



Australia's first criminal prosecution for research fraud

A case study from The University of
Queensland

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Abbreviations & acronyms

CCC	Crime and Corruption Commission
CI	Chief Investigator (at a University)
CMC	Crime and Misconduct Commission
CNCDR	Centre for Neurogenic Communications Disorders Research
ECC	Ethical Clearance Certificate (UQ)
EJN	European Journal Of Neurology
FAC	Funding Application Coversheet (UQ)
Go8	Group of Eight (universities)
MAIC	Motor Accident Insurance Commission
NHMRC	National Health and Medical Research Council
TMS	transcranial magnetic stimulation
UPA	unit of public administration
UQ	The University of Queensland

Chronology

6 April 2011	Article entitled “Treatment of articulatory dysfunction in Parkinson’s disease using repetitive transcranial magnetic stimulation” by Doctor Bruce Murdoch, Doctor Caroline Barwood (both of The University of Queensland), with another researcher, was first received by the <i>European Journal of Neurology</i> (EJN).
26 July 2011	Article accepted by EJN.
September 2011	On the basis of the research described in the EJN article, Doctor Murdoch and Doctor Barwood submitted applications for grant funding to several bodies.
4 October 2011	EJN published the article (online).
16 September 2012	UQ Office of Pro Vice-Chancellor (Research and International) advised of suspected research misconduct involving (then) Professor Murdoch and Doctor Barwood in relation to the research described in the EJN article.
21 May 2013	UQ preliminary investigation established that there is a case to answer of research misconduct.
20 June 2013	UQ reports concerns about Professor Murdoch and Doctor Barwood to the CCC.
25 June 2013	CCC refers the matter to UQ to conduct an internal investigation.
5 July 2013	Professor Murdoch resigned from UQ and consequently loses his title “Professor”. His resignation precluded any disciplinary action being taken against him.
12 July 2013	UQ Academic Misconduct Review Panel was formed to further investigate the issues.
1 August 2013	UQ Academic Misconduct Review Panel commences by interviewing Doctor Barwood and Doctor Murdoch
9 August 2013	UQ requested EJN to retract the article.
3 September 2013	UQ issued a public statement “UQ investigates events leading to retraction” about its request for the retraction of the article in the EJN.
3 September 2013	UQ dis-established the Centre for Neurogenic Communications Disorders Research (CNCDR).
6 September 2013	UQ advised the CCC of the allegations that had been substantiated against Doctor Murdoch and Doctor Barwood.
11 October 2013	Doctor Barwood resigned from UQ. Her resignation precluded any disciplinary action being taken against her.
7 November 2013	UQ issued a public statement “UQ research integrity investigation” about CCC endorsing UQ’s findings from the internal investigation.

20 January 2014	UQ issued a public statement “UQ continues second phase of research misconduct investigation” about the examination of more than 100 published papers associated with Doctor Murdoch and Doctor Barwood.
4 April 2014	UQ issued a public statement “Journal retracts article on UQ advice” about the retraction of an article in <i>Aphasiology</i> associated with Doctor Murdoch and Doctor Barwood.
8 April 2014	UQ referred further concerns to CCC, in relation to falsification of progress reports to a funding body.
28 April 2014	UQ issued a public statement “UQ investigation prompts further retraction” about the retraction of an article in <i>International Journal of Speech-Language Pathology</i> associated with Doctor Murdoch and Doctor Barwood.
6 June 2014	UQ issued a public statement “UQ workshops research misconduct investigations with Go8” about a workshop held with Group of Eight (Go8) universities.
31 October 2014	CCC issued a public statement “University researcher to appear in court on fraud offences” about Doctor Barwood having been issued a notice to appear on the fraud-related offences.
12 December 2014	CCC issued a public statement “Former researcher to face court over alleged fraud” about Doctor Murdoch having been issued a notice to appear on the fraud-related offences.
1 April 2016	Doctor Murdoch convicted and sentenced on 17 charges of fraud and attempted fraud.
27 October 2016	Doctor Barwood convicted and sentenced on 5 charges of fraud and attempted fraud.

Introduction

Science likes to shelter its crooks with euphemisms. The prefix “research” softens fraud, and to deliberately obtain public money through deception gets labelled misconduct, among other things. This reflects the fact that the crime is viewed as being against professional standards rather than against the laws of wider society.¹

The University of Queensland (UQ) received information that (then) Professor Bruce Murdoch may have committed research misconduct. An inquiry commenced in 2013 which concluded that both Professor Murdoch and Doctor Caroline Barwood had a case to answer for academic fraud. In the wake of the inquiry, both resigned their positions at UQ (in the process losing their academic careers), and UQ withdrew Murdoch’s right to the title of Professor.

The initial fraud was perpetrated by Doctor Murdoch in the form of a published article discussing the outcome of research he said that he had conducted with Doctor Barwood. The reported research was never carried out and the article was entirely fabricated. Upon being informed about her status as co-author of the article Doctor Barwood chose not to report the fraud. Instead they used this fabricated research as the basis for fraudulent grant applications from a variety of funding sources.

As a result of the initial investigation, UQ undertook actions including returning research funds awarded on the basis of the fraudulent research and ensuring retraction and correction of research publications based upon these activities.

The media attention at the time of their resignations, and during the subsequent court cases and convictions in 2016, held this matter in the public eye for several years and told of Australia’s first charges and convictions for academic fraud and attempted fraud. Doctor Murdoch was convicted of 17 charges and Doctor Barwood was convicted of 5 charges.

The retracted articles and criminal convictions brought significant reputational harm to Doctor Murdoch, Doctor Barwood and UQ.

