QIB Policy on Scientific Integrity

INTRODUCTION

Quadram Institute Bioscience (QIB) has a responsibility to ensure that the funds it disperses are properly spent, in accordance with the law, funder requirements and in the public interest. Researchers have a duty to their profession, to QIB and to research funders, to conduct their research to the highest professional standards.

Policy aims

Research misconduct (as defined below) is least likely to arise in an environment where professional standards and principles of good practice are adopted and where appropriate managerial systems are in place to provide support and oversight. QIB is committed to the maintenance of such an environment through the provision of this policy and through supervision at all levels to ensure good research practice is adhered to.

Who this policy applies to

This policy applies to all staff, students or visiting workers working at QIB, including but not limited to: research, support and administrative staff employed by QIB; staff employed on grants or short-term contracts. Students may also be subject to additional policies of their sponsor or registering University. Students registered at UEA will also be required to adhere to the UEA policy on research integrity: https://www.uea.ac.uk/research/our-research-integrity

The term 'research' as used here refers to all aspects of the research process, including but not limited to: applications for funding; the formulation of a hypothesis; the designing of experimental protocols; the performance of experiments and the generation of data; the recording, analysis, publication and archiving of data; the preparation and publication of experimental designs, data and conclusions; the communication of research to colleagues and the wider community; and the use of experimental organisms and materials.

PROFESSIONAL STANDARDS

QIB researchers must adhere to the following standards of professional conduct:

1. Honesty and fairness: QIB scientists should be honest when reporting on their research, particularly concerning how it is conducted, interpreted and reported, its potential implications, and in acknowledging the work of others.
2. Accuracy and rigour: in conducting, reporting and publishing research, clarifying what the data and conclusions are based on, where they were derived from, and how they can be verified. Proper record keeping of the primary data is essential, as is the fair representation of individual contributions.
3. Accountability to funders and the public.
4. Openness and transparency: Researchers should have no other interest beyond their own scientific integrity and should always be willing and able to account for their actions. Researchers should always be prepared to communicate, analyse, report and question the outcome of their research and to disclose any conflicts of interest.
5. Independence: Researchers are expected to conduct their research with independence and impartiality, in keeping with the environment of academic freedom they work in and regardless of the funder of the research. Researchers should not interfere with the independence of their colleagues or team members.

6. Respect for colleagues and for experimental organisms and subjects, including compliance with relevant research ethics policies and requirements.
7. Co-operation and collegiality in scientific interactions and communications, and in the sharing of resources.

DEFINITION OF RESEARCH MISCONDUCT

QIB researchers are expected to observe the highest standards of professional conduct, outlined above in the proposing, conducting and reporting of research. Any practice or conduct that deviates from ethical and professional standards for these activities will be treated as misconduct.

Research misconduct includes, but is not limited to:

1. Mis-representation, falsification or fabrication of data, including fraud – intentionally misleading or the deliberate false reporting of information.
2. Unacknowledged appropriation of another's work, including plagiarism, piracy, the abuse of confidentiality with respect to unpublished materials, or misappropriation of results, materials or other resources.
3. Conduct that contravenes the professional standards expected by QIB or other relevant bodies, including funders, and that deviates from accepted ethical and professional standards in research.
4. Failure to follow accepted procedures or to exercise due care in avoiding unreasonable risk of harm to colleagues or research subjects or organisms.
5. Mismanagement or inadequate preservation of data and primary materials.
6. Inappropriate conduct in peer review, including failure to disclose conflicts of interest, disregard of the requirement for confidentiality, or the misuse of data for personal advantage.
7. Misrepresentation of involvement or authorship.
8. Improper dealing with allegations of misconduct.

Full definitions agreed by RCUK of misconduct in research and other acceptable research behaviour can be found within the BBSRC Employment Code:

Research misconduct does not include honest error, or honest differences in the interpretation or assessment of data.

However, once an error is detected it is the researcher's responsibility to address the issue and correct the record in a timely fashion. Failure to do so could be construed as research misconduct.

PRINCIPLES OF GOOD RESEARCH PRACTICE

A Critical Approach

Researchers should always be prepared to question the outcome of their research. QIB expects all research results to be checked by Research Leaders. It is important that research can be challenged and tested once published.

Researchers should not become subject to other pressures such that the normal processes of research inquiry cannot be enforced, e.g. via their Research Leader or by constraints imposed by the source of funding of the research. Pressure to produce results that suit the specific interests of a funder must be resisted. This is particularly the case where researchers could be perceived to have a conflict of interest, e.g. where they might have an equity share in the funder, or may hold a position with or be involved in consultancy with the funder. Any such conflict of interest,

whether real, potential or perceived, should be disclosed at the earliest opportunity to the Deputy Director of Science Operations and entered on the register of outside interests.

