

Genetics Practice Problems II

We will work through the following problems during this lab period.

The problems can be found in the Genetics chapter of *A Problems Approach to Introductory Biology (APAIB)*. They are:

- 1.5.1
- 1.2.5

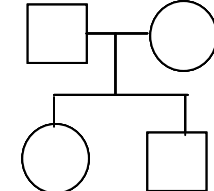
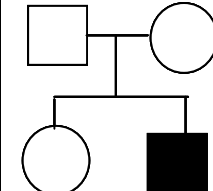
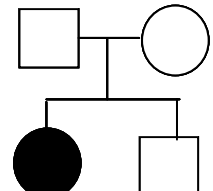
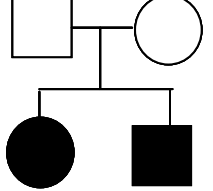
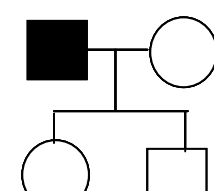
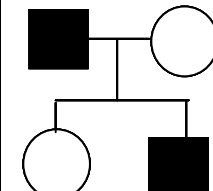
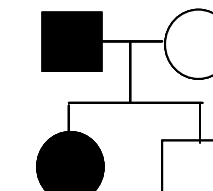
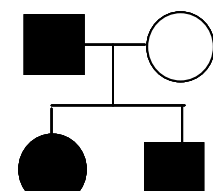
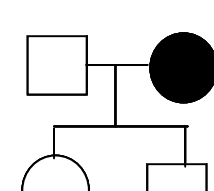
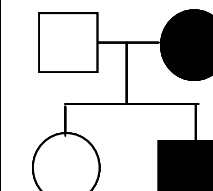
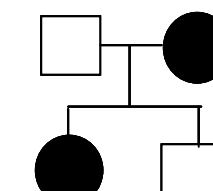
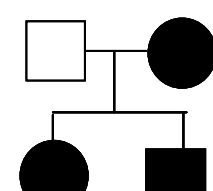
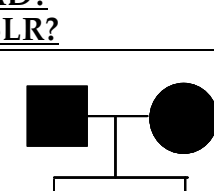
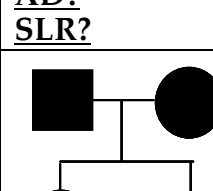
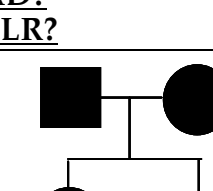
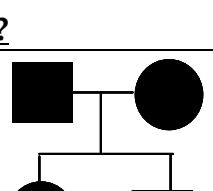
In addition, if there is time, you should work through this problem in lab.

“Sixteen Pedigrees”

The table on the next page shows the 16 possible pedigrees that could occur in a family of four (mom, dad, brother, sister). For each pedigree:

