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Genomic imprinting in human placentas and the intergenerational transmission of parental phenotypes: a two-generation cohort study

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Genomic imprinting is a mechanism of epigenetic regulation in the sperm and eggs that selectively represses either the maternal or the paternal copy of a gene. Partial de-repression of imprinted alleles, or “loss of imprinting” (LOI), leads to quantitative variation in allelic bias between individuals and is potentially an understudied mechanism for the parental transmission of phenotypes. At my long-term field site among the Dogon of Mali, we collected tissue from 470 placentas and then used RNA-seq to analyze allele specific expression in ~100 imprinted genes. A unique feature of this study is that it entails two generations of longitudinal data on human phenotypes. We enrolled ~1700 males and females in the F1 generation in infancy and early childhood and followed them regularly until adulthood (20^+ years). We enrolled 470 members of the F2 generation at birth, in conjunction with sampling their placentas, and followed them regularly for 5^+ years. This talk will have two goals: (1) to present the results of tests for associations between allelic bias and maternal and offspring phenotypes (e.g. sex, birth length, height at age two years, age at menarche), and (2) to discuss the significance of these results for evolutionary theory on genomic imprinting.

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