

Research Integrity among academics in a South African University: Knowledge, attitudes and conduct

Dear postgraduate student,

We are inviting you to participate in a study on research integrity in the Faculty of Health Sciences, University of the Witwatersrand (Wits). The study is being conducted among all academic staff members and postgraduate students from the Wits Faculty of Health Sciences.

The overall aim of this study is to generate information on the knowledge, attitudes and conduct of Wits staff and postgraduate students towards research integrity. The study consists on a confidential, anonymous questionnaire. It will take you no longer than 10-15 minutes to complete.

Your participation in this study is completely voluntary and there will be no negative consequences if you do not want to participate. By undertaking the survey you acknowledge consent to participate in the study.

Ethical approval for this study has been obtained from the University of the Witwatersrand Human Research Ethics Committee (HREC) Medical (#M200202).

We would be happy to answer any questions you have about this study. If you have concerns about your rights as a study participant, or queries about any aspect of the research, you may contact the HREC (Medical): Prof C Penny, Tel 011 717 2301, email Clement.Penny@wits.ac.za; Ms Z Ndlovu and Mr Rhulani Mkansi Administrative Officers 011 717 1234/1252/2656/2700 zanele.ndlovu@wits.ac.za; Rhulani.mkansi@wits.ac.za

Thank you for participating. Bev Kramer, Tanya Augustine, Elena Libhaber and Mapule Nhlapho (Wits), Lone Bredahl, Mette Eriksen and Bjorn Hofmann (Scandanavia)

1a. Your gender Female Male Other

1b. Indicate your position

- Postgraduate student only
 Postgraduate student and staff member
 Staff member only
-

1c. For how many years have you been in an academic/research position?

- 0-5 years
 6-10 years
 11-15 years
 >15 years
-

1d. Where did you do your undergraduate studies?

- At Wits
 At another University in South Africa
 At a University external to South Africa
-

1e. Highest degree obtained

- undergraduate
 Masters
 Doctorate

If you have a doctorate, where did you complete your doctoral studies?

- At Wits
 Elsewhere

What kind of research were you doing during your doctoral studies?

- Clinical research
 Basic Research (in the life sciences)
 Other research

1f. How many doctoral students have you supervised?

- 0 students
 1-5 students
 6-10 students
 11-15 students
 >15 students

2. Ethics misconduct:

Standard definitions of terms used in the questionnaire: Scientific misconduct is behaviour by a researcher, intentional or not, that falls short of good ethical and scientific standards (e.g., Kakuk, P. (2009), The Legacy of the Hwang Case: Research Misconduct in Biosciences. Sci Eng Ethics, 15(4): 556).

Fabricating data is the act of making up research data, instead of achieving data through research, and not disclosing it.

Falsifying data is the act of intentionally altering research data in order to achieve preferred results, and not disclosing it.

Plagiarising data is claiming someone else's data as one's own.

Plagiarising publications (in whole or in part) is the wrongful appropriation, close imitation, or publication of another author's language, thoughts, ideas, or expressions, and the representation of them as one's own original work.

a. In relation to your research, please answer the following:

	Yes	No	I do not remember
1 Have you had lectures or courses in science ethics as part of your undergraduate studies?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Have you had lectures or courses in science ethics as part of your postgraduate studies?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Have you during the last 12 months been the object of pressure to fabricate data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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- | | | | | |
|---|--|-----------------------|-----------------------|-----------------------|
| | Have you during the last 12 months been the object of pressure to falsify data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5 | Have you during the last 12 months been the object of pressure to plagiarise data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6 | Have you during the last 12 months been the object of pressure to plagiarise publications (in whole or in part)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7 | Present results in some other misleading way? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

2. Ethics misconduct

b. Knowledge on international, national and local prevalence of research misconduct

Have you heard of anyone at national or international level during the past 12 months who has:

- | | | Yes | No | I am uncertain |
|---|---|-----------------------|-----------------------|-----------------------|
| 1 | Fabricated data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2 | Falsified data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3 | Plagiarised data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4 | Plagiarised publications (in whole or in part)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5 | Breached research confidentiality (in any other way)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

3. Personal conduct

a. Please answer the following questions in relation to your own personal conduct in the last 12 months:

- | | | Yes | No | I am uncertain |
|---|--|-----------------------|-----------------------|-----------------------|
| 1 | Have you yourself during the last 12 months ever fabricated data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2 | Have you yourself during the last 12 months ever falsified data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3 | Have you yourself during the last 12 months ever plagiarised data? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4 | Have you yourself during the last 12 months ever plagiarised publications (in whole or in part)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5 | | | | |

Have you yourself during the last 12 months ever presented results in some other misleading way?

