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Applying for research funding. Part 2 – Writing a grant application

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Abstract

Objective: The process of writing a grant application can be challenging. In this article we summarise key aspects of the process including when to begin, whom to submit to and how to construct a research hypothesis. It is intended that this article will be a useful resource for individuals seeking to embark on research as part of a higher degree.

Keywords

Research, urology, science, grant, application

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Introduction

There's no escaping it – writing a grant application can be a challenging and arduous process. On the other hand, it is also an opportunity to showcase a brilliant idea that could change the future of medicine. Either way, it is a fact of academic life that money must be found to pay for research, and so the process must be embraced.

Typing 'how to write a grant application' into a well-known Internet search engine generated 185,000,000 results in 0.38 seconds,[1] so there's no shortage of advice already available. What follows in this article are a few 'top tips' suggested by the authors, primarily for individuals at the beginning of their academic clinical careers seeking to fund research for a higher degree (e.g. MCh, MD, PhD).

Start early

Developing a research proposal and writing a grant application from scratch takes a long time, and usually needs to be balanced alongside a full-time clinical job. Different funding bodies have very different application forms to complete ranging from a single side of A4 (e.g. Cambridge Cancer Centre[2] and Wellcome Trust Clinical PhD Programme[3]) to approximately 30 A4 pages in the case of the Medical Research Council (MRC).[4] The application process itself can also vary widely among funding bodies, so it is important to have sufficient time to become familiar with these details before starting to write a proposal. In the authors' experience, the process from initial conception of the research hypothesis to final grant submission takes a minimum of three to four months' dedicated effort.

Work closely with your supervisor

The importance of this point cannot be emphasised enough. Your supervisor will know the literature and the key people (i.e. potential reviewers/competition) involved in your research area, and can therefore advise on a) the novelty of your proposal; b) the feasibility of the project; c) potential collaborators and d) getting the right support in place for you to undertake the work. These are all essential factors

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Table 1. Examples of 'person' and 'place' questions to address in the grant application.

	Questions to consider
Person	How suitable are you for the funding?
	Relevance of qualifications/experience to your proposal?
	What is your motivation for doing research?
	Medium/long-term career intentions?
Place	High-impact publications?
	Successful graduate students attaining higher degrees?
	Success rate in securing competitive grant funding?
	Is your supervisor a recognised figure in the field?
	Does your department have appropriate expertise and experience for the project you are proposing?

to address in an application if reviewers are to be convinced that your proposal is worth funding.

The right grant to the right funding body

As discussed in part 1 of this article series (Nelson and Gnanapragasam *J Clin Urol* 2015, article in press), different funding bodies have different research priorities, often based on particular strategic aims of the organisation or in the case of charitable bodies, funding for specified topics linked to an individual benefactor. Take time to carefully read the aims and scope of each organisation to understand where best to submit your application, and how best to align it with their research interests. Ask around to see if colleagues have obtained funding from the organisation to which you are considering applying, and have a look at their application to see the format and content required.

Follow the instructions

It might sound obvious, but read the application instructions carefully before beginning. The formatting, style and requirements of each funding body's application vary widely, so each application must be individualised accordingly. Often careful decisions must be made as to where best to place particular items of information so as to maximise the use of the available word count (which should be carefully observed) and communicate your thoughts as clearly as possible. Different sections of the application will require very different styles of writing and language, especially the 'lay summary'. If required, this will be assessed to determine your ability to communicate your work and its significance to the general public.

The 3 Ps: Person/Place/Project

In broad terms, these are the main things that will be evaluated once your application is under review. It is important that your proposal covers each of these (Table 1). The space to address these points may be very limited in the application form, but it is vital to answer them fully to sell yourself and demonstrate that the place you intend to work can support you.

