Contribution ID: **8** Type: **not specified**

Genomic epidemiology, sex & evolution of bacterial sugars

Wednesday 23 September 2020 16:25 (30 minutes)

Horizontal gene transfer, or HGT, is a fundamental mechanism of genetic innovation and phenotypic change in bacterial evolution. In the last twenty years, by sequencing and comparing a large number of bacterial genomes, we have learned that HGT is much more pervasive and important than some have thought. However, research studies have also highlighted that different HGT processes are under different selective forces, that bacterial populations vary in their propensity to undergo HGT, and that more HGT is not always better. Hence understanding how HGT drives bacterial evolution requires knowing the precise evolutionary and ecological context in which it occurs and the phenotypes is generates. One interesting system to study the impact of HGT on bacterial evolution are genetic loci that synthesise the production of bacterial surface polysaccharides, like polysaccharide capsules and lipopolysaccharides. In this talk, I will show that such loci can be thought of as diversity generating machines that are evolutionary optimised to rapidly generate novel bacterial antigens via HGT under diversifying selection. Then, using a dataset of over 27,000 genomes of bacterial isolates from the order Enterobacteriales, I will demonstrate the importance of between-species and between-genus horizontal exchanges in evolution of bacterial surface polysaccharides. Finally, I will discuss one hypothesis that could potentially explain the elevated HGT rates in surface polysaccharide loci, namely co-evolution with bacteriophages.

Author: Dr MOSTOWY, Rafał

Presenter: Dr MOSTOWY, Rafał

Session Classification: Afternoon Session