Good Research Practice

The University of Cambridge's Guidelines on Good Research Practice have been developed to emphasise the importance of integrity and rigour in all research carried out at and in partnership with the University. The policy covers openness, supervision, training, intellectual property, the use of data and equipment, publications of research results, and ethical practice.

Table of contents

1.1 Introduction

The University of Cambridge is committed to conducting its business in accordance with the seven principles identified by the Committee on Standards in Public Life (selflessness, integrity, objectivity, accountability, openness, honesty and leadership)1 and is responsible for ensuring that its research is carried out in conformity with current legislation (Council's Statement on Corporate Governance contained in the Abstract of Accounts for the year ended 31 July 2001, Reporter, Special Edition No, 10, 22 February 2002). The University expects all those engaged in research to observe these principles, whether they are employees of the University, or students, and irrespective of the sources of their funding, or their area of research.

This document provides guidelines on good practice in research and is intended for all staff, including persons with honorary positions, and students carrying out research at or on behalf of the University. Research in the biomedical area involving humans and other animals raises specific ethical issues. These are addressed in Section 11.

1.2 General Principles

Sponsored research currently provides one third of the University's total income. Research sponsors cannot be prescriptive about individual approaches taken by

researchers to solving particular research problems. However, sponsors can reasonably expect the University to ensure that an adequate policy framework exists that promotes and promulgates good research practice, that emphasises integrity and rigour in research, and that creates a culture in which the following general principles can be understood and observed. Among the University's leading sponsors, The Director General and Chief Executives of the Research Councils have published a joint statement entitled "Safeguarding good scientific practice" 2 and The Wellcome Trust has published its own policy document entitled "Guidelines on Research Practice".

Charities can only fund research that falls within their charitable objects. Medical charities provide nearly one third of the University's research income and their objects may focus on a particular disease or condition, a range of diseases or more widely, on improving human health through education and research. Charity law imposes certain obligations and restrictions on the use of charitable funds for research, for example a requirement to disseminate research findings, and a proscription on funding research for the purpose of commercial or private gain. Researchers should note these obligations when in receipt of charitable funding regardless of the source, and that these obligations apply to the University itself, which has charitable status.

The Association of Medical Research Charities (AMRC), which represents over 100 medical charities, including The Wellcome Trust, has recommended that its members do not fund research in institutions that do not have in place written procedures describing good research practice and for handling allegations of research misconduct. The AMRC has published guidelines on good research practice and the use of these in formulating this document is acknowledged.

The University's Research Services Division has produced Standard Collaboration and Studentship Agreements that describe its preferred terms of engagement with industrial and other sponsors. The standard agreements are available here. In addition, a statement of the University's policy and procedure on research misconduct, which includes formal written procedures for the investigation of allegations of research misconduct, is available on the Personnel Division's web site.

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2. Integrity

Researchers should be honest in respect of their own actions in research and in their responses to the actions of other researchers. This applies to the whole range of research work, including designing experiments, generating and analysing data, applying for funding, publishing results, and when peer reviewing the work of other researchers. The direct and indirect contributions of colleagues, collaborators and others should be acknowledged. (see Section 10, Dissemination and Publication of Results).

Researchers are accountable to society, their professions, the institutes where the research is taking place, the staff and students involved and, in particular, to the sponsor

that is funding the research. Researchers are expected to understand and apply the following principles:

- Plagiarism, deception, or the fabrication or falsification of results is regarded as serious disciplinary offences
- Researchers are encouraged to report cases of suspected misconduct, and to do so in a responsible and appropriate manner.

The University's approach to managing these issues is described in detail in the policy document entitled "Misconduct in Research".

Researchers should also declare and manage any real or potential conflicts of interest, both financial and professional. The University's Financial Regulations contain further information on the declaration of personal interests.

Areas of potential conflict might include:

- Where researchers have an existing or potential financial interest in the outcome of the research
- Where there is a private or private practice benefit significantly dependent upon the outcome of the research
- Where the researcher's professional or personal gain arising from the research may be more than might be usual for research.

The University's policy on the declaration and management of conflicts of interest and which describes these issues in more detail will be published shortly.

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3. Openness

Whilst recognising the need for researchers to protect their own academic and, where appropriate their intellectual property rights (IPR), the University encourages researchers to be as open as possible in discussing their work with other researchers and with the public. The aim in disseminating charity-funded or University research is to increase knowledge and understanding: its purpose should not be primarily to seek publicity for the researcher, for the University or for the sponsor.