The Project

Clearly, the project itself will come under intense scrutiny for its novelty, interest, feasibility and relevance to the broader field. Here are a few things to bear in mind:

1. Construct a clear hypothesis – this forms the starting point for the whole proposal, so must be explicitly stated. In the authors' experience, this is the most difficult part of writing a proposal, so it is worth taking time over it and getting input from senior colleagues (Table 2).
2. Describe several clear aims of the research – here you can set out several of the more specific research questions that you intend to use to test your hypothesis. Again, be explicit; for example, 'I aim to determine the incidence of thromboembolic events following radical cystectomy', or 'I aim to discover the role of androgen receptor splice variants in the development of castrate resistant prostate cancer'. Consider having two aims in the project that are very achievable, and a third that might be considered more 'high-risk' that will be more difficult to achieve, but will increase the novelty and impact of your research. The intention is to show reviewers that you are prepared to push the boundaries, take risks and be genuinely innovative.

Table 2. Examples of previously funded research hypotheses.

Successfully funded research hypotheses
HES6 enables persistent growth in castrate conditions by enabling the AR to bind chromatin in the absence of ligand binding.[5]
FGF8 in prostate cancer is regulated by the androgen receptor.[6]
Immunodetection of FGF8b in archival prostate cancer specimens is of potential prognostic value.[7]
Exploitation of the FGF axis contributes to more effective targeting of growth factors in prostate cancer.[8]
Prostate cancer can be classified into distinct molecular subgroups based on integration of copy number and transcript changes.[9]
Subgroups of prostate cancer with distinct genetic features will have different outcomes in terms of relapse-free survival.[9]
Transcript profiling of diagnostic needle biopsies defines therapy-specific biomarkers of outcome in prostate cancer.[10]
Multiparametric MRI improves tumour staging and reduces positive margin rates in radical prostatectomy compared with T2-weighted MRI alone.[11]

AR: androgen receptor; FGF: fibroblast growth factor; MRI: magnetic resonance imaging.

3. Clearly describe the methodology to be used – this will form the basis of how reviewers assess the feasibility of the project, i.e. will the methods described allow you to adequately answer the research aims and test your hypothesis? Descriptions should be detailed and precise but not overly technical so as to be incomprehensible to a reviewer who may not have expertise in that particular area.

The Finances

Depending on which funding body you are applying to, your funding will cover your personal salary (including national insurance and pension contributions), a contribution towards research expenses and possibly an allowance for travel/publication costs. Some will also cover university fees. These funds will be handled through your place of work, so you should contact the financial administrators early in the process, well in advance of the submission deadline. You will need to provide them with recent payslips to determine your salary, and a breakdown of your anticipated costs so they can generate a detailed financial proposal to accompany your application. Your proposal may require a 'sign-off' from senior individuals within your institute before submission, so ensure you leave sufficient time for this.

Check, check and double check – then have someone else check!

Your proposal may be fantastic, but if the application is littered with poor grammar and spelling mistakes, the chances of success will be greatly diminished as these errors will distract reviewers from the important content. Poor writing will also give the impression of sloppiness in your work, which is not the impression you are trying to make. Although style varies from person to person, rarely does the writer get it right the first time. When the text has been completed, it is important to allow time for it to 'mature'. Use a spellchecker; ensuring it is set to the correct dictionary (e.g. American vs. British English). If your proposal contains a lot of technical/scientific language, have someone else who knows the field read it to ensure you have the terminology correct. If English is not your first language, have a native-English speaker check the application too. It is also helpful to find a senior person (ideally involved in the reviewing of grant applications) who has never read your proposal before to read it with a fresh set of eyes. Finally, once the application is finished and ready to submit, put it in the top drawer of your desk overnight and read it again the next morning. You will undoubtedly find further errors of grammar or idiom, which you were unable to spot without a fresh head.

Summary

Writing a grant application is hard work. It is worth bearing in mind that success rates for the major funding bodies are around 20%,[12,13] so anticipate that you will need to submit your application several times to succeed. By preparing well, enlisting the support of senior colleagues and leaving yourself sufficient time, this difficult process instead becomes an opportunity to sell yourself and your project.

Conflicting interests

The Authors declare that there is no conflict of interest.

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