SKILLS team

Scientific Report Writing

From the Skills Team, University of Hull

Contents

Introduction

The following guidelines are intended for all students, from undergraduates writing practical reports, through to postgraduates preparing theses and papers. The intention is to provide additional information on scientific report writing – this leaflet does not cover experimental design or data analysis. Students should always adhere to the advice of their department or supervisor, in the relevant departmental handbook.

Why write scientific reports?

It is important to demonstrate your understanding of the science that you have studied and practised by writing about it in a scientific report. The general purpose is to give you practice at writing professional reports for your future career in science. The ultimate aim of most scientists is to publish their research findings in professional scientific reports. This includes peer-reviewed journal articles, which report original findings and contribute to the global pool of scientific knowledge. Scientists spend their time writing proposals, planning research, undertaking experiments, analysing data, tracing research, and reading related articles. Published reports and journal articles provide evidence of this dedication. Therefore, a scientific report is not simply some extra work that is done at the end of a project - it is an important historical document that provides evidence of work to the wider scientific community (1).

Similarly, a student's scientific report should not be viewed as the extra bit of work that is done at the end of the project. Your scientific report is an opportunity to showcase your skills, including your practical and theoretical understanding of the work.

What do you need to tell your reader in a scientific report?

Research findings are typically presented in journals and other professional reports in the **IMRaD** format (**I**ntroduction, **M**ethods, **R**esults, **D**iscussion). The purpose of each of these sections is to answer the following questions:

Why did you do your experiments?
Introduction

Which experiments did you do and how did you do them?
Methods

What happened when you did them?
Results

What do the results mean?
Discussion

Why is it important to convey these details in a scientific report?

First, who would be interested in scientific research that was undertaken without a reason? Explaining why you did your experiments puts your work into context (**Introduction**).

Secondly, you need to say exactly which experiments you did and exactly how you did them. This allows others to repeat your experiments and expand on your work (**Methods**).

Thirdly, it is essential to report exactly what happened when you did your experiments, so that other scientists can make a critique of your work and compare your findings with other people's work (**Results**).

Finally, it is essential to discuss what your results mean, so that your reader understands the ultimate implications of your work (**Discussion**)(1, 2).

The four sections described above form the **main body** of a scientific report. There are several other important sections, including:

- A specific title for your report,
- An abstract or summary at the beginning that provides a synopsis,
- An acknowledgements section, for thanking those who assisted with your work,
- A reference list and in-text references,
  and
- Appendices (optional).

The importance of record keeping

Central to your scientific report are your results. **Don't forget to update your lab book** with complete details *every* time you do practical work.

The Scientific Report

The following sections provide general advice on the contents of a scientific report, based on the expectations for the content of a journal article. Refer to your department for more specific advice.

Title

The main purpose of the title is to *sum up your work in a single phrase or sentence.*

The title of your scientific report needs to be clear, specific, and brief. First impressions are very important; therefore, a title must be prepared carefully. Scientists scan through journal article titles which they find using online journal databases. They decide which abstracts they will read based on the titles. The title should therefore sum up the experiments and findings in a single phrase[*], providing as much specific information as possible, in order to differentiate your work from the work of others. A title should be worded carefully, so that its meaning is clear to most readers. Technical terms and abbreviations should only be used if they will be familiar to the readers of your report. For example, an acronym such as DNA is widely recognised and is quite acceptable in a title (1, 4, 5).

This example is a title for a study on the breast cancer drug, Tamoxifen:

> 'The role of Tamoxifen in blocking breast cancer growth'

[*] Some authors advise that titles should always be phrases, and that sentences and questions should not be used as titles since they are too long (1). However, sentences and questions are frequently used as titles in some journals, and can be very effective (3). For example: "Does Tamoxifen provide new hope for breast cancer patients? Inhibition of the G1 phase cell cycle progression of malignant human breast epithelial cells in vitro". For further advice, refer to your tutor/supervisor or the author's guidelines in journals in your field.