Once results have been published, the University expects researchers to make available relevant data and materials to other researchers, on request, provided that this is consistent with any ethical approvals and consents which cover the data and materials, and any intellectual property rights in them. Procedures for managing the transfer of materials in and out of the University are described on the Cambridge Enterprise website.

Sponsors recognise that publication of the results of research may need to be delayed for a reasonable period pending protection of any intellectual property arising from the research. Any such periods of delay in publication should be kept to a minimum and this should normally be no more than three months.

Researchers should be especially careful when discussing work that is not complete or has not been published, particularly if it has not undergone peer review. Exchange of

confidential information by e-mail is not recommended especially if patent applications are anticipated.

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4. Professional Guidance and Legislation

Where available, the University expects researchers to observe the standards of research practice set out in guidelines published by scientific and learned societies, and other relevant professional bodies.

All researchers should be aware of the legal requirements, which regulate their work noting particularly health and safety legislation and data protection. Detailed information is available from the University's Health and Safety Division and Data Protection web sites respectively.

Legislation that is specific to biomedical research is referred to in Section 11 below.

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5. Leadership and Co-operation

Heads of institutions and their senior colleagues should ensure that a research climate of mutual co-operation is created in which all members of a research team are encouraged to develop their skills and in which the open exchange of ideas is fostered.

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6. Supervision

The University wishes to ensure that appropriate training and direction of research and supervision of researchers is available. Training in supervisory skills is provided as part of the University's overall staff development programme. See Section 7, Training.

Guidance for supervisors includes, advice on frequency of contact, responsibilities regarding scrutiny of primary data, and the broader development needs of research trainees and students.

Supervisors should supervise all stages of the research process, including outlining or drawing up a hypothesis, preparing applications for funding, the design of experimental or research protocols, data recording and data analysis.

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7. Training

The University offers many courses to enable students and new researchers to understand and adopt best practice in research as quickly as possible. Supervisors should encourage students and colleagues to attend relevant courses as part of their overall career development. Lists of courses are available on the Human Resources web site and relevant courses are increasingly available as part of the University's teaching programme (eg: Professional Practice and Ethics, Part1 A, Computer Science Tripos).

The University therefore expects researchers to undertake appropriate training in, for example:

- Research design
- Regulatory and ethics approvals and consents

- Equipment use
- Health and safety
- Record keeping
- Data protection
- Management of intellectual property, including confidential information
- Use of materials requiring statutory registration such as radioisotopes, pathogenic and GM organisms
- Data management
- Obtaining Home Office licences when using animals in medical research
- Involvement of patients and consumers in research
- NHS research governance requirements
- Conduct of clinical trials.

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8. Primary Data / Samples / Equipment

There should be clarity at the outset of the research programme as to the ownership and use of, where relevant:

- Data and samples used or created in the course of the research
- The results of the research
- Patient questionnaires
- Equipment paid for by sponsors.

The responsibilities and procedures for the storage and disposal of data and samples (including compliance with the requirements of any ethics committee) should be made clear at the commencement of any project. Any research collaboration agreement relating to the research should contain clauses describing any necessary arrangements.

Researchers should keep clear and accurate records of the procedures followed and the approvals granted during the research process, including records of the interim results obtained as well as of the final research outcomes. This is necessary not only as a means of demonstrating proper research practice, but also in case questions are subsequently asked about either the conduct of the research or the results obtained. Properly maintained notebooks may be used in evidence when establishing ownership of inventions in the US under their "first to invent" patenting system.

Data generated in the course of research should be kept securely in paper or electronic format, as appropriate. Back-up records should always be kept for data stored on a computer. The AMRC considers a minimum of ten years to be an appropriate period. However, research based on clinical samples or relating to public health may require longer storage to allow for long-term follow-up to occur.

Researchers should report any changes in the direction of sponsored research to the sponsor or any other relevant body. Best practice would be to discuss any change in direction of the research with the sponsor prior to its implementation. The University's Model Collaboration Agreement provides a mechanism for handling this process.

9. Intellectual Property

Researchers must inform the Technology Transfer Office of any intellectual property rights that may arise from externally funded research and also inform the sponsor, if they so request. Full details of the University's approach to managing intellectual property are available on the Cambridge Enterprise website.

