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Appendix A

NATIONAL HEALTH LABORATORY SERVICE

Academic Affairs and Research
1 Modderfontein Road, Sandringham, 2031
Tel: +27 (0)11 555 0367/0406
Email: babatyi.kgokong@nhls.ac.za
academic.research@nhls.ac.za
Web: www.nhls.ac.za

10 August 2023

Applicant: Ayanda Chiliza
Institution: Central University of Technology
E-mail Address: ayachiliza.ac@gmail.com
Tel: 066 255 2441 **Cell:** 078 587 7188

Project Title: ANTIMICROBIAL SUSCEPTIBILITY ANALYSIS OF GRAM-NEGATIVE ESKAPE ORGANISMS AT INKOSI ALBERT LUTHULI CENTRAL HOSPITAL AND MAHATMA GANDHI MEMORIAL HOSPITAL FROM 2018 TO 2022.
Reference Number: PR2232466

Research Application Type(s):
1. Request for Data

RE: APPROVAL LETTER: REQUEST TO ACCESS NHLS RESOURCES FOR RESEARCH PURPOSES

This letter serves to advise that the application requesting permission to conduct the above-mentioned research using the listed NHLS resources has been reviewed and **"Approved"**. Please note that the approval is granted on the condition that you comply with the NHLS Research Material and Data Access Policy and requirements stated below.

1. All material and data requested shall be used as per the research protocol submitted to the NHLS and as approved by the relevant Health Research Ethics Committee (HREC) in South Africa.
2. Access to the NHLS material and/or data shall be limited to the minimum required for successful completion of the approved study and shall be made available ***without patient names and other patient identifiers (including, but not limited to, national identity numbers, hospital/clinic file numbers, addresses and telephone numbers)***.
3. Confidentiality shall be maintained at the participant and institutional level and there shall be no disclosure of personal information or confidential information.
4. Data and/or material shall not be shared with other parties unless approved by the NHLS
5. The material and/or data obtained from the NHLS shall be anonymised and not, for any reason, be used to track or recruit patients as no pre-approval/consent is obtained from patients.
6. Processes shall be discussed with the relevant NHLS departments (i.e. Corporate Data Warehouse (CDW), NHLS Laboratory Management, Operations Office, etc.) and agreed upon.
7. Any amendments to the study requirements, including the use of the material and/or data for purposes not initially disclosed to the NHLS) shall be cleared by an approved HREC and submitted to the NHLS for approval via the AARMS system – https://aarms.nhls.ac.za.
8. The NHLS shall be acknowledged as a source of material and/or data in any output, such as abstracts and journal articles, emanating from the project.
9. A final report of the research study and any published output resulting from this study shall be submitted to the NHLS via AARMS

Please note that this letter constitutes approval by the NHLS Academic Affairs and Research Office. The NHLS entities tasked with providing the material and/data may have additional requirements for access. Data related queries may be directed to NHLS CDW, email: zarina.sabat@nhls.ac.za; contact number: 011 386 6074 and sample related queries (if applicable) shall be directed to the relevant business manager.

Dr Babatyi Malope-Kgokong
National Manager: Academic Affairs and Research

Appendix B

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
UFS HEALTH SCIENCES

Health Sciences Research Ethics Committee

07-Oct-2024

Dear **Ms Ayanda Chiliza**

Ethics Number: UFS-HSD2023/0400/2908-0001

Ethics Clearance: **Antimicrobial susceptibility analysis of Gram-negative ESKAPE organisms at Inkosi Albert Luthuli Central Hospital and Mahatma Gandhi Memorial Hospital from 2018 to 2022**

Principal Investigator: **Ms Ayanda Chiliza**

Department: **CUT - Central University of Technology**

Submission Page

SUBSEQUENT SUBMISSION APPROVED

With reference to your recent submission for ethical clearance from the Health Sciences Research Ethics Committee. I am pleased to inform you on behalf of the HSREC that you have been granted ethical clearance for your request as stipulated below:

- Annual re-approval: The ethical clearance of this project is extended to **06 October 2025.**