3. Personal conduct

b. Have you during the last 12 months been exposed to unethical pressure concerning:

	Yes	No	I am uncertain
1 Inclusion or ordering of authors?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Design/method of your study?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Analysis?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Results?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 In any other part of your study?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Personal conduct

c. Have you personally during the last 12 months been affected by any scientific misconduct which resulted in consequences such as:

	Yes	No	I am uncertain
1 Ethical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Legal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Methodological	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Any other aspect of the research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Witnessing misconduct

Please answer the following questions in relation to witnessing misconduct:

	Yes	No	I am uncertain
1 Do you know about anyone in your department who during the last 12 months has fabricated data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Do you know about anyone in your department who during the last 12 months has falsified data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Do you know about anyone in your department who during the last 12 months has plagiarised (in any way)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Do you know about anyone in your department who during the last 12 months has presented results in some other misleading way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Scientific behaviour

a. In your work as a scientist, have you engaged in any of the following behaviours in the last three years?

	0 times	Once	Multiple times	Regularly	Always
1 Fabricated data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 To confirm a hypothesis, selectively deleted or changing data after performing data analysis?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Deleted data before performing data analysis?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Concealed results that contradicted previous research you published?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Used phrases or ideas of others without their permission?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Used/ing phrases or ideas of others without citation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Turned a blind eye to colleagues' use of flawed data or questionable interpretation of data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 Modified the results or conclusions of a study under pressure from an organisation that (co-)funded the research?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 Deliberately not mentioned an organisation that funded your research in the publication of your study?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 Added one or more authors to a report who did not qualify for authorship (honorary author)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 Selectively modified data after performing data analysis to confirm an hypothesis?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 Reported/ing a downwardly-rounded p value (eg. reporting that the p value of 0.054 is less than 0.05)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13 Reported an unexpected finding as having been hypothesized from the start?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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|----|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Decided whether to exclude data after looking at the impact of doing so on the results? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15 | Omitted a contributor from the author's list, who deserved authorship? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16 | Stopped collecting data earlier than stipulated in the protocol because the result in hand had already reached statistical significance? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17 | Deliberately failed to mention important aspects of the study in the article? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18 | Not disclosed a relevant financial or intellectual conflict of interest? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19 | Spread results over more articles than needed in order to publish more articles (salami slicing)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20 | Used confidential information obtained while being a reviewer for your own research or publications? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

5. Scientific behaviour

b. Please rank the level of your agreement or disagreement with each of the following statements:

- | | | Strongly disagree | Disagree | Neither disagree or agree | Agree | Strongly agree |
|---|--|-----------------------|-----------------------|---------------------------|-----------------------|-----------------------|
| 1 | It is never appropriate to report experimental data that have been created without actually having conducted the experiment. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2 | It is never appropriate to alter experimental data to make an experiment look better than it actually is. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3 | It is never appropriate to try a variety of methods of analysis until one is found that yields a result that is statistically significant. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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|----|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | It is never appropriate to take credit for the words or writing of someone else. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5 | It is never appropriate to take credit for the data generated by someone else. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6 | It is never appropriate to take credit for the ideas generated by someone else. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7 | If you are confident of your findings, it is acceptable to selectively omit contradictory results to expedite publication. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8 | If you are confident of your findings, it is acceptable to falsify or fabricate data to expedite publication. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9 | It is more important that data reporting be completely truthful in a publication than in a grant application. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10 | If you witness someone committing research misconduct, you have an ethical obligation to act. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11 | If you had witnessed a co-worker or peer committing research misconduct, you would be willing to report that misconduct to a responsible official. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12 | If you had witnessed a supervisor or principal investigator committing research misconduct, you would be willing to report that misconduct to a responsible official, | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13 | If fabricated data are discovered in a published article, all co-authors must equally share in the blame | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14 | If fabricated data are discovered in a published article all co-authors must get the same punishment. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

5. Scientific behaviour

c. Please rank the level of your agreement or your disagreement with each of the following statements:

	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
1 Scientific misconduct (fabrication, falsification, plagiarism) is common in my area of research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Forms of scientific misconduct other than fabrication, falsification and plagiarism are common in my area of research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Authorship misconduct (inappropriate authorship) is common in my area of research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 The risk of being detected if you commit severe scientific misconduct in my area of research is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 The risk of being detected if you commit less severe scientific misconduct in my area of research is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 The risk of being detected if you commit authorship misconduct in my area of research is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 The consequences of being detected if you commit severe scientific misconduct in my area of research are severe (loss of scientific career, loss of funding, retraction of publications).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 The consequences of being detected if you commit less severe scientific misconduct in my area of research are severe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Wits policies**Do you have knowledge of a written Wits policy about:**

	Yes	No	I am uncertain
1 Application for funds?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Use of funds?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Changes in design/methods of protocol?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Changes to results?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Fabrication of data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Falsification of data?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Handling of scientific authorship?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 Plagiarism?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 Duplicate publication (publishing the same article/information twice)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 Unethical pressure in relation to research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. If you are a member of the Health Professions Council of South Africa (HPCSA), please answer the following questions:

	Yes	No	I am uncertain
1 I have read the HPCSA booklet 4: General Ethical Guidelines for Health Researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I am aware that the HPCSA defines scientific misconduct as fabrication, falsification or plagiarism.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I am aware that should scientific misconduct occur I should report this to the HPCSA.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Supplementary Table 1: Occurrences of personal consequences of research misconduct by Wits staff and postgraduate students

Question: Have you personally during the last 12 months been affected by any scientific misconduct which resulted in consequences such as:	Category	PG n (%)	Staff n (%)	p-value
ethical repercussions?	Yes	5 (1.9)	4 (2.9)	0.38
	No	255 (97.7)	129 (94.9)	
	I am uncertain	1 (0.4)	3 (2.2)	
legal repercussions?	Yes	0 (0.0)	2 (1.2)	0.066
	No	259 (99.6)	162 (97.0)	
	I am uncertain	1 (0.4)	3 (1.8)	
methodological repercussions?	Yes	2 (0.8)	2 (1.2)	0.412
	No	255 (98.8)	163 (97.0)	
	I am uncertain	1 (0.4)	3 (1.8)	
any other aspect of the research?	Yes	4 (1.6)	5 (3.0)	0.226
	No	253 (98.1)	160 (95.2)	
	I am uncertain	1 (0.4)	3 (1.8)	
Question: Please rank level of agreement/disagreement	Category	PG n (%)	Staff n (%)	p-value
The consequences of being detected if you commit less severe scientific misconduct in my area of research are severe.	Agree	121 (47.3)	58 (35.2)	0.03
	Neither	105 (41.0)	80 (48.5)	
	Disagree	30 (11.7)	27 (16.4)	

Supplementary Table 2: Knowledge of institutional policies

Question: Do you have knowledge of a written Wits policy about:	Category	PG n (%)	Staff n (%)	p-values
application for funds?	Yes	102 (39.8)	63 (38.4)	0.895
	Uncertain	62 (24.2)	43 (26.2)	
	No	92 (35.9)	58 (35.4)	
use of funds?	Yes	87 (34.0)	66 (40.2)	0.336
	Uncertain	65 (25.4)	42 (25.6)	
	No	104 (40.6)	56 (34.1)	
changes in design/methods of protocols?	Yes	138 (53.9)	84 (51.5)	0.843
	Uncertain	42 (16.4)	30 (18.4)	
	No	76 (29.7)	49 (30.1)	
changes to results?	Yes	94 (36.7)	41 (25.0)	0.043
	Uncertain	55 (21.5)	41 (25.0)	
	No	107 (41.8)	82 (50.0)	
fabrication of data?	Yes	147 (57.4)	65 (39.9)	0.002
	Uncertain	34 (13.3)	28 (17.2)	
	No	75 (29.3)	70 (42.9)	
falsification of data?	Yes	148 (58.0)	65 (39.9)	0.001
	Uncertain	36 (14.1)	30 (18.4)	
	No	71 (27.8)	68 (41.7)	
Plagiarism?	Yes	238 (93.0)	142 (86.1)	0.063
	Uncertain	7 (2.7)	8 (4.8)	
	No	11 (4.3)	15 (9.1)	
duplicate publication (publishing the same article/information twice)?	Yes	94 (36.7)	53 (32.3)	0.552
	Uncertain	49 (19.1)	30 (18.3)	
	No	113 (44.1)	81 (49.4)	
unethical pressure in relation to research?	Yes	90 (35.4)	34 (20.6)	0.005
	Uncertain	53 (20.9)	44 (26.7)	

	No	111 (43,7)	87 (52.7)
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Supplementary Table 3: Knowledge of HPCSA[#] policies

Question: If you are a member of the Health Professions Council of South Africa, please answer the following questions:	Category	PG n (%)	Staff n (%)	p-value
I have read the HPSCA booklet 4: General Ethical Guidelines for Health Researchers	Yes	47 (36.7)	36 (30.8)	0.365
	Uncertain	17 (13.3)	12 (10.3)	
	No	64 (50.0)	69 (59.0)	
I am aware that the HPCSA defines scientific misconduct as fabrication, falsification, or plagiarism	Yes	75 (60.0)	70 (59.8)	0.813
	Uncertain	12 (9.6)	14 (12.0)	
	No	38 (30.4)	33 (28.2)	
I am aware that should scientific misconduct occur, I should report this to the HPCSA	Yes	65 (52.8)	52 (44.8)	0.698
	Uncertain	18 (14.6)	21 (18.1)	
	No	40 (32.5)	43 (37.1)	

[#] Health Professional Council of South Africa