HARDY-WEINBERG: WORKSHEET ACTIVITY

1. Observations: **These are the number of individuals of each genotype.**

*A1/A1:* ***28 individuals***

*A1/A2:* ***79 individuals***

*A2/A2:* ***15 individuals***

1. Based on this information, what is the **total number of each of our 2 alleles** (i.e., *A1* and *A2*) in the population?
2. What is the **frequencyof each of our 2 alleles** (i.e., *A1* and *A2*) in the population?

Fill out the table below, assigning one of the alleles to “*p*”, and the other allele to “*q*”.

|  |  |
| --- | --- |
| Alleles | Frequency |
| *p* |  |
| *q* |  |
| *Check*:  *p* + *q* = 1? |  |

1. Based on the allele frequencies you calculated above (and assuming that mating is random with respect to these alleles), **what is the expected frequencyof each genotype** (i.e., *A1*/*A1*, *A1*/*A2*, and *A2*/*A2*)? Check your calculations by confirming that *p*2 + 2*pq* + *q*2 = 1.
2. Now go back to your original observations. What is the **observed frequencyof each genotype** (i.e., *A1*/*A1*, *A1*/*A2*, and *A2*/*A2*) in the population? Check your calculations by confirming that *p*2 + 2*pq* + *q*2 = 1.

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1. **Is our population in Hardy-Weinberg equilibrium?** Justify your response by comparing your predictions to the observations.
2. **If the population is *not* in Hardy-Weinberg equilibrium, can you come up with a possible explanation for why it isn’t?** *Note*: Your explanation should fit with your observations.
3. **Is it possible to make a definite statement about whether or not our population is evolving?**

*Hint*: What are the assumptions of the Hardy-Weinberg equilibrium model?

* If our observations do not match the predictions made by the model, it suggests that one (or more) of the assumptions have not been met.
* …Are there any assumptions that might not be met, even if allele frequencies are staying the same between generations (i.e., even if evolution is *not* occurring)?