



DNA Doe Project recently selected its first group of 8 apprentices for a 4-week program to be held in summer of 2022. The goal of this program is to provide experienced genetic genealogists with the opportunity to work a forensic case. By participating in the program, apprentices will learn about responsible practice of forensic genetic genealogy.

The lecture portion of the program is run via online format two evenings a week, making it accessible to participants from across the US and the UK and those who work during the day.

Evaluation of applications was performed by Rhonda Kevorkian, Gwen Knapp and Wendy McLean of DNA Doe Project's education work group under the leadership of Cairenn Binder, Director of Education and Development. Criteria for evaluation included correctness of answers to questions 1, 5, 6, 8 and 11. Additionally, essay questions were evaluated individually to determine applicants' understanding of tools commonly used for forensic genetic genealogy, most importantly GEDmatch. Understanding of the sensitive nature of forensic cases (as well as unknown parentage cases) was also scored highly when observed in essay answers. Demonstration of work on a variety of diverse cases was also desirable as DNA Doe Project applies genetic genealogy to a diverse population of Does.

Exam Questions and Answers:

- 1. John Doe's top match shares 3500cM with John Doe. What are the potential relationships of this match to John Doe?**

Acceptable answers to this question included self, parent, child, identical twin, and in rare cases child of identical twin.

- 2. Approximately how many unknown parentage cases have you solved?**

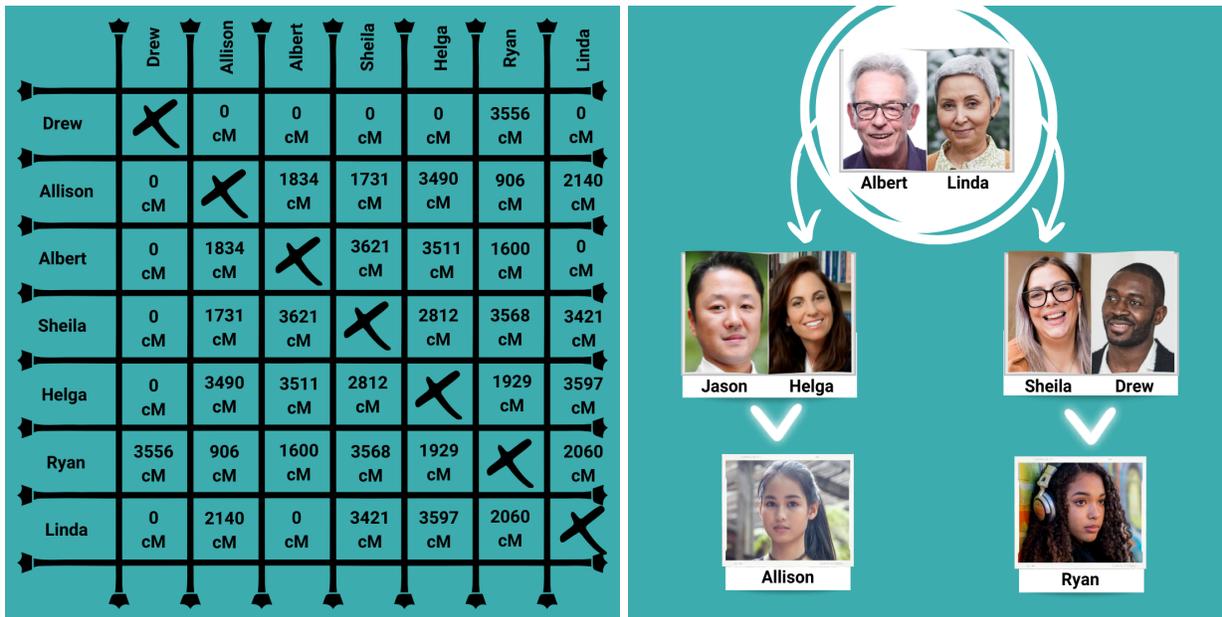
Answers to this question weighed only moderately in the evaluation group's decisions. We looked for applicants that had solved enough unknown parentage cases to have experienced a variety of scenarios, but knowledge of GEDmatch and other tools we use in casework was more important.

- 3. Describe your process when first approaching an unknown parentage case.**

Answers to this question were evaluated individually. High quality answers included details such as: approaching with sensitivity, respecting privacy of the client and their DNA matches, gathering geographical and chronological data from the client, and using a multifaceted approach when evaluating DNA matches. Answers that incorporated the use of GEDmatch tools were also sought.

4. *John Doe's top match is Ryan (F) who shares 422 cM autosomal and 23.4 cM X DNA with John Doe. You are attempting to identify Ryan in order to determine her relationship to John Doe. Many family members of Ryan have taken DNA tests and are also on GEDmatch. You build a matrix of the family, pictured above. Draw a family tree which would describe these 7 family members' relationships to one another and upload it here:*

Correct answer is demonstrated in the family tree pictured. (Please note "Jason" was not part of the puzzle / matrix). There is not enough information in the matrix to determine how the Doe might be related to this family; we were looking for a family tree only including the family members listed in the matrix.



5. *In GEDmatch, what are the advantages to using the 1:1 tool to compare matches rather than the 1:many tool?*

High quality answers demonstrated knowledge that individual segments can be evaluated using the 1:1 tool, and that the algorithm used by Verogen for 1:1 has a different threshold than 1:many.

6. *John Doe has two matches, Sally and Raymond, that both match John Doe at the same location on chromosome 6. Sally shares 32 cM at this location. Raymond shares 26 cM at this location. What other information do you need to know to decide if these matches triangulate on the chromosome 6 segment?*

Correct answers stated that you must directly compare Sally and Raymond to know if they triangulate with the Doe on chromosome 6 on the same segment. Otherwise, they may each share with the Doe on opposite parent sides (one chromosome 6 from the Doe's mother and one from their father).

