

BIOL21090

Student and supervisor guidelines for the Dissertation

PLEASE READ THIS DOCUMENT IN FULL

1. Aim

Making sense of original research, sifting through primary literature and being able to summarise the current state of knowledge in a defined area in clear and simple language: these are universal skills for any graduate career which you may choose in the future. Your dissertation is an opportunity to engage deeply with exciting scientific research, and build on your experiences of first year essays and lectures, so far.

You will improve your skills in; designing literature research strategies; the use of literature data bases; organisation of information into meaningful and logical structures, and styles of scientific writing including the use and design of appropriate figures and figure legends. The experience gained during this unit is fundamental and will also be applicable to your future studies (including exam essays, the final year literature review and project write-ups). Your success in achieving these aims will be judged by the production and marking of a substantial, up to 9 page, Dissertation on your agreed title.

2. Schedule of the unit

- [Viewing and selection of titles](#): 15th October – 26th October 2018
- [Publication of title allocations](#): 15th November 2018
- [Dissertation researching and writing period](#): 15th November 2018 – 21st March 2019
- [Submission of your Dissertation](#): 21st March 2019

3. Key resources

There are a number of resources that you can access to help you with researching, planning and writing your Dissertation.

[Writing and Referencing Skills](#) (BIOL10742)

[My Learning Essentials](#) (University of Manchester Library)

[English Grammar Classes](#) (University of Manchester English Language Centre)

4. General expectations and structure of supervision

Your key objective on this unit is to demonstrate your ability to perform a literature search and turn this into a Dissertation that meets professional standards (see [Appendix, Tip 1](#)). This section briefly outlines what is expected of you, and what you can expect from your supervisor.

- Follow good practice as learned in [BIOL10742 Writing and Referencing Skills](#) course and [My Learning Essentials](#). To refresh your memory this information can be accessed by clicking on the links above.
- It is essential that you demonstrate professionalism and take ownership of the whole Dissertation process. It is NOT the task of your supervisor to send you reminders to trigger activities or prompt the next step. Your supervisor is there to support you in this process which is organised and driven entirely by you.
- Start early and do not leave tasks to the last minute. Agree with your supervisor on a realistic timetable (see later) and then demonstrate professionalism by sticking to the agreed deadlines. Keep in contact with your supervisor by email and let them know with at least a week's notice if (for unavoidable reasons) you are unable to keep to the agreed timetable. It is important that you remember that your supervisor is busy and has many demands on their time. If you have not

received a response within 2 working days, don't hesitate to resend your message. By making sure you receive appropriate supervision within a realistic time period you take ownership of the Dissertation process. Contact the Dissertation coordinator (susan.h.taylor@manchester.ac.uk) for help if you feel that you are not getting the right amount or quality of supervision.

- Supervisors will provide starting references but not a comprehensive reading list. Part of the Dissertation process is for you to identify the specific research objectives of the Dissertation and demonstrate your ability to search the literature and find the relevant material (see [Appendix, Tip 2](#)).
- If you have strong interests that are related to, but not identical to the allocated title, you may discuss this with your supervisor. Note however that deviation from the allocated title can only be by mutual agreement.
- During this unit you are entitled to supervision/ feedback at three different times: (1) your first meeting with your supervisor ([Section 8](#)), (2) feedback on your bullet point outline ([Section 8](#)), and (3) feedback on your sample section ([Section 8](#)). Use your feedback options wisely. Supervision/ feedback will take place in the form of written feedback. Written feedback is a form of high quality supervision that may save you and your supervisor valuable time. You will then have the opportunity to discuss the feedback further at a face-to-face meeting with your supervisor. This helps to ensure that you have the opportunity to ask questions about the feedback. Use the FBMH Intranet meeting form to keep an up-to-date log of meetings and/ or major written feedback you receive. In addition to these key times when you will receive supervision/feedback, you may also contact your supervisor for occasional advice - provided your questions are important and precise ("*Is it appropriate to focus the second part of my review on current strategies attempting to cure Alzheimer's disease?*" rather than "*what aspects of Alzheimer's disease research should I incorporate?*").

5. Use of the Library

You should make good use of all the Library facilities. There is a wide range of online resources you can use to discover what has been published on a particular subject, including a number of bibliographic databases accessed by [Google Scholar](#) and [Pubmed](#) and [Web of Science](#) (a scientific citation indexing service) which are easy to use and provide access to high-quality peer-reviewed journal articles, conference proceedings, book chapters, Dissertations and other sources, as outlined in the [BIOL10742 Writing and Referencing Skills](#) course.

