**Exercise 5** (Due Friday, July 20, 2018)

1. Read through “Ancient Admixture in Human Prehistory”, by Patterson et al. (2012), especially p. 1065-1072. Write 1-2 paragraphs reflecting/summarizing what you understand about f-statistics. (This may be hard to understand, but just try your best. I learn new things every time I read this paper!)
2. Given a Han individual, a French individual, an Mbuti individual, and an outgroup (i.e., the Chimp), what are the three D-statistic combinations, and what do you expect the result to be for each?
3. Test #1 with the dataset, using Admixtools to calculate the D-statistic.
4. Take your previously published individual and test with whom, if any, this individual forms a clade. Do you get the results you expect based on your understanding of this individual’s ancestry? **Be prepared to share briefly what you find Friday morning.** Some things to consider:
   1. We provide a comprehensive log file of D-statistics for every modern human set in the dataset (see /public/adna/student/results/) – who do you include in your panel?
   2. Use numpy and xlsxwriter to write a script for yourself to retrieve the relevant data and put them into an Excel folder to visually analyze (**if you do not have many Python skills yet, let the instructor know and she can help make those tables for you, if you let her know what panel you want**).
   3. Determine the relationship your individual shares with other humans using the resulting Excel file.
5. **Bonus Challenge:** We mostly visually explore D-statistic tables, comparing between 1-2 tables to determine where cladal patterns or connections occur. Can you brainstorm other ways of summarizing or depicting the data to help rapidly determine cladal relationships? Try brainstorming and writing/drawing up your idea. If you feel confident in your scripting skills, perhaps see if you can write a script based on your idea.