Fraud can take many forms, depending on the context. As a general definition, it could be described as deliberately and dishonestly giving or telling something to another person with the intention of misleading them. Under the law both fraud and attempted fraud are criminal offences.

This case of fraud at a university was significant as it was the first time individuals in Australia faced criminal prosecution for conduct of this type.

Although research misconduct is not unknown, the prosecutor noted in his sentencing submission against Doctor Murdoch:

This is an unusual case, if for no other reason that it involved the criminal law extending into the area of what might be called research fraud.²

It is important for researchers to understand when research misconduct may also constitute a criminal offence. The case highlighted several important lessons for both the research community and the public:

- Universities and other research organisations are units of public administration (UPAs) that apply for and receive both public and private funding.

1 Editorial, 4 December 2013, Call the cops: The long arm of the law has reached into an investigation of alleged scientific misconduct in Italy, and should perhaps stretch still farther. *Journal of Nature*, vol 504(7478), p 7.

2 Crown sentencing submission, 15 March 2016, pages 1-7.

- All UPAs are accountable for the management of public funds (and, in the case of universities, the private funding that they receive), and as such are expected to deliver services with integrity and maintain public confidence in their operations.
- All UPAs should have robust internal control and risk management systems.
- Any agency may have a potential high-risk employee, even a senior and highly respected one, who can defraud or corrupt its processes.

Decision to issue a public report

The Crime and Corruption Commission (CCC) does not publish reports on every matter it investigates. Given the significance of this case, the CCC decided to issue a public report on this matter in order to:

- Highlight the drivers, consequences and impact of Doctor Murdoch's and Doctor Barwood's actions – for researchers, the university and those who wish to rely on the research.
- Demonstrate how a university's internal investigation into research misconduct contributed to the successful investigation of the criminal offences.
- Identify the vulnerabilities in the university's governance framework that were exploited and enabled the frauds to be perpetrated.
- Remind all public sector agencies — including universities and other UPAs that carry out or commission research — of the need to ensure that they have robust internal control mechanisms in place that guard against fraud and that these controls cover all areas of business that the agency undertakes including both pecuniary and non-pecuniary activities.

The information in this report is presented based on structures, processes and events existing at the time of the inquiry by UQ and the investigation by the CCC. It is acknowledged that UQ has acted on the recommendations of a 2013 self-initiated independent review to address these issues.

Caveat regarding other researchers

In discussing the conduct of Doctor Murdoch and Doctor Barwood, the CCC emphasises that no adverse conclusions should be drawn about any other researchers at UQ, the staff of the Centre for Neurogenic Communications Disorders Research (CNCDR), co-authors or colleagues of Doctor Murdoch and Doctor Barwood from UQ, or researchers from any other university. The investigations conducted by UQ and by the CCC established that Doctor Murdoch and Doctor Barwood were the sole perpetrators of the frauds and attempted frauds against UQ and the funding bodies.

1 UQ investigation of research misconduct

The UQ research context: an overview

Publications, employment and funding

Publications are a significant part of the academic environment, with researchers expected to publish original articles about their work. For a researcher, publications in peer-reviewed journals build professional credibility and assist in securing ongoing or temporary employment, promotion and pay rises. The ability to attract research grant funds also demonstrates expertise and research leadership in a given field. In addition to benefiting individual researchers, widely published articles promote their university as a centre of excellence in that particular field, which in turn assists in attracting national students and international full fee-paying students, other academics and grant fund providers.

Competition exists amongst researchers, particularly junior researchers, to regularly publish in order to increase the likelihood of continuing employment and promotion. Accordingly, the issues of authorship ranking, number of articles published, impact factor (the frequency with which the article has been cited in a particular year) and ability to attract grant funds are closely interlinked.

Collectively, these pressures are colloquially described as “publish or perish”. These pressures are not unique to UQ researchers; “publish or perish” is experienced sector wide globally.

Grant application process

With the exception of a few specialist funding sources, UQ does not control who can apply for particular grants. The central point at UQ through which grant applications are submitted for consideration by funding bodies is the Research Grants Unit (RGU). This unit is responsible for quality control in terms of making sure applications are complete and correctly filled out but is not responsible for assessing the truthfulness or validity of all the information contained in applications — that is the responsibility of the applicants and the majority of funding applications request the Chief Investigator³ (CI) to certify the accuracy of content of the application at the time of submission.

The majority of funding bodies require grant applications to be submitted via the RGU. Some funding schemes may permit researchers to submit applications directly however it is a requirement of UQ that all applications are submitted through the RGU. However, the RGU may not see all applications. On occasion a researcher may, against policy, forward an application directly to a funding agency without going through the RGU and may also fail to notify the RGU about the submission. Despite this, all successful UQ grant applications are recorded in a database called Research Master administered by the RGU.

As part of the RGU application process, a researcher fills in the UQ Funding Application Coversheet (FAC). It is an administrative two-page form that sets out who will be the CI/s, whether the project needs ethical approval, the funding amount applied for and other relevant information. The Head of School must sign off the FAC but does not make any judgement on the quality of the application. Their role is to affirm that UQ has the facilities, that the applicant has a position with UQ and that if the researcher’s application is successful, they can undertake the project. These arrangements may not apply in instances where the researcher independently applies for funding, and reassurances about matters normally contained within a FAC would be confirmed by UQ prior to entering into a funding agreement. The responsibility for the content of the application being true and complete lies with the applicant.

