The recent explosion of work on human genomics has produced an astonishing array of information once thought impossible. We now have detailed data on natural selection acting on human beings 10,000 years ago, the genetic structure of the Neanderthal genome with clear evidence of interbreeding with modern European and Asians, Neanderthals having preferentially contributed parasite resistance and skin color genes to our genome. We now know the exact genetic structure of the human and chimpanzee Y chromosome, revealing the extraordinary evolution of huge palindromes covering large sections of the Y, we have detailed evidence of variation in human recombination—individual, chromosomal and sexual—and on the role of miRNAs in within-genome conflict, e.g. acting against transposable elements, the prevalence and importance of imprinted genes, the possible role of selfish X action on the behavior of paternal grandmothers and so on.

The purpose of this course is to introduce students to these topics. Form of the course will be a three-hour seminar once a week, in which students will discuss assigned papers and I will lecture for about an hour—often in preparation for the next week’s reading. Prerequisite: consent of the instructor, although prior knowledge of some genetics or social evolution would be valuable.

Exam will be written (~2 hours) in which students be will asked to give short summaries of assigned papers and answer direct questions on them and other course content. There will be choice among the questions. Exam will make up ~60% of the grade, classroom participation the rest. Educational goal is to master the assigned papers while learning how to read genetics papers and report on them to others.

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Course outline with most of assigned reading

Origin of human genetic and linguistic variability in southern Africa and its decay with distance from origin


Positive selection in the recent human past


Positive selection in the distant past as inferred from the genome


Genetics of recent human forms such as Neanderthal


[paper on skin color genes being of Neanderthal origin]
mtDNA and Y diversity across space and within societies


Selfish elements and the structure of the human genome


[additional reading]

The importance of imprinted genes


Imprinted genes and pediatric growth disorders


Do paternal Xs in grandmothers bias behavior toward granddaughters?


**The evolution of human sex chromosomes (dimorphic, Y palindromes)**


**Sex differences in recombination**


**Exam**

Students are expected to master a series of assigned papers, both what the papers claim to show and the methodology used to achieve the claimed results. A secondary aim is to teach students how to read scientific papers and how most efficiently to describe them to others. Critical faculties are emphasized—is the work on a firm foundation, where is the methodology weakest and so on?

Each class several students will be required to read all of the assigned papers and may be asked to master one or two additional ones. Each is then available to present the entire paper. Others are asked to read the assigned papers and may be questioned but are not penalized for ignorance.

A standard way of reading and summarizing a paper will be emphasized—abstract first, then key results, ideally with a key figure or table, followed by methodology, introduction and discussion, roughly in that order.