Avoid obvious phrases, like 'The role of', 'Studies of', 'An examination of'', 'An investigation into', 'Research into', and 'An experiment on'. Titles with these words are often too long or not descriptive enough. The following title is better:

> 'Tamoxifen blocks breast cancer growth'

This is effective, but what does this title tell us? Was it a study in the laboratory, or was the study performed on breast cancer patients? Which types of breast cancer tissue/cells were studied? Were they human cells? How does Tamoxifen block the growth?

A short title that is less than 50 characters is included at the top of each page in journal articles and some reports. This general title may be suitable for this purpose; however, it is not specific enough to be used as a main title.

The following improved title informs the reader where the work was done (in vitro: in the laboratory), which species was studied (human), which type of breast cancer cells were studied (malignant epithelial cells) and how the growth was blocked (inhibition of G1 phase cell cycle progression):

> 'Tamoxifen inhibits the G1 phase cell cycle progression of malignant human breast epithelial cells in vitro'

Abstract or Summary

The main purpose of the abstract is to *give a summary of the entire report for quick reading of your reasons for doing the work, your methods, your findings, and your conclusions.*

The abstract is an influential part of your report (6). Scientists read it after they have read the title. Online journal article databases provide abstracts, so that scientists can decide whether they will read an entire article based on the content of the abstract. Thus, an abstract needs to be both interesting and easy to read.

The abstract must be independent of the rest of your scientific report – it is a 'mini–report' which needs to make sense completely on its own. References to other authors, or to tables, figures, or text within the report, should not be included. There should be no new information or ideas in the abstract that are not included in the rest of the report (1, 5, 7).

According to Day (1), "the abstract should (a) state the principal objectives and scope of the investigation, (b) describe the methods employed, (c) summarise the results, and (d) state the principal conclusions."

Other tips for writing the abstract:

- Like the title, an abstract is usually written for a wider audience than the rest of the article. Jargon and abbreviations should therefore be minimised (1, 5, 7).

  A sentence or a couple of phrases describing the methods is sufficient. Do not go into detail about the methods in the abstract. For example: "Reduced expression of JAK-2 was identified in COS-7 cells using western blotting." The method is "using western blotting". This is adequate for the abstract.

- Typically, the information presented in an abstract is given in the same order as it is in the article.
- Journals tend to impose a 200 – 300 word limit on abstracts. A good abstract will usually fall within this range.
- Abstracts are usually written in past tense in a single paragraph.
- Since it is a condensed version of the full report, it is easiest to write the abstract last (1, 4).

Introduction

The main purposes of the introduction are to:

> *state the research problem clearly,*
> *establish your hypothesis,*
> *provide justification for the work,*
> *state the methods and results briefly, and*
> *state the major conclusions*†(1).

Stating the research problem and providing justification for your work
You must describe your research objectives clearly and simply in your introduction, if you want your readers to be interested in your research solutions (1, 5). The introduction is your opportunity to explain and define your work, putting it into context. This is where to explain why your particular research problem is distinctive (4).

> The introduction must include a clear statement of your hypothesis: a prophetic statement, based on current theory, which states what you expect your experiment to reveal (4, 7).

Your introduction should include a literature review, which provides general background information about what has already been published in your research area. The introduction should start broadly within your field, putting your topic into a wider context in order to orient your reader, and should then quickly and briefly focus on your specific research problem. It should provide adequate information about your research area, so that readers do not need to refer to other materials to understand your research problem (1, 3, 4).

Can you give a good reason for doing your work in the first instance?
Reasons for doing the work will differ, depending on the level of study, and whether the work that you have done is original work.

> ***Original work***
> If your work is for a third year project, a postgraduate thesis, or a journal article, you (or your supervisor) may have identified a gap in the existing

† Some authors argue that results, methods and conclusions should not be included in the introduction. Refer to your departmental handbook or supervisor.

knowledge. The purpose of your research will be to fill this gap, where your experiments are likely to be the first experiments done to solve this particular research problem (3). Importantly, to prove that your work is original, your introduction will require a comprehensive review of all journal articles which precede your work, or are very closely related to it (7).

