Bio2133 – Lab 2 Report: Evaluation guideline - 2015

This report has to be done INDIVIDUALLY

Marking Scheme

- **Title Page (2 marks) on ONE SEPARATE PAGE:**
  - A proper title page is required (See example in *General Lab Information + Useful Files / Guide Lab Report at p. 22*).
  - Please include the name of your other team member (if you have one) in parentheses under your name.
  - Include a meaningful and specific title using your OWN words.
  - **A penalty of 10 % of the total mark value is applied if not present.**

- **Introduction (30 marks) :**
  (6 pages double-spaced maximum; Minus 2 marks for each page over limit)
  - **Part 1. Mono-, Di and Tri-hybrid Crosses (21.5 marks):**
    - ✓ Definition/Explanation of autosomal mutation (1 mark) *(use at least one reference other than lab manual for your answer)*.

    - ✓ Assigned Monohybrid Cross (5.5 marks), you must indicate:
      - Question SPECIFIC for your assigned autosomal mutation
      - Hypothesis SPECIFIC for your assigned autosomal mutation
      - THREE assumptions
      - Predictions ⇒ You must do TWO Punnett squares (one for F_1 generation and another for F_2 generation) and include the phenotype and genotype of the two individuals being crossed (Parents or F_1) on top of each of the Punnett squares + the predicted phenotypic ratio (F_1 or F_2 generations) right below each of the Punnett squares as shown by these examples:

        Example of Predictions :

        1) Predicted phenotypic ratio of the F_1 generation (parental cross):

        Phenotype of parents : ♀ BL x ♂ +

        Genotype of parents: ♀ BLBL x ♂ ++

♀ \ ♂	+
BL	BL+

        Predicted phenotypic ratio of F_1: 1 + OR 100% + (wild)

        2) Predicted phenotypic ratio of the F_2 generation (F_1 cross):

        Phenotype of parents F_1 : ♀ + x ♂ +

        Genotype of parents F_1 : ♀ BL+ x ♂ BL+

♀ \ ♂	BL	+
BL	BL+	BL+
+	BL+	++

        Predicted phenotypic ratio of F_2: 3 + : 1 BL OR 75% + (wild) : 25% BL (mutant)

- ✓ Assigned Dihybrid Cross (7.5 marks),you must indicate:
  - Question SPECIFIC for your two assigned autosomal mutations
  - Hypothesis SPECIFIC for your two assigned autosomal mutations
  - THREE assumptions
  - Predictions ⇒ Use the same format as the examples on page 1 for both F_1 and F_2 generations
  - Overview of experimental design ⇒ Give a BRIEF description in a few sentences of the methodology (experiment) you have used to achieve your question/hypothesis/predictions (*use the lab manual as the reference*).

- ✓ Assigned Trihybrid Cross (7.5 marks), you must indicate:
  - Question SPECIFIC for your three assigned autosomal mutations
  - Hypothesis SPECIFIC for your three assigned autosomal mutations
  - THREE assumptions
  - Predictions ⇒ Use the same format as the examples on page 1 for both F_1 and F_2 generations

- **Part 2. Testcross (8.5marks):**
  - ✓ Definition/Explanation of a testcross (1 mark) *(use at least one reference other than lab manual for your answer)*.

  - ✓ Assigned Testcross (7.5 marks), you must indicate:
    - Question SPECIFIC for your assigned testcross
    - Hypothesis SPECIFIC for your assigned testcross
    - THREE assumptions
    - Predictions ⇒ You must do TWO Punnett squares for the testcross generation: One if you assumed that the F_1 offspring are homozygous dominant + Another if you assume that the F_1 offspring are heterozygous. You must also include the phenotype and genotype of the two individuals being crossed on top of each Punnett squares + the predicted phenotypic ratios of the testcross right below each Punnett squares as shown by the examples on page 1.
    - Overview of experimental design ⇒ Give a BRIEF description in a few sentences of the methodology (experiment) you have used to achieve your question/hypothesis/predictions (*use the lab manual as the reference*).

➢ **Results (20 marks) :**

- **TWO Tables:**
  - **Must respect the criteria** indicated in *General Lab Information + Useful Files / Tables on p. 23-25.*
  - **Table 1 (on ONE SEPARATE PAGE) for Part 1 (Mono-, di- and tri-hybrid crosses) (8 marks):**
    - ✓ Create your own specific and meaningful title.
    - ✓ For each cross type (mono-, di- or tri-hybrid), you must show the parental and F_1 crosses with their sample size (n), their predicted ratios and their observed ratios. Also, for each F_2 generation (issued from F_1 cross), you must also show the results of your Chi-square test (total Chi-square value (X^2), degrees of freedom (DF), probability (p) and finally, you must indicate if the null hypothesis (H_0) is accepted or rejected).
    - ✓ Please round up to TWO numbers after the decimals.

