- 10 Li, C., Yan, X. & Lillehoj, H. S. Complete Genome Sequence of *Clostridium perfringens* LLY_N11, a Necrotic Enteritis-Inducing Strain Isolated from a Healthy Chicken Intestine. *Genome Announc* **5**, doi:10.1128/genomeA.01225-17 (2017).
- 11 Kiu, R., Caim, S., Alexander, S., Pachori, P. & Hall, L. J. Probing Genomic Aspects of the Multi-Host Pathogen *Clostridium perfringens* Reveals Significant Pangenome Diversity, and a Diverse Array of Virulence Factors. *Front Microbiol* **8**, 2485, doi:10.3389/fmicb.2017.02485 (2017).
- 12 Ngamwongsatit, B. *et al.* Multidrug resistance in *Clostridium perfringens* isolated from diarrheal neonatal piglets in Thailand. *Anaerobe* **38**, 88-93, doi:10.1016/j.anaerobe.2015.12.012 (2016).