Non-original work
If your report is for a module that is part of your undergraduate degree, it is unlikely that you were the first person to do your experiments. Therefore, it is not necessary to prove that your work is original. However, you will still need to provide justification for doing the experiments, by giving current background information about your research problem.

Briefly stating the methods and results
Since you have stated your research problem, it is also important to describe how you attempted to answer it, and to give your results. This does not mean providing extensive technical details – these are given in your methods and results sections. Don't describe your methods **-** just say which methods you used. A sentence or two is usually adequate.

Stating the major conclusions
Your scientific report is not a novel. Don't be tempted to include suspense or surprise endings in your report – your findings and conclusions must be clear from the beginning. State your major conclusions in your introduction. Keep these conclusions brief, and only make minor suggestions about implications for future work. You will have plenty of time to discuss them in more depth in the discussion (1).

The introduction should be mainly written in the present tense, since you are describing a current problem and current conclusions. Details of methods and results given in the introduction should be in the past tense, and future implications based on the conclusions should be in the future tense (1).

Materials and Methods

The main purpose of the materials and methods section is to *provide an extensive protocol for your experiment which can be repeated by others.*

Essentially the materials and methods section is an instruction manual; all workers in your field should be able to reproduce your experiments after they have read this section. Reproducibility is a fundamental tenet of good scientific research; therefore, you must make reproduction a possibility, by providing the necessary details in your materials and methods section. A good way to test your materials and methods section is to ask a fellow student, friend, or colleague to read it, to see if they can follow your method (1).

This section should be chronological and informative, providing

- details of the experimental design,
- details of the controls used, including their purpose,
- details of the data recording techniques,
- exact quantities and purities of reagents,
- technical specifications of the apparatus,

- specific methods of the sample preparation,
- accurate nomenclature,
- precise details of any subjects/samples included in the study, and
- details of the sampling protocols (1, 4, 5, 7).

Other tips for writing the materials and methods section:

- Do not prepare your materials and methods section like a cookbook. Include the apparatus and reagents within the body of the text. Consider the following example:

> "HUVECs from six-well plates were centrifuged at 200 g for 10 min, resuspended in 300 μl phosphate-buffered saline (PBS) and then fixed in 70% ice-cold ethanol overnight. The cells were recovered by centrifugation, and resuspended in 250 μl of PBS to which 10 μl of 0.5 mg ml-1 propidium iodide solution was added" (8).

- If there are a lot of specifications in your methods section, it is sometimes better to present them in a table. For example, a table may be appropriate if a large number of different solutions have been prepared, or a wide range of bacterial strains have been used (1, 5).

- Explain any assumptions that have been made in the experiments, and give details of the units of measurement (1, 5).

- Ensure that this section is not confused with the results section – do not report any findings in the materials and methods section (1).

- It is unlikely that the methods you are using are new; therefore, references should be cited for your techniques. If your methods are new, extensive details must be provided (1).

- A materials and methods section will usually include subheadings for the different techniques used in your work, such as 'Western blotting for SHP-1 in COS-7 cells' and 'RT-PCR for SHP-1 in COS-7 cells'. It can look good if the headings in your methods section complement the headings in your results section (1).

- This section is usually written in the past tense, since you have already completed the experiments (1).

- Brief details of the statistical methods that were used, including the reason for their choice, should also be included (9).

Results

The main purpose of the results section is to *present your data in a manner that is easy to read and interpret.*

This is where the core of the work is presented – your experimental data. Thus, clarity is essential since the rest of your report hinges on what you present here. The results section should be kept brief and repetition of methods or results should be avoided. Relationships between your data should be described in the text of your results section. Never discuss the implications of your results in the results section – save this for the discussion (1).

Your results section may have subheadings which complement the headings in your materials and methods section.

Ethics and honestyonD
Don't be tempted to exclude results that don't fit. Results that do not fit give you an opportunity to demonstrate your understanding of the experiments (9). You can suggest why your results were different in your discussion section. Try to find references in the literature to support your reasons for your unexpected results, negative results or experimental failure.

