

## **Guidelines for preparation and submission of a doctoral thesis (Ph.D./Dr. rer. nat.) at the GSLS**

The aim of the doctoral thesis is to compile the candidate's work as a doctoral researcher, and to contextualise and discuss the work in relation to the broader research field. As decided by the GSLS Common Graduation Commission ("Gemeinsame Promotionskommission") on 10<sup>th</sup> February 2022, the thesis may be prepared in the form of a monograph ("Monographie") or a manuscript/chapter-based compilation thesis ("Manuskript-/Kapitel-basierte Thesis"). Both thesis types are considered equivalent; there is no *a priori* difference in quality constituted by the choice whether a thesis is written as a monograph or as a compilation thesis. In either case, it is essential that the thesis forms a cohesive body of work.

Before starting the writing process, the doctoral researcher must discuss with their thesis committee, which type of thesis will be best suited. When handing in a compilation thesis at the GSLS office, a signed approval must be provided that confirms that the advisory committee members agree with the submission of the thesis in the current manuscript-based form. A further approval by the section speakers or the GSLS Common Graduation Commission is not required. The formal structure of the thesis will be checked by the GSLS upon submission. In cases of potential concern, the section speakers may be asked for advice.

Independent of the thesis type, at least one accepted co-author publication in a peer-reviewed international journal is a prerequisite for graduation at the GSLS. The marks "magna cum laude" or "summa cum laude" require at least one first authorship publication in a peer-reviewed international journal. The time period between submission of a manuscript and its acceptance for publication may be substantial. In order to account for this, the GSLS accepts not yet accepted first authorship manuscripts in conjunction with a guarantee of the primary supervisor ("Bürgschaft") that 1) the manuscript will be published in a peer-reviewed international journal and 2) the doctoral researcher will remain first author even in the case of potential revisions.

### **Thesis formats**

#### **A) Monograph**

- The monograph is a coherent body of text that includes a detailed report of the material and methods used, and of the results obtained by the candidate.
- The monograph should give sufficient detail to allow to understand and assess, what has been done and achieved by the doctoral researcher.

A monograph should include the following sections:

**Title page:** based on the GSLS template

**Names of the thesis committee members and the chairperson**

**Table of contents**

**Summary:** A one-page summary in English

**Zusammenfassung:** A one- to two-page summary in German

**Introduction:** This section should give a comprehensive overview on the relevant scientific background, as well as a statement of the research goals. It typically contains an extensive review of the relevant background literature and how this leads to the specific research goals of the doctoral project. An exhaustive summary of prior research in the broader field is not requested. The section should conclude with a concise description of the key research questions being addressed in the thesis.

**Material & Methods:** This section gives a comprehensive description of the material and methods used. Sufficient detail must be given to allow reproduction of the experiments by other researchers. We recommend the use of a format similar to the STAR Methods (see <https://www.cell.com/star-authors-guide>).

**Results:** This section describes in a detailed fashion the results the candidate has obtained during the doctoral project. It may further contain results obtained in collaboration of the candidate with others. In this case, the candidate must clearly state the individual contributions of the candidate or collaborators. If figures depict data that have not been generated by the doctoral candidate, this must be clearly acknowledged in the figure legend.

If necessary, results obtained by others without contribution of the participant can be included, but must be properly cited and identified, and permissions must be obtained if unpublished results are mentioned (“personal communication”).

**Discussion:** This section should not merely summarise and repeat the results already described in the results section. Instead, in this section, the candidate should show their ability to critically reflect on the results and to place them in a broader scientific and theoretical context. The “Discussion” section should consider possible experimental limitations, weigh the theoretical/practical implications of the work, point out how the results advanced the field, and present suggestions for future work.

**References**

**Signed CV**

**Affidavit/“Eidesstattliche Erklärung“**

Further relevant information, such as a list of publications, list of figures, abbreviations, raw data etc., may be given in an Appendix section at the end of the thesis.

## **B) Compilation (manuscript/chapter-based) thesis**

- The compilation thesis consists of at least two research articles or manuscripts ("chapters"), which are framed by an introduction and a comprehensive summarising discussion.
- The research articles and manuscripts must either be published or accepted, or be of a quality that meets the requirements for publication in recognised international academic journals with peer-review procedures.
- The research articles or manuscripts ("chapters") must be organised in a standard format that meets the requirements for publication in a peer-reviewed journal. This typically includes the sections: abstract, introduction, material & methods, results and discussion. Results and discussion may be combined into one section. Additionally, the thesis may contain technical manuscripts describing a new method established during the doctoral work in a format that meets the standard requirements for publication in a methods journal or book. It may also contain systematic reviews which provide new insights, for instance by meta-analysis of published data. Narrative review articles are not considered as original research, and are therefore not counted as research article or manuscript.
- The candidate must be (shared) first author on at least two of the included research articles or manuscripts. This implies that the candidate has substantially contributed to writing, design and execution of experiments, data analysis, and interpretation of results. Further published articles or accepted manuscripts in which the candidate is acting as a co-author can be added if the research carried out by the candidate and the obtained results are of high relevance to the doctoral project.
- The candidate must clearly identify, which experiments and results are due to their own work, and which experiments and results are due to the work of colleagues. For each article and manuscript, the candidate must include a statement of individual author contributions according to the GSLS templates, independent of whether the article or manuscript has been published or not ([Statement of individual author contributions and of legal second publication rights](#), [Statement of individual author contributions to figures/tables](#)).
- As several authors may have contributed to writing the included articles and manuscripts, the framing sections of the thesis (introduction and discussion) will be of particular relevance for the reviewers in assessing the autonomous and independent performance of the candidate.

