

RESEARCH INTEGRITY ANNUAL REPORT 2019-20

A Paper by the College Secretary

INTRODUCTION

1. The College is a signatory to the UK Concordat to support research integrity and is committed to maintaining the highest standards of rigour and integrity in all aspects of research, and to meeting its obligations under the Concordat
2. In accordance with these obligations, the College considers an annual report on research integrity and misconduct. This is the seventh such annual report from the Research Misconduct Response Group (RMRG) about the College's support for research integrity. As well as providing an update on the actions taken to support research integrity, and to investigate concerns about research in the last year, this report forms the basis of the annual high-level statement on research integrity to be made to the Council in accordance with the College's commitments under the Concordat. A copy of this annual report will also be published on the College's Research Integrity webpages.
3. In addition to this high-level statements of the actions taken by the College this year, a more detailed statement of the College's framework for research integrity, and its procedures for investigating allegations of research misconduct, is set out in Annex B of this Report.

THE CONCORDAT TO SUPPORT RESEARCH INTEGRITY

4. The UK Concordat to Support Research Integrity, which was first published in 2012, was revised and updated in 2019. The revised concordat includes a clearer statement of the expectations for institutions and researchers, as well as a requirement for increased monitoring of compliance with the concordat and its commitments. In addition to "*maintaining the highest standards of rigour and integrity in all aspects of research*", and "*ensuring that research is conducted according to appropriate ethical, legal and professional frameworks, obligations and standards*" under the revised Concordat, research institutions are now also expected to commit to:

- *supporting a research environment that is underpinned by a culture of integrity and based on good governance, best practice, and support for the development of researchers*

- *using transparent, timely, robust and fair processes to deal with allegations of research misconduct should they arise*
- *working together to strengthen the integrity of research and to review progress regularly and openly.*

5. The College framework for supporting research, which meets the extended commitments under the revised Concordat, is set out in Annex B.

SUPPORT FOR RESEARCH INTEGRITY

6. To meet the Concordat's enhanced training requirements for researchers, the Research Governance and Integrity team as part of the Research Office is developing a dedicated webpage to ensure further engagement in research integrity and a research integrity online training course. The provision of in-house training on research integrity will also enable the College to meet another objective, which is to collect and maintain accurate training records for all researchers. As well as being useful in their own right, these training records will also assist the College in providing information for future audits by research funders. The webpage will also be able to be used as a promotional pamphlet when more staff return to working on campus.

7. The College has this year introduced routine plagiarism checks as part of the submission process for PhD projects, with procedures agreed for the use of Turnitin⁽¹⁾ for Early Stage Assessments for all new students who started this year. This process will also apply for all PhD theses submitted from 2021-22.

RESEARCH MISCONDUCT

8. In 2019-20 the College received five allegations of research misconduct. In accordance with the Concordat the outcome of all cases that are referred for full investigation are reported to the Council. Two cases that were referred for full investigation in previous years have now been concluded, and these are reported on below. In addition, one case has been referred for full investigation this year, although in this case the formal investigation has not yet commenced. Further information on research misconduct cases in 2019-20 is attached at Annex A.

1. Turnitin is the online plagiarism checking system used by the College. The system enables institutions and staff to compare students' work with a vast database of electronic sources including: over 12 billion websites (including archived websites); over 10,000 major newspapers, magazines and scholarly journals; thousands of books; previously submitted student work to other UK educational institutions; essays from cheat sites; and copyright-free material.

9. A common feature of several allegations since 2012, including two in 2019-20, is the inclusion of plagiarised material in manuscripts presented for publication. The two cases this year concerned former students' PhD theses, both of which included material that had either been copied from other students' work, or included without authorisation or acknowledgement. The recent introduction of plagiarism checks as part of the submission process for all PhD theses should assist in reducing such instances in the future.

10. A growing number of allegations concern the manipulation or duplication of data in research papers and proposals, including one of the cases of proven research misconduct reported below. These allegations often centre on the use of western blots.⁽²⁾ To prevent future misuse of these techniques, departments should be clear that the intentional manipulation and misrepresentation of results is research misconduct, and will be treated as such.