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2020); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; International Council for Harmonisation (ICH) Harmonised Guideline, Integrated Addendum to ICH E6(R1), Guideline for Good Clinical Practice (GCP) E6(R2), 2016, SAHPRA Guidelines as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

The Principal Investigator (PI) bears final responsibility for the RIMS application. In the event of any misconduct or improper activities perpetuated by a third party, the PI will be held vicariously liable. The HSREC will bear no responsibility or liability for any actions of a PI and/or third party or breach of confidentiality caused by the PI and/or third party.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4012650/9860 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this request for ethical clearance and we wish you continued success with your research.

Yours Sincerely

Dr. C. Armour (Barrett)
Chairperson : Health Sciences Research Ethics Committee

Health Sciences Research Ethics Committee
T: +27 (0)51 401 2650/9860 | E: ethicsfhs@ufs.ac.za
IRB 00011992; REC 230408-011; IORG 0010096; FWA 00027947
Block D, Dean's Division, Room D104 | P.O. Box 339 (Internal Post Box G40) | Bloemfontein 9300 | South Africa
www.ufs.ac.za

Appendix C

Central University of Technology, Free State

FACULTY OF HEALTH AND ENVIRONMENTAL SCIENCES

March 14, 2023

ATTN: UFS Ethics Committee

Re: Scientific Review

Student: Ayanda Precious Chiliza
Student No: 223052462

To Whom it may concern

This letter serves to confirm that the research protocol, titled, ***"Antimicrobial susceptibility analysis of Extended-Spectrum Beta-Lactamase and Carbapenemase-producing Gram-negative ESKAPE organisms at Inkosi Albert Luthuli Central Hospital and Mahatma Gandhi Memorial Hospital from 2018 to 2022."*** has been reviewed the Faculty Research and Innovative Committee (FRIC) of the Faculty of Health and Environmental Sciences, Central University of Technology on the 13th March 2023 and has been judged to be relevant, designed in accordance with accepted scientific practices and norms.

FRIC resolution reference: FHES 3/13/03

Should you require additional information, please contact Prof TJ Makhafola at jmakhafola@cut.ac.za

Sincerely;

Tel: +27 51 507 3369
Prof TJ Makhafola
Assistant Dean; Research, Innovation and Engagement
Faculty if Health and Environmental Sciences

• Private Bag X20539 • Bloemfontein • SOUTH AFRICA • 9300 •
Tel: +27 051 507 3369 • **Fax:** +27 051 507 3369 • **E-mail:** jmakhafola@cut.ac.za • **Website:** www.cut.ac.za

Central University of Technology, Free State

FACULTY OF HEALTH AND ENVIRONMENTAL SCIENCES:
DEPARTMENT OF HEALTH SCIENCES

Programme: MHBIO - Biomedical Technology

30 March 2023

Confirmation Letter for AP Chiliza: student number: 223052462

This letter is to certify that AP. Chiliza of student number 223052462 is a student in MHBIO in Biomedical Technology at the Central University of Technology (CUT). I hereby confirm that as her supervisor, all evaluation comments were implemented.

Title of research project

"Antimicrobial susceptibility analysis of Gram-negative ESKAPE organisms at Inkosi Albert Luthuli Central Hospital and Mahatma Gandhi Memorial Hospital from 2018 to 2022".

Kind regards

Dr. P. Makhoahle
Programme: Medical Laboratory Sciences
Senior Lecture: Department of Health Science
Contact Details:
(051) 507 2075
pmakhoahle@cut.ac.za

Appendix D

Count of ORGANISM_NAME	AMIKACIN								
ORGANISM_NAME	SENSITIVE	%	NULL	%	RESISTANT	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1823	75,52%	161	6,67%	209	8,66%	221	9,15%	2414
PSEUDOMONAS AERUGINOSA	979	85,13%	48	4,17%	122	10,61%	1	0,09%	1150
ACINETOBACTER BAUMANNII COMPLEX	126	13,25%	675	70,98%	130	13,67%	20	2,10%	951
ENTEROBACTER CLOACAE COMPLEX	172	64,66%	75	28,19%	6	2,26%	13	4,88%	266