A compilation thesis should include the following sections:

**Title page:** based on the GSLS template

**Names of the thesis committee and chairperson**

**Table of contents**

**Summary:** A one-page summary in English

**Zusammenfassung:** A one- to two-page summary in German

**Introduction:** A comprehensive description of the aims of the research, the key research questions being addressed, and how these are addressed in the research articles and manuscripts that are included in the thesis. This section typically contains a review of the relevant background literature. An exhaustive summary of prior research in the broader field is not requested. The section should conclude with a concise description of the aims of the thesis.

**Manuscript section ("chapters"):** This section contains original research articles or manuscripts as specified above, containing a description of the methods and materials that have been used, and results that have arisen from the doctoral work. Each chapter has to follow the standard format as specified above. Narrative review articles are not to be included in this section. At least two original research articles or manuscripts have to be included, on which the candidate is (shared) first author. The total number of articles or manuscripts included in the thesis is not significant in itself. The evaluation will be based on the scale and scope of the articles or manuscripts, in terms of the amount and significance of the research included, and the nature of the discipline. Generally, at least one of the included articles or manuscripts should have been published or accepted for publication. Additional data or method descriptions, which are not part of the manuscripts, can be included at the end of the thesis in an appendix.

**Summarising Discussion:** This section should not merely summarize and repeat the results already described in the individual research articles and manuscripts. Instead, it should be written with a holistic view on the overall aims of the thesis. It is also encouraged to describe initial approaches that have failed, or modifications that have occurred during the course of the work. The relationship between the projects and results described in the individual articles and manuscripts must become clear. In this section, the candidate should show that they are able to critically reflect on their results and place them in a broader scientific and theoretical context. The summarising Discussion will thus integrate and discuss the main findings of the research presented in the individual research articles and manuscripts. It considers possible limitations, the theoretical/practical implications of the work, and how the work advances the field. It should also present suggestions for future work

## **References**

## **Signed CV**

## **Affidavit/Eidesstattliche Erklärung**

Further relevant information, such as a list of publications, abbreviations, raw data etc., may be given in an Appendix section at the end of the thesis.

## **Requirements by the University Library**

Prior to the publication of the dissertation and thus prior to receiving the doctoral degree, the University Library demands that the candidate signs an “Author Contract” ([www.bibliothek.uni-wuerzburg.de/fileadmin/ub/pdf-Dateien/OPUS/Autorenvertrag\\_OPUS\\_de.pdf](http://www.bibliothek.uni-wuerzburg.de/fileadmin/ub/pdf-Dateien/OPUS/Autorenvertrag_OPUS_de.pdf)). This document certifies that the candidate is legally entitled to publish the manuscripts within the dissertation. Issues to be considered in this respect:

- Co-Authors

Copyright law and good scientific practice require that any publication be approved by all co-authors. Therefore, the candidate must inform all co-authors about the intended (secondary) publication of a manuscript in the context of the dissertation and obtain permission to do so (e-mail suffices).

- Publishers

The candidate must clarify with the journal publishers the publishing rights for each manuscript to be included in the dissertation. The candidate must also clarify with the journal publishers the publishing rights for each adopted original figure from other publications (e.g. reviews) to be included in the dissertation. The respective rules and regulations of most publishing companies can be found at “SherpaRomeo” ([www.sherpa.ac.uk/romeo](http://www.sherpa.ac.uk/romeo)). However, the information obtained on this web page is not legally binding. Alternatively, most relevant journals can now be asked for permissions online via <https://marketplace.copyright.com/rs-ui-web/mp>. If still in doubt, it is necessary to check the publisher’s homepage (for an example see: <https://ashpublications.org/blood/pages/rights-permissions>) or to directly ask the publisher for permission. Many publishers allow a secondary publication of an already-published manuscript within a dissertation. However, restrictions often apply in case of manuscripts which are still in the review process (“Pre-Print”). Please note that this is also true for manuscripts which are not yet submitted. In other cases, it is not allowed to use the layout of the journal, or there may be an embargo period. If the latter is the case, the candidate may still immediately submit the dissertation to the University Library, asking for a publication deferment until the embargo period is over. This fulfills the requirement to submit the dissertation to the library and the doctoral diploma can be awarded without delay.

### **Remarks**

The requirement to clarify with the journal publishers the publishing rights for each manuscript included in the thesis cannot be circumvented by submitting to the library printed copies or microfiche only. Even then, consent of the publisher is required.

Please consider that all the issues raised above may apply also for manuscripts that have not yet been submitted. In case of questions regarding citations and copyright, we recommend to contact the University library for advice.

The candidate is advised to contact the GSLS staff before the eight copies of the dissertation necessary for the evaluation process are printed. This serves to avoid formal mistakes and thus unnecessary costs and delays.