

What is a research proposal?

Imagine **you** have an idea.....



A research proposal is a written essay that

- **explains your research idea**
- **sets the frame and describes the area for what the idea is useful for**
- **summarizes the novelty of the research plan**
- **lists the resources you need**

- **Convince** others that the planned research is worthwhile to be pursued

- Provide the necessary **information** about
 - a) Background on the research topic
What do you plan to do? What is known so far?
 - b) Reasons for the research project
Why do you want to do it?
 - c) Plan how to achieve your research goal
How do you want to do it?

- Demonstrate YOUR **knowledge, capabilities and arguments** for pursuing the research idea
 - Novelty of the research plan
 - „Hot topic“
 - High quality of research proposal (clear, convincing etc...)
 - Your personal experience (from courses, studies, internships publications, etc....)

What?

Why?

How?

Why you?

1. Title

2. Abstract

3. Introduction/Background

4. Significance

5. Description

6. Methods

7. Previous results, capabilities,
motivation

8. Reference

9. Timetable

10. Resources

} **Can be
combined**

- **Structure is often defined (DFG, FCI, BMBF)**
- **Almost always page limit!**
- **A lot of chapters interfere with/built upon each other!**
- **Be as specific as possible!**

1. Title

- Concise
- Descriptive
- Catchy (try to omit „An investigation of....“)

Try to raise interest!

2. Abstract

- The most important part!!!!!!!
- Brief summary of the research question/aim and how you want to address it
- Sometimes you can combine it with a Figure (but abstract must be concise without Figure!!!)
- Not exceed 300 words/half a page!

Write the abstract at last!

3. Introduction/Background

What?

- The introduction typically begins with a general statement of the problem area, with a focus on a specific research purpose
- Provide necessary background and context
 - Describe the general area of research
e.g. catalysis, biological chemistry...
 - What has been done before? Short Literature review!!!
e.g. relevant previous articles, if possible from your own group!
 - Identify Key Players!!!
 - Focus (*Zoom in*) your research target
 - Briefly describe the major issues of your research plan

Do not ramble, try to pic only relevant points!

Focus on structure! Cite precisely!!!

4. Significance

Why?

Provide necessary arguments for your research plan

- Position your research („hot topic“, viable area“)

e.g. public interest (*H5N1*, *Mad-cow disease*)

fast developing area (*organocatalysis*)

industrial relevance (*green chemistry*)

- Give answers to : What if successful? Why should one fund it?

Try to convince, but be REALISTIC!

5. Description

How?

- Describe the research you want to pursue.
- Be specific, but do not overshoot it
 - e.g. *total synthesis*: describe the key reactions you are using, but leave out specific conditions (unless optimizing them is part of your idea)

6. Methods

Why you?

- What techniques do you need for this study?
(*Do you have experience for that?!*)
- Do you need help from others? Collaborations?

Try to find a balance between specific details and the big picture!

Include back-up plans at critical points!

- **Mention the limitations and weaknesses of the proposed research, mention solutions!**

Be optimistic, don't let it sound weak! Omit the word „problems“!

7. Previous results, capabilities, motivation **Why you?**

- **Has there anything been done before in your group?**
- **Any specific reason why you should be involved in this research?**

Very important for postdoc application!

Interacts with 4. and 6.!

8. Reference

- **Cite relevant papers, reviews etc. (but read them before!!!)**

9. Timetable

- **In many proposals, a timetable is required.**
- **Assume time intervals for your research based on a conservative judgement, i.e. do not assume the worst nor the best case scenario**
- **Try to overlap timeframes within each step of your proposed research**
- **Do not plan linearly, but progressively!!**

10. Resources

- **Detailed cost calculation**
 - Personal
 - Consumables
 - Investment
 - Travel and Conferences
- **Statement of the homing institution**
 - What infrastructure do you need
 - Are there any other relevant resources
 - Check who has to sign (university officials need time)
- **What other resources do you need?**
 - Cooperation partners (LOI etc.)

How to come up with ideas?

Identify real needs



Read and check the literature

Come up with a potential idea

Discuss ideas! Identifies weaknesses and strong points in papers!

Do not stop after reading literature and understanding it! Ask yourself what's next!

