GUIDE FOR THE RESEARCH PROPOSAL

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1. INTRODUCTION

The research proposal is one of the mandatory parts of your research master's. Within this proposal, you describe a study that has the duration of a PhD-project. First you select a research paper as the basis for your proposal. You need to completely understand this paper in order to come up with new questions and hypotheses. After you have established a possible follow-up study, the scientific literature should be read carefully to ensure that your question has not already been answered. Once you have this overview, you can start devising means and methods to test your hypotheses and explain why these are useful and realistic. You should also include a section about the societal impact of your research in your proposal.

The research proposal serves a triple goal, namely explaining why there is a *need* for your research, detailing why your research is *feasible* and *perspectives* of your research. As such writing a research proposal is a valuable exercise even if you do not pursue a scientific career. You will have to sell and describe your ideas in any job, for example when writing quotations.

This guide will offer you an overview of the proposal writing process, the structure of a research proposal and the expectations regarding supervision Supervisors and students can decide to deviate from these guidelines, if agreed at the start of the writing process. However, when deviating from the original structure, the learning aims must be taken into careful consideration.

1.1 SHORT CRITERIA

In short, your research proposal should:

1. Consist of at most 3 pages review, 2 pages discussion of a research article and 5 pages research description. In exceptional cases, the length of the research proposal might be different, but this should always be discussed at the start of the writing process.
2. Be a follow-up study to a research article related to your specialization, in the form of a PhD-project;
3. Contain a title, summary with graphical abstract (see 3.3), introduction with theoretical framework and discussion of a research topic, a description of the research with an approach, objective, innovation and impact, a timetable and a reference list;
4. Be supplemented by defence in the form of a rebuttal, defence in an interview-like setting with your supervisor or during a public presentation. If you choose this public presentation you usually do not have to write a second version of your proposal as the presentation will act as one;
5. Showcase an independent and professional work attitude;
6. Be well written (spelling, grammar and structurally sound, arguments are clearly framed and readable);
7. Have a workload of 6 ECTS (168 hours, approximately 4 weeks fulltime);
8. Be completed under responsibility of an approved Radboud University examiner. Certain intermittent supervision tasks may be delegated to internal or external colleagues, but responsibility for course quality and grading remains with the examiner at all times.

1.2 EER LEARNING AIMS FOR WRITING A RESEARCH PROPOSAL

The purpose of writing this research proposal is learning to explain the need and feasibility of your ideas and to sell them to an audience of peers. Writing a research proposal will help you to reach the following learning outcomes as derived from the *Education and Examination Regulation* coupled to the criteria for the proposal.

Research proposal	**Education and Examination Regulation** *You will be:*
Review Discussion research article Research description	Capable, based on broad and up-to-date knowledge of biological and/or biomedical processes, in combination with specialist knowledge (theories, methods, techniques) and research experience in at least one sub-area of this field, of setting up research aimed at acquiring new knowledge and insight in this research area;
Research description	Capable of formulating new questions and hypotheses in the biological/ biomedical field, and familiar with the research methods and state-of-the-art techniques to solve them, taking into account available equipment and resources;
Research description Independent and professional work attitude	Capable of setting up scientific experiments in an independent manner, including the related controls;
Review Discussion research article Independent and professional work attitude	Capable of independently identifying, critically reading and comprehending relevant, up-to date international literature from different disciplines, of discriminating essential from nonessential information, and of integrating new information in his overall view on nature;
Review Discussion research article Research description	Capable of using concepts from different organization levels in biology, in combination with those from physics, chemistry and mathematics, to solve a complex biological/ biomedical problem at a specific abstraction level;
Rebuttal/ defending one-on-one/ presentation	Capable of defending his view and of critically evaluating other views in a scientific discussion;
Research description (impact)	Capable of integrating ethical aspects in his professional practice, along with the ability to reflect on the potential implications for society.

2. THE WRITING PROCESS

In this section, the writing process will be explained in more detail for each of the different phases of writing.

When you are writing your proposal there are three moments of submission:

1. The first submission (via an email to your supervisor) consists of your outline that contains the main- and sub-questions of your research, a short description of the experimental procedures and the structure of your introduction. You should also add the proposed deadlines for your first and final version;
2. The second submission (via an email to your supervisor) consists of the first, full version of your proposal;
3. The third submission (by uploading your research proposal to SPIB) consists of the revised version of your proposal (including the rebuttal if this is the chosen defence variant).

During the writing process you will interact with your supervisor at least four times either via mail or in person. It is advisable to agree on the next moment during the preceding one. The moments are:

1. Agreeing on supervision and the broad subject;
2. Discussing the outline;
3. Discussing the first version of your proposal;
4. Defending your proposal (can be combined with step 5);
5. Discussing your grade.

