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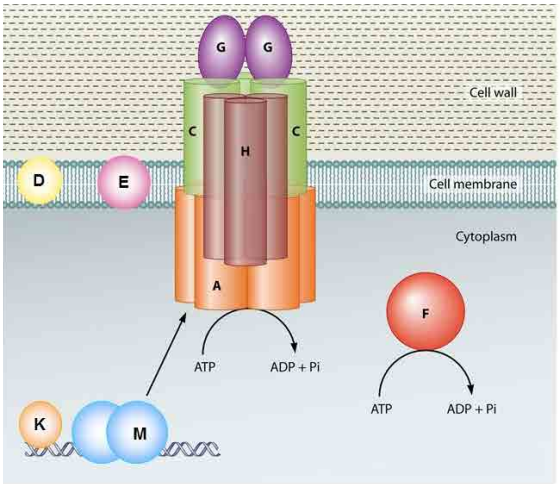
Research in our laboratory is centred on the molecular genetics of pathogenic anaerobic bacteria, asking three fundamental mechanistic questions.

- How do pathogenic anaerobes, particularly *Clostridium perfringens* and *Dichelobacter nodosus*, cause disease in humans and animals?
- How is the expression of virulence genes regulated in these bacteria?
- How do virulence and antibiotic resistance genes move from one bacterium to another?

Research Projects

1. **Host-pathogen interactions in *Clostridial myonecrosis***
2. **Regulation of toxin production in *Clostridium perfringens***
3. **The conjugative toxin plasmids of *Clostridium perfringens***
4. **Pathogenesis and genomics of the ovine footrot pathogen, *Dichelobacter nodosus***



Model of the *Clostridium perfringens* conjugation apparatus.

Selected significant publications:

1. Kennan RM, M Gilhuus, S Frosth, T Seemann, OP Dhungyel, RJ Whittington, JD Boyce, DR Powell, A Aspán, HJ Jørgensen, DM Bulach and **JI Rood**. 2014. Genomic evidence for a globally distributed, bimodal population in the ovine footrot pathogen *Dichelobacter nodosus*. *mBio* 5: e01821-14.
2. Yan X, C Porter, A Keyburn, D Steer, AI Smith, N Quinsey, V Hughes, J Cheung, R Moore, JC Whisstock, TL Bannam, **JI Rood**. 2013. Structural and functional analysis of the pore-forming toxin NetB from *Clostridium perfringens* *mBio.* 4: e00019-13.
3. Porter CJ, R Bantwal, TL Bannam, CJ Rosado, MC Pierce, V Adams, D Lyras, JC Whisstock, **JI Rood**. 2012. The conjugation protein TcpC from *Clostridium perfringens* is structurally related to the type IV secretion system protein VirB8 from Gram negative bacteria. *Mol. Microbiol.* 83: 275-288.
4. Kennan RM, W Wong, O Dhungyel, X Han, D Wong, D Parker, CJ Rosado, RHP Law, S McGowan, SB Reeve, V Levina, GA Powers, RN Pike, SP Bottomley, AI Smith, I Marsh, RJ Whittington, JC Whisstock, CJ Porter and **JI Rood**. 2010. The subtilisin-like protease AprV2 is required for virulence and uses a novel disulphide-tethered exosite to bind substrates. *PLoS Pathogens*. 6: e1001210.
5. Lyras D, J O'Connor, S Sambol, P Howarth, G Carter, T Phumoonna, R Poon, V Adams, G Vedantam, S Johnson, D Gerding & **JI Rood**. 2009. Toxin B is essential for virulence of *Clostridium difficile*. *Nature* 458:1176-9.