



BiRC Seminar – open to all

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Title: Genomic effects and control of mammalian recombination - GC-biased gene conversion and the role of PRDM9

Time: Friday 9 October, 2015, 14:15 - 15:00

Place: BiRC, Aud. 1110-223, C.F. Møllers Allé 8, 8000 Aarhus C

Abstract:

“Recombination is the process in which chromosomes exchange genetic material during meiosis. It generally occurs in short genomic intervals referred to as recombination ‘hotspots’, and is required for correct chromosome segregation and increases diversity, which enables selection of separate chromosomal segments to be more effective. However, recombination simultaneously promotes the neutral process GC-biased gene conversion (gBGC), which acts similar to positive selection but increases the fixation of G and C alleles regardless of fitness effect. Therefore it is important to identify the distribution and quantify the extent of gBGC in genomes, to distinguish between the two forces in scans of adaptive evolution. Mammalian recombination is generally controlled by the protein PRDM9, which determines the location of the double stranded break that initiates recombination by binding to a specific DNA sequence motif. This motif is overrepresented in breakpoints of human copy number variants (CNVs), which suggests a role of recombination in creation of CNVs. Dogs lack an active copy of PRDM9, but has hotspots despite the absence of this crucial protein. This suggests a different control of recombination in dog than in human and other mammals. Dog hotspots instead tend to be rich in GC-content, especially CpG sites. In the light of missing PRDM9, we have characterized CNVs and hotspots in dog to elucidate how recombination is controlled and its effects on genome evolution.”

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