The University carries out research and the research councils and charities fund research for public benefit and not for direct commercial or private gain. Public benefit may arise from education, i.e. the gain of knowledge that is placed in the public domain, or in the case of biomedical research improvement in the treatment or care of patients or in the prevention or cure of diseases. Charities cannot support a piece of research solely for the purposes of commercial gain although commercial benefit from the exploitation of the results of the research may accrue to their inventor(s), the University and, by agreement, to any charitable sponsor of the research.

10. Dissemination and publication of results

The University encourages the publication of and dissemination of results of high quality research but believes that researchers must do this responsibly and with an awareness of the consequences of any such dissemination in the wider media.

The University tries to ensure that sponsors understand that researchers must have academic freedom and sponsors should not discourage publication nor the dissemination of research or research findings. The University recommends that every effort should be made to inform the sponsors of any potential publication or dissemination of the research findings. This will enable the sponsor in question to have adequate time and accurate information to protect any arising intellectual property or to plan their own public relations, in conjunction with the University. Publicity may be important to industrial sponsors and to fund-raising charities and is increasingly important to the University itself. Advice on press releases and publicity can be obtained from the University's Office of External Affairs and Communications.

Researchers should take into account the following guidance when publishing or disseminating their research or research findings including any plans they may have to publish or publicise research at conferences or on web sites.

- The sponsor should be notified in advance when the research might be published, publicised or disseminated. The Model Collaboration Agreement describes a procedure for handling this process.
- Researchers should make every effort to make sure research is peer reviewed prior to it being published, publicised or disseminated. If research is placed in the public domain before peer review has been undertaken, the researcher must make this clear in any publicity.
- All funding sources must be acknowledged in any publication or publicity.

- Results of research should be published in an appropriate form, usually as papers in refereed journals.
- Anyone listed as an author on a paper should accept responsibility for ensuring that he or she is familiar with the contents of the paper and can identify his or her contribution to it. The practice of honorary authorship is unacceptable.
- The contributions of formal collaborators and all others who directly assist or indirectly support the research should be both specified and properly acknowledged.
- Examples of goods publication practice can be found in the Committee on Publication Ethics guidelines "Code of Conduct" and on the Nature web site.

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11. Ethical practice in Research involving Humans and other Animals

11.1 Research involving human participants

Approval from the University's Human Biology Research Ethics Committee is required for all research, excluding psychological research, that is funded by AMRC member charities or other sponsors, that involves human participants or human biological samples. Programmes in human psychology require approval by the Cambridge Psychology Research Ethics Committee.

In most cases AMRC member charities expect that the relevant regulatory approval is in place before funding is allocated to a researcher.

The University reminds researchers of the importance of obtaining necessary regulatory approval from bodies such as:

- Human Fertilisation and Embryology Authority
- Gene Therapy Advisory Committee.

In some cases it may be also appropriate to seek the views of relevant patient groups. Researchers should ensure the confidentiality of personal information relating to the participants in research, and that the research fulfils any legal requirements such as those of the Data Protection Act 1998 (see Section 4 above) and of the NHS Research Governance Framework.

11.2 Research involving animals

The University and its sponsors require that research involving animals should have been subject to the following (through the appropriate bodies):

- Ethical Review Process
- Home Office licence application.

Researchers should consider, at an early stage in the design of any research involving animals, the opportunities for Reduction, Replacement and Refinement of animal involvement "The Three Rs". The University recommends that researchers should refer to AMRC's guidelines on 'Promoting good practice in research involving animals'.

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12. Patient aspects / consumer involvement

Researchers should consider and be aware of the active involvement of patients and consumer groups in research and in the dissemination of research findings. It is important that researchers in the biomedical areas consider the impact any publication of research findings may have on patients with the condition under investigation, those involved in their care, those involved in the research and on consumer groups.

Further details about user involvement may be found in the MRC's Clinical Research Governance documents.

Other Useful Sources of Information

1. Social Services Research Group, Code of good practice for research, evaluation, monitoring and review studies in social, housing and health studies
2. The Office of Research Integrity (ORI), USA.
3. Arts and Humanities Data Service, Guides to Good Practice in the Creation and Use of Digital Resources
4. BBSRC Statement on Safeguarding Good Scientific Practice
5. EPSRC Guide to Good Practice in Scientific and Engineering Research
6. ESRC Safeguarding Good Scientific Practice (Annex B in the ESRC Research Funding Guide)
7. MRC Good research practice
8. NERC Research Grants Handbook
9. STFC Research Grants Handbook