³ The generic term used in funding agreements to describe the senior researcher responsible for conducting a research project

Funding approval and recording of approval process

If a grant is approved, a funding agreement under which the funds are provided is established with the funding body. Many bodies, including the Australian Research Council and the National Health and Medical Research Council (NHMRC), establish the funding agreement between the funding body and the Administering Institution. Some funding agencies also require the CI to co-sign the funding agreement. Research Master is used to manage the approved grants recording dates for progress reporting and contract variations. Once a grant is approved and recorded a Grant Record Letter is created and forwarded to the CI, relevant UQ department and Central Grants Accounting Unit and the individual school's finance officers. This commences the invoicing cycle and funds are then channelled to the researchers.

Ethics Clearance Certificate (ECC) process

Where research involves human participants or human-related materials (including their personal data and/or tissue) a researcher must apply to a Human Research Ethics Committee (HREC) for ethical review and approval of their proposed project. Upon approval, the HREC issues an Ethical Clearance Certificate (ECC). The application for an ECC includes information on the participants in the research, data (if available), the methodology to be used in the project and an explanation about the proposed project which includes expected outcomes of the research and future use for the anticipated results. Assuming all elements of the application address ethical considerations correctly, the ECC is granted with a unique identification number. Although a researcher is free to seek funding from any source at any time, they cannot commence a project conducting research on human subjects and the funds will not be released by the administering institution until an ECC has been obtained.

Once an ECC is granted, the issuing HREC is responsible for monitoring the project at least annually. Monitoring of projects at UQ at minimum consists of submission of annual and final reporting by the lead Chief Investigator as well as through random site monitoring visits conducted by the Office of Research Ethics.

Standards governing the conduct of research

The following codes of practice and policies, and legislation were in force at the time of Doctor Murdoch's and Doctor Barwood's conduct:

- Australian Code for the Responsible Conduct of Research (2007)
- National Statement on Ethical Conduct in Human Research (2007)
- Code of Conduct (UQ)⁴
- Research Misconduct (UQ)⁵
- Serious Misconduct (UQ)
- University of Queensland Enterprise Agreement 2010–2013
- *Crime and Misconduct Act 2001*.⁶

As UQ is a unit of public administration (UPA) and both Doctor Murdoch and Doctor Barwood were public officers by virtue of their employment by the university, their conduct came within the jurisdiction of the (then) Crime and Misconduct Commission (CMC) and the *Crime and Misconduct Act 2001*.

4 Under section 4.5 of UQ's *Code of Conduct*, "staff who conduct research must comply with the principles of intellectual rigour, appropriate research methodologies and research ethics and must adhere to UQ's policy Responsible Conduct of Research".

5 Under section 13.1 of UQ's *Research Misconduct* policy, all researchers must comply with existing laws, guidelines of regulatory agencies and institutional policies, which includes but is not limited to, the *Australian code for the responsible conduct of research* and the *National statement on ethical conduct in research involving humans*.

6 The allegations giving rise to this report were received by the then Crime and Misconduct Commission (CMC) on 20 June 2013 and 8 April 2014. On 1 July 2014, the CMC became the Crime and Corruption Commission (CCC), with amended legislation, jurisdiction and threshold for referral of allegations. Throughout this report, CCC is referred to.

Background of Doctor Murdoch and Doctor Barwood

Doctor Bruce Murdoch was first employed at UQ in November 1984 as a lecturer in the Department of Speech and Hearing and held a series of progressively more senior positions with the university. Until his resignation in July 2013, Doctor Murdoch was the Director of the Centre for Neurogenic Communication Disorders Research (CNCDR), a research centre located within UQ's School of Health and Rehabilitation Sciences. Doctor Caroline Barwood was first employed at UQ as a research assistant at the Motor Speech Research Unit in 2007. She was a Doctor of Philosophy (PhD) student at UQ and was awarded her doctorate in June 2011. Until 11 October 2013, Doctor Barwood was a research assistant and then a postdoctoral research fellow at the CNCDR, managed by Doctor Murdoch who had been her PhD supervisor.

Publication of a research article on treatment for Parkinson's disease

The European Journal of Neurology (EJN) is the official publication of the European Federation of Neurological Societies, which has registered members from 44 European national neurological societies and represents more than 19,000 neurologists across Europe. The EJN has worldwide circulation.

In March 2011, Doctor Murdoch completed an article entitled "Treatment of articulatory dysfunction in Parkinson's disease using repetitive transcranial magnetic stimulation". The authors were listed as Doctor Murdoch, Doctor Barwood and another researcher. The EJN article stated that 20 patients with Parkinson's disease had participated in the research study and that those who had speech problems had a noticeable improvement after undergoing a particular treatment, transcranial magnetic stimulation (TMS). The data collection (the patient treatment and assessment) was stated as taking place between 2007 and 2009.

Doctor Murdoch submitted the article and author guarantee statement to the EJN on 6 April 2011. In the author guarantee statement he guaranteed, among other things that "There has been no ghost writing by anyone not named as co-author. The manuscript is free from falsification, fabrication and plagiarism." Upon peer review of the article, Doctor Murdoch was requested by the EJN to provide information concerning ethics approval. He resubmitted a revision including a statement of informed consent by the participating patients and stated that ethics approval had been granted by the UQ Medical Research Ethics Committee.

On 26 July 2011, Doctor Murdoch sent an email to the EJN enquiring when he might receive some advice about his article and noted that subsequent grant funding was dependent upon its publication. That day, Doctor Murdoch was informed that the article had been accepted for publication. The article was published online on 4 October 2011.