11. Disputes over the inclusion or exclusion of researchers as listed co-authors on papers continue to result in a significant number of allegations each year. In order to avoid authorship disputes, departments and principal investigators are encouraged to confirm at the outset that only those researchers who have made a significant intellectual or practical contribution to the work should be listed as a co-author, and that all authors should abide by the College's authorship guidelines.

RESEARCH MISCONDUCT ALLEGATIONS FOUND TO BE PROVEN

12. In 2018, a Research Associate in the Physics Department posted two single author papers on arXiv. A detailed analysis of both papers demonstrated that the papers failed to acknowledge fully the contributions made by other staff and students, even though both were heavily influenced by the ideas and experimental results of other members of staff in the research group. Following the completion of a full investigation, the panel concluded that research misconduct had taken place with regard to the both of the single author papers, in that they had made use of the ideas and experimental results of other members of staff without permission or attribution. The panel recommended that both Journals should be asked to publish corrigenda acknowledging the contributions made by Imperial College staff the RA's current employers be informed of the College's findings. The College is currently in discussion with both journals about the proposed corrections to the papers, although both have thus far refused to take any action on the basis that the author disputes the College's findings and has refused to agree the wording of any corrigenda, despite the clear evidence of proven research misconduct on the part of the author.

2. The western blot (sometimes called the protein immunoblot), or western blotting, is a widely used analytical technique for protein analysis, which can produce qualitative and semi-quantitative data about the protein being analysed. It is particularly useful in the fields of molecular biology, biochemistry, and cell biology. However, western blot images are also susceptible to manipulation and/or falsification, and there are numerous examples of papers having to be retracted or withdrawn as a result of suspect western blot images.

13. In 2019 allegations concerning data manipulation were made against a Professor in the Faculty of Medicine. The main allegations concerned repeated duplicated western blot bands and irregularly spliced gels in several of his papers. It was also alleged that he had manipulated and changed images that had been submitted for a paper in order to make them more consistent with his hypothesis. Given the serious and repeated nature of the allegations, it was agreed to refer them for full investigation by a panel including external representation. Although the majority of the allegations concerning suspect images were dismissed, the investigation found that the separate allegation made about data manipulation was proven. The Panel found that figures had been manipulated to alter their appearance by the introduction of non-contemporaneous results, by the removal of inconvenient results, and by the “normalisation” of results. Furthermore, results had been presented as if they were aggregate independent biological repeats, when they were actually the outcome of single biological experiments performed in triplicate. Consequently, the results were not consistently a summary of multiple biological experiments, contemporaneously performed, and could not be relied upon. The intentional manipulation and misrepresentation of results in this manner was found to be a clear case of research misconduct. A disciplinary case against the Professor concluded in July 2020 with the result that he was dismissed for gross misconduct. As his case has now been concluded, the College is making arrangements for the paper which contained manipulated data to be retracted.

WIDER SECTORAL CONCERNS

14. As noted above, the Concordat to support research integrity, to which the College is a signatory, was revised and updated in 2019. The revisions were, in part, a response to the House of Commons Science and Technology Committee’s 2018 report of its inquiry into research integrity and the effectiveness of controls/regulation (formal and informal) in this area. As well as meeting the additional commitments noted above, institutions will also now be expected to share information on their research misconduct investigations with funders and with UKRI, which is to establish a Research Integrity Committee which is intended to:

“champion best practice and produce an annual report on the health of the sector regarding research integrity. It will check that institutions have complied with terms and conditions of UKRI funding when investigating research misconduct, and provide oversight of UKRI research grant funding by reviewing investigations undertaken by individual research institutions and providing an annual assurance statement. It would apply sanctions if deemed necessary.”

15. Although UKRI’s remit does not extend explicitly to other research funders, UKRI will expect to be informed of almost all instances of ‘alleged research misconduct’, whether funded by the research councils or not, on the basis that almost all research conducted by higher education institutions is underpinned by UKRI’s QR funds.

