Cellular microbiology-laboratory – how bacteria manipulate host cell signaling

Research group:
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Project description:
The cellular microbiology-laboratory takes a multidisciplinary approach with molecular biology, biochemistry, cell biology, microscopy, structural biology, proteomics, next generation sequencing and functional genomics to understand bacterial pathogenesis. We aim primarily to identify bacterial toxins/effector proteins, to understand how the toxins/effector proteins are secreted, how the toxins/effector proteins recognize and enter the target host cell and how the toxins/effector proteins manipulate host cell signaling to ultimately influence the disease progression. Our ultimate goal is to gain insights that allow development of new antimicrobials for emerging antibiotic resistant bacteria.

List of selected publications (2012 –):
Gillespie, J.J., Phan, I.Q.H., Scheib, H., Subramanian, S., Edwards, T.E, Lehman, S.S., Piitulainen, H., Rahman, M.S., Rennoll-Bankert, K.E., Staker, B.L., Taira, S., Stacy, R., Azad, A.F., and Pulliainen, A.T. (2015) Structural insight into how bacteria prevent interference between multiple divergent type IV secretion systems. mBio 6:01867-15

Veikkolainen, V., Vesterinen, E.J., Lilley, T.M., and Pulliainen, A.T. (2014) Bats as reservoir hosts of human bacterial pathogen, *Bartonella mayotimonensis*. Emerging Infectious Diseases 20:960-967.

Oksi, J., Rantala, S., Kilpinen, S., Silvennoinen, R., Vornanen, M., Veikkolainen, V., Eerola, E., Pulliainen, A.T. (2013) Cat scratch disease caused by *Bartonella grahamii* in an immunocompromised patient. Journal of Clinical Microbiology 51:2781-2784.

Pulliainen, A.T., Piels, K., Brand, C., Hauert, B., Böhm, A., Quebatte, M., Wepf, A., Gstaiger, M., Aebersold, R., Dessauer, C., and Dehio, C. (2012) Bacterial effector binds host cell adenylyl cyclase to potentiate Gs-dependent cAMP production. Proceedings of the National Academy of Sciences USA 109:9581-9586.

Pulliainen, A.T., and Dehio, C. (2012) Persistence of *Bartonella* spp. stealth pathogens: from sub-clinical infections to vasoproliferative tumor formation. FEMS Microbiology Reviews 36:563-599.

Funding:
Academy of Finland, Sigrid Jusélius Foundation, Jenny and Antti Wihuri Foundation, The Finnish Society of Sciences and Letters, University of Turku (medical faculty), Turku University Foundation