Subsequent use of the research as the basis for grant applications

Doctor Murdoch and Doctor Barwood referred to the EJN article when applying for grants, as detailed below:

Doctor Murdoch

- In February 2012, Doctor Murdoch applied to and received \$20,000 from Parkinson's Qld Incorporated, a registered charity. Subsequent investigation established that the EJN article significantly influenced the provision of the grant funds.
- In February 2012, Doctor Murdoch unsuccessfully applied to the National Health and Medical Research Council (NHMRC) for \$400,356.

- In May 2011, Doctor Murdoch unsuccessfully applied to the Brain Foundation for \$35,068.91.⁷
- In February 2013, Doctor Murdoch was lead investigator on three applications to the NHMRC for three grants valued \$541,481, \$457,804 and \$405,212.⁸ UQ subsequently withdrew these applications from consideration by the NHMRC on the basis of the findings of the investigation.

Doctor Barwood

- In January 2013, Doctor Barwood applied for and received a five-year Lions Medical Research Foundation Research Fellowship to the value of \$300,000 (\$60,000 per year).⁹ On 9 July 2013 the first payment of \$16,500 was made to UQ.
- In May 2013, Doctor Barwood successfully applied for an Ian Potter Foundation travel grant to attend the 8th World Congress for Neurorehabilitation in Istanbul in April 2014.¹⁰ The application was processed through the UQ Research Grants Unit and approved on 26 August 2013, but the travel grant was never paid to Doctor Barwood.
- In April 2012, Doctor Barwood unsuccessfully applied for a NHMRC Early Career Fellowship to fully fund her paid employment for four years.¹¹
- In May 2012, Doctor Barwood unsuccessfully applied to UQ for the grant of a Postdoctoral Research Fellowship to the value of \$204,245.85.¹²
- In February 2013, Doctor Barwood was associate investigator on three applications led by Dr Murdoch to the NHMRC for three grants valued \$541,481, \$457,804 and \$405,212.¹³ UQ subsequently withdrew these applications from consideration by the NHMRC on the basis of the findings of the investigation.
- In April 2013, Doctor Barwood applied for a four-year Early Career Research Fellowship to the NHMRC to the value of about \$70,000 per year.¹⁴ UQ subsequently withdrew this application from consideration by the NHMRC on the basis of the findings of the investigation.

Uncovering the research fraud

The idea of conducting further research involving TMS and speech disorders was first discussed at UQ in or around May 2011 as a result of Doctor Barwood's PhD and how the methodologies designed during her PhD could be expanded to future research. One staff member first became aware of research involving TMS and Parkinson's disease around that time, when told by Doctor Barwood that Doctor Murdoch had been doing some research involving patients with Parkinson's disease in Hong Kong.

7 The Brain Foundation is an Australian registered charity that funds and promotes community awareness of diseases, disorders and injuries of the brain and spinal cord.

8 The NHMRC applications relied on the research detailed in the EJM article, and contained a number of publications falsely attributed to Doctor Barwood which were designed to add to her credibility by improving her research and authorship history.

9 Although these funds were paid to UQ and not directly to Doctor Barwood, the monies awarded were for support of her salary, not for research costs.

10 Doctor Barwood's application to the Ian Potter Foundation stated: "I will present a podium presentation on research data and methods collected at The Centre for Neurogenic Communication Disorders Research at the University of Queensland. The presentation will focus on brain stimulation techniques combined with traditional therapy to assist speech performance for individuals with Parkinson's disease."

11 This NHMRC application relied on information contained in the EJM paper and a letter from Professor Murdoch who supported Doctor Barwood's assertions.

12 Doctor Barwood's application stated that she had been instrumental in conducting this pilot research. Professor Murdoch acknowledged and supported the application by Doctor Barwood and stated that he was willing to act as her supervisor.

13 The NHMRC applications relied on the research detailed in the EJM article, and contained a number of publications falsely attributed to Doctor Barwood which were designed to add to her credibility by improving her research and authorship history.

14 Doctor Barwood's application stated that she had been instrumental in conducting the pilot research. Professor Murdoch acknowledged and supported the application by Doctor Barwood and stated that he was willing to act as her supervisor. This application also contained a number of publications falsely attributed to Doctor Barwood.

In May 2011, the investigation revealed that Doctor Murdoch invited another researcher to be part of a grant application to the Brain Foundation. That person was told the project was based upon pilot work Doctor Murdoch had conducted in Hong Kong involving the use of TMS in the treatment of speech disorders in Parkinson's disease. The person first became aware of the EJM article in July or August 2011 and was surprised, as they was not aware of any research involving TMS and Parkinson's disease being conducted by researchers based at UQ. Upon reading the EJM article in some detail the person formed the view that there was "something not right" because at that time:

- there was only one laboratory at UQ where the experiments described in the EJM article could have been completed
- neither Doctor Murdoch nor Doctor Barwood had the necessary skills to operate the equipment required
- the laboratory equipment usage logs confirm that it was not used in the way alleged by Doctor Murdoch
- it was impossible for the number of people with Parkinson's disease claimed in the EJM paper to have participated in the project to be tested in the UQ laboratory because the equipment could not be used with the required frequency in order to process that quantity of participants
- that quantity of participants were never seen in the laboratory at the stated time.

Concerns about the research methodology were also raised. The key piece of testing equipment described in the EJM article was not available at the university at the time the so-called research took place. It was not purchased by UQ until 23 July 2008, two days after the supposed completion of the purported testing.

In August 2011, a conference poster was prepared for Doctor Murdoch based upon the EJM article.¹⁵ In or around June 2012, Doctor Murdoch and Doctor Barwood attended a speech pathology conference in Hobart. Shortly after the conference, their poster was hung in the CNCDR. Upon reading the poster and later, the EJM article staff raised numerous concerns about the research, including:

- where and when the research had been conducted
- the methodology described
- the timing of the purported research
- the use of particular equipment and
- the number of people with Parkinson's disease who were stated to have come into the centre for testing during that period.