If you are an experienced writer already, you will probably not need the detailed instructions for each phase and reading the headers will suffice. If you feel that you would like to have more information about writing, reading (parts of) the following books may be helpful:

- Joy de Jong *Handboek Academisch Schrijven* (Coutinho; in Dutch);
- Karin Knisley *A student handbook for writing in biology* (W.H.Freeman & Co Ltd);
- Martyn Denscombe's *Research Proposals, A practical guide (Open University Press);*
- Piet Verschuren's *De probleemstelling voor een onderzoek (Spectrum) which is in Dutch.*

2.1 DETERMINING A SUBJECT

The first phase of writing a proposal is selecting a suitable topic. A good starting point when choosing your subject are the courses you have already followed and particularly liked. For example, *cancer-gene regulation*, *ecology of urban birds*, *flowering of arctic plants* and *neurogenesis in adults* are all suitable topics at this moment. Alternatively, you may select a topic related to your research internship. However, your proposal should not be a direct follow-up to your internship, with completely overlapping background. Obviously, there are many more ways to determine your subject and these can be suitable as well. Just remember that at the end of this phase you should have a topic that you find interesting.

2.2 FINDING A SUPERVISOR

The second phase of writing a research proposal is finding a suitable supervisor. The supervisor must be an approved examiner (mostly U(H)D or professor) from Radboud University/Radboudumc. An examiner may delegate intermittent supervision tasks to internal/external colleagues (such as a PhD student or a Postdoc), upon own proposal or upon request by the student, but in all cases, remains responsible for quality of the course and final grading. There are multiple ways to find a supervisor within the area of your interest. For example, you can contact the lecturer of a course that you find interesting and you can search on the FNWI webpages for interesting research groups and approach their group leader. If you find it hard to find and/or approach a supervisor, you can contact the internship coordinators and your study advisor for help and tips. Once you have identified a suitable supervisor, you may ask about supervision possibilities via email, but it can sometimes be helpful to talk to them in person. Usually, you will have a (short) first discussion about your plans and your supervisor might already give you a few papers to read, so you can start refining your topic. After a teacher has agreed to supervise you, fill in the details of supervision in the form that has been send to your email account after enrolling for the course. By doing this you ensure that you can upload your final version to SPIB.

2.3 CHOOSING A RESEARCH ARTICLE AS BASIS FOR YOUR PROPOSAL

The basis of your proposal should be a research article that has recently been published in a reputable journal. This will automatically narrow down your topic. You can look for three or four research articles in reputable journals that lay in or near the expertise of your supervisor. You should give these papers to your supervisor and they will choose the one on which you will have to base your proposal. When doing this, keep in mind that you will have to write a proposal for the duration of a PhD-project. The amount of data and experiments in the research paper must therefore be enough to act as a foundation for new experiments and testable hypotheses. Alternatively, your supervisor will give you a selection of papers or a defined topic from which you can select one yourself.

2.4 FORMULATING THE CENTRAL QUESTION AND SUB-QUESTIONS

Once you have selected a research article that will act as the basis for your proposal, you will have to carefully analyse it and look for possible follow-up studies. Where do new and exciting questions arise? Do you already have an idea how to answer these questions? It is a good idea to write down your ideas while analysing the research article so you can return to them when deciding on your central question. Moreover, having written this will help you greatly when writing the discussion of the paper in the introduction.

Once you have a central question that is formulated as precisely as possible it is time to explain why you are going to answer this question and how you are going to do that. As such your central question should be supported by the two following elements (also formulated as precisely as possible):

- Goal, which explains the importance of your main question;

- Specific research questions (sub-questions) that provide more details of how you will answer your main question. These research questions should be followed by hypotheses that will help in designing the experiments of your proposal.

Naturally, the goal plays a key role in *selling* your proposal and detailing the *need* of its research, while the specific research questions will help in explaining to the reader *how* you will answer the question and how this can be done in a *feasible* way.

2.5 WRITING AN OUTLINE

Writing an outline will undoubtedly assist the writing process. In general, this outline serves a dual purpose:

1. It helps you structure your proposal and ensures that all required sections (title, summary, etc.) are present;
2. It ensures that your sub-questions actually help in answering the main question.

When starting to write this outline, use the main question and the sub-questions you formulated in the previous phase as a starting point. These questions should be addressed in the first part of the actual proposal wherein you state the objective of your research. Each sub-question will be addressed separately in the approach of the research where you detail the ways in which you will test your hypotheses. In this section you should explain your experimental design too. It is advisable to write shortly about what the innovation and the impact of your research will be as well.

At this point you should also write an outline for the introductory part of you research proposal. The first part should provide the reader an overview about the topic of your research proposal and as such resembles a short review. Think carefully about the organisation of this section as this state of the art should logically flow into second part, namely the discussion of the research article that is the basis of your proposal.

As soon as you have finished your outline, look at it again critically. Is the order of the sections logical? Do the different sections actually contribute to answering your main question? If you find small problems with the outline change these straight away, as a problematic outline will lead to frustration and more problems during the actual writing process later on.