The main [biology and medical databases](#) are available including Web of Science (for example Biosis Previews), Proquest – Science and Technology collection, Medline, Embase, Scopus and CAB abstracts (see also specialist [guides](#) and the MLE search [toolkit](#)). There are computer clusters in the Main Library and Alan Gilbert Learning Commons, and laptop plug-in spaces where you can access these resources. All of the Library's electronic resources can be accessed both on-campus and remotely, using either your University username and password or VPN.

[My Learning Essentials](#) contains helpful information on how to plan a search and find literature on your title using bibliographic databases.

5.1 Virtual Library Drop-ins

Using the virtual drop-in sessions, which are available through the main library, you can now ask questions about the basic structure of your literature review, how to save your searches and where you can find help on referencing. Just ask via the [online drop-ins](#).

5.2 My Learning Essentials Drop-ins

Have you got a burning question that you need a quick answer to?

Sessions run on each Wednesday, 12noon – 1pm in AGLC, Training Room -104. No need to book.

5.3 Computing facilities on campus

Make good use of the software you were shown in the [BIOL10401 Data Handling Skills](#) and [BIOL10742 Writing and Referencing Skills](#) courses. For example, ISISDraw – for drawing chemical structures and EndNote – for managing your references and creating a bibliography.

Plan ahead: Remember that there will be >600 students all wanting to use the computers over the same period. Always save your work to the P drive and have at least one recent backup copy. Do not save on the hard disc of Microlab or other networked computers.

6. Viewing and selection of titles

15th October – 26th October 2018

You will have the opportunity to choose eight preferred titles from a list of many hundreds offered by academic staff. You are strongly advised to make use of ALL eight selections as choosing fewer titles than this may result in you not being allocated a preferred title. Titles will be made available between the dates indicated above through the [FBMH Second Year Dissertation Intranet page](#). You will receive an email to let you know when viewing and selection of Dissertation titles becomes available.

It is important that you take the selection process seriously and use it to identify subject areas that are the most exciting or interesting for you. Being motivated to read about the title of your choice will be of great help when dealing with the significant amount of literature to be studied on this unit.

If you do not make a selection between 15th October and 26th October 2018, you will be allocated a title at random by the Dissertation coordinator.

7. Publication of title allocations

15th November 2018

Although we will make every effort to allocate a title of your choice, unfortunately this will not always be possible. Allocations will be announced by the date indicated in bold (above) through the [FBMH Second Year Dissertation Intranet page](#).

Titles will not be allocated on a first come first serve basis. Those students making their selection on 15th October will have the same chance of being allocated their chosen title as those students making their selection on 26th October.

8. Dissertation researching and writing period

Contacting your supervisor

Check your allocated title as soon as their publication is announced and write an email to your allocated supervisor without delay. This email has three purposes to: (1) establish contact, (2) ask for the details on 2-3 papers to be studied before the first meeting and (3) arrange a date for the first meeting.

The 1st meeting

First meeting with supervisor between 15th November – 14th December 2018

The 1st meeting with your supervisor has to occur face-to-face. **It is the most important meeting.** We strongly advise that this meeting takes place within 2 weeks of receiving your title.

- **Come well prepared:** (1) carefully read the instructions and advice given in this document, (2) thoroughly study the papers that were suggested, (3) identify a focus/direction for your Dissertation, (4) know your timetable for the period of this unit (i.e. are there any holidays, time-consuming course units or practical's such as the RSM, other deadlines for the submission of course work?) so that you can plan accordingly, and (6) bring a copy of these guidelines or your own preparation notes to double-check during the meeting that all necessary points are covered.

- Discuss with your supervisor potential content and a basic structure for your Dissertation to give you initial ideas about the directions in which the Dissertation can take you.
- Agree with your supervisor realistic deadlines for submission of the bullet point outline as well as the sample section. Make sure that you keep a record of these discussions. When setting these deadlines consider that:
 - You will have busier and quieter times during the course of the semester and there will be periods when your supervisor is unavailable (e.g. away at a conference).
 - **Developing the bullet point outline will require substantial effort: it involves the bulk of the reading to be undertaken to ensure you gain a thorough enough understanding of the title to develop a logical structure.**
 - The deadline for the sample section can only be set once the bullet point outline has been agreed; therefore you must allow sufficient time for your supervisor to read and provide feedback on the bullet point outline.
- Agree with your supervisor in which form you will exchange written feedback on the bullet point outline; for example, will you use track changes in Microsoft Office Word?
- Immediately after this initial meeting, record your feedback or discussions and a summary of the outcome of your meeting using the FBMH Intranet meeting form. The onus is on YOU to fill out these forms.