16. In June 2020 UKRI announced that Dr Helen Munn had been appointed as the Interim Chair for the Research Integrity Committee. It is expected that Dr Munn, who was previously Executive Director of the Academy of Medical Sciences, will refine the scope of the Research Integrity Committee and consult with the sector, before an open recruitment process is instigated for the Committee Chair and members. The creation of an overarching Research Integrity Committee represents a significant change for the sector, as all universities will, in future, have to report all research misconduct allegations, whether substantiated or not, to the new UKRI Committee. There will also be much more scrutiny of the extent to which universities comply with the Concordat. For example, the House of Commons Science and Technology Committee found that in 2018 only 58% of universities complied with the requirement to publish an annual report on research integrity. Under the revised Concordat, all universities will be expected to demonstrate full compliance with its commitments.

17. The revised concordat also includes a commitment that all researchers should be provided with training on research ethics and research integrity throughout their careers. As is reported above, the College's Research Governance and Integrity team in the Research Office is developing a research integrity online training course that will be made available to all researchers, although particular emphasis will initially be placed on providing training for new researchers. In addition to this, UKRIO is developing two online training modules; Introduction to Research Integrity and Research Integrity in Practice, which can be made available for all researchers. It is expected that the development of these courses will be completed by the end of the year, and that they will be rolled out shortly thereafter.

18. The RMRG will continue to engage with these wider sectoral discussions and will monitor external developments in relation to research integrity and misconduct.

John Neilson
November 2020

RESEARCH MISCONDUCT

The following charts show the number of allegations of research misconduct received and the investigation outcomes since 2012, as well as the types of allegations made this year, and since 2012.