Qualitative data
Where relevant, provide specific details of qualitative data, such as appearance, location, texture and odour. For example, 'a small quantity of white, powdery precipitate appeared at the bottom of the flask after 90 seconds' (4).

Quantitative data
Do not present all your raw data – a pre-digested representative sample is usually adequate. Interpret and analyse your data so that others can understand it (1, 3). Ensure that your statistics are meaningful, and provide P values (1). The following example, given in How to Write and Publish a Scientific Paper by Robert Day (1), demonstrates the importance of using meaningful statistics:

> "33~% of the mice used in this experiment were cured by the test drug; 33~% of the test population were unaffected by the drug and remained in moribund condition; the third mouse got away."

Your results are the core of your scientific report. If you have quantitative data, your final results will often have been derived from the statistics you used to analyse your raw data. Statistical processing software packages, such as SPSS, can be very useful in analysing data. However, a computer program cannot tell you whether you have chosen the correct type of statistical analysis for your data. Take the time to read about your statistics, so that you thoroughly understand their strengths, limitations, errors and intended uses.

Using tables and figures

- Data is often presented outside the text, in tables or in figures. Figures include graphs, photographs, sketches, or other images.
- Small quantities of data can be presented in the text, whereas large quantities of data should be presented in tables or figures.
- Present the data in one way – a table and a figure are not usually generated for the same data[‡].

[‡] Sometimes there is a rare exception here, where very precise data is shown in a table, and a corresponding graph shows a trend in the data (1). Ask your tutor or supervisor for advice.

- Describe the important data from your tables and figures within the text of the results, without recapitulating the numbers (1).
- Become familiar with the computer programs that you can use to generate tables, graphs, and figures (eg Microsoft Word, Microsoft Excel, Sigma Plot, SPSS). These programs will allow you to present your data in a variety of ways, so that you can identify what looks the best.

Table, graph, or figure?

- Quantitative data is usually presented in tables or graphs, and occasionally as output from a computer linked to a piece of laboratory equipment.
- Qualitative data can be presented in tables, allowing for direct comparison between different elements within the table. Qualitative data is also often in the form of photographs, sketches, or other images (1).
- Tables are appropriate for presenting precise numerical data, whereas it is easier to identify a trend in a graph.
- Tables and graphs are often unnecessary. Unless there is considerable variation within your data, do not use a table or graph. For example, if you have tested 12 samples for enzyme activity, and 10 samples lack enzyme activity, do not produce a table filled with zeros, or an empty graph. You could simply state that 10 of the samples were negative for enzyme activity, and provide details of the samples that were positive (1).

Labelling tables and figures

Figures and tables are much easier to read and interpret if they stand alone – this can be achieved by including an appropriate title and a legend.

Titles

- The rules for writing a title for a table or figure are similar to the rules for writing a title for your report - use a brief, descriptive phrase.
- The title for a table is usually **above** the table, whereas the title for a figure is usually **below** the figure.
- Generally, figure titles and table titles should be in bold fonts; however the font should not be larger than the font of the text (1).
- If you use the 'Insert Caption' option in MS Word, it will position the caption in the appropriate place and enable you to make tables of figures/tables automatically.

Numbering

- Consistency is very important when there are multiple tables and figures.
- Graphs, and any other figures, are generally labelled as 'figures' within a scientific report or paper.
- Each figure or table in your report should have a number, which precedes the title.

- Number your tables and figures separately, for example, Table 1, Table 2, Figure 1, Figure 2, Figure 3. *MS Word allows you to specify a label of 'table' or 'figure'.*

- Check that your tables and figures appear in the correct order, that is, check that the table or figure that you refer to first within your text is Table 1 or Figure 1 (1). *Using the Insert Caption option in MS Word will mean tables or figures are automatically renumbered if you insert others beforehand.*

Legends

- Include a legend consisting of a few lines. It should provide brief details of the experiment associated with that particular table or figure. This helps the table or figure to stand alone.

