We are all Africans: Decoding recent human migration history from mutations

Gyan Bhanot
Department of Biochemistry & Molecular Biology
Rutgers University, New Brunswick, NJ

Mitochondria are organelles in eukaryotic cells responsible for energy production. They are of bacterial origin, their DNA (mtDNA) does not undergo recombination and is only transmitted maternally. The Y chromosome is paternally transmitted and only recombinant in a small region without genes with homology with the X chromosome. Mutations on mtDNA and the Y-Chromosome can be used to trace recent migration history of humans. These studies show that all humans (outside Africa) derived from two, almost coincident "Out of Africa" events, which occurred ~50,000-70,000 years ago. Tracing the evolutionary tree of mtDNA and Y-Chromosome to the most recent female and male common ancestors dates "Mitochondrial Eve" to ~150,000 - 200,000 years ago and "Y-Chromosome Adam" to ~70,000 years ago. I will describe the basic biology needed to understand these ideas and show how they reveal connections between diverse groups such as the European Gypsies and Banjaras from Rajasthan and between the Vikings and the Irish. The talk will be presented at a general level and will be accessible to non-experts.