Count of ORGANISM_NAME	AMOXICILLIN_CLAVULANIC_ACID								
ORGANISM_NAME	NULL	%	RESISTANT	%	SENSITIVE	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	153	6,34%	1027	42,54%	759	31,44%	475	19,68%	2414
PSEUDOMONAS AERUGINOSA	1143	99,39%	5	0,43%	1	0,09%	1	0,09%	1150
ACINETOBACTER BAUMANNII COMPLEX	948	99,68%	2	0,21%	1	0,11%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	63	23,68%	196	73,68%	6	2,26%	1	0,38%	266

Count of ORGANISM_NAME	AMPICILLIN_AMOXICILLIN								
ORGANISM_NAME	NULL	%	RESISTANT	%	SENSITIVE	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	365	15,12%	2047	84,80%	2	0,08%	0	0%	2414
PSEUDOMONAS AERUGINOSA	1145	99,56%	5	0,43%	0	0%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	948	99,68%	3	0,32%	0	0%	0	0%	951

ENTEROBACTER CLOACAE COMPLEX	248	93,23%	16	6,02%	1	0,38%	1	0,37%	266

Count of ORGANISM_NAME	CEFEPIME								
ORGANISM_NAME	RESISTANT	%	SENSITIVE	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1177	48,76%	742	30,74%	474	19,63%	21	0,87%	2414
PSEUDOMONAS AERUGINOSA	116	10,09%	821	71,39%	169	14,69%	44	3,83%	1150
ACINETOBACTER BAUMANNII COMPLEX	762	80,13%	96	10,09%	86	9,04%	7	0,74%	951
ENTEROBACTER CLOACAE COMPLEX	47	17,67%	97	36,47%	121	45,49%	1	0,37%	266

Count of ORGANISM_NAME	CEFOTAXIME_CEFTRIAXONE								
ORGANISM_NAME	RESISTANT	%	SENSITIVE	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1555	64,42%	591	24,18%	261	10,81%	7	0,29%	2414
PSEUDOMONAS AERUGINOSA	978	85,04%	2	0,17%	170	14,78%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	815	85,70%	3	0,31%	92	9,67%	41	4,31%	951
ENTEROBACTER CLOACAE COMPLEX	78	29,32%	86	32,33%	98	36,84%	4	1,50%	266

Count of ORGANISM_NAME	CEFOXITIN								
ORGANISM_NAME	NULL	%	SENSITIVE	%	RESISTANT	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	385	15,95%	1445	59,86%	581	24,07%	3	0,12%	2414
PSEUDOMONAS AERUGINOSA	1144	99,48%	1	0,09%	5	0,43%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	948	99,68%	1	0,11%	2	0,21%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	104	39,10%	3	1,13%	159	59,77%	0	0%	266

Count of ORGANISM_NAME	CEFTAZIDIME								
ORGANISM_NAME	RESISTANT	%	SENSITIVE	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1381	57,21%	613	25,39%	367	15,20%	53	2,19%	2414
PSEUDOMONAS AERUGINOSA	98	8,52%	902	78,43%	110	9,56%	40	3,48%	1150
ACINETOBACTER BAUMANNII COMPLEX	770	80,97%	120	12,62%	31	3,26%	30	3,15%	951
ENTEROBACTER CLOACAE COMPLEX	69	25,94%	87	32,71%	106	39,85%	4	1,50%	266

Count of ORGANISM_NAME	CIPROFLOXACIN								
ORGANISM_NAME	RESISTANT	%	SENSITIVE	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1267	52,48%	1028	42,58%	62	2,57%	57	2,36%	2414
PSEUDOMONAS AERUGINOSA	217	18,61%	899	78,17%	13	1,13%	21	1,83%	1150
ACINETOBACTER BAUMANNII COMPLEX	827	86,96%	112	11,78%	8	0,84%	4	0,42%	951
ENTEROBACTER CLOACAE COMPLEX	82	30,83%	180	67,67%	3	1,13%	1	0,37%	266