- The reader does not need to be able to repeat the experiment by reading your figure legend so keep it brief.

- Footnotes are useful for showing extra details for a table; superscript lowercase letters are usually used.

- Symbols can be used within a graph to indicate different elements within a scatter graph or line graph, or to show which data points are statistically significant.

- Symbols are usually defined within the graph itself if there is space, or are defined in the legend at the bottom of the graph, directly after the title (1).

- A single asterisk is typically used to denote a statistical significance of $P < 0.05$, and a double asterisk is typically used to denote a statistical significance of $P < 0.01$.

Design of tables, graphs and figures

Tables

- Arrange your tables such that similar elements read vertically, not horizontally. This will make your table easier to read (1, 7).

- Try to arrange tables so that the reader does not have to rotate the page to read them, that is, use portrait, not landscape.

- Use as few vertical and horizontal lines in a table as possible (7).

- Do not provide standard conditions for your experiments in a table unless they vary for the data that is included in the table.

- Only give significant figures in a table, and ensure that there is consistency in terms of figures, notation, and symbols (1).

- Ensure that units for numerical data are included in a table.

- Only include noughts in a table if there are actual zero readings – you can use dots or dashes to indicate that there is no data for a particular cell in a table (7). Alternatively, the abbreviations 'ND' (no data) or 'NT' (not tested) may be used, but ensure that these abbreviations are defined in the legend (10).

The following is an example of a well-designed table, from The Journal of Bacteriology: 2006 Instructions to Authors (11):

Table 1.
Induction of creatinine deiminase in Clostridium sp. strains XP32 and XP56

N source[a]	*Clostridium* sp. strain XP32		*Clostridium* sp. strain XP56	
	Total enzyme[b]	Sp act (U/mg of protein)	Total enzyme	Sp act (U/mg of protein)
Ammonia	0.58	0.32	0.50	58.30
Glutamic acid	5.36	1.48	2.18	0.61
Aspartic acid	2.72	0.15	1.47	0.06
Arginine	3.58	2.18	3.38	2.19
Creatinine	97.30	58.40	104.00	58.30

[a]The inoculum was grown in glucose broth with ammonium sulphate, washed twice, and then transferred into the media with the N sources listed above.

[b]Enzyme units in cell extract obtained from ca. 10^{10} cells.

Graphs

The best graphs are the simplest graphs. Your reader should be able to understand the trends that you are illustrating in your graph.

- Avoid 3D graphs and unnecessary 'chart clutter'.
- If you have a large amount of data to present, can it be grouped?
- 3D graphs can be used, but use them with caution since they can quickly become sloppy and confusing if they contain too much data.
- Can your data be presented in different graphs, with the experimental controls included in every graph (1)?
- In terms of size, a good graph strikes a balance between its legibility and its size. A graph should be small but clear.
- The scale of the axes of the graph should be designed so that the data 'fills' the graph; do not let an excessive scale restrict the size of your graph. For example, if your lowest reading is 23, and your highest reading is 91, your scale should go from 0 to 100, not from 0 to 1000 (1).
- Show error bars whenever possible. Indicate in the legend whether your error bars are plus or minus the standard deviation or the standard error (± SD or ± SE). Your error bars can significantly change the interpretation of your results. Also, your results will be taken more seriously if you can show the degree of error in your measurements (1).

- Limit your use of colours and patterns. Most computer programs that are used for drawing graphs offer an array of colours and patterns that you can use. If you use these excessively, your graph may look unprofessional. Most scientific journals only publish black and white graphs; have a look at some of the journals in your field and identify how the authors present their data in black and white.

> ***To denote different elements within a graph, you can use:***
>
> symbols, such as □, ▲, ●
>
> different types of connecting lines, such as dashed lines, dotted lines and unbroken lines, or
>
> shading or patterns within bars/sections (1).

Choosing the right type of graph

- Line graphs are effective for showing trends
- Bar charts are effective for showing relative proportions
- Pie charts are effective for showing proportions of a total
- Combined charts are effective for showing correlations, for example, a few bar charts or line graphs may be combined, or a bar chart and line graph may be combined (1).