Documenting Results

Throughout their work, researchers should keep clear and accurate records, in English, of the procedures they have followed, the sources of research material, where archives or collections are located and of the results obtained, including interim results. This is necessary not only as a means of demonstrating proper research practice, but also for effectively responding to questions and concerns, for example, about how research has been conducted, about the results obtained, and about the ownership of the data or results. The proper documentation of lab work and the correct archiving of raw data (see point below) will minimise instances where essential information required for dealing with allegations of research misconduct, such as the original data, have allegedly been lost or cannot be replicated. It is a requirement of QIB that all primary data and relevant analysis, images and documents relating to a publication are held in a specific folder or directory. This makes it easier for all staff concerned with a publication to access the relevant data, have version control on the document and to be able to revisit the data in future as necessary.

Storage and Disposal of Data

Primary data that forms the basis of published work should be securely stored in line with the QIB policy on Data Management. Responsibility for provision of appropriate backup facilities lies with the Research Leader, and it is the responsibility of researchers to use these facilities to ensure all data is appropriately backed up and stored securely.

Publication and report authorship

Authorship is important in the context of good research practice. Authors are generally defined as individuals who have made substantial contributions to the conception or design of the work, and to the acquisition, analysis, or interpretation of data for it; they also contribute to drafting and revising the article for its intellectual content and must approve its final version for publication. Authors must therefore be familiar with the content of the published article and be accountable for all aspects of the work, and for ensuring that questions relating to the accuracy or integrity of any part of the work are appropriately responded to, investigated and resolved. Where co-authors cannot be contacted, or are deceased, it is at the Research Leader's discretion to include them on the paper. However, such inclusion must be made adhering to the highest standards of integrity.

It is critical that Research Leaders appreciate the importance of authorship to their team members and co-authors. Authorship is the primary currency of productivity in science and it can dramatically impact a researcher's career. Therefore, senior/corresponding authors should ensure that authorship and author ranking is distributed in a fair and transparent manner. Pre-arranged authorship deals, e.g. when a team member is promised first authorship prior to the completion of the experiments, should not be made. Conversely, team members should appreciate the importance of authorship to their peers and should not aggressively and unfairly lobby their Research Leader for a position that doesn't reflect their contribution relative to their colleagues.

If a researcher at the Institute is informed of, or discovers for themselves, errors in a published article that they have co-authored that diminish the reliability of the published results or the key conclusions drawn, they must discuss this with the lead investigator of the paper and notify promptly any co-authors and the journal concerned. A rapid correction to the published work should be sought, either in the form of a published correction or a retraction, depending on the circumstances involved.

Collaborators and Partners

Any person who participates in a substantial way in conceiving, executing or interpreting a significant part of the relevant research should be given the opportunity to be included as an author of a publication that derives from that research. The practice of honorary authorship is unacceptable - only those who have participated in the research should be listed as an author. The contributions of formal collaborators and all others who directly assist or indirectly support the research should also be properly acknowledged. This applies to any circumstances in which statements about the research are made, including provision of information about the nature and process of the research, and in publishing the outcome. In accordance with funders requirements and where appropriate, the funders of the research and other collaborating bodies should be acknowledged.

INSTITUTE SUPPORT AND OVERSIGHT

Support and oversight are two key responsibilities held by QIB in support of research integrity. In recognition of this, QIB provides training and oversight to all employees in the following ways.

Training on Research Integrity

QIB will provide an annual workshop for staff at all levels to train them on key aspects of research integrity and publishing ethics.

All newly-appointed scientific members of QIB are required to attend the workshops during their first year of employment at the QIB. Appropriate management action will be taken in relation to any non-attendance.

PROCEDURE FOR REPORTING ALLEGATIONS OF RESEARCH MISCONDUCT

QIB is committed to upholding the most rigorous standards of good conduct to ensure that the highest-quality research is conducted at and published by researchers at the QIB. It will not condone any form of malpractice in the workplace and is committed to creating a safe, fair and honest working environment within the framework of the Public Interest Disclosure Act (PIDA).

Individuals raising in good faith a genuine concern about malpractice, or co-operating in associated investigations, will be protected from any form of retribution or detriment because of doing so, including harassment or victimisation from another employee.

QIB expects and enables employees to speak out when they encounter or suspect malpractice. This is supported by public interest disclosure (whistleblowing) policies available on the HR pages of the intranet. While these procedures provide for the anonymous reporting of allegations, employees are encouraged to make open and specific disclosures to aid any necessary investigation.

Any allegation reported by staff, visiting workers or students will be managed in accordance with the relevant procedure or arrangements applicable to the parties involved. This may include, but is not limited to:

- Research Council Investigating allegations of misconduct in research policy:
- Research Council Whistleblowing policy:
- Research Council Disciplinary Procedure:
- BBSRC policy on good scientific practice

All the above are available from within the BBSRC Employment code. In addition staff are referred to:

- QIB Disciplinary Procedure and Policy – available on the HR pages of the intranet
- QIB Whistleblowing Procedure Policy – available on the HR pages of the intranet

UEA registered students will also be required to adhere to UEA policy on research integrity.