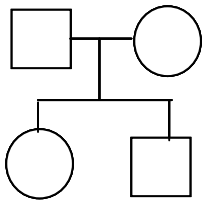
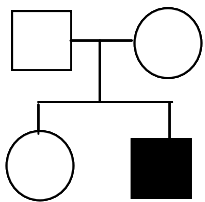
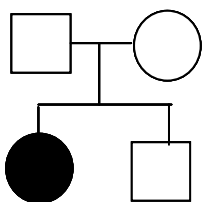
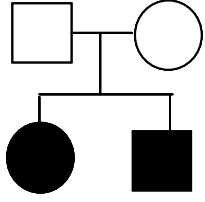
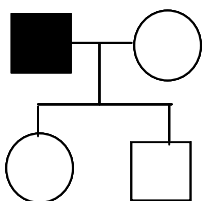
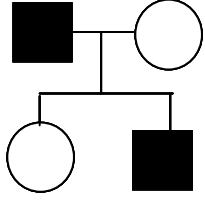
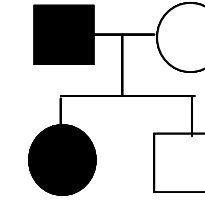
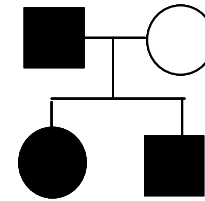
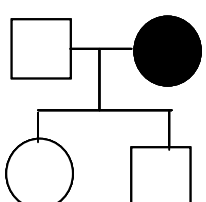
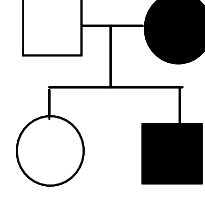
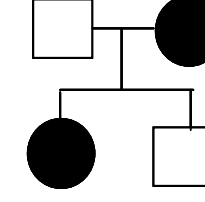
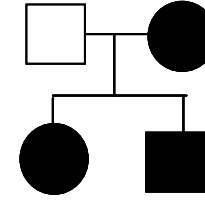
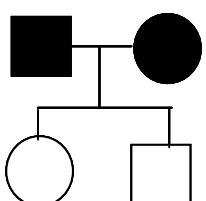
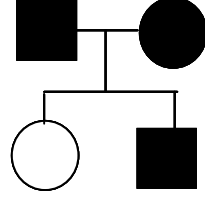
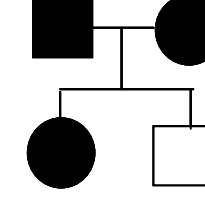
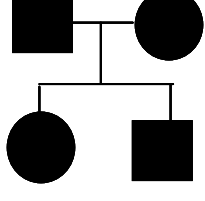
- is it consistent with an autosomal recessive mode of inheritance?
 - if yes: write “consistent” after AR? and write in the number of unrelated individuals who bring in at least 1 disease allele that are required to complete the pedigree.
 - if no: write “inconsistent” after the AR?
- is it consistent with an autosomal dominant mode of inheritance?
 - if yes: write “consistent” after AD? and write in the number of unrelated individuals who bring in at least 1 disease allele that are required to complete the pedigree.
 - if no: write “inconsistent” after the AD?
- is it consistent with an sex-linked recessive mode of inheritance?
 - if yes: write “consistent” after SLR? and write in the number of unrelated individuals who bring in at least 1 disease allele that are required to complete the pedigree.
 - if no: write “inconsistent” after the SLR?

Solutions to this problem can be found at the end of this section of the lab manual.

| | | | |
|--|--|---|--|
|  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |
|  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |
|  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |
|  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |  <p><u>AR?</u> <u>AD?</u> <u>SLR?</u></p> |

This page intentionally left blank.

Solutions to "Sixteen Pedigrees"
(number of "unrelated carriers" in parentheses)

| | | | |
|---|--|--|---|
|  <p><u>AR?</u> consistent <u>AD?</u> consistent <u>SLR?</u> consistent</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> inconsistent <u>SLR?</u> consistent (1)</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> inconsistent <u>SLR?</u> inconsistent</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> inconsistent <u>SLR?</u> inconsistent</p> |
|  <p><u>AR?</u> consistent (1) <u>AD?</u> consistent (1) <u>SLR?</u> consistent (1)</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (1) <u>SLR?</u> consistent (2)</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (1) <u>SLR?</u> consistent (2)</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (1) <u>SLR?</u> consistent (2)</p> |
|  <p><u>AR?</u> consistent (1) <u>AD?</u> consistent (1) <u>SLR?</u> inconsistent</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (1) <u>SLR?</u> consistent (1)</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (1) <u>SLR?</u> inconsistent</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (1) <u>SLR?</u> inconsistent</p> |
|  <p><u>AR?</u> inconsistent <u>AD?</u> consistent (2) <u>SLR?</u> inconsistent</p> |  <p><u>AR?</u> inconsistent <u>AD?</u> consistent (2) <u>SLR?</u> inconsistent</p> |  <p><u>AR?</u> inconsistent <u>AD?</u> consistent (2) <u>SLR?</u> inconsistent</p> |  <p><u>AR?</u> consistent (2) <u>AD?</u> consistent (2) <u>SLR?</u> consistent (2)</p> |