An example of a simple bar chart is shown below.

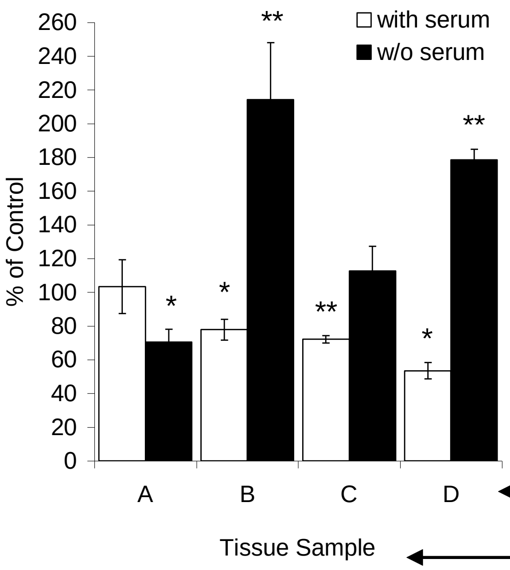

Figure 1. Effect of Compound X on 3[H]-Thymidine Incorporation in Cultured Endothelial Samples.
Human umbilical vein endothelial cell samples from 4 patients were treated with 5 µg/ml Compound X and cultured for 24hrs with and without 10% serum before 3hrs incubation with 3[H]-thymidine. The CPM were measured after TCA precipitation. Data are expressed as mean ± SD, determined from three replicates. ** P < 0.01, * P < 0.05.

A key is used to indicate different elements within the graph.

Error bars are shown. Asterisks denote statistical significance. These are defined in the legend.

The axes are labelled with titles. The scales are designed so that the data fills the graph.

The fonts are the same size (or smaller) than those in the text.

The figure title is specific.

The experimental conditions are described briefly in the legend.

Other figures

- Only use other figures, such as photographs and sketches, if they are absolutely necessary. For example, photographs are often essential for showing the presence or absence of certain cellular structures in a biological report.
- Crop any photographs to the smallest size at which the distinguishing features can still be clearly seen (1).
- Use small arrows to indicate any important features in the photograph, and then include a description of what the arrows indicate in the figure legend. For example, "Arrows indicate positive immunostaining for JAK-2" (1, 5, 7).

Discussion

The main purposes of the discussion are to:

- *discuss the relationships between your results,*
- *discuss how the results relate to your initial objectives and hypotheses,*
- *describe the shortcomings of your work,*
- *describe the implications of your work,*
- *provide major conclusions supported with evidence, and*
- *suggest future applications of your research findings (1).*

This is your opportunity to discuss your work – showcasing your ability to understand what you have done. This is where you discuss the relationships between each of your results, and discuss the principles that these relationships may demonstrate. Do not simply recapitulate your results in the discussion section (1).

> Importantly, your initial hypotheses should be discussed, in terms of whether your results provide adequate support for each hypothesis (5).

It is important to discuss the problems that you had with your experiments - but never focus your entire discussion on the failings of your experiments. Always include the results that don't quite fit, that is, the negative or insignificant results. Never be tempted to omit or adjust your results (1). Your ability to explain any experimental anomalies, based on the established theories that you have learned, is a skill that your tutor or supervisor is looking for! Discuss how your results are similar or different from published findings, and attempt to explain any differences, with support from references (1). If it is impossible to find a good explanation for your results – simply admit it. It is better to admit uncertainty, rather than create poor, unsubstantiated excuses (4). For example, 'The cause of this reduction in sis1 expression is unclear'. Remember that new discoveries can flow from anomalous results!

Clearly state all of your conclusions, and build on your conclusions by providing evidence from your data and from the literature (1). Be careful when quoting similar findings from the literature - ensure the reader knows which findings belong to you. Discuss the significance of your findings, in terms of their potential application, or in terms of relevant future research (5).

