

Institute for Life Sciences & Archaeology Seminar

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Date: 20 July 2015, 12:00 – 13:00

Venue: Room 1175 (L/T C), Building 65, Avenue Campus

“Chromosomal rearrangements as barriers to genetic homogenization between archaic and modern humans”

Abstract: Chromosomal rearrangements, which shuffle DNA across the genome, are an important source of divergence across taxa that can modify gene expression and function. Using a paired-end read approach with Illumina sequence data for archaic humans, I identify changes in genome structure that occurred recently in human evolution. Hundreds of rearrangements indicate genomic trafficking between the sex chromosomes and autosomes, raising the possibility of sex-specific changes. Additionally, genes adjacent to genome structure changes in Neanderthals are associated with testis-specific expression, consistent with evolutionary theory that new genes commonly form with expression in the testes. I identify one case of new-gene creation through transposition from the Y chromosome to chromosome 10 that combines the 5' end of the testis-specific gene Fank1 with previously untranscribed sequence. This new transcript experienced copy number expansion in archaic genomes, indicating rapid genomic change. Finally, loci containing genome structure changes show diminished rates of introgression from Neanderthals into modern humans, consistent with the hypothesis that rearrangements serve as barriers to gene flow during hybridization. Together, these results suggest that this previously unidentified source of genomic variation has important biological consequences in human evolution.

All welcome, refreshments available after the seminar