The 2nd meeting - The bullet point outline

BEFORE formulating any text passages, prepare a bullet point outline of up to 2 pages. For this, you may want to apply the following procedures:

- Carry out a literature search (see [Appendix, Tip 2](#)); you may want to ask for advice from your supervisor if you feel that your reading might lead you away from the title. Note that the writing of your Dissertation should be driven by your personal interests. Therefore, if you strongly feel that you would like to make important changes to the title of your Dissertation, you should discuss this with your supervisor at an early stage.
- Maintain a "think-tank" document ([Appendix, Tip 3](#)) to keep an overview of newly learned information, ideas and thoughts.
- Write a rough bullet point outline of your Dissertation which should reflect a typical essay organisation ([Appendix, Tip 4](#)) and then refine that outline step-by-step by adding subordinate bullet points providing key arguments or information, as well as introductory and concluding thoughts for each section. You are given only one opportunity to submit a bullet point outline. Send the outline by the agreed deadline to your supervisor. Your supervisor will provide you with written feedback and feedback during a face-to-face meeting which will address aspects such as: adding further points you may have overlooked, changing the organisation by re-ordering bullet points, suggesting changes in balance of the content or pointing out where you failed to address the title properly.
- As soon as you receive the feedback, record the feedback and a summary of the outcome of the meeting with your supervisor using the FBMH Intranet meeting form. The onus is on YOU to fill out these forms.

The sample section and Turnitin plagiarism report

Once an outline has been agreed, you should choose a section of 2 pages to fully write. Wait for your supervisor's feedback on the 2-page draft BEFORE you perform the full write-up, so that you can adjust your writing style accordingly.

- Please pay particular attention to the information on plagiarism [Academic Malpractice](#). Your sample section MUST contain: (A) at least ONE figure, diagram or table (**with accompanying legend written in your own words**) and (B) at least FOUR properly formatted references using a style that provides author names and publication date in the text (see [Appendix, Tip 2](#)).

You may use a published figure as found if it illustrates your point well but you must refer to your sources appropriately. You are also encouraged to design your own figures or tables, as this is a good way to process and understand information (see [Appendix, Tip 5](#)).

- Make sure you send the sample section to your supervisor by the agreed deadline. Your supervisor will provide you with detailed feedback (in written form and during a face-to-face meeting) on aspects such as scientific content, your writing style, figures and legend in addition to the use and formatting of references.
- **PLAGIARISM CHECK** – You must also submit the same sample section to Blackboard before attending the 3rd meeting with your supervisor. A submission folder will be available on Blackboard. The sample section will be analysed for plagiarism and the report made available to your supervisor before you receive feedback on the sample section at the 3rd meeting.
- There is no deadline for submission of the sample section, however this does need to be submitted in advance of the meeting with your supervisor to get feedback on the TurnItIn plagiarism report.
- As soon as you receive the feedback, record your feedback and a summary of the outcome of your meeting with your supervisor using the FBMH Intranet meeting form. The onus is on YOU to fill out these forms.

9. Academic Malpractice including Plagiarism

This is a **very serious offence**. The Dissertation should be **written in your own words**.

You must not simply copy sections of text from other works whether they are books, journals, theses or other Dissertations even if you fully acknowledge the source. Instead, you must write the text in your own words. Make a conscious effort to take notes and summarize your sources in your own words, borrowing nothing more from your sources than technical terms. You **must not simply copy or closely paraphrase** sentences or whole sections, including diagrams or tables from other works whether they are books, journals, theses, other Dissertations or your own previously submitted writing, even if you fully acknowledge the source.

The same applies to figure legends which must also be **written in your own words** and not simply copied and pasted from the original source. On those rare occasions where quoting the work of others verbatim is appropriate, this must be made clear by the use of quotation marks and appropriate citations ie. acknowledgement of the source of information.

Plagiarism is treated very seriously (See the Academic Malpractice module in [BIOL10742 Writing and Referencing Skills](#), and notes on *Plagiarism* in your [Second Level Handbook](#)).