The actual writing process can start if you have written a satisfactory outline. Make sure that your supervisor agrees with the outline, as you might have to rewrite large parts of your proposal if you do not consult him/her. You should also add a planning to the outline, with deadlines for your first and final version. To ensure that you discuss your outline with your supervisor, you will have to send it to him/her by email. It is better to spend too much than too little time on this phase, as it will make writing your first draft much easier.

2.6 WRITING A FIRST DRAFT

Writing a first draft starts with the outline you have agreed upon with your supervisor. If written correctly, the outline should be your guide when writing your proposal. It is not recommendable to first read "everything" and to write it down only afterwards. This leads to problems with citing other researcher's work and you will lose out on cross-fertilization between the literature and your text. Usually writing, reading, citing, rewriting, rereading and reformulating of sub-questions go hand in hand. Therefore, do not fear to play around with sections you have written already, it is perfectly normal to discard some parts at a later point.

A pitfall in the actual writing of a proposal is the feeling that there is just too much to do and you have no idea where to start. The best way to tackle this problem is by simply writing (but always keep an eye on your outline), even when your output is not perfect yet. Moreover, if you set small goals during the writing process, you will notice that this overwhelming feeling will disappear rapidly. Another way to help you during this phase is teaming up with another student who is also writing a research proposal or by making an appointment with the Radboud Writing Lab (www.ru.nl/writinglab/english/).

2.7 REVISING YOUR RESEARCH PROPOSAL

Once you have finished your first draft (title, summary, graphical abstract, introduction, actual proposal, timetable and reference list), it is time to revise. First check if your story is coherent and if you yourself can get through the text without any effort. If you have some problems with your own text, a reader is bound to have many more, and revising the problematic parts is important. At this point it is also useful to make sure that the different sections of your proposal are easily discernible, *e.g.* by providing clear headings and subheadings.

After you have checked for the larger cohesion of your proposal, it is time to look more critically at the individual parts. Are your arguments sound and do they contribute in answering your question? Moreover, do the arguments flow logically or are steps missing? At this point it is also a good idea to look at the structure of your paragraphs. Do they have an introduction, body and conclusion as well?

Naturally, other people will spot problems with your proposal more easily than you yourself can. Ask a friend (or another student) to critically look at your work. You can look at his/hers in return and you will see that critically looking at a proposal of someone else will actually help you to critically evaluate yours too. When this peer-review has taken place, critically evaluate the comments.

When revising, it may be useful to leave the proposal for a while, as parts that looked good one day, might actually be less clear the next. It is advisable to revise the entire proposal once more before submitting it to your supervisor for the first time. Of course, revision also includes checking grammar and spelling. Submitting the first, complete version of your review should be done via an email to your supervisor.

2.8 DEFENDING YOUR RESEARCH PROPOSAL

2.8.1 CONVERSATION AND PRESENTATION

After you have revised the final version of your research proposal you should defend it. This can be done either in a conversation with your supervisor or during a seminar of a department in 10 minutes. The audience or supervisor will subsequently have the chance to ask questions and discuss the proposal. Why is your proposed research needed? The way in which you present your proposal and subsequently answer the questions will count towards your grade.

2.8.2 REBUTTAL

Or, after your supervisor has commented on your proposal it is time to revise again. In science, it is common practice for proposals to undergo peer feedback before the final draft is send in. The feedback is collected, and a rebuttal document is written in which the feedback is analysed and addressed. It therefore is an integral part of the writing process and not just accepting all comments and not think that much about the changes you implement. Moreover, always make sure you critically evaluate the comments you get and understand why you got them. To support your thought-process and enable your supervisor to understand the changes you made, you must create a short document ("rebuttal") where you discuss the most important comments of your supervisor and explain why you did or did not implement these. If another student also looked at your proposal, you may incorporate those comments in this document as well. You need to add these rebuttal pages at the end of your proposal.

2.9 SUBMITTING THE RESEARCH PROPOSAL

At this point you have finished your proposal and all you have to do is submit it for grading. To do this upload the final version of your proposal to SPIB (http://thesissubmission.science.ru.nl). If you and your supervisor have reasons to keep your research proposal confidential, please select the option "non-disclosure agreement" (NDA) on the submission page of SPIB. After grading, you discuss the grade with your supervisor and get final feedback.

3. STRUCTURE OF THE RESEARCH PROPOSAL

When writing a research proposal, it is important to stick to the structure that is provided. The structures might vary depending on which program you are writing for. When writing the research proposal, we advise you to follow the structure below. However, your proposal might call for a different approach or your supervisor might decide to use a different form. Therefore, it is important to discuss which format you will use with your supervisor. Notable examples of formats which fit this research proposal are the Radboud PhD call format (appendix 1), the NWO-ENW-M format (appendix 2) and the NWO-ENW-XS format.

Each research proposal must at least comprise of the following:

- A title page (title, name of the author, student number, name of the supervisor, place and date);
- A brief summary;
- A graphical abstract;
- An introduction with:
    - At most 3 pages of theoretical framework;
    - At most 2 pages of discussion of a given research article;
- At most 5 pages of description of the proposed research with:
    - The objective of the research;
    - The approach of the research;
    - The innovation of the research;
    - The impact of the research;
- A timetable of the project;
- A reference list.
- A rebuttal in which you react directly to the most important comments of your supervisor (and peers).