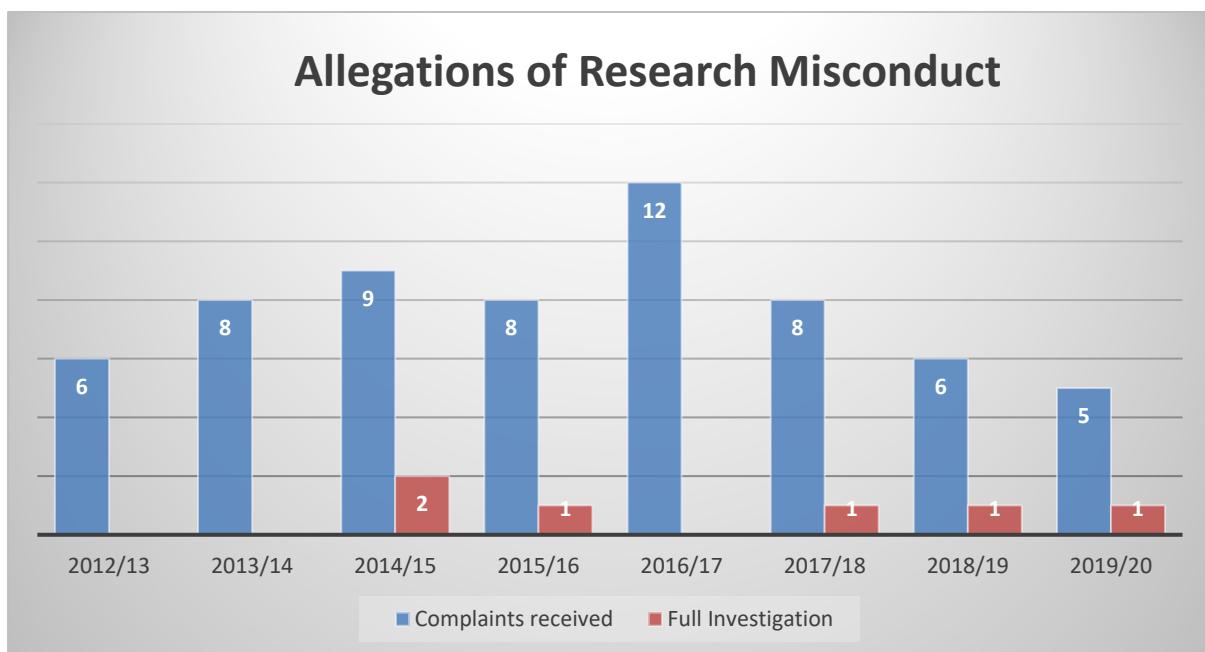


Figure 1. Allegations of research misconduct 2012 – 2020