Construct your arguments carefully and logically (1). Refer to the Skills Guide on Scientific writing style available on the website: www.hull.ac.uk/skills. One of the most common failings of a scientific report is a poorly written discussion. Whilst including all of the important sections described here, keep the discussion as brief as possible.

> "Occasionally, I recognise what I call the squid technique: the author is doubtful about his facts or reasoning and retreats behind a protective cloud of ink" (1).

Most of the discussion should be written in the present tense. When you discuss your data, write in the past tense, and when you discuss future implications of your work, write in the future tense (1, 5, 7).

References

The main purposes of the references are to:

- *acknowledge sources in order to avoid plagiarism, and*
- *strengthen your arguments with support from the existing literature.*

A scientific report should be well referenced. Every piece of information that is included in your report, excluding your original data, should be referenced, preferably from peer-reviewed sources. Your arguments will be much stronger if you can support them with references. It is also essential to include references in order to avoid plagiarism. Make sure that you include your references while you are actually writing. Tracking back to find references is an extremely difficult task.

References are typically presented in scientific reports using the Harvard system, or a numerical system. Check with your department for advice on the appropriate referencing system. For further advice on referencing, refer to the Skills Guide on Referencing on our website: www.hull.ac.uk/skills.

Acknowledgements

The main purpose of the acknowledgements is to *thank those who were directly involved in your work.*

Acknowledgments are about courtesy, where you thank those who were directly involved in your work, or were involved in supporting your work. Do not confuse the acknowledgements section with a dedication - this is not where you thank your friends and relatives unless they have helped you with your manuscript.

Did you receive significant support from technicians, tutors, or other students? Were you provided with financial support? Did somebody prepare your reagents for you? Were you given essential samples or reagents? Remember, in most reports this section tends to be *very brief*, a few lines at the most. Identify those who provided you with the most support, and thank them appropriately (1, 7).

Appendices

The main purpose of the appendices is to *present additional data that is too extensive to be included within the main body of the text.*

Appendices are not included in *all* scientific reports; however they are frequently included in the back of theses. For example, printouts of raw data or other supplementary materials may be included as appendices at the back of a thesis. Different types of material included in the appendices can be labelled as Appendix 1, Appendix 2, and so forth.

Some electronic journals now offer scientists the opportunity to include extra materials that are too extensive for the main body of a journal article in an 'e-appendix'. Confirm the inclusion of appendices with your tutor or supervisor

---

Written by Robyn Adams, edited by Jacqui Bartram

All web addresses in this leaflet were correct at the time of publication.

The information in this leaflet can be made available in an alternative format on request – email skills@hull.ac.uk

References in this Guide

1. Day, R.A. (1998), How to Write and Publish a Scientific Paper, Westport: Oryx Press.

2. O'Connor, M. (1992), Writing Successfully in Science, London: Chapman & Hall.

3. Montgomery, S.L. (2003), The Chicago Guide to Communicating Science, London: University of Chicago Press.

4. Porush, D. (1995), A Short Guide to Writing About Science, New York: HarperCollins College Publishers.

5. Malmfors, B., Garnsworthy, P., and Grossman, M. (2000), Writing and Presenting Scientific Papers, Nottingham: Nottingham University Press.

6. van Emden, J., and Easteal, J. (1996), Technical Writing and Speaking: An Introduction, Berkshire: McGraw-Hill Publishing Company.

7. Barrass, R. (1995), Scientists Must Write: A Guide to Better Writing for Scientists, Engineers and Students, London: Chapman & Hall.

8. Adams, R.L., Adams, I.P., Lindow, S.W., Zhong, W., and Atkin, S.L. (2005), Somatostatin receptors 2 and 5 are preferentially expressed in proliferating endothelium, British Journal Of Cancer 92:1493-1498.

9. Davis, M. (1997), Scientific Papers and Presentations, San Diego: Academic Press.

10. Jones, A., Reed, R., and Weyers, J. (1994), Practical Skills in Biology, Harlow: Longman Scientific & Technical.

11. American Society for Microbiology (2006), Instructions to Authors, Journal of Bacteriology 188: 1-18.