Details about style (tenses of verbs, active/passive voicing, citing styles, etc.) should be discussed with your supervisor.

3.1 TITLE PAGE

This section is mainly meant for easy recognition of your proposal and should contain at least a title, your name and student number, MSc specialisation, the name of your supervisor, place and date. The title itself should cover the content, but also act as an invitation to start reading your proposal. An interesting title is therefore of great importance, but make sure that you do not oversell the contents of your proposal or state claims that are too bold.

3.2 SUMMARY

In the summary (or abstract) you should explain your research proposal in the most concise way. Once again, this section is intended to draw your reader in and ensure that he will read your proposal. The summary must contain:

- Background of your proposed research*, i.e.* why your topic is important;
- Main question of your proposed research;
- Sub-questions that help you to answer your main question;
- Proposed methods and an explanation of these methods;
- Impact of your proposed research;
- And must be enticing to read.

Often the summary will also be presented as a part of the "title page", though this is a matter of personal preference of you and your supervisor. The summary can also be backed up by several keywords that help your reader understand the content of your proposal even better. These keywords should not be present in the title already.

3.3 GRAPHICAL ABSTRACT

The graphical abstract has more or less the same function as the summary, however it is based solely on the description of the proposed research itself. The graphical abstract details the biological principle you will study and how you will do this. Guidelines for graphical abstracts can be found online and differ between publishers as well. Possible examples can be found on:

- https://www.elsevier.com/authors/journal-authors/graphical-abstract
- https://www.cell.com/pb/assets/raw/shared/figureguidelines/GA_guide.pdf

3.4 INTRODUCTION

3.4.1 THEORETICAL FRAMEWORK

The first part of your proposal will be a theoretical framework in which you give the relevant and essential, on topic, background to your proposal. It is important that all the key concepts that play a role in your proposal are introduced. This section should incorporate research articles and reviews, and the synthesis of these texts should logically lead to the next section of the introduction by pointing to an interesting research topic.

3.4.2 DISCUSSING THE PAPER

In this section, you discuss the research article you used as the basis for your proposal. You should explain what the paper "discovered" and what new questions arise from these findings. You do not have to discuss the entire paper, but can focus instead on the figures, experimental procedures and hypotheses, which you have used as the basis of your own proposal.

3.5 DESCRIPTION OF THE PROPOSED FOLLOW-UP RESEARCH

3.5.1 THE OBJECTIVE OF THE RESEARCH

In this section you describe the main scientific objective of the proposal. This scientific object flows logically from the theoretical framework and discussion of the paper in the previous section. State clearly what your central question is, and what sub-questions and hypothesis will lead to answering the central question and give alternative routes of investigation to intercept problems that might arise.

3.5.2 THE APPROACH OF THE RESEARCH

In this section you need to explain how you are going to test your hypotheses. Make sure your experimental set-ups really help to answer your sub-questions and that they are the most elegant way to do so. When describing your methods also think about which model systems you are going to use, experimental parameters and the order of your experiments. Make sure that experiments that can be done in parallel to each other will be planned as such, as experiments are bound to fail and this would derail your project. Therefore, you should discuss possible limitations of your methods and what possible solutions might be. You should also state what you expect your results to be, how you will analyse your data and describe how the results are connected to your research questions.

3.5.3 THE INNOVATION OF THE RESEARCH

In this section you will need to describe the originality and the innovative aspects of your novel research question and the proposed method. You should discuss what you have changed in regard to previous research and how this will further the field.

3.5.4 THE IMPACT OF THE RESEARCH

In this section you will need to describe the importance of your research. You should identify several stakeholders in your research and explain how they will benefit from your research and how the knowledge will be applied both within and outside the field.

3.6 A TIMETABLE FOR THE RESEARCH

In the timetable you should explain how you will structure your project and the order of experiments should fit the central question and sub-questions. A Gannt chart might be useful in visualising this. In this section you should make it clear that the experiments can be carried out during the PhD-project and how the different experiments are (in)dependent from/on each other.

3.7 REFERENCE LIST

Correct referencing of your sources is of vital importance in proper scientific writing. Whatever style you choose, you should keep referencing consistent throughout your entire proposal. Make sure that a reference list is also present at the end of your proposal.

3.8 DEFENCE

3.8.1 PRESENTATION

In presenting your research proposal, the emphasis is not on your presentation skills but should be on the content of the research proposal itself. Therefore, you should select the most important pieces of information to guid your audience through the setup of your proposal. After your presentation, the audience should ask critical questions, challenging your proposal, upon which you can defend the proposal and the choices you have made while writing. This defence will substitute the rebuttal.