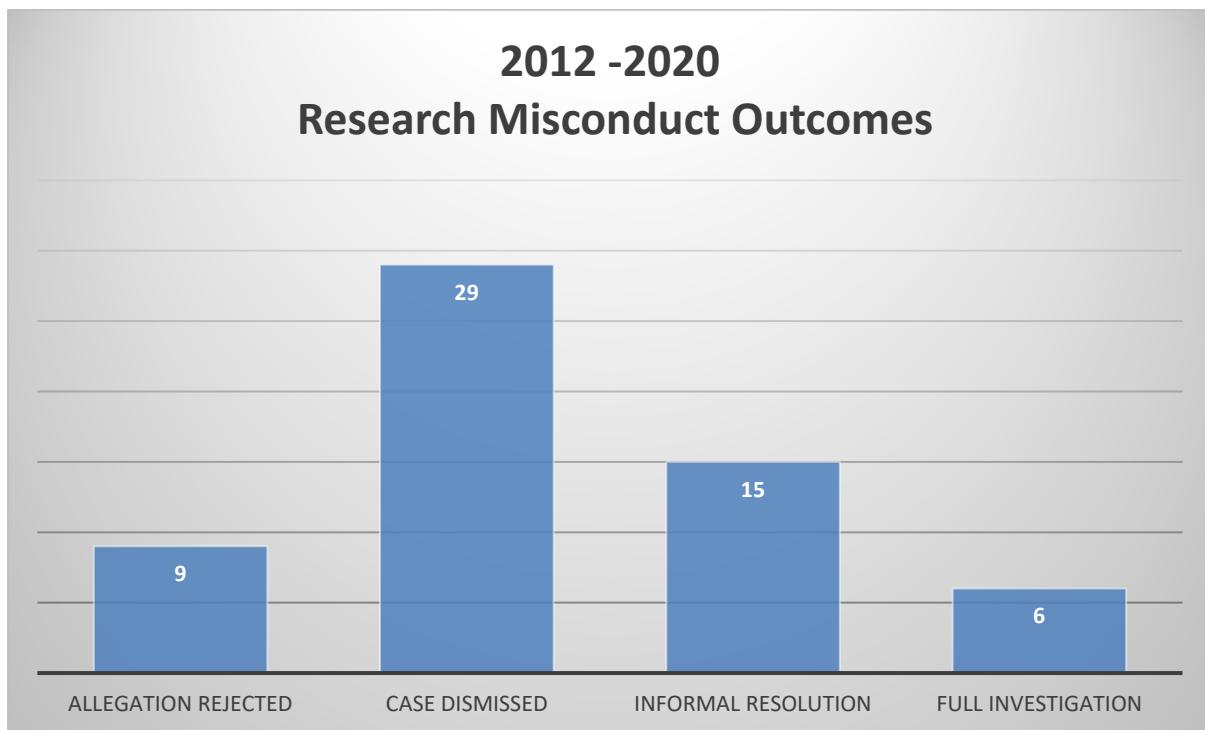
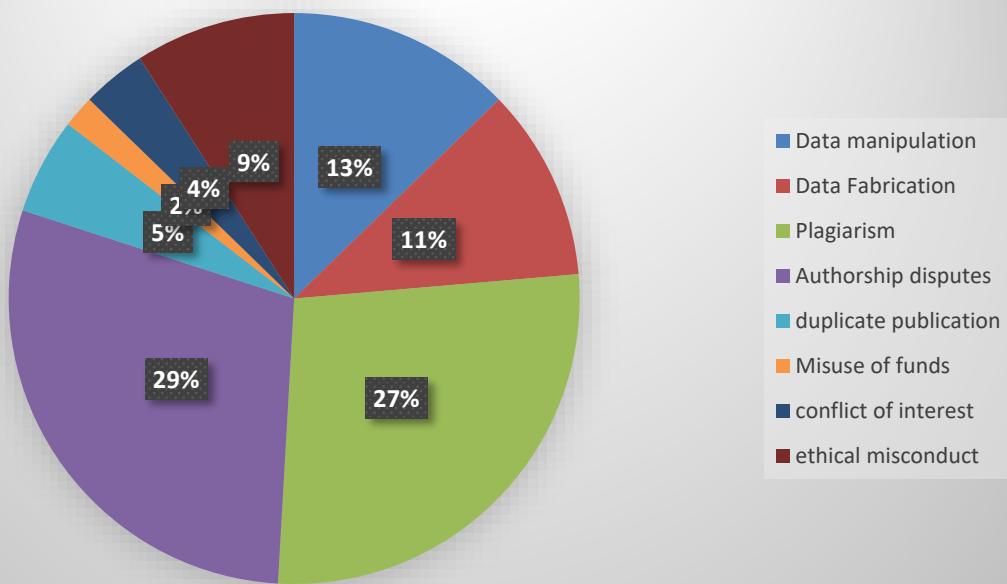
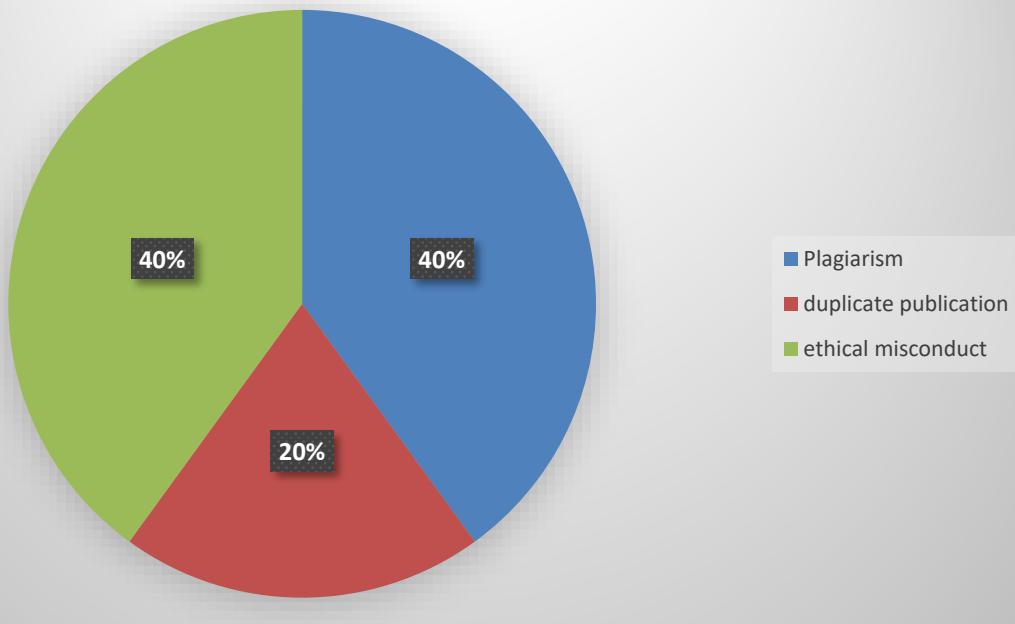