In September 2012, UQ's Office of the Pro-Vice-Chancellor (Research and International) was advised of suspected research misconduct involving Doctor Murdoch and Doctor Barwood in relation to the research described in the EJM article. UQ referred the complaint to the CCC and was advised to continue their internal investigation and that the CCC would monitor their investigation.

Internal investigation by UQ

UQ examined the ECC referred to in the EJM article and determined that it post-dated the publication of the EJM article and referred to a different recruitment method and research project. For these reasons, this ECC was discounted. UQ cross-checked all research projects for which Doctor Murdoch had been listed as a CI and had been granted an ECC, and each was discounted as the body of work described in the EJM

¹⁵ Posters are used at conferences to display research about which the researcher is not giving a formal presentation. The researcher normally stands next to the poster and attendees are able ask the researcher about particular aspects of their project. It was normal practice within the CNCDR for posters previously used at conferences to be displayed within the centre as a demonstration to visitors about the research being undertaken.

article because the research appeared to relate to different projects, the dates did not align or Doctor Murdoch or Doctor Barwood did not appear as either CIs or co-investigators.

On 3 December 2012, UQ interviewed Doctor Murdoch. Doctor Murdoch identified various ECCs, however, these too were eliminated because they related to other projects. He then stated the research occurred at the University of Hong Kong and produced a forged ECC.

Doctor Murdoch was later directed to supply the participant consent forms related to his research and provided these on 26 March 2013.

UQ commenced a preliminary investigation by an independent researcher which included a review of the EJM article, the ECC for the research project discussed in the article and the participant consent forms. The reviewer's report concluded that Doctor Murdoch had a case to answer of research misconduct because the EJM article discussed a research project which did not appear to have taken place, and that the ECCs supplied by Doctor Murdoch were either subsequent to the publication of the EJM article or related to a different methodology and project. A formal Committee of Inquiry was formed to examine the allegation and first met 1 and 2 August 2013.¹⁶

At this time there was a suspicion that the research project did not occur and consequently nobody participated in the laboratory testing, despite the existence of the twenty participant consent forms. This left open two possibilities; that the research did occur but that the data was "lost" or, that the project did not occur and that no data ever existed. If the second alternative were true it could be concluded that the participant consent forms provided by Doctor Murdoch may not be genuine. To remove doubt about this, UQ arranged to have the forms forensically tested by a handwriting expert. The handwriting expert concluded that six of the twenty participant consent forms could be examined, and that these were either not authored by the person named as the participant or contained a false signature.

The expert assessment provided more information that the research project probably did not occur, that no researcher conducted the project, that there was no patient participation and that the data referred to in the EJM article was fabricated.

Findings of the UQ investigation

The UQ investigation obtained evidence in relation to allegations of research misconduct against Doctor Murdoch and Doctor Barwood. The investigation demonstrated that Doctor Murdoch was able to conduct his fraud despite the oversight provided by the HREC's on-going monitoring arrangements for his ECC.

Fabrication and falsifying research

- University records show that Doctor Murdoch was on leave for significant periods of time throughout 2007 and 2008 when he was supposed to have been conducting the research.
- There was no raw data relating to the research despite a requirement that it be kept for five years post-publication. Further, there was no reasonable explanation as to why it had not been kept.
- The person said to have been assisting Doctor Murdoch in collecting data left UQ in 2008, a year before the data collection was said to be completed. No-one else was identified as assisting Doctor Murdoch in the data collection.
- For the first 12 months of the data collection phase, UQ did not possess a key piece of equipment required to conduct the research described in the EJM article.
- There is evidence that Doctor Murdoch was not experienced in the use of the treatment discussed in the article.

¹⁶ In accordance with Section 7.1 (a) of UQ's Research misconduct policy.

- There was no evidence of advertising for patients to participate in the pilot study as claimed in the article, no record of their attendance, CNCDR staff did not recall seeing any participants attend the centre and there was no data electronically recorded to support the research.

Misleading UQ in relation to ethical clearances

- Doctor Murdoch misled the university (and the EJN) about having obtained the appropriate ECC for the research. He did this by being evasive or misleading about which was the correct ECC, about where the research had been conducted and later by producing a fraudulent ECC.

Fabrication of participant consent forms and records

- Twenty participant consent forms provided by Doctor Murdoch in March 2013 were forgeries. He obtained consent forms from a colleague in relation to a study of her own, which he then used as a template to create consent forms for his fabricated study.¹⁷

Outcomes of the UQ investigation

The UQ investigation established that:

- the research described in the EJN article never occurred
- the co-authors named in the fabricated research paper had no knowledge of the project at the time the article was published
- Doctor Barwood subsequently became aware of her co-author status on the article and, despite knowing that she had not participated in the project, she chose not to report Doctor Murdoch's actions but instead used her status as named co-author to apply for other grants.

Doctor Murdoch and Doctor Barwood resigned from UQ in July 2013 and October 2013 respectively. The terms of the UQ Enterprise Agreement meant that the university could not take any disciplinary action against Doctor Murdoch or Doctor Barwood following their resignations.

