STAT 494*: Statistical Genetics

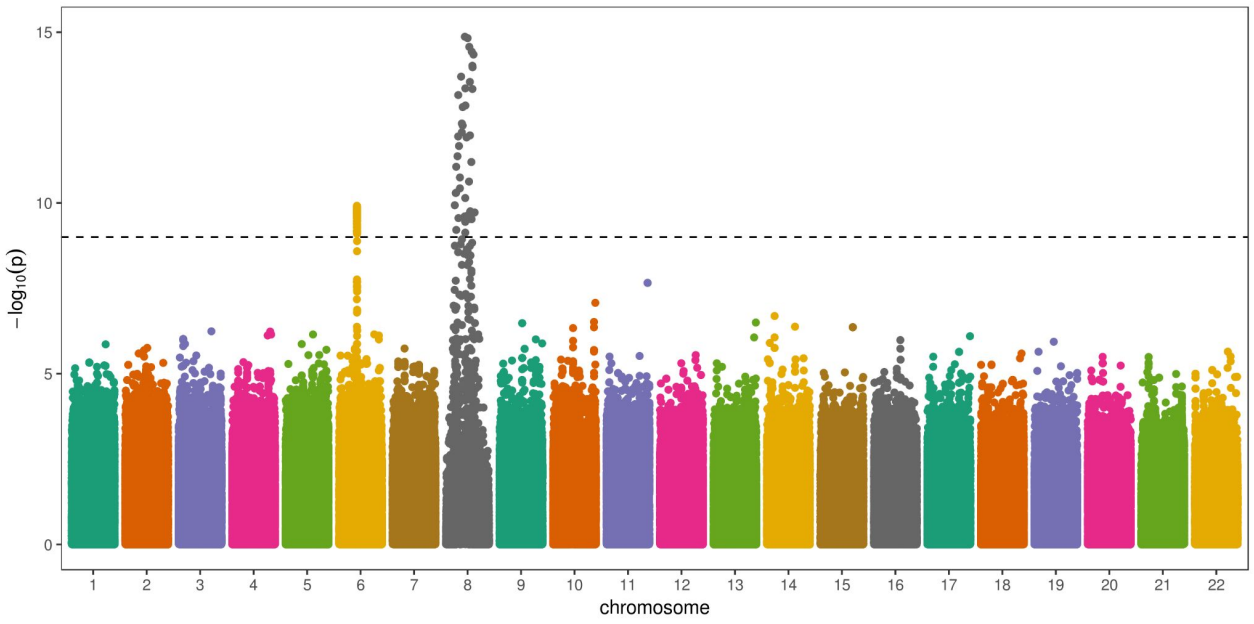
*this course can be used to satisfy the STAT capstone requirement

Fall 2022 | MWF 1:10 – 2:20 pm | Prof. Kelsey Grinde

Statistical methods for **analyzing genetic data** and **understanding the genetic basis of human diseases and traits** are at the heart of government-sponsored precision medicine initiatives, genetic testing routinely conducted at health clinics, and direct-to-consumer genetic and ancestry testing offered by companies like 23andMe and AncestryDNA. Statistical geneticists work to answer these important scientific questions while navigating the **unique statistical challenges posed by genetic data**:

BIG (p >> n) **Correlated** **Observational** **Sparse**

In this course, we will explore the statistical methods that have been proposed to address these challenges, **applying ideas from other statistics courses** (e.g., linear models, hypothesis testing, classification, principal component analysis, probability theory) **in the context of genetic data**. Specific topics will include genome-wide association studies, genetic ancestry inference, admixture mapping, and more.



Prerequisites: *STAT 155* and *MATH/STAT 354*. Prior knowledge of genetics and statistical machine learning will be helpful, but are not formally required.