Figure 2. Research misconduct investigation outcomes since 2012.

Research Misconduct allegations 2012-20



Research Misconduct Allegations 2019/20



Figures 3 and 4. Nature of research misconduct allegations made since 2012 and in 2019-20

RESEARCH INTEGRITY FRAMEWORK

1. Imperial College London is a signatory to the UK Concordat to Support Research Integrity, which was first published in 2012, and was revised and updated in 2019. The Concordat seeks to provide a national framework for good research conduct and its governance. All of its signatories, including the College, are committed to:

- *upholding the highest standards of rigour and integrity in all aspects of research*
- *ensuring that research is conducted according to appropriate ethical, legal and professional frameworks, obligations and standards*
- *supporting a research environment that is underpinned by a culture of integrity and based on good governance, best practice, and support for the development of researchers*
- *using transparent, timely, robust and fair processes to deal with allegations of research misconduct should they arise*
- *working together to strengthen the integrity of research and to review progress regularly and openly.*

Accordingly, the College not only provides support, guidance and training for researchers so that research is conducted according to appropriate ethical, legal and professional frameworks, obligations and standards, it also has robust processes in place to deal with allegations of research misconduct when they arise.

2. The revised Concordat also includes the following commitments for research organisations, with which the College also complies:

"Employers of research will:

- *identify a named senior member of staff to oversee research integrity and a named member of staff who will act as a first point of contact for anyone wanting more information on matters of research integrity ensure that this information is kept up to date and publicly available on the institution's website.*
- *provide a named point of contact or recognise an appropriate third party to act as confidential liaison for whistle-blowers or any other person wishing to raise concerns about the integrity of research being conducted under their auspices.*

- *produce a short annual statement, which must be presented to their own governing body, and subsequently be made publicly available, ordinarily through the institution’s website. This annual statement must include:*
 - *a summary of actions and activities that have been undertaken to support and strengthen understanding and the application of research integrity issues (for example postgraduate and researcher training, or process reviews)*
 - *a statement to provide assurance that the processes the institution has in place for dealing with allegations of misconduct are transparent, timely, robust and fair, and that they continue to be appropriate to the needs of the organisation*
 - *a high-level statement on any formal investigations of research misconduct that have been undertaken, which will include data on the number of investigations. If no formal investigation has been undertaken, this should also be noted*
 - *a statement on what the institution has learned from any formal investigations of research misconduct that have been undertaken, including what lessons have been learned to prevent the same type of incident re-occurring*
 - *a statement on how the institution creates and embeds a research environment in which all staff, researchers and students feel comfortable to report instances of misconduct.*

3. The College confirms on its [Research Integrity](#) webpages that the senior member of staff with leadership oversight for research integrity at the College is the Vice-Provost (Research and Enterprise), Professor Nick Jennings; and that the named point of contact for any person wishing to raise concerns about the integrity of research conducted at Imperial College is the College Secretary, John Neilson, who is both the Chair of the College’s Research Misconduct Response Group (RMRG), and the designated person to receive Public Interest Disclosures under the College’s whistleblowing procedures.

4. In accordance with its obligations under the Concordat, the College also considers an annual report on research integrity and misconduct. This report from the RMRG provides the Provost’s Board with a statement of the actions taken to support research integrity, and to investigate concerns about research in the last year, and forms the basis of the annual high-level statement on research integrity made to the Council in accordance with the College’s commitments under the Concordat. A copy of the annual report to the Council is then published on the College’s Research Integrity webpages.

RESEARCH INTEGRITY

5. The College's reputation and success in research are underpinned both by the quality and expertise of the individuals within the College, and by the standards of research governance and integrity that the College expects all researchers to meet. To this end, the College has adopted the Council for Science and Technology's Universal Ethical Code for Scientists and upholds its three principles, which are:

- Rigour, Honesty and Integrity
- Respect for Life, the Law and the Public Good
- Responsible Communications: Listening and Informing

6. The Vice-Provost (Research and Enterprise), Nick Jennings, has leadership oversight for the research environment, including Ethics and Integrity. The Research Office's responsibilities now also encompass an Ethics and Integrity function that has been reviewing gaps in the College's provision in this area. Additional information and guidance on the following areas of research integrity is also made available on the College website:

- Ethics
- Health and Safety
- Research Misconduct
- Equipment sharing
- Animal research
- Authorship
- Open Access
- Data Collection and Retention
- Public Interest Disclosures
- Peer Review
- Conflicts of Interest
- Intellectual Property
- Our Responsibilities

