How to write a good research grant proposal

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Abstract

This article aims to provide a step-by-step overview of the process of applying for research funding and will be most relevant to either a new academic joining a group or a young clinician wanting to establish their own research. The article covers the steps involved in preparing, writing and submitting an application. Included is a description of the different types of funding available, how to choose the right funding body, a discussion of the various people who should be involved in developing the research proposal (including the role of patient and public engagement in research) and the sources of support available to help the new researcher take their ideas forward. A checklist is provided to reiterate the key points.

Keywords funding; patient and public involvement; public engagement in research; research grant; research proposal

What's new?

This review provides an update on the process of writing a research grant proposal. As well as being generally updated there are two new topics:

- Evidence of public engagement in research (PER)/patient and public involvement (PPI) is now expected by the majority of funders and this is discussed and some guidance and further reading is suggested
- The impact of any research proposal is now a major issue following its inclusion in the process by which Universities' research is assessed. The review now includes some advice on how to maximize potential impact

This article is aimed at the reader who is a trainee academic, or a young clinician wanting to establish their own research. The authors have a clinical research background but most of the issues in applying for funding are common to both clinical and basic science research.

Preparation

Getting started

Carrying out research is expensive, even the simplest project will entail a lot of man hours whilst for more complex projects the costs can run into millions of pounds in staff and equipment costs. As a result, getting a research idea funded is time consuming, testing and highly competitive.

For those at the start of their career in research there are broadly two types of funding available:

1) Fellowships: These are designed to support the individual to have funded time in order to develop both research skills and, eventually, their own research programme. Depending on the body awarding the Fellowship, exactly what is covered in any award will vary. Some fund an individual's time to work with an established research group and gain training (and perhaps make project grant applications with that group – see below). Others include an element of funding that should enable a project (submitted as part of the application) to be completed during the fellowship and provide the basis of a PhD thesis. Many issues raised in this article are also relevant for Fellowship applications. However one important difference is that the academic strength of the individual applying and the standing of the group with whom he or she intends to work are also important parts of the assessment process for Fellowship applications. Demonstrating that the applicant has some previous research experience and publications will enhance the chances of success. Similarly joining an established and successful research group will also enhance the potential for success compared to an application involving a team without any such track record.
2) Project grants: These are grants designed to fund a specific piece of work. If successful the funds will go to the main applicant and the institution for which he or she works. In terms of the clinician or researcher with an idea that they wish to pursue this is the best route. The emphasis here, in terms of success, is the importance of the topic, the feasibility of the project, its cost and, in the view of those assessing the project, the likelihood of its successful delivery by the individuals involved. The various sections below focus on the issues to be considered when seeking funding by this route although, as mentioned above, many are relevant to other types of application such as a Fellowship.

Get help

This is definitely the first step. The process of getting funding is highly competitive and complex. It is important to have advice through all aspects of the process. The nature of the help required in developing a grant application varies over time and the various types of support needed are discussed below. The best place to start is with an established researcher or research team who are active in the same field. They will be in a position to advise on either how you can work with them to develop a proposal or alternatively assess the best way to take forward your own idea(s).

Defining the research question

Whether the grant application is intended to support your own research idea or is a spin off idea from a group you have joined,

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deciding on "the question" is crucial and needs the most time and thought. The research question will evolve as a result of reflection following a thorough literature review, discussions with the other members of the research team and input from collaborators. The research question will usually also be modified in the light of practical considerations such as numbers of potential study participants and costs. Once the question is set it defines all other aspects of the project from the duration of the project to the data to be collected and how it is to be analysed.

It is important to remember that the question will also be reviewed by those who assess the grant. The reviewers will look specifically at the relevance of the question and the feasibility of the project it defines. The reviewers will also look at the issue of feasibility in relation to the applicants and their previous track record and ask 'Is this the right institution(s) for this research?' Therefore in developing the question it is important to consider the expertise of the applicants and whether the skills of additional individuals are required.

Choice of funding bodies

Identification of funding bodies: every funding body has its own research priorities and it is very important that you read the "scope" of the funding the organization aims to provide. For example, the National Institute for Health Research (NIHR) essentially funds clinical research that is likely in the short term to have an impact on patient care. However the details of the various streams supported by NIHR vary. At the time of writing the NIHR have grants known as NIHR Programme Grants for Applied Research. These support research that will have practical applications for the benefit of patients typically through improved healthcare or improved healthcare delivery that will occur within three to five years of a programme's end. In contrast, the BUPA foundation provide medical research grants for clinically relevant medical research projects aimed at increasing medical knowledge and effectiveness in patient care. It is important to check the maximum amount of support available and the maximum duration of any award as such constraints may further limit the number of suitable funding streams available.

Finding a source of funding

There are a number of online resources which provide lists of funding bodies, for example; the Research Councils UK website (www.rcuk.ac.uk) and the Vitae website (a not-for-profit UK based charity aimed at supporting researchers, https://www.vitae.ac.uk). Funding bodies can be national and international and can be broadly categorised as government funding bodies, learned and professional organizations, charities and trusts and, finally, "Industry".

There are other considerations that may not be immediately obvious. For example in the UK research grants from NIHR bring additional funding to the host NHS Trust and similarly funding from the UK Medical Research Council (MRC) brings additional funds to the host University. Advice from peers, collaborators and your supervisor regarding the most appropriate funding bodies for the type of research is indispensable.

Fellowships: where the application is for a Fellowship many of the same principles apply. Check the type of individual (e.g. clinical vs non-clinical) the Fellowship is designed to support. Check any particular stipulations either about milestones that should have been achieved before applying or that must be achieved whilst in receipt of the Fellowship.

Designing the research methodology

Having decided the question, the broad nature of the project to be undertaken should be clear; however a great deal of detail normally remains. The nature of this "detail" will vary depending on the type of project but some examples of aspects to be considered are given below:

- What type of study: In terms of clinical studies there are a range of study designs. These vary from the gold standard randomised trial to purely qualitative studies. Studies involving mixed methodologies are also becoming more commonplace. If you are part of a research team advice on this sort of issue can often come from individuals within the team. The National Institute for Health Research has funded a network of Research Design Services (NIHR RDS) across England with the aim of increasing the volume and quality of successful research grant applications. They can provide help with aspects of study design as well as some of the issues listed below.
- Public engagement with research (PER): Funding bodies often want details of how patients and the public have been involved in developing the research concept and if not will ask for justification of why not. PER is the involvement of patients and/or the public in the design and development of the study. It is also known as patient and public involvement (PPI). PER is to 'generate dialogue and trust between research and society in order to inspire and inform the public, enhance quality and impact of research and contribute to the future UK economy and well-being of society' (Research Councils UK). The aim is to lead to more relevant research questions, more ethical recruitment procedures, more study participants, and research findings that are more likely to have influence and lead to improvements. Consider involvement of people with particular health conditions, living or working in certain areas, or with interests that relate directly to the research. Local Research Design Services (RDS) often keep details of people willing to be involved or have contacts with local groups and organizations that could be useful.
- Sample size: Sample size calculations are a way of demonstrating that the size of study you are planning has a reasonable chance of answering the question you have posed. To be performed adequately it requires some background information (for example about the estimated rate of an adverse outcome you want to influence). It should be performed with the help of a statistician. Funding bodies typically expect to see a statistician as part of the team or perhaps an individual from another discipline with recognized statistical expertise.
- Consent: In general all research studies involving patients requires the consent of the patient before they are entered into the study. Whilst there are one or two exceptions to this you should proceed on the basis that consent will be