3.8.2 CONVERSATION & REBUTTAL

After conversation with your supervisor on the final version of your proposal or comments from you supervisor (and peers) in writing you should critically evaluate the most important comments in a rebuttal. Structure this document with sections for each chosen comment wherein you first cite the comment itself and subsequently explain why you did/did not implement it and how you did this. The rebuttal pages need to be added at the end of your proposal.

These points might help you create an effective rebuttal:

1. Begin the rebuttal by a small paragraph thanking the reviewers for their time and effort, mentioning that their feedback will help improve your writing.
2. Address each and every point raised by the reviewers in a clear and concise manner. If you do not agree with one of the points raised, explain your reasoning behind it.
3. Provide a point-by-point response. Number each of the responses made by the reviewers and respond to them sequentially. Highlight changes and additions you have made to you document so the changes are easy to follow and distinguished. If comments are in formulated into paragraphs, split them into points so you can address them individually.
4. Categorize the comments to help you keep a clear picture and achieve an integrated approach to your response.
5. If a reviewer misunderstood something, clarify your thoughts politely.
6. If you cannot address a comment, explain why you will not do so in a concise and respectful manner. Give scientific based arguments as to why you have chosen not to address this comment instead of personal reasons. Your answer should be clear and logical and backed by evidence.
7. The overall tone used in your rebuttal should be polite and respectful.
8. Conclude your rebuttal by a final formal, polite sentence in which you state your willingness to reflect and make further changes if required.

4. SUPERVISION

In this section you will read about the supervision during your proposal writing process. Be aware of the fact that different supervisors have different styles of supervising; you may want to get a clear understanding of this at the start. This section can mostly be seen as a general guideline.

4.1 THE ROLE OF THE STUDENT

When writing a proposal you are responsible for your own work. This means that you initiate the appointments with your supervisor and come prepared to these appointments. You need to work individually and stick to the deadlines you set. Do not be afraid to make an appointment if you have questions or are stuck as your supervisor is usually more than willing to help you.

It is of critical importance that you communicate clearly with your supervisor, especially if you need to finish your proposal in a short time period in which grading also has to take place. Remember that your supervisor may well be busy and not be able to grade or have an appointment with you on short notice.

4.2 THE ROLE OF THE SUPERVISOR

When writing a proposal, you can expect your supervisor to advise you during your writing process, to help you if you have become stuck and to critically evaluate your outline and first version. To do this, your supervisor will have at least four appointments with you, either via email or in person (see also section 2): (i) to agree on supervision and the broad subject, (ii) to discuss the main question, sub-questions and outline, (iii) to discuss the comments on the first version, and (iv) to discuss your grade and to sign the testimonial. Apart from these four moments, you should also meet once to defend your proposal either in a presentation or during a conversation with your supervisor.

4.3 TIME PATH AND APPOINTMENTS

One possibility is to write your proposal during a four-week full-time period. Please not that you need to make clear appointments with your supervisor so you will not experience any delay. An alternative possibility, for example when you are following other courses in parallel, would be to modify this timeframe in which you will spread the 6EC workload over 6-8 weeks. Please discuss the possibility for a modified timeframe with your supervisor. It is expected that you and your supervisor set deadlines for the outline, first version and final version. This deadline setting will also ensure that your supervisor has allocated time for providing feedback and grading. If you deviate from your deadlines tell your supervisor in a timely fashion. It might also be a good idea to make the next appointment with your supervisor when you are already at an appointment.

4.4 GRADING

Your supervisor will use an online evaluation form (PDF available in the study guide) to grade your research proposal. As you will notice, the weight of the different categories is not specified further, and there is the possibility to add (or omit) a category, when deciding on a specific form or style of the proposal together with your supervisor. It is advisable to discuss grading at an early point in your writing process so you will not be surprised later on. A good moment to do this is when discussing your outline.

4.5 RESIT

In the event that you get a failing grade, you may choose to resit the course with a revised version. You can base the revision on the feedback you previously received on your text and on the feedback belonging to the grading; no additional feedback will be provided by your supervisor. If the revised version is also found failing, you will have to choose a new topic and may change to another supervisor for a next resit. In case of a failing grade, you and/or your supervisor should always inform the course coordinator, who will ensure proper handling of the procedures, which includes a second opinion on the grades.

5. APPENDIX

Appendix 1	***Example of a research proposal format:*** PHD COMPETITION Pre-Proposal application form 2021
Appendix 2	***Example of a research proposal format:*** Application Form – NWO Open Competition Domain Science – M-1, 2020-2021

Appendix 1 Example of a research proposal format: PHD COMPETITION Pre-Proposal application form 2021

1. Details of applicant

Title	Initials	First name	Surname	M/F	MSc programme

Postal address (private)	Email-address	Telephone and fax number(s)

Student number	Date of birth	Place and country of birth	Nationality

2. Secondary education

School type	City and country	Graduation date	Grade average

3. Bachelor's degree (or 'Propaedeuse')

University/College of Higher Education	City and country	Grade average *(and scale)*

Faculty	BSc Programme name	Graduation date

Internship	Location	Supervisor	Grade

4. Master's degree

University/College of Higher Education		City and country	Grade average (up to date of application)
Faculty /discipline		MSc Programme name	Expected graduation date
Internship 1	Location	Supervisor	Grade
Internship 2 (*if applicable*)	Location	Supervisor	Grade

5. Current work experience or previous relevant work experience (if applicable)

Give per appointment: function, period, fulltime or part time.

