Mechanisms of Evolution Lab

Pre-class worksheet

Part 1: Evolution: Population Genetics: Genetic Drift

Read the description and instructions on the Random Genetic Drift simulation on the website virtualbiologylab.org Go under the Evolution Models > population genetics > Model 3 – Random Genetic Drift > Directions-pdf, or read the pdf posted on the CCLE course site.

Run the simulation twice with default settings, and make sure the "stop when fixed" button is ON. For each simulation trials, take note of how many populations are fixed for the *bw* allele, and in which populations (i.e., population #1-10) the *bw* allele became fixed. To determine the generation where 50% of the populations are fixed, find the point where the fifth population is fixed for one of the two alleles (either *bw* or non-*bw*). Place your cursor on the line on the graph where the population becomes fixed (i.e., is at 1 or 0 on the y-axis), and the number of generations that have occurred at that point will appear on the x-axis.

	Trial	Total # of populations fixed for *bw*	Which populations are fixed for *bw*?	Generation where the first population is fixed for *bw* or *non-bw*	Generation where five of the populations are fixed *bw* or *non-bw*	Generation where all populations are fixed *bw* or *non-bw*
N=10	1					
N=10	2					
N=20	1					
N=20	2					
N=80	1					
N=80	2					

1. What was the effect of increasing population size on time to fixation? Explain your results.

2. Since the simulation starts with 50% of the *bw* allele, what is the average number of populations that would become fixed for this allele? Explain your answer.

3. What is the effect of changing initial *bw* allele frequency on time to fixation? Explain your answer <u>including data</u> (either in table or figure format) collected from the simulation. You need to decide what parameters to change and what to use as a control in order to answer this question.