RESEARCH INTEGRITY TRAINING

7. To support research integrity, the College already provides a variety of training opportunities and guidance to its researchers, including e-learning and face-to-face covering a variety of areas of research integrity, including health and safety, academic supervision, intellectual property, the responsible conduct of animal research, data protection, plagiarism awareness etc. In addition to these College's online resources and training opportunities,

new fellows and clinicians are provided with a half-day induction programme that aims to equip the new starters with a wide range of information and tools to help them start their careers at Imperial College. The induction programme includes a specific introduction to research integrity at the College.

8. The revised Concordat to Support Research Integrity confirms that researchers should be provided with training on research ethics and research integrity and that they should also be provided with suitable learning, training and mentoring opportunities to support the development of their skills throughout their careers. In addition, funders are increasingly seeking assurances that institutions are providing training for researchers which can be documented as part of each individual's training record. To meet these new requirements, the Research Governance and Integrity team as part of the Research Office is developing a dedicated webpage to ensure further engagement in research integrity and a research integrity online training course.

9. Over the last year, to make clear policies on ethical review and approval available to all researchers, the Research Governance and Integrity team also reviewed and updated all Standard Operating Procedures and the Terms of Reference for the Imperial College Ethics Service. An ethics awareness talk has now been delivered to all Faculty Research Committees and the aim is now to deliver this talk to each Department. To embed a culture of ethics and integrity throughout the College the Research Governance and Integrity team now also delivers training courses on research transparency, NHS research ethics and Imperial College Research ethics. Yearly training on ethical review has also been implemented for all College and Lay members of the Imperial College Research Ethics Committees.

10. As well as providing training and support for early research staff at the College, advice and guidance on research integrity is also provided for postgraduate students by the College's Graduate School. Its online plagiarism course, which is intended to equip Imperial PhD students with a working knowledge of the concept of plagiarism and how to avoid it, is compulsory for all 1st year Doctoral students and must be completed before the 9 month Early Stage Assessment. A similar mandatory course is also provided for Masters level students.

11. The Graduate School has also developed a Supervisors' Guide, which is available online, and also as a printable handbook. The guide sets out the College's requirements for the continuing professional development of supervisors, and contains information about the recruitment of research degree students, the roles and responsibilities of supervisors and Imperial's research degree milestones. The guide is also intended to support the effective development of student supervisor partnerships, a key part of the effective development of future researchers.

RESEARCH MISCONDUCT

12. Allegations of research misconduct are considered under Ordinance D17, *the Investigation of Allegations of Research Misconduct*, which aligns closely with the requirements of the Concordat and with the UK Research Integrity Office's model procedures for the investigation of misconduct in research.

13. Under these procedures, allegations of research misconduct are made in confidence to the College Secretary, as Chair of the RMRG. The other members of the RMRG are the Vice-Provost (Research and Enterprise), the Director of the Research Office and the Director of HR. If the RMRG agree that an allegation constitutes research misconduct, it will arrange for a screening investigation to be conducted. The purpose of the screening investigation is to determine if there is a *prima facie* case of research misconduct. There are normally three possible outcomes from a screening investigation:

- a. That a *prima facie* case has not been established, in which case the case will normally be dismissed.
- b. If the screening investigation determines that there is some substance to the allegations, but it is judged that they are minor or there is lack of intention to deceive then the allegation may be dealt with through informal resolution.
- c. That there is a *prima facie* case for further investigation. In such cases, the Provost will convene an investigation panel, which must include an independent, external member, to conduct a formal investigation and reach a conclusion on whether the allegations are founded, based on the balance of probabilities. Where an allegation is upheld, it will then be referred to a disciplinary panel, which will determine the appropriate penalty to apply.

14. The Chair of the RMRG, the Director of the Research Office and the Head of Central Secretariat meet on a weekly basis to monitor progress with all research misconduct investigations.

15. In accordance with the Concordat the outcome of all cases that are referred for full investigation are reported to the Council.