✓ Example:

Cross type	Cross (♀ x ♂)	n	Predicted ratio	Observed ratio	Total X^2	DF	p	H_0
Monohybrid	P (BL) x P (+)	10 023	100% +	100% +	-	-	-	-
	F_1 (+) x F_1 (+)	…	…	…	0.25	1	0.67	Accepted
Dihybrid	P (C, +) x P (+, BL)	…	…	…	…	…	…	…
	F_1 (+, +) x F_1 (+, +)	…	…	…	…	…	…	…
Trihybrid	P (+, +, +) x P (AP, E, EY)	…	…	…	…	…	…	…
	F_1 (+, +, +) x F_1 (+, +, +)	…	…	…	…	…	…	…

- **Table 2 (on ONE SEPARATE PAGE) for Part 2 (Testcross) (8 marks):**
  - ✓ Create your own specific and meaningful title.
  - ✓ You must show the testcross with its sample size (n), its correct predicted ratio, its observed ratio, its Chi-square test (total Chi-square value (X^2), degrees of freedom (DF), probability (p) and finally, you must indicate if the null hypothesis (H_0) is accepted or rejected).
  - ✓ Please round up to TWO numbers after the decimals.
  - ✓ Exemple:

Testcross (♀ x ♂)	n	Predicted ratio	Observed ratio	Total X^2	DF	p	H_0
…	…	…	…	…	…	…	…

- **Consistency of the results in your tables with those of your team's *Notebook* (4 marks):**
  - ✓ The results in your tables match EXACTLY those found in your team's *Notebook* during your Lab 2 session (2 marks).
  - ✓ The team's *Notebook* is complete and has been saved as a .doc file in the team's computer and proper lab section folder under the proper filename (Last name of team members-Lab 2 Results.doc) (2 marks)

➢ **Discussion (8 marks) (on SEPARATE PAGES from the Results):**
(2 pages double-spaced maximum; Minus 2 marks for each page over limit)

- **Part 1. Mono-, di and tri-hybrid crosses (ONE paragraph) (6 marks):**
  - **INTERPRETATION** of the results obtained and major **CONCLUSIONS** in regards to the classic phenotypic ratios of both F_1 and F_2 generations from monohybrid, dihybrid and trihybrid crosses (*use at least one reference other than lab manual)*

- **Part 2. Testcross (ONE paragraph) (2 marks):**
  - ✓ **INTERPRETATION** of the results obtained (*use at least one reference other than lab manual)* in order to determine the genotype of the F_1 generation.

- **References (5 marks):**
  - Must include at least **TWO references in addition to the lab manual** from a monograph (i.e. textbook), a scientific article and/or an electronic reference. (3 marks)
  - Proper citation in body of text and proper listing at end of report as demonstrated in *General Lab Information + Useful Files / Guide Lab Report at p. 19-21*. (2 marks)

- **Appendix (3 marks) :**
  - Must include a Chi-square Table with a proper caption for your **dihybrid cross ONLY**. Please use exactly the same format as Table 2 in *General Lab Information + Useful Files / Chi-square Test at p. 18.* Make sure that you indicate the degrees of freedom, the p value and whether or not H_0 is accepted or rejected just under the Tableau (like as a footnote).

- **Presentation (2 marks) :**
  - Respect format instructions (Text is typed, Lettering size is 12 + Font style is Times New Roman). The Text is double spaced, EXCEPT for the captions/footnotes from Tables and for the phenotypes/genotypes/predicted phenotypic ratios from Punnett squares that are single spaced.
  - Proper spelling (no omissions) and Proper grammar (sentence structure).

Final Mark : 70

Date of submission:

- The report needs to be submitted **ON LINE** in Blackboard Learn – Genetics / Lab 2 / Lab 2 Report Submission for your lab section before 4:00 pm as a **Word.doc, Word.docx OR .pdf** file under the tab **Assignment Submission / Attach File** and then click on **Browse My Computer**. Please do NOT forget to click on the **"SUBMIT"** link before leaving the page.
- Please make sure to use the following format for the name of your file: **Surname, First Name(s)-Course code with your lab section-Lab 2** *e.g. Perin, Sofia-Bio2133C4-Lab 2.*
- **Only your first attempt will be marked**. If you encounter any technical issues during the submission process of your first attempt and require another attempt, you are required to contact me as soon as possible and explain the situation. You must receive permission from me in order to make a second submission. **Do not**, under any circumstance, send your lab report to me, your lab demos or you lab correctors. If you are worried that submitting your file as a .doc or .docx will create content to shift pages, please submit your lab report as a .pdf file instead.
- **Please do not forget that there is a penalty of 10% per day late for a maximum of 2 days!**