If an individual has a concern about potential research misconduct, they should seek advice on process from the QIB HR Manager and/or the Manager of the Graduate Studies Office if they are a student. Additionally, they may seek advice from their line manager, a Research Leader, Programme Leader, the Director or, in the case of a matter involving the Director, the Chair of the Board of Trustees. In all cases, the concerns should be referred without delay.

Reporting of Outcomes/ Findings
The QIB Board of Trustees considers the issue of scientific misconduct to be of the utmost importance. A full record of allegations will be presented to the Board annually for review.

Additional control measures
In addition to the whistleblowing procedures described above and to introduce further assurance and control, points we will:

1. **Ensure a level of early oversight in experimental planning**. This is aimed at helping IFR meet its ambition of only conducting world-class research and to reduce pressure on researchers.

2. **Undertake a degree of additional quality assurance (QA) and surveillance processes for journal publications**, to help ensure the highest level of scientific integrity and act as deterrence against scientific fraud.

Proposed approval procedure at the experiment planning stage
In general, a starting point of any substantial piece of experimental work should be a written proposal, which:

- describes the scientific hypothesis, primary objectives, and explains how the experiments proposed relate to these;
- contains an outline plan of work with details of the samples to be examined, the resources and facilities needed, what measurements will be performed, and how the data will be analysed;
- is written such that a non-specialist can understand the aims and underpinning science.

In summary, it should contain enough information to allow an effective appraisal process, to decide whether the project has been well-planned and should be approved to proceed. All external funding bodies expect a proposal of this kind as the basis of any grant application. We would expect all PIs to use the Sift A procedure to facilitate the development of a well-planned experimental workplan with sufficient detail to satisfy external peer review. **A written proposal should also be expected as the first stage in planning all large experimental studies <u>funded internally</u> (i.e. using core funds) at QIB**.

The written outline requires an approval procedure before going forward with the work. The following classes of study are subject to formal sign-off procedures:

- **Human intervention studies**. Sign-off at the proposal stage is carried out by the chair of the Human Research Governance Committee (HRGC).
- **Animal research studies.** At the level of a proposed programme of work the scientist must complete a written PPL application following discussion with the Home Office (HO). This

application is then reviewed and signed off by Animal Welfare and Ethical Review Body (AWERB) before submission to the Home Office who have ultimate sign-off.
At the level of a project/set of experiments the scientist completes a written 'Notification of Work' form which details the work they wish to carry out and this must be reviewed and signed-off by the PPL holder before experimentation can commence.

- **All other 'large studies',** intended to mean planned experimental studies that make use of substantial amounts of institute resource. This could be in terms of usage of core facilities (proteomics, metabolomics, etc), or equally in terms of the amount of ISP CSG-funded staff time involved. It could also include studies which are very large in terms of numbers of samples/data collected, and would thus benefit from expert oversight at the planning stage (experimental design, power calculations etc). The sign-off for these proposals rests with the Institute Statistician. This sign-off is not formally required for eternally funded work which is subject to external peer review. However, staff are recommended to seek advice during the preparation of proposals.

Note: The Institute Statistician is involved in the sign-off procedure for animal and human studies

Quality assurance (QA), surveillance and oversight

Like any community of scientists, QIB is not invulnerable to incidences of poor scientific practice. This could take the form of poor statistical analysis or unjustified exclusion of data, but at its extreme, this also includes the fraudulent manipulation or fabrication of data. The discovery of such instances would severely damage the reputation of the scientist(s) involved, and at worst could potentially be career-ending. Furthermore, if fraudulent work was published before being discovered, it would need to be retracted; this would adversely impact on any co-authors, and compromise the international standing of the Institute.

QA procedures at QIB place emphasis on scientific integrity to provide better safeguarding against poor scientific practice and fraud.

Publications

A publication sign-off procedure has been introduced. This sits alongside the IP approval process that requires all publications to be submitted to ipmanagement@quadram.ac.uk. Additional obligations on authors are:

- The lead author must enter the publication details into NBIROS at the same time the IP assessment is made.
- All IFR co-authors must have seen and approved the final draft of the publication.
- **A small proportion of publications**, randomly selected at this point-of-submission stage will be subject to review by the Scientific Integrity Committee. The Committee will be constituted by the Deputy Director Science Operations with membership appropriate to the content of the publication.

The appraisal step involves a detailed review to verify that the publication complies with best practice standards of scientific integrity. It will typically involve author(s) taking the investigator step-by-step through the published work, from raw data to final submitted outputs. These reviews will take some time, but can run in parallel to the journal submission and review process, so that publications are not held up unduly. Retracting an article during the review process, but before publication, will incur far less damage to the Institute's reputation than a post-publication retraction.

To comply with existing data storage policy requirements, data should already be stored for the recommended number of years (as required by discipline). Wherever possible, a set of data should exist in its raw, unprocessed form, irrespective of whether subsequent processed datasets are also stored. See also QIB Data Management Policy.