For more information, look at the University's policy on plagiarism:

[Academic malpractice - including plagiarism](#)

The 2-page sample section and the final Dissertation you submit will **both** be checked for plagiarism in the following ways:

- The plagiarism check for the full Dissertation will ignore the 2-page sample section which you submitted for feedback
- Academic staff are asked to lookout for suspected plagiarism when marking your Dissertation
- Phrases or sentences in your assessed work may be checked against material accessible on the internet, using commonly available search tools
- The University subscribes to TurnItIn (an online plagiarism detection service) which is specifically designed for academic purposes. **Your Dissertation will be examined using this software.**

If you are found guilty of this offence, marks will be deducted in accordance with disciplinary processes and in serious cases a mark of zero will be given.

10. Formatting of your Dissertation - Full write-up

Once you have received the sample section feedback, apply the agreed style to the full write-up and adhere to the following format instructions and page limits:

- Font: Arial 10 point
- Format: A4, 1.5 line spacing with 2.5 cm page margin on all sides
- Lay and scientific abstracts: 200 words each/ no more than one A4 page
- Page limit: 9 pages excluding title page and references

11. Dissertation Marking Criteria

Each Dissertation will be marked against the following criteria:

Abstracts (Lay abstract 10%, scientific abstract 10%)

You are required to include two abstracts in your Dissertation. One abstract must be written with a lay audience in mind and the other abstract should be written for the scientific community. Each abstract should be a maximum of 200 words and both should fit onto the same A4 page. They should summarise the content of your Dissertation and be intelligible without reference to the content of your Dissertation, i.e. “stand-alone”. In other words, each abstract should contain an introduction to the Dissertation topic (about two sentences), the aim of the Dissertation (about two sentences), the major findings of your Dissertation (the bulk of your abstract) and a conclusion (approximately two sentences). It is not standard practice to insert references in the abstracts and the fewest possible abbreviations (all defined in the abstract) should be used. Your abstracts will be examined for their clarity, accuracy and comprehensiveness. The abstract written for the lay audience will also be assessed on its use of lay language.

Content (30%)

A Dissertation is more than a long essay. It is an exercise in the reporting, construction and presentation of a piece of scholarly work on a title, carried out over a long period (i.e. a review article). Have the readers in mind as you write. Your supervisor may be an expert on your title but the second marker will not be. Provide a clear structure, explaining any technical terms and making clear what each section will cover.

INTRODUCTION: Beginning with a clear brief introduction is key to a good Dissertation. The introduction should provide the background to the general title. You should begin by “setting the scene”: explain why this title is important and how it fits into the general scheme of things. You should end the introduction with a clear statement of what you aim to address in detail in the main body of the Dissertation.

BODY: This is where you describe in detail the different aspects of your title. Make good use of headings and subheadings to divide the Dissertation into sections. Depending on your title a section may be devoted to a specific example related to your title or a section may describe one aspect of the whole title. Do not be tempted to write many short sections with little detail. A Dissertation with a few detailed sections is much better.

CONCLUSIONS: A good Dissertation has a critical drawing-together of the future research areas and requires a summary of what you have just described in the introduction and main body of the text. In this section you should also describe any remaining questions associated with your title and any future work that needs to be done. This is also a good place to give support for your own opinions (which you should have developed, as you should now be quite knowledgeable on the title). This will show that you have understood the title and have not just reproduced information you have found on the title.

We expect you to demonstrate through your Dissertation a detailed knowledge of your chosen title, a soundness of understanding, an awareness of how theories have been tested, and how concepts have developed. The content of your Dissertation will be examined for its scope (i.e. have you considered all areas of relevance to the title?), the relevance of information to the title (i.e. have you been selective in the information that you have included?) and the accuracy of the information included.

Use of Literature (Range 10%, citation 10%)

We expect you to demonstrate your capability in accessing and making good use of library resources by the range and types of literature you cite and the way you make use of the literature. We expect you to have made use of databases of references and abstracts (such as MEDLINE via PubMed search engine) to find relevant information. The library offers assistance in literature searches – look out for the notices stating when drop-in sessions are available. However, it should be emphasised that it is more appropriate for you to consult up to date research papers and review articles than specialist books which quickly become out of date. We expect you to show that you understand the differences in levels of authority between different forms of literature such as textbooks, reviews and scientific papers, by the way in which you use information from them in your Dissertation. Your Dissertation should be up to date, i.e. refer to current literature, where appropriate. You **MUST** cite your references and list your references in a consistent manner and follow the guidelines given below.