Return of funding and withdrawal of grant applications

An internal review of all grant applications prepared by Doctor Murdoch and Doctor Barwood since January 2007 identified that a number of these were possibly fraudulent or had relied upon the EJN paper as part of their track record.¹⁸ The UQ withdrew grant applications and repaid (where applicable) the funding bodies, as follows:

- UQ repaid \$20,000 received from Parkinson's Qld Incorporated
- UQ repaid \$20,000 to the Stroke Foundation
- UQ repaid \$16,500 received from Lions Medical Research Foundation
- UQ removed Doctor Murdoch as a Chief Investigator and rescinded his component of the NHMRC grant application for \$2.5 million to the lead University
- UQ withdrew three 2013 grant applications to the NHMRC led by Doctor Murdoch and on which Dr Barwood was an Associate Investigator
- UQ withdrew Doctor Barwood's 2013 application to the NHRMC for an Early Career Research Fellowship

17 The proper UQ procedure for recording the participation of patients involved in human research requires that their names be entered into a subject assessment book at the time the research is undertaken, which in this instance was purported to be in 2007. The names on the forged participated consent forms were not recorded until March 2013.

18 University of Queensland 2014. UQ continues second phase of research misconduct investigation. Available <www.uq.edu.au/news/article/2014/01/uq-continues-second-phase-of-research-misconduct-investigation>

- The Ian Potter Foundation travel grant money was never paid as Doctor Barwood withdrew from the conference upon her resignation from UQ, and the grant was subsequently cancelled.

Retraction of articles

On 3 September 2013, UQ issued a public statement about its request for retraction of the article in the *EJN*.¹⁹ The article was retracted on 18 September 2013.²⁰ On 20 January 2014, UQ issued another public statement relating to its examination of about 100 published papers that included either or both Doctor Murdoch and Doctor Barwood as authors.²¹

Subsequent advice from the University to journal editors has resulted in four further retractions — one on the basis of falsified statistics, one for failure to conduct research in accordance with ethical approvals and two for plagiarism. Corrections to authors and author order have been published for an additional four papers.^{22, 23}

Changes to the UQ management, reporting and oversight processes

After the discovery of the research misconduct and criminal offences committed by Doctor Murdoch and Doctor Barwood, UQ modified the management, reporting and oversight processes relating to managing research grants and Human Research Ethics and took steps to raise awareness within the research community of the responsible conduct of research. These included:

- progressively rolling out fraud and conflict of interest awareness training to staff and integrity and ethics awareness training to all academic staff
- presenting regular research integrity workshops and seminars to academic and professional staff and research higher degree students across all campuses and faculties
- implementing mandatory research integrity training to all research higher degree students
- presenting biannual research integrity workshops as a component of training to research higher degree student advisors
- sharing its expertise in investigating and preventing research misconduct with other Group of Eight (Go8) universities²⁴
- increasing the staff of the Office of Research Integrity from one to two
- increasing the number of volunteer Research Integrity Advisors from seven to sixteen
- significantly reviewing and strengthening the resources and procedures supporting the ethical conduct of human research at UQ
- restructuring and strengthening financial governance arrangements in the Faculty of Health Sciences by:
 - streamlining and centralising financial reporting arrangement to remove undue influence by the Head of School
 - increasing the oversight responsibility of the Grants Management Office in relation to the expenditure of grants funds.

19 University of Queensland 2013. UQ investigates events leading to retraction. Available: <www.uq.edu.au/news/article/2013/09/uq-investigates-events-leading-retraction>

20 Editor (2013). Retraction statement: Treatment of articulatory dysfunction in Parkinson's disease using repetitive transcranial magnetic stimulation, *European Journal of Neurology*, vol 20(11), p 1497, DOI: 10.1111/ene.12276

21 University of Queensland 2014. UQ continues second phase of research misconduct investigation. Available <www.uq.edu.au/news/article/2014/01/uq-continues-second-phase-of-research-misconduct-investigation>

22 University of Queensland 2014. UQ investigation prompts further retraction. Available: <www.uq.edu.au/news/article/2014/04/uq-investigation-prompts-further-retraction>

23 Editor (2015). Retraction notice: Language abilities of patients with primary progressive multiple sclerosis: A preliminary group and case investigation. *International Journal of Speech-language Pathology*, vol 17(1), p, 96. DOI: 10.3109/17549507.2014.907673

24 University of Queensland 2014. UQ workshops research misconduct investigations with Go8. Available: <www.uq.edu.au/news/article/2014/06/uq-workshops-research-misconduct-investigations-go8>

2 CCC investigation of criminal offences

Referral to the CCC by UQ

On 20 June 2013, UQ first raised concerns about Doctor Murdoch and Doctor Barwood with the CCC. On 6 September 2013, at the conclusion of its internal investigation, UQ advised the CCC of the allegations that had been substantiated against Doctor Murdoch and Doctor Barwood. The CCC began its investigation into possible criminal offences arising out of the research misconduct.

Significance of the case: first criminal prosecution for research misconduct or fraud in Australia

At the start of its investigation, the CCC was unable to identify any previous criminal prosecutions relating to research misconduct or fraud in Australia, although several prosecutions had been conducted in the USA and UK. The CCC formed the view that the dishonest conduct of Doctor Murdoch and Doctor Barwood was not only research misconduct but constituted criminal offences as it involved:

- falsification and fabrication of written information and
- financial fraud, in gaining or attempting to obtain grant funds on the basis of fabricated information, inducing those bodies to provide or pledge in excess of \$1.4 million in grant funds.

Additional offences by Doctor Murdoch identified

After Doctor Murdoch's resignation, the CCC identified irregularities in his dealings with funds provided by the Motor Accident Insurance Commission (MAIC) for ongoing research into traumatic brain injury as a result of motor vehicle accidents. From 1997 until 2012 the MAIC entered into a series of grant funding arrangements with UQ and provided \$250,000 to assist in establishing the Queensland MAIC Research Unit at UQ. In 2008 the funding agreement was renewed, and the agreement was contingent on UQ providing six-monthly progress reports, supported by audited financial statements. The CCC investigation showed that Doctor Murdoch falsified the six-monthly progress reports that he supplied to the MAIC by incorrectly stating and inflating the number of participants who were involved in the study.