7. What are your favorite genetic genealogy tools to work with? What do you like about it/them?

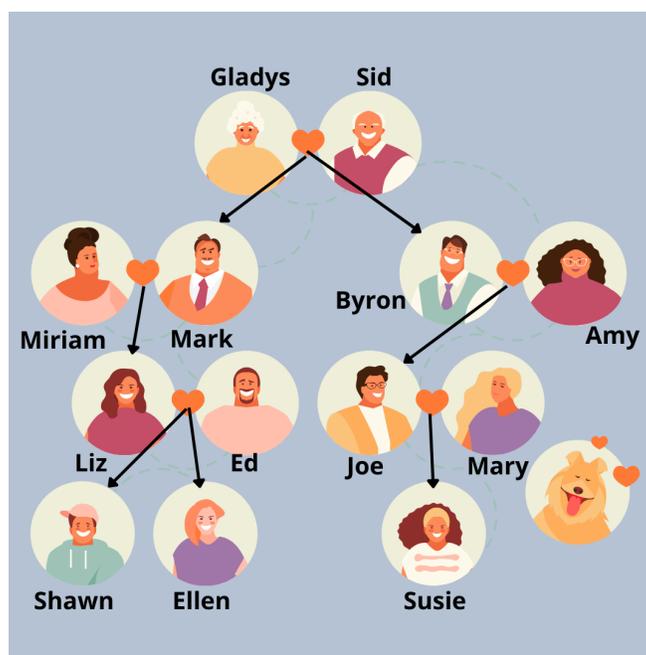
The answers to this question were evaluated individually; our team looked for knowledge of a variety of tools that may be utilized in forensic work. Use of DNA sorting tools within AncestryDNA, for example, is not of utility in forensic cases as AncestryDNA is not used. Use of GEDmatch tools, DNA painter, FTDNA chromosome browser, etc. are of greater utility in forensic cases.

8. What difficulties might you encounter in the case of a Puerto Rican, African American, or Mediterranean John or Jane Doe? (choose one to describe challenges)

While our team did not require experience on working the types of cases listed in this question, we sought those who had at least read about or understood the challenges of specific populations. For example, endogamy is a factor affecting genetic genealogy in the Puerto Rican Population.

9. In the diagram below, you are working on Shawn's DNA match list. Which of his family members might share X-DNA with Shawn?

Correct Answers: Ellen, Liz, Miriam, Mark, Byron, Gladys



10. You are attempting to identify a DNA match on GEDmatch. The person has used an alias in their "name" field and their email address does not show any results in search tools. What is your immediate next step in attempting to identify the match?

High quality answers included: examining the match's top matches in order to identify them, running the user lookup tool in GEDmatch to see if they have administered other kits.

Medium quality answers included: googling the alias, checking social media sites for the alias.

Low quality answers included: contacting the match.

11. You are working on the case of a John Doe, and note the match above on GEDmatch. List some information you can surmise in regards to the match and their relationship to John doe.

| | | | Haplogroup | | Autosomal | | | X-DNA | | | |
|---|--|---|--|---|--|---|---|--|---|--|---|
| Age(days)  | Type  | Sex  | Mt  | Y  | Total cM  | Largest  | Gen  | Total cM  | Largest  | Source  | Overlap  |
| 87 | 2 | F | | | 737.1 | 73.4 | 2.14 | 81 | 47.9 | Ancestry | 125904 |

Highest quality answers included the following: The match has been on GEDmatch 87 days, identified the kit as belonging to a female, shares 737.1 cM autosomal with the Doe with largest segment of 73.4 cM, Shares 81 cM X DNA with the doe with largest segment 47.9. Uploaded their DNA data from Ancestry. Most likely a relative on John Doe's maternal line within 2-3 generations.

For those who wish to reapply in the future for the next apprentice program, we recommend the following resources:

DNA inheritance

<https://familyloket.com/charts-for-understanding-dna-inheritance/>

<https://www.familysearch.org/en/blog/cousin-chart>

https://isogg.org/wiki/Paths_of_DNA_inheritance

GEDmatch tools

<https://education.gedmatch.com/>

Segment Triangulation and inheritance

<https://segmentology.org/>

DNA Painter tools (from Family Tree Webinars - all free but worth the subscription to get access to all the education webinars)

<https://familytreewebinars.com/webinar/an-introduction-to-dna-painter/>

<https://familytreewebinars.com/webinar/four-ways-dna-painter-can-help-with-your-family-history-research/?category=dna&free=1&sortby=newest>

<https://familytreewebinars.com/webinar/what-are-the-odds-an-online-tool-that-can-help-solve-dna-puzzles/?category=dna&free=1&sortby=newest>

Complex cases - Endogamy, Hispanic, African American, etc

<https://www.legacytree.com/blog/dealing-endogamy-part-exploring-amounts-shared-dna>

<https://thednageek.com/the-endogamy-files-what-is-endogamy/>

<https://blog.kittycooper.com/tag/ashkenazi-dna/>

<https://dna-explained.com/native-american-dna-resources/>

Unknown Parentage and Finding Living people

<https://familytreewebinars.com/webinar/using-dna-to-solve-adoption-and-unknown-parentage-mysteries/> (unfortunately not free but very good webinar with a priceless useful information)

GEDmatch Ethnicity information

<http://genealogical-musings.blogspot.com/2017/04/finally-gedmatch-admixture-guide.html#:~:text=Admixture%20is%20a%20scientific%20term,a%20different%20person%2C%20mostly%20a%20cademics.>