Referencing

References should be quoted in the text and listed in a references section at the end of the Dissertation. Throughout your Dissertation you will need to refer to the work of others (a citation). We expect that for the Dissertation you will use a citation format eg. Harvard, that shows author and publication year, such as the format used by a scientific journal (see [Appendix, Tip 2](#) for more details).

You will have access to a computer database program for storing, retrieving and sorting references (e.g. EndNote) which you should now know how to use after completing the Writing and Referencing Skills (BIOL10742) course.

NOTE: you are advised to use no more than 2 web citations. Information provided on a web page can change rapidly and reliability of the information brought into question. In the reference list, when citing a web page you should report when the web page was accessed to obtain the information included in your Dissertation.

Organisation [subdivision & balance (10%), use of English (10%), presentation (10%)]

The Dissertation will be assessed on subdivision and balance, use of text, tables and figures.

Try to avoid separating subheadings from associated text at the bottom of a page. Use appropriate scientific terminology to construct your Dissertation.

You are strongly encouraged to use diagrams and tables where these are clearer than long explanations in words or where they will enhance the text. For example, if you are having trouble explaining a concept in words, a diagram may be more appropriate. Figure and tables must be supported by a legend which explains the content and which references the sources. Figures and tables should have a title and a legend to explain their content and should enable the reader to understand the information presented without referring to the main text. Provide keys for tables and figures if abbreviations or special symbols are used. Make sure you explain the meaning of arrows, brackets, etc. where this is not obvious (and do not assume that much is obvious to the reader!). If you use tables or figures from other sources, or put these together using information published elsewhere, remember to acknowledge your sources and include them in the Reference section. Acknowledgement of the original articles should be included in the legend to the table or figure using a phrase such as “taken from Smith and Jones (2001)”. In addition to the figure/ table legend you must also include some text in the main body of the Dissertation which describes the figure ie the figure/ table should be integrated into the text. Ensure that the text for the figure/ table and the associated legend appear together on the same page.

Your Dissertation MUST be submitted as a pdf document. We expect you to use the skills you have developed in using relevant computer software packages (e.g. word processing and graphics packages and other relevant software). Your Dissertation will be examined for consistency and quality of presentation style and use of English. You should select Arial (10pt) as the font, use 1.5 line spacing with margins of at least 2.5cm all around the text. The document you submit as a pdf must meet all the presentation requirements or marks will be deducted accordingly.

12. Submission of your Dissertation

By 4pm THURSDAY 21st March 2019

Your Dissertation **must be uploaded onto Blackboard** by 21st March 2019, 4pm. Late submission will be penalised with a reduction of 10 marks per day (or part thereof beyond the deadline) for 5 days, after which a mark of zero will be awarded.

Only Dissertations submitted in pdf format onto the Blackboard site will be accepted for marking. Any other electronic submission (such as e-mailing the report to your supervisor) will not be accepted. Instructions on how to upload your Dissertation will be given to you nearer the time. There is NO requirement to produce a hard copy of your Dissertation.

13. Feedback on your Dissertation and mark

Supervisors will award a provisional mark for the Dissertation using the available marking guidelines. To ensure that the assessment task and marking are accurate and to assure a consistent standard of marking and of student attainment within the unit Dissertations will undergo a moderation process. Final marks will be confirmed by the Examination Board.

Supervisors are asked to provide constructive feedback using Grademark on Blackboard. **Please read this feedback and download it from Blackboard so you can revisit it next year.** The feedback provided should help you when tackling similar pieces of work e.g. final year project. The expected date of release of feedback and the provisional marks is 2nd May 2019.

Supervisors have all been asked to read the available 'Supervisors Guidelines' found on both the Intranet and Blackboard. Members of staff will have slightly different approaches to supervision. This is something to be welcomed and allows staff to play to their strengths. You should not feel disadvantaged if the interactions you have with your supervisor differs from that of your peers. If you have concerns or worries about any aspect of supervision and feedback provided then, a mature approach to take would be to discuss these issues openly with your supervisor in the first instance. All staff are working with you towards the same goal: that of providing you with the necessary scientific skills to complete a good literature review and produce your final Dissertation.

If you have any concerns at any point during the unit, you should inform the Dissertation coordinator (susan.h.taylor@manchester.ac.uk) as soon as possible to allow sufficient time for suitable interventions.