Outcomes of the criminal investigation

As a result of the CCC's criminal investigation, Doctor Murdoch was charged with 17 criminal offences:

- two counts of fraud, for publication of an article which he knew to be false, and for dishonestly inducing Parkinson's Qld Incorporated to give the University \$20,000 in grant funding
- three counts of attempted fraud, for attempting to dishonestly obtain for Doctor Barwood two early career fellowships and one post-doctoral research fellowship
- four counts of attempted fraud for attempting to dishonestly obtain project grants
- six counts of falsifying records (the MAIC progress reports) with intent to defraud
- one count of forgery of 20 participant consent forms with intent to defraud, and
- one count of uttering (publishing) 20 participant consent forms with intent to defraud.

Doctor Murdoch pleaded guilty to all 17 criminal offences and was sentenced to two years imprisonment, wholly suspended for four years, with a conviction recorded. Doctor Murdoch repaid to

UQ \$20,000 in restitution of the funds which had to be repaid by the university to Parkinson's Qld Incorporated. In sentencing Doctor Murdoch, Judge Privitera noted:

Now, in relation to sentencing, there is no precedent that's been placed before the Court, and no similar case that the court has been able to find ... which suggests that the offences are by no means prevalent and extremely rare, this seeming to be the only case that has come before any Court in this country. The offending is serious, because you were in a position of trust, which you abused. You – your false research was such as to give false hope to Parkinson's researchers and Parkinson's sufferers. Good funds, in the form of \$20,000, were used and may have been better used for more legitimate projects.

The research laboratory at the University of Queensland was unable to continue to operate, and there were flow-on effects to persons involved in or working at that laboratory. The reputation of the University of Queensland was significantly damaged. Your own reputation was trashed.²⁵

Doctor Barwood was charged with 7 criminal offences. Following a jury trial, Doctor Barwood was convicted on two counts of fraud and three counts of attempted fraud (in relation to her applications for funding from various bodies), with two counts held over. She was sentenced to two years imprisonment (wholly suspended for three years), with convictions recorded. In sentencing Doctor Barwood, Judge Martin noted that:

The offences of which you have been convicted involved your applying for funding from various bodies, which applications included some entirely false representations. You repeatedly asserted that you had performed an integral role in a pilot study. As it turned out, the asserted pilot study never existed. ... Your motive in this offending was to enhance your chances of successfully applying for the funding. Of course, this was at the potential expense of the many other applicants making honest applications in relation to limited funds available.²⁶

25 Transcript, R v Murdoch [2016] Magistrate Privitera, 31 March 2016, p 2 line 38 – p 3 line 4

26 Transcript, R v Barwood [2016] QDC Martin SC DCJ, 25 October 2016, p 2 line 9-18

3 Prevention of research misconduct or fraud

Drivers and vulnerabilities

This investigation of research fraud highlights the challenging environment that researchers can face under the expectations that they publish regularly and succeed in obtaining grant funding. These are core expectations of researchers but for some, can become the key drivers of research misconduct or fraud. It is important, therefore, that the potential impact of these pressures be part of ongoing conversations around research integrity and accountability in the Queensland public sector.

The UQ and CCC investigations found that a senior researcher with an internationally respected reputation committed research fraud and in the process contributed to the demise of a fellow researcher's career. Doctor Murdoch's actions also resulted in the closure of the centre where he was the director and head of discipline (the UQ CNCDR). Additionally his actions corrupted the ECC process, may have embarrassed a major international publication, undermined the reliability of the peer review process, damaged the trusting relationship between a number of grant funds providers and the university and highlighted the risk of funding bodies being defrauded by dishonest grant applications.

Publish or perish

The reasons for the frauds committed by Doctor Murdoch and Doctor Barwood were not disclosed during the CCC investigation. However, this investigation revealed the strong interrelationship between working on research projects, publishing peer-reviewed articles, attracting grant funds, professional advancement and the reliance on each of these for employment.

It is understood that performance-based competitive arrangements tend to produce consistently high results over time. Due to the competitive nature of research and the quest for diminishing research funds, the "publish or perish" cultural model has developed incrementally over time within universities and may for some result in unintended consequences. The CCC's experience with the underlying drivers of corrupt conduct reveals that where an individual's ability to support themselves and their family is in jeopardy or their desire to achieve career advancement advocates dishonesty, a deliberate choice to act corruptly in order to achieve these results is, to some, a tempting choice.

Competition and pressure to apply for grant funds

As a general statement, dishonesty at any stage to progress work is corrosive. Senior staff may be strict when supervising subordinates about completing work with ethical integrity, creating work records that accurately reflect events as they occurred, and accurately capturing and reporting those results. However, it sends mixed messages if a senior staff member appears to tolerate or engage in dishonesty in their daily work and in their reports to management or external stakeholders. A possible driver for the acceptance of dishonestly completing daily work or reporting to others is to appear to exceed service delivery key performance indicators or to outperform co-workers. However, this is lying, and it should never be accepted in the workplace or elsewhere.

This investigation revealed that Doctor Murdoch, a highly experienced and well regarded professional, systematically lied in research project progress reports and grant fund applications in order to secure the continual flow of funds. In sentencing Doctor Murdoch Magistrate Previtera said:

The falsification of records charges relate to the falsification by you of progress reports required to be provided by University of Queensland to the Motor Accident Insurance Commission, pursuant to a funding agreement between those two bodies as to – and the falsification related to the number of participants engaged in the research project.

