Help with Writing a Short Report in Molecular Biology:

The discussion section is probably the most difficult and challenging to write because you have to think carefully about
  • the specific results you obtained in your experiment,
  • relate them to the aims,
  • interpret them
  • and generalise from them.
In this way you relate your own results to the store of scientific knowledge.

In a short report, your discussion section will also include your conclusion(s) and you can therefore use other headings such as 'Discussion and Conclusion', or simply 'Conclusion(s)'. It is also acceptable to use the heading 'Interpretation'. Pay careful attention to the following points when writing your discussion:

1. The discussion can start with a summary of the aims and the results (write about x-fold or % changes rather than just repeating the results) You should try to explain the results, but only within the context of the study - integrating swags of theory into the discussion is not necessary and leads to rambling reports.
2. The protocols and, if necessary, the assays must be criticised. It is crucial to suggest how the protocols/study design /assays could be improved.
3. The validity and accuracy of the data should be discussed. Any problems with data collection should lead to cautious interpretations of the results. Important data should not be omitted. If any data has been omitted, then this should be noted and discussed, although only in general terms.
4. The discussion must focus on implications and criticisms of the study as a whole rather than on the idiosyncrasies of individual results.
5. Definitive conclusions cannot be drawn without calculation of statistical differences (not required in second year). You need to be circumspect about your conclusions - this indicates that you have thought about the validity of the results.
**STRUCTURE**

The staging of the discussion is not always straightforward and the order in which you sequence the information depends on the aim of the experiment and the kind of results you obtained. Your discussion is an **argument** about how you see your results.

One guideline for staging the discussion is shown here based on extracts from the discussion from a student report to determine if dietary intervention with low- or high-cholesterol diets could affect cholesterol levels in middle-aged subjects. Although this is a good guideline, remember it is only a guideline and you need to adapt it to each experiment you carry out.

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<th>Stage 1</th>
<th>Relate your results to the aims of the experiment.</th>
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<td>Stage 2</td>
<td>Summarise your results.</td>
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<td>Stage 3</td>
<td>Explain your results. Discuss the validity and accuracy of your results. Explain inconsistent or unexpected results.</td>
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<td>Stage 4</td>
<td>Identify problems in experimental technique and suggest improvements</td>
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<td>Stage 5</td>
<td>State the significance or implications of your experimental findings and recommend areas of future research.</td>
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**Consumption of a high cholesterol diet** did not significantly increase blood cholesterol concentration over a 12 week period (Figure 1). Similarly, over the same period, consumption of a **low cholesterol diet** did not significantly reduce plasma cholesterol concentration. However after 12 weeks the plasma cholesterol concentration of the high-cholesterol diet group was 50% greater than that of the low-cholesterol group (P<0.05). This result should be interpreted with caution because each of the 3 subjects used in the analysis for the high-cholesterol group finished the study with an identical plasma cholesterol concentration of 8 mM (probably coincidentally).

In this study, the sample size was small (n=3-4 for each group) and was heterogeneous with respect to age, weight, starting cholesterol concentration and other lifestyle factors. In addition, each subject only consumed either the high- or low-cholesterol diet and a cross-over study in which each subject consumed both diets for 12 weeks would have improved the validity of the data.

In a future study, it is recommended that more subjects of both sexes be chosen; that meals of known cholesterol content are prepared for the subjects and that their compliance with the dietary regime be monitored effectively; and that each subject acts as his/her own control by consuming both diets in a randomised, cross-over sequence. Even then, any conclusions pertaining to the influence of dietary cholesterol on plasma cholesterol concentrations would be limited to Caucasian, middle-aged omnivores.