

## **DNA II: Analyzing your Genetic Genealogy Results**

This discussion class will walk you through the steps to analyze the test results that you have received. We will concentrate on the basic autosomal test that shows relative matches going back 4-5 generations. We will also discuss the Y chromosome and mitochondrial testing that examines the paternal and maternal lines, respectively.

Activities in square brackets.

DNA II Outline:

1. Introduction: Quick review of Genetic Genealogy and DNA science (Days 1-3)  
[Pre-Unit Questionnaire; Video call #1] [Homework Assignment #1: Creating a DNA focused family tree]
  - A: What are the advantages/disadvantages of genetic genealogy compared to traditional (document-based) genealogy?
    - \*Advantage: Follows the biological tree rather than surname tree
    - \*Disadvantage: May find unexpected non-parental-events (NPE)
      - \*Advantage: Can find relatives that are not yet connected to your tree
      - \*Disadvantage: May locate relatives that are probably related but there is not enough data to place them in your tree. This is especially complicated by cousin marriages in Eastern Europe
    - \*Advantage: Y DNA genetics let's you explore the paternal line before surnames were adopted
    - \*Disadvantage: Requires special test on males and may not be informative if others from the same line have not tested
    - \*Advantage: Ability to explore admixture calculations.
    - \*Disadvantage: Calculations are inexact; answers vary between the sites operating with the same DNA inputs.
  - B. What types of information are available from genetic genealogy tests?
    - \*Find branches of your family have been hard to locate via paper records  
Case Study 1: What is the autosomal matching process like?
    - \* Get hints regarding surnames from paternal line (Y chromosome)  
Case Study 2: Tracking down surnames
    - \* Find out about the maternal line (mtDNA)  
Case Study 3: Maternal line matching
  - C. What is the science that supports genetic genealogy

Define and explain core concepts:

Chromosomes, Base pairs, sequence, centimorgans (cM), single nucleotide polymorphisms(SNPs), short tandem repeats (STR), identical-by-state (IBS) vs identical by descent (IBD), Y-DNA, mtDNA, haplogroup, endogamy, pedigree collapse.

D. Ethics of genetic genealogy (uses for adoptees, solving criminal cases, unexpected health information, etc.)

2. Overview: Analyzing your results—concentrating on autosomal testing on the following sites: Ancestry, 23andMe, FTDNA, MyHeritage, GEDMatch (Days 4-12)

2a. Reviewing and sorting match lists

2b. Using DNAPainter to understand possible relationships

2c. Transferring results to other sites: FTDNA, MyHeritage, GEDMatch2

2d. Using the chromosome browser to compare autosomal data

[Video Call #2]

2e. Triangulation methods, Leeds Method for clustering matches, Building “Quick and Dirty” Trees, generating automatic clusters and trees

[Homework 2: Leeds Method]

2f. Endogamy (why you have 2000+ close relatives!)

2g. Phasing kits

2h. X chromosome matches

[Homework 3: Chromosome Browser and Clustering approaches]

[Video Call #3]

3. How to contact prospective relatives with genetic genealogy results:  
\*what information to provide= what constitutes a “good” match

4. Other testing modalities: Day 13-15

4a. Paternal line testing with Y chromosome  
Tools available and what they show

4b. Maternal line testing with mtDNA  
Tools available and what they show

5. Summary of Genetic Genealogy Tools and Techniques and Next Steps  
[Videocall #4 Summary and Final Presentations]