What do you need the proposal for?

Students

- **Requirement for some courses**
- **Some universities: Definite requirement in a Ph.D. program to write and defend a proposal within your second year of studies**
- **Sometimes: Application for scholarships**
- **To familiarize yourself with the process of developing and describing research ideas!!!**

Als Bewerbungsunterlagen sind einzureichen:

- Gutachten des Hochschullehrers, der die Diplomarbeit betreut hat sowie eines weiteren Hochschullehrers, der den Kandidaten aus dem Studium hinreichend beurteilen kann (fachliche und persönliche Qualifikation)
- Begründung des Ortswechsels (ggf. des Wechsels der Fachrichtung)
- Thema und Arbeitsplan der Doktorarbeit [Zusammenfassung und Ziele (1 Seite), Einleitung mit Literaturstellen / Stand der Forschung, geplante Experimente (5-7 Seiten), Zeitplan (1 Seite)]; vom Doktoranden zu erstellen
- Zeugnis mit Einzelnoten über den Hochschulabschluss
- 2 Exemplare der Diplom- bzw. Staatsexamensarbeit oder Masterarbeit

Doktoranden-Stipendium
www.studienstiftung.de

<http://classic.unister.de/Unister/studium/stipendium/index.html>

**Kekule-Stipendium
des FCI**
www.vci.de/fonds

Bei positiver Entscheidung erhält der Bewerber die Aufforderung, für die
Hauptauswahl folgende Unterlagen in zweifacher Ausfertigung einzureichen:

- einen ausformulierten Lebenslauf mit zusätzlicher tabellarischer Übersicht
- ein Exposé des Dissertationsvorhabens mit Angaben zum Stand der Forschung und zu den eigenen Vorarbeiten, zur Methode, zum geplanten zeitlichen Ablauf mit Anführung einschlägiger Literatur
- ein Gutachten eines zweiten Hochschullehrers
- eine Kopie des Studienabschlusszeugnisses
- ein Resümee der schriftlichen Examensarbeit (soweit eine solche angefertigt wurde) auf zwei bis drei Seiten.

What do you need the proposal for?

Ph.D.-Students

- *Applications for scholarships, especially for postdoctoral work (DAAD, DFG, Humboldt, Leopoldina, Marie-Curie EU)*
- *To „stay on track“ and organize your own research*

<http://www.daad.de/ausland/foerderungsmoeglichkeiten/stipendiendatenbank/00658.de.html>

Professors/Group leaders

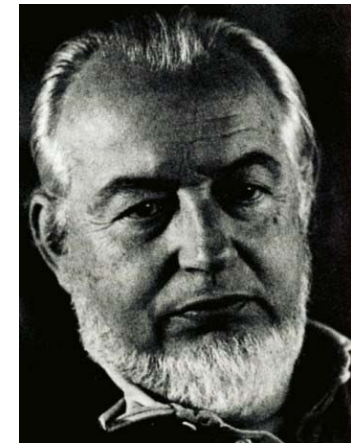
- *To apply for certain positions (junior faculty position)*
- *To apply for certain start-up grants (Emmy Noether, Liebig Stipendium)*
- *To apply for funding at various institutions, funding agencies (FCI, DFG, ERC, Volkswagen-Stiftung, ...)*

**Proposals differ in size and complexity
(but structure is basically the same)!
Differentiate between
research projects and research programs!**

„In den meisten Fällen stellt sich heraus, dass die Probleme nicht etwa deshalb ungelöst bleiben, weil Ihre Lösung zu schwierig gewesen wäre, sondern deshalb weil sie als Probleme überhaupt nicht gesehen wurde. Ich bezeichne das auch als **den blinden Fleck der Forschung**. Anders ausgedrückt: **Die meisten Antworten wurden nicht gefunden, weil man die Fragen, die zu ihnen hätten führen können, erst gar nicht gestellt hat.**“

“In most cases it turns out that the problems remain not unresolved, because your solution would have been too difficult, but because it was not at all seen as problems. I call this the **blind spot of research**. In other words:

Most answers were not found, because the questions, which could have led to them, were not asked at all.”



Hoimar von Dittfurth (1921-1989)

**How to search for something when you do not know
what you are searching for?!**