6. International activities (if applicable)

List activities such as study visits abroad, international cooperation, etc. Mention the calendar period and duration of the visits.

7. Other academic activities (if applicable)

Include, for example, membership of boards, posts on committees and involvement in the organisation of conferences.

8. Research grants and prizes (if applicable)

List any scholarships/grants or prizes you have won.

9. Gaps (if applicable)

If your CV contains large gaps (in time) that you would like to explain, please do so here. Any period of prolonged leave, for example in connection with pregnancy or parental responsibilities, can also be mentioned here.

10. List of publications (if applicable)

Please mention manuscripts with you as (co) author which have been submitted or accepted for publication or which have already been published. Give the author(s), date, title of the publication, journal or series, volume, pages, and (if applicable) publisher and place.

11. Details of intended supervisor(s)

Primary supervisor

The (major part of the) project is performed in the research group of the primary supervisor. The supervisor must be a Radboudumc (junior) Principal Investigator per 01-01-2020. List one name only.

Title	Initials	First name	Surname	M/F	Department	Institute#

#Choose one of the following: Donders Centre for Medical Neuroscience (DCMN) –Radboud Institute for Health Sciences (RIHS) –Radboud Institute for Molecular Life Sciences (RIMLS)

Intended promoter(s) (if different from intended primary supervisor)

Title	Initials	First name	Surname	M/F	Department	Institute#

#Choose one of the following: Donders Centre for Medical Neuroscience (DCMN) –Radboud Institute for Health Sciences (RIHS) –Radboud Institute for Molecular Life Sciences (RIMLS)

12. Title of research idea:

13. Summary of research idea (max 300 words, plus 5 keywords) in layman terms

Word count:

14. Motivation (including match to one of the Radboudumc research themes; max 150 words)

15. Signatures

Theme leader of the intended research Theme

I hereby confirm that this project proposal fits in the research theme focus

Title	Initials	First name	Surname	Research Theme	Signature

Head of the intended Department

I fully support this project proposal and should it be granted agree to embed the awarded PhD position within my department.

Title	Initials	First name	Surname	Department	Signature

Appendix 2 Example of a research proposal format: Application Form – NWO Open Competition Domain Science – M-1, 2020-2021

Part A – Applicant

How to fill out this application form?

IMPORTANT: *When writing your proposal, please take into account that it will be assessed by both expert referees as well as more broadly composed cluster committees and domain wide assessment committees. This application form consists of three parts. In Part A you fill out the basic details of the main applicant. Only name and affiliation are required. Part B is devoted to the scientific proposal, including abstract, summary and a justification for the project budget. Finally, Part C contains additional information which is not immediately necessary for the scientific proposal but contains administrative information aiding the assessment procedure. Only Part A and B will be assessed by the referees and the cluster and domain wide assessment committees. Please adhere to the following rules when filling out this application form:*

- *remove the examples and comments (in italic and blue) before converting the application to PDF and submitting it;*
- *use the Calibri font at font size 9.5 (or similar) and do not change the margins (2 cm in either direction);*
- *each of the three Parts A, B and C should start on a new page;*
- ***no*** *budget table should be included in this application form; please use the separately provided spreadsheet to construct your budget table and upload the pdf of it together with this application form;*
- *the basic details of the proposal (section B.1, incl. abstract and summary) are limited to* ***one*** *page;*
- *the scientific proposal (section B.2) is limited to* ***six*** *pages, which includes figures and tables, but excludes the list of literature references.*
- *it is not allowed to include hyperlinks in M-applications.*
- *NWO signed the San Francisco Declaration on Research Assessment (DORA) in April 2019. DORA aims to call a halt to the irresponsible use of bibliometric indicators in assessing research and researchers (such as the H-index, Journal Impact Factor and citations). It is a global initiative for all research disciplines (for more information about this, see https://sfdora.org/). NWO implements its principles in all instruments. Therefore it is* ***not allowed*** *to mention these and similar bibliometric indicators in M-applications.*

What to submit to NWO through ISAAC?

Upload as a separate pdf:

- *Application form*
- *Budget table*
- *If applicable: letter request for preferential treatment signed by applicant*
- *If applicable: employer's statement when*
  - *preferential treatment is being applied for (including extension clause)*
  - *contract of the applicant does not cover the runtime of the project: guarantee adequate supervision of the to be appointed personnel*

A.1 **Main applicant**

Name (titles, initials, first name, last name):	*prof.dr. J. (Joan) Doe*
Affiliation (university/institute + department):	*University of Discworld, Department of Magic*

Part B – Scientific proposal

B.1 Basic details

*Part B.1 covers some basic details of the application and contains information to aid the scientific assessment of your proposal as it contains both an **abstract suited for your scientific peers** and a **summary for non-specialists in multidisciplinary scientific assessment committees**.*

B.1.1 Title

The title should be clear and concise, and not an explanation. An acronym is optional.