14. Applications for Extensions to the Submission Deadline

Formal applications for extensions must be made by completing an extension request form and submitting it to the SBS Student Support Office such that an extension can be granted prior to the deadline of 4pm on the 21st March 2019. Applications for an extension to submit after the deadline of 4pm on 21st March 2019 **must be received by 10am on Wednesday 20th March 2019** for this to be considered. No retrospective extensions will be granted. Extensions will only be granted for medical reasons if verified by a medical certificate or in exceptional personal circumstances that have been brought to the immediate attention of the Senior Advisor (Dr Tracey Speake) or the Chief Exams Officer (Dr David Hughes). Please note that computer failure, lost memory sticks, slow internet connection etc **do not** constitute "exceptional personal circumstances" and will **not** be considered.

Late submission will result in a reduction of 10 marks per working day (or part of working day).

Further help and advice

Please contact the Dissertation coordinator if you have any questions/queries or require any assistance:

Dr Susan Taylor

1.203 Stopford Building

Email: susan.h.taylor@manchester.ac.uk

To seek an extension, please contact the SBS Student Support Office:

G.483 Stopford Building

Tel: 0161 275 1487

Email: sbsstudentsupportoffice@manchester.ac.uk

APPENDIX

- Tip 1: What are a Dissertation and a literature review?

The Dissertation is a literature review, a written piece of work in which you summarize and synthesize the arguments and ideas of others rather than make new discoveries based on new sources. The word “**literature**” refers to any collection of materials on a title that means anything from a set of government pamphlets to scholarly articles, for example on Alzheimer's disease. The word “**review**” means that you show you have a good understanding of the main published work concerning a particular title or question in a specific field. Your review should not be simply a *description* of what others have published in the form of a set of summaries, but should take the form of a *critical discussion*, showing insight and an awareness of differing arguments, theories and approaches. It should be a synthesis and analysis of the relevant published work, linked at all times to the objectives of your Dissertation. It might give a new interpretation of old material or combine new with old interpretations. Or it might trace the intellectual progression of the field, including major debates. The final section of **the Dissertation should make a case for further investigation and research, highlighting gaps in knowledge and asking questions that need to be answered in order to advance this area of research.**

The Dissertation should:

- compare and contrast different authors' views on an issue
- group together authors who draw similar conclusions
- comment on aspects of methodology
- note areas in which authors are in agreement and disagreement
- highlight exemplary studies
- show how your study relates to previous studies
- highlight gaps in research

- Tip 2: [LITERATURE SEARCHING AND REFERENCING](#)

You may find it helpful to review what you learnt in Year 1 about how to reference the right way by accessing the [BIOL10742 Writing and Referencing Skills](#) course.

- Literature searches usually start with review articles about the title, followed by primary articles that attract your attention. You may want to search directly in PubMed or Web of Science, but it might be more efficient to use literature database programs, such as [EndNote](#) or [Reference Manager](#). These programs not only support database searches with the option of selecting attractive hits and incorporating them into your database, but provide you with abstracts and links to the PubMed site (where you find direct links to the original journal site and often free-to-download versions of the article), to equip filed articles with your personal keywords, link them to your PDF collection, insert references into your text, and to carry out the final formatting of your Dissertation in an automated manner using a journal template of your choice (which can be flexibly changed thereafter).
- For your literature searches, use clever strategies to reduce search results to manageable numbers (see examples in Table. 1). When this has been achieved, first read the titles of those publications, pick the most relevant ones and read their abstracts. If the title and abstract look relevant, then download the respective PDFs and file them using a transparent naming scheme (e.g. "[Miller+al_16-JCellBio](#)"). If you use appropriate programs (e.g. Acrobat Reader) to read articles on-screen, you can highlight text and insert comments, and this information will be easily accessible once the PDFs are properly filed. To keep an overview of studied materials, maintain a ‘think-tank’ document (see Tip 3).

SEARCH TERM 1		SEARCH TERM 2		SEARCH TERM 3	# HITS
"Alzheimer*" (<i>All Fields</i>)	AND	-	AND	"review" (<i>All Fields</i>)	~30K
"Alzheimer*" (<i>Title</i>)		-		"review" (<i>All Fields</i>)	~12K
"Alzheimer*" (<i>Title</i>)		"treatment" (<i>Title</i>)		"review" (<i>All Fields</i>)	~900

"Alzheimer*" (Title)		"drug treatment" (Title)		"review" (All Fields)	~45
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Table 1. Examples of search terms and the number of papers found when applying these. Search terms are given within speech marks, the respective search field is indicated in brackets; all search terms are connected via an AND condition; number of found papers (#HITs) for each search is indicated in the very right column.