You then relied upon the falsified research when making subsequent unsuccessful research grant applications for significant amounts of money, including money to fund further research into the false initial published research paper, and you also supported grant applications made by the co-author Dr Barwood for, again, significant funding sums in relation to grants which were unsuccessful, and your assistance or support included falsifying her author history.

The investigation revealed that Doctor Barwood was assisted by Doctor Murdoch and she too lied in grant fund applications. These were self-serving actions without appropriate merit. In sentencing Doctor Barwood Judge Martin said:

Your motive in this offending was to enhance your chances of successfully applying for the funding. Of course, this was at the expense of the many other applicants making honest applications in relation to limited available funds.

Lack of oversight

Universities are complex institutions working in highly competitive markets. All organisations responsible for administering multi-billion dollar budgets and employing large work-forces must have reporting mechanisms and internal governance arrangements that require a corporate level of accountability that will integrate all relevant laws within those arrangements. These are fundamental to maintaining high levels of confidence in the administration of the system. Integrity in the following processes is paramount to ensure accountability by researchers:

- grant fund applications
- ethics applications
- declaring and managing conflicts of interest
- project reporting
- grant funds expenditure and reporting
- data retention and publication
- inception to publication tracking of research projects.

This investigation reveals that the grant application process, including the article citation process that supports grant applications, is open to being corrupted. At UQ quality control does occur when the Head of School, or the Executive Dean, endorses applications by their staff. But the claims made by applicants at both the application and publication stages, not unreasonably, rely heavily upon the honesty and integrity of each academic, as well as on local controls and a global peer-review system. UQ also monitors approved ECCs through the Office of Research Ethics as a means of ensuring compliance by the CI with the conditions set out in the ECC. But this monitoring process would ensure that the mandatory reports were submitted, not validate the claims made in those reports or how the funds were used. In this instance, the quality control in the application process broke down and this needs to be addressed in order to ensure the ongoing integrity of the process.

Universities must determine how to deal with the conflict between appropriate vetting to deter and detect fraud, the costs associated with such vetting and the likely consequences on the timeliness of applications. Thorough vetting to ensure quality control of claims made in application documents, even if possible, would be costly and time consuming to implement due to the sheer scale and complexity of applications lodged each year, which would delay the application process.²⁷ Scientific claims made in applications are unable to be verified unless the data being relied upon is independently reproduced; and this is considered to be an improbable requirement.

It is acknowledged that this is a complex process requiring a balanced approach in order to address these competing interests. Notwithstanding, the CCC is of the firm view that the criminal outcomes of

²⁷ UQ is a global top 50 university which publishes approximately 9,000 scholarly articles per annum across a wide range of specialities and submits greater than 3,000 funding applications per annum.

this investigation and the reputational harm associated with this matter means that universities must consider these competing interests and find ways to implement effective controls.

Prevention of research misconduct and fraud

It is acknowledged that corrupt actions will occur from time to time. While pressures do not excuse corrupt behaviour by public officers, they do help to target prevention and oversight efforts. In anticipation, UPAs must rigorously oversight the actions of their employees to ensure accountability, maintain integrity and appropriately manage the resources allocated to them. This can be done by learning from the outcome of investigations, taking both a systematic and a creative approach to identifying the possible avenues for corrupt conduct to occur, and taking appropriate preventative measures.

The CCC considers that some of the actions of Doctor Murdoch and Doctor Barwood, such as making false claims in grant applications and falsifying project progress reports, may have been preventable. However, it is acknowledged that writing an article about a fabricated research project and submitting it for publication were actions entirely outside UQ’s approved systems, and would have been very difficult to identify at the time. This investigation demonstrates that actions previously considered highly unlikely are now possible and universities are urged to anticipate these in their fraud, corruption and misconduct control planning.

Table 1 outlines vulnerabilities and a range of prevention measures that universities could consider implementing to build resistance to research misconduct and fraud. Failing to implement prevention measures to address these vulnerabilities may mean administering institutions become a signatory to funding agreements based on falsehoods and funding organisations may inadvertently direct research funding to unworthy projects.

Table 1. Vulnerabilities and prevention measures

Issue	Systemic vulnerabilities	Prevention measures
Quality and integrity of research	<p>Chief Investigators are responsible for reporting their progress and success</p> <p>Academic culture and norms</p> <p>Difficult to verify whether research occurred</p>	<p>Conduct training to improve understanding of the legal obligations of the CI regarding research misconduct and fraud</p> <p>Conduct integrity and ethics training which is aligned to informing staff about their obligations to infuse their daily activities with the requirements contained in their employer’s policies and procedures</p> <p>Conduct organisational culture training to embed understanding of and commitment to the institution</p> <p>Ensure research and funding reports do not rely only on information provided by the CI</p> <p>Increase access to data and information upon which the research is based</p> <p>Audit research processes, use of labs, machines and other technology and ethics documentation</p> <p>Obtain third-party or organisational verification of research output</p>
Administering institution management and oversight	<p>Administering institutions are large and complex, and research centres have different cultures and practices</p>	<p>Develop an ability to track grant applications and publication submissions (unique identifier)</p> <p>Organisational endorsement of all grant applications</p>

Issue	Systemic vulnerabilities	Prevention measures
	Need to balance academic independence with obligations of administering organisation	Audit grant expenditure Ensure approval processes are separate and independently verified Rotate key positions in key processes Create dedicated positions to monitor research integrity



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