B.1.2 Abstract

*The abstract should summarize the proposed research in a clear way and should be aimed at your scientific peers. Please bear in mind that NWO attaches the abstract to the invitation for referees. **This abstract also needs to be uploaded through NWO's online application system ISAAC.***

B.1.3 Summary

The summary explains your research proposal to the assessment committees which do not necessarily contain experts from your field. The members from the assessment committees are scientists having a background in the research areas covered by the NWO Domain Science.

B.1.4 Keywords

Use any keywords to describe your research proposal. This can aid the referees and committees to quickly understand the broad scope of your proposal.

B.2 Scientific proposal

*While drafting your research proposal keep the assessment criteria from the call for proposals in mind. The two main assessment criteria are "Scientific quality of the proposal" (70%) and "Scientific and/or societal impact" (30%). For the assessment of proposals the basic principle is that the proposals must describe in a clear and concise way **what** will be investigated and **why** the proposed research should be carried out. Committee members judge your M-1 proposal in competition with M-invest and M-2 proposals.*

B.2.1 Research topic

This part of the proposal includes the overall aim, objectives and background. It also deals with the scientific originality and/or the innovative approach of the proposed research and investment, including its cutting-edge aspects and/or groundbreaking character.

B.2.2 Approach

Describe which methods and techniques will be used in the proposed research and discuss their applicability and accessibility. Include a detailed work plan and indicate the duration of the proposed research.

B.2.3 Justification

Discuss the choice for the type (e.g. PhD and/or post-doc) and number of personnel. In case a small investment (up to € 150,000) is foreseen, indicate whether this investment will be developed exclusively for the proposed research, why there is no nearby equipment available that warrants this investment and how the investment relates to the number of researchers using it. Also discuss and motivate your choices for budget decisions. Provide a justification for the budget for knowledge utilization, internationalisation, Money follows Cooperation, and a motivation for an excess in materials budget (if the cumulative total exceeds more than k€ 15 per scientific position per year).

B.2.4 Embedding

Describe how the proposed research and investment fits with the participating researcher(s) and how it benefits from local, national and/or international collaborations. Also indicate how the proposed research and investment fits within the (inter)national science landscape. Remember to comply with DORA. Do not include hyperlinks.

B.2.5 Risk assessment

Discuss feasibility of the research proposal and indicate the possible risks involved with the proposed research, including risks from the methods, techniques, available infrastructure, etc. Indicate how these risks can be mitigated and whether an alternative approach (plan B) exists.

B.2.6 Scientific and/or societal impact

Specify which kind of impact the proposal focusses on and motivate your choice. Please elaborate on all applicable parts of the criteria for the chosen form of impact (see call for proposals).

☐ Primary focus on scientific impact

☐ Scientific and societal impact are of comparable focus

☐ Primary focus on societal impact

Motivation:

Explanatory Notes

The applicant has the choice whether to focus on achieving scientific impact, societal impact, or a combination thereof. It is not necessary to include both types of impact to get a good score for this assessment criterion. A focus on scientific impact, a focus on societal impact, or a combination thereof, can lead to a good score, provided that it is well motivated. On the basis of the referee reports and the rebuttal, the committee will assess whether there are possibilities for impact that are not described in the proposal, and take this into account in its assessment.

Scientific impact is the impact of research on one's own research field, on related research fields or on the broader scientific community. Societal impact can broadly be defined as any cultural, economic, industrial, environmental and/or societal change that is (in part) the result of the knowledge and skills acquired through the proposed research.

B.2.7 Literature/references (in this proposal)

The list of references should be relevant to the research proposal, cited in the texts of section B.2 and only include 'open literature'. It should not include internal documents (such as master theses) nor should it be a mere list of publications of the main applicant. ***This section does not count toward the limitation of six pages.***

Part C – Additional information

C.1 Research areas

Include at least one and at most five research areas applicable to your research proposal. The list of admissible research areas can be found in the last section of the call for proposals. Please indicate for each chosen research area (in percentages) the relevance to your research proposal. Use increments of 5%. The minimum percentage can be 20% and the sum of percentages should not exceed 100%. By using percentages, rather than a ranking of research areas, you can also indicate that some research areas contribute equally to your proposal. For example:

- Theoretical astronomy (25%)

- Inorganic chemistry (25%)

- Geotechnics (20%)

- Subatomic Physics (30%)

Please note that these research areas do not correspond to the discipline codes asked for when submitting your proposal through NWO's online application system ISAAC. The research areas listed in this proposal (submitted as pdf) are used for further assessment of your application (e.g., the distribution of the proposal among the different cluster committees); the codes in ISAAC are not used for any such purpose. ***Please only supply the main discipline in ISAAC.***

C.2 Main applicant – additional information

Name:	*(copy from A.1)*
Affiliation:	*(copy from A.1)*
Position:	*professor / associate professor / assistant professor / other (specify):*
Paid position:	*yes / no*
Type of contract:	*fixed term / tenure track / permanent*
End date of contract:	*dd-mm-yyyy*
Full time or part time:	*full time / part time (1.0/0.8/... fte)*

C.3 Other grant applications

Please indicate below each proposal on the same research topic as the current proposal (to be) submitted to NWO or other funding agencies by you or by members of your research group. Describe the difference (give a percentage) of the current proposal with the other proposals. Running grants do not need to be reported. Please bear in mind that NWO does not fund the same/similar research twice. Copy and paste the table as often as needed.