- Throughout your literature research, develop a personal keyword system which will allow you to efficiently find appropriate text sources. You may ask yourself during the writing process "*Which was the paper that described mechanism XY?*" or "*What review gave the overview of behavioural aberrations in XY pathologies?*" Prepare yourself for these questions by designing good key words and entering them in your database. This will allow you to find the right references quickly and save you valuable time!
- To facilitate the task for supervisors and markers, we expect that for the Dissertation you will use a citation format that shows author and publication year, such as the format used by the journal 'Cell' (one author: "*Miller, 2011*"; two authors: "*Miller and Smith, 2012*"; more than two authors: "*Miller et al., 2015*").
- Note that reference programs such as EndNote and Mendeley are available to you through the University IT system and their proper use can be learnt in less than 10 minutes and will save you many valuable hours!

- Tip 3: MAINTAIN A 'THINK-TANK' DOCUMENT

Throughout the process of literature research and writing you will come across many interesting statements and examples, you will have many interesting thoughts, and you might want to keep track of key ideas or information from papers that you have read. Make it a habit to maintain a dedicated 'think-tank' document in which you note down information and thoughts whenever they occur. Keep notes as concise bullet point statements, accompanied by their respective source references (ideally copied in from your literature database). In this way you collate a document which will provide a valuable source of information for discussions with your supervisor and when you write your outline and final Dissertation (even if many of these statements never make it into your final Dissertation).

If you plan on using the notes in your think-tank document directly in your Dissertation, make sure they are already in your own words - **otherwise you risk plagiarism!** Alternatively, copying text directly from your sources into the think-tank document can be OK if you are strict about highlighting it as quotation (e.g. by making it bold red) and make sure you re-think and re-word it for the final Dissertation.

- Tip 4: DISSERTATION ORGANISATION

A Dissertation is organized around information and NOT the sources. The overall structure of your review should group together the scientific information published by different authors on a particular topic. You should not just describe what one author says, and then go on to give a general overview of another author, and then another, and so on. If you are tempted to start a paragraph with "Another study that looked at...", you are on the wrong track.

Your structure should be dictated instead by title areas, controversial issues, if appropriate or by questions to which there are varying approaches and theories. As you read widely (but selectively) around your title area, consider what themes or issues connect your sources together. Is there an aspect of the field that is missing? How well do they present the material and do they portray it according to an appropriate hypothesis? Do they reveal a trend in the field? An on-going debate? Pick one of these themes to focus the organization of your review. A good Dissertation is organised into introduction, main body and discussion.

- The introduction highlights the wider importance of the title [*e.g. the socioeconomic burden of neurodegenerative diseases (ND)*], identifies a problem [*e.g. the lack of understanding of the cellular processes underlying ND*] and ends with the objective or working hypothesis of your

Dissertation [e.g. *"Using Alzheimer's disease (AD) as an example, I will explain potential disease mechanisms and principal strategies to treat the disease"*]

- The main body is dedicated to your interpretation of the literature, arranged in a logical way that clearly addresses your objective or supports your hypothesis. For example, it may start off with a general overview [e.g. *first you define neurodegeneration and explain different forms of neurodegenerative diseases*] which is followed up by more specific sections [e.g. *focus on AD and explain the specific features of this disease, then explain current understanding of disease mechanisms of AD, finally highlight the most prominent strategies to treat the disease*]. Break the different sections of your main body down by providing subheadings with clear messages.
- The discussion is the most challenging part of the Dissertation, but it provides you with an opportunity to demonstrate your depth of understanding and your ability to extract key concepts, and draw reasonable conclusions. The discussion usually starts off by responding to the objective set out in the introduction [e.g. *"Here I have provided an overview of current trends in AD research and treatment..."*] and briefly summarises the key statements or conclusions [*"I have highlighted the key problems of AD research which lie in ..., likely pathomechanisms which include ... and highlighted the most prominent current treatments which focus on ..."*]. These introductory sentences make sure the reader is reminded of the key ideas and information of your review that your discussion will refer to. To avoid unhelpful repetition do not follow the structure of the main body but organise the subsections of the discussion along the key arguments or statements you want to highlight [e.g. *What do you think are the key reasons for slow progress? Which strategies for research and treatment are the most promising and why? In which direction could the field move in future? Is there justified hope that a breakthrough can be achieved?*]. In your discussion, make use of subheadings that formulate your arguments and align under them supporting facts, statements and arguments from across your main body of text and from the literature.
- To organise your Dissertation, number sections and subsections [1. *Introduction*, 2. *Current understanding and treatments of AD*, 2.1. *What classified AD?*, 2.2. *Underlying pathomechanisms of AD*, 2.3. 3. *Discussion*, 3.1. *The enormous complexity of AD pathology is a key inhibitor to advance*, 3.2. *The most promising trends in AD research and treatment*, 3.3.]. The numbering forces you to organise your Dissertation in a logical way and facilitates effective cross-referencing.

