

### Romanov Assignment

1. The Romanovs were the last family of the Russian monarchy that were exiled to the city of Yekaterinburg and eventually executed by firing squad.
2. The wife of Nicholas II, Alix, was a direct descent of Queen Victoria. Queen Victoria would pass down her role as a carrier to Alix who passed the disease to her son, Alexis. This probably was a major contributor to the fall of the Romanov family in Russia.
3. Nicholas II, Emperor and Autocrat of All the Russias
4. After failure to maintain control of Russia, and through a series of revolutions, Nicholas II was forced to abdicate the throne. Nicholas II offered the throne to Grand Duke Michael, but he declined. Nicholas II and his family were then exiled and executed. The Ural Soviet seized control of Russia.
5. Nicholas was married to Alix of Hesse and had 5 children. Nicholas was the son of Alexander III and Maria Fyodorovna. Nicholas also had an older brother, Alexander, who passed away at infancy.
  - a. Because the Soviets feared a retaliation from the former royal family, Nicholas, his wife, and his five children were executed by firing squad.
6. Queen Victoria was her maternal grandmother.
7. Hemophilia is a disease that affects blood clotting. This can result in excess bleeding and easy bruising. Hemophilia is an X-linked recessive disorder.
8. When scientists examined the body of czar Alexis they found a mutation in the F9 gene that is responsible for causing hemophilia B.
9. The gene that causes hemophilia is on the X chromosome.
10. The mutation is caused by a substitution in the splice acceptor site of exon 4 in the F9 gene.
11. This mutation could result in an early stop codon which negatively impacts the protein it creates.
12.  $X^H X^h$
13.  $X^H X^h * X^H Y = X^H Y, X^h Y$
14.  $X^H X^h * X^H Y = \text{Male} (X^H Y, X^h Y) \text{ Female} (X^H X^H, X^H X^h)$
15. For a female to acquire the disease her father would have to be a hemophiliac along with her mother also being a hemophiliac or a carrier.
16. Unless a sister had a son that was a hemophiliac, there was not a way to determine if she was a carrier or not.
17.  $X^H X^h * X^H Y = \text{Male} (X^H Y, X^h Y) \text{ Female} (X^H X^H, X^H X^h)$  The probability of having a daughter that is a carrier is 25%
18. The probability of having four daughters that are carriers of hemophilia is  $(1/4)^4 = 1/256$
19.  $X^H X^h * X^H Y = X^H X^H, X^H X^h$ 
  - a. The only possible way for one of the daughters to have hemophilia is if their dad had hemophilia.

20. Alexi was a frail boy and because his mother was so concerned for him, she kept him close to the mystic Grigori Rasputin, who they thought had healing magic. The Russian people thought Rasputin was using his connections with the royal family to influence in his own policy's in government. This possibly led to distrust in the Russian people with the royal family and hastened the revolution.
21. One grave had 9 members the other had two bodies.
22. The larger mass grave was discovered in the late 1970s and the smaller grave was discovered in 2007.
23. The White Russian Army were the main opponents of the soviets and were in favor of monarchs ruling the country.
24. Nuclear DNA testing confirmed the sex of the bodies and established that they were a part of the royal family.
25. Short Tandem Repeat
26. Because scientists knew that Alix was a carrier for Hemophilia. This could be used to identify the daughters of Alix.
27. Because Prince Philip's lineage could be traced back to Alice of Hesse, who was Alix's mother. Prince Philip is married to Queen Elizabeth II and is the Grandfather to Prince William, Duke of Cambridge, and Prince Henry of Wales.
28. One body was the son of Nicholas, Alexi and one of his sisters, either Maria or Anastasia
29. It did not matter if one was female and the other was male. There were no sex-linked traits to compare to Nicholas II. Both the Duke of Fife and Princess Xenia were maternal relatives to Nicholas II.
30. Heteroplasmy was at position 16169 C/T for Nicholas II while his maternal relatives were fixed for 16169 T.
31. Heteroplasmy
32. mtDNA, autosomal STR, and Y-STR
33. Y-STR testing
34. Prince Andrew Andreevich Romanov
35. No, Anastasia was found in the first grave discovered. Maria was the body found with Alexis
36. Anna Anderson was a woman who claimed to be a missing daughter, Anastasia who narrowly escaped execution. Anna was thought to be Franziska Schanzkowska who was admitted to two different mental hospitals but later disappeared in 1920, around the same time Anna appeared and claimed to be apart of the royal family.
37. Anna eventually settled in Charlottesville, VA
38. She married Dr John Eacott Manahan
39. Small bowel samples and six hairs.
40. From their bones
41. STR analysis and mtDNA analysis
42. HRH the Duke of Edinburgh and Carl Maucher
43. A location within nuclear DNA in which base pairs repeat or have substitutions

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44. That Carl Maucher, who was the great nephew of Schanzkowska, was a maternal relative of Anna Anderson
45. The last two children were accounted for in 2007.

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### Works Cited

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