Title proposal:	*The answer to life, the universe and everything*
Applicant(s):	*prof.dr. J. (Joan) Doe*
Funding agency and call:	*ERC, Starting Grant*
Budget applied for:	*k€ 1.200*
Date of submission:	*1 august 2020*
Estimated date of decision:	*1 may 2021*
Difference with this proposal:	*75% difference*
Describe difference:	*Instead of using Deep Thought we will ask the mice.*

C.4 Public summaries

Include a short (max. 100 words) public summary both ***in Dutch*** *AND* ***in English*** *with a catchy title, which NWO can use in press releases and on their website in case your research proposal gets granted.*

C.5 Questions Data management section

1. Will this project involve re-using existing research data?

- ☐ Yes: From my own or a collaborator's prior research.
- ☐ Yes: Publicly available data.
- ☐ No: Have you considered re-using existing data but discarded the possibility? Why?

If no, please briefly explain why; if yes, state any constraints on re-use of existing data if there are any.

2. Will data be collected or generated that are suitable for reuse?
   - ☐ Yes: Please answer questions 3 and 4.
   - ☐ No: Please explain why the research will not result in reusable data or in data that cannot be stored or data that for other reasons are not relevant for reuse.
3. After the project has been completed, how will the data be stored for the long-term and made available for the use by third parties? Are there possible restrictions to data sharing or embargo reasons? Please state these here.
4. Will any costs (financial and time) related to data management and sharing/preservation be incurred?
   - ☐ Yes: Then please be sure to specify the associated expenses in the budget table of this proposal.
   - ☐ No: All the necessary resources (financial and time) to store and prepare data for sharing/preservation are or will be available at no extra cost.

Explanatory Notes

Responsible data management is part of good research. To promote effective and efficient data management, data sharing and data reuse, NWO expects researchers to carefully manage data resulting from NWO-funded research and prospectively plan for which data will be preserved and shared.

With the data management section, NWO mainly wants to raise awareness about the importance of responsible data management. The section is therefore not included in a committee's decision about whether or not a proposal should be awarded funding. NWO does, however, submit this section to the committee and referees for advice.

It is recommended that you seek advice from a data steward or research support office at your home institution to complete this section. They will be able to recommend suitable storage facilities and repositories for your data, and to advise on data management costs.

After a proposal has been awarded funding, grantees are required to elaborate the data management section into a detailed data management plan explaining how research data and other results emerging from the NWO-funded research will be stored and made findable, accessible, interoperable and reusable (FAIR).

What does NWO understand as research data?

Research data are the evidence that underpin the answer to research questions, and can be used to validate findings. Data can be quantitative information or qualitative statements collected by researchers in the course of their work by experimentation, observation, modelling, interview or other methods, or information derived from existing evidence.

For the purpose of NWO's data management policy, the definition of research data does not include physical objects such as scientific and archaeological collections, physical arts works or biobanks; however, digital information extracted from such objects are to be regarded as research data.

Software is also not included in the definition of research data. NWO recognizes that software (algorithms, scripts and code developed by researchers in the course of their work) may be necessary to access and interpret data. In

such cases, the data management plan will be expected to address how information about such items will be made available.

What data does NWO expects you share and preserve?

Research results should be stored in such a way that they can be retrieved and reused in the long term, also by researchers in disciplines and organisations other than those in which the research took place. The operating principle is that all stored data are, in principle, freely accessible and that access is only limited if needed for reasons such as privacy, public security, ethical restrictions, property rights and commercial interests.

NWO expects researchers to preserve the data resulting from their projects for at least ten years, unless legal provisions or discipline-specific guidelines dictate otherwise. As much as possible, research data should be made publicly available for reuse, unless there are valid reasons not to do so. As a minimum, NWO requires that the data underpinning research papers should be made available at the time of the article's publication. Any tools or software (algorithms, scripts and code developed by researchers in the course of their work) necessary to access and interpret data should be made available alongside the data.

The costs of data management are eligible for funding and should be included in the project budget.

Important factors that determine the costs are:

- *the type of data;*
- *the capacity needed for storage and backup;*
- *the amount of work needed to allocate metadata and the compilation of other documentation such as codebooks and the queries used in the statistical package;*
- *the extent to which the data needs to be protected;*
- *the hiring in of external data management expertise or other expertise.*