▪ Tip 5: COMPOSING FIGURES AND LEGENDS FOR SCIENTIFIC PUBLICATIONS

- 1) When reading scientific publications, take note of the figures, their design and how and where they are used. Some will appeal to you more than others. Analyse carefully what factors explain this difference, so that you can apply them to your own figures.
- 2) Choose your images / tables carefully. Well chosen figures tend to be referred to repeatedly in the text, self-evidently demonstrating their value. But this is not a general rule, as explained next.
- 3) Figures/tables can have two principal purposes:
 - They can support statements in the text:
 - be used as a complementary means to convey complex information [e.g. *flow diagrams of gene regulatory networks*]
 - illustrate statements that are difficult to describe or important to show [e.g. *histological brain section of a dementia patient*]
 - provide scientific proof for your statements, particularly in primary science reports [e.g. *image documentation, graphs or statistical analyses of data*]
 - Figures/tables can be used to present additional information that, if described in the text, would break the flow of the Dissertation. In such a case, you would make a basic statement in the text [e.g. *"Numerous signalling pathways have been demonstrated to regulate GSK β kinase activity"*] and accompany this with a figure in which detail is added for those readers

who would like to know such detail [*e.g. add a graph with a regulatory flow diagram illustrating the key signalling pathways upstream of GSK β*]

- Occasionally, a figure in one of your sources will complement your text perfectly. In that case it is fine to use the image as found, but make sure you write a bespoke figure legend: the context of your dissertation will be different from that of the source. More typically, the best figure will be one that is adapted from its source by cropping, simplification, annotation, addition (consider multi-panel figures with images from different sources), or it might even be a diagram you have drawn from scratch. Such figures are more challenging to produce, but if done well can significantly enhance your Dissertation because they demonstrate deeper understanding and engagement with the science. If you produce a custom figure, consider including it in the 2-page sample for feedback.
- 4) Ideally, the specialist reader should be able to grasp the key message and the information in a figure without having to study the legend in detail. Here are a few tips:
- Think of a statement you want to make with a figure and choose the images supporting this statement.
 - Arrange images within a figure in a logical sequence that can be easily explained in your legend. Keep figures as simple as possible by avoiding irrelevant details that you do not describe or refer to in the text.
 - Label single images with capital letters, and refer to these letters when explaining your images, which also allows you to make more precise references in the main text [*"Hallmark features of AD patients' brains are amyloid plaques and tau tangles (Fig. 2B)"*].
 - Use symbols or abbreviations in the figure to guide the reader unequivocally and efficiently through your images; use symbols and abbreviations consistently in the figure (ideally across all figures of the document); all letters and symbols should be large enough to be legible - even upon bad print or when the figure is reduced in size.
 - Indicate specific information directly within each image [*e.g. indicate abbreviated genotypes of each specimen in the top right corner of each image and the respective antibody staining in the bottom right corner*]. A specialist reader will understand this information instantly.
 - Microscopy images must show a scale bar to indicate the size of shown specimens.
- 5) Compose a concise figure legend that technically explains all features seen in the image and can be read and understood without needing to refer to the main text. You do not have to deliver explanations or interpretations (which is usually done in the text) - although you may occasionally choose to make such statements to emphasise a key message.
- Formulate a title for your figure that clearly states what the figure shows [*e.g. "Histological indicators of AD pathology"*].
 - Explain everything shown: which species, which tissue, which stage, which staining, all symbols, abbreviations and colour codes used; these explanations can be woven into your text [*e.g. "in the brain of Alzheimer's patients aggregations of tau can be seen (arrows)"*] or listed at the end of your legend [*e.g. "Symbols used: arrows, tau aggregates; arrow heads, amyloid plaques;...."*].
 - Be economical in your wording [*e.g. group statements common to all or several images: "all brain sections were stained for tau and β -amyloid"*]; this strategy saves space and facilitates reading.