Count of ORGANISM_NAME	COLISTIN								
ORGANISM_NAME	NULL	%	SENSITIVE	%	RESISTANT	%	INTERMEDIATE	%	Grand Total

KLEBSIELLA PNEUMONIAE	2413	99,96%	1	0,04%	0	0%	0	0%	2414
PSEUDOMONAS AERUGINOSA	172	14,96%	916	79,65%	45	3,91%	17	1,48%	1150
ACINETOBACTER BAUMANNII COMPLEX	93	9,78%	818	86,01%	40	4,21%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	266	100%	0	0%	0	0%	0	0%	266

Count of ORGANISM_NAME	ERTAPENEM								
ORGANISM_NAME	NULL	%	SENSITIVE	%	RESISTANT	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	625	25,89%	1508	62,47%	212	8,78%	69	2,86%	2414
PSEUDOMONAS AERUGINOSA	1147	99,74%	2	0,17%	1	0,09%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	949	99,79%	0	0%	2	0,21%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	128	48,12%	126	47,37%	5	1,88%	7	2,63%	266

Count of ORGANISM_NAME	GENTAMICIN								
ORGANISM_NAME	SENSITIVE	%	RESISTANT	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	997	41,30%	1098	45,48%	289	11,97%	30	1,24%	2414
PSEUDOMONAS AERUGINOSA	846	73,56%	133	11,57%	161	14,00%	10	0,87%	1150
ACINETOBACTER BAUMANNII COMPLEX	170	17,87%	699	73,50%	47	4,94%	35	3,68%	951
ENTEROBACTER CLOACAE COMPLEX	111	41,73%	59	22,18%	96	36,09%	0	0%	266

Count of ORGANISM_NAME	IMIPENEM

ORGANISM_NAME	SENSITIVE	%	RESISTANT	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1752	72,58%	389	16,11%	145	6,01%	128	5,30%	2414
PSEUDOMONAS AERUGINOSA	897	78,00%	156	13,57%	94	8,17%	3	0,26%	1150
ACINETOBACTER BAUMANNII COMPLEX	112	11,78%	806	84,75%	16	1,68%	17	1,79%	951
ENTEROBACTER CLOACAE COMPLEX	208	78,19%	13	4,89%	32	12,03%	13	4,89%	266

Count of ORGANISM_NAME	MEROPENEM								
ORGANISM_NAME	SENSITIVE	%	RESISTANT	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1806	74,81%	446	18,48%	112	4,64%	50	2,07%	2414
PSEUDOMONAS AERUGINOSA	876	76,17%	135	11,74%	91	82,73%	48	4,17%	1150
ACINETOBACTER BAUMANNII COMPLEX	115	12,09%	819	86,12%	13	1,37%	4	0,42%	951
ENTEROBACTER CLOACAE COMPLEX	226	84,96%	10	3,76%	26	9,77%	4	1,50%	266

Count of ORGANISM_NAME	NITROFURANTOIN								
ORGANISM_NAME	NULL	%	RESISTANT	%	INTERMEDIATE	%	SENSITIVE	%	Grand Total
KLEBSIELLA PNEUMONIAE	365	15,12%	900	37,28%	740	30,65%	409	16,94%	2414
PSEUDOMONAS AERUGINOSA	1144	99,48%	5	0,43%	0	0%	1	0,09%	1150
ACINETOBACTER BAUMANNII COMPLEX	948	99,68%	3	0,32%	0	0%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	107	40,22%	18	6,77%	73	27,44%	68	25,56%	266

Count of ORGANISM_NAME	PIPERACILLIN_TAZOBACTAM								
ORGANISM_NAME	SENSITIVE	%	RESISTANT	%	INTERMEDIATE	%	NULL	%	Grand Total
KLEBSIELLA PNEUMONIAE	1107	45,86%	918	38,03%	249	10,31%	140	5,80%	2414
PSEUDOMONAS AERUGINOSA	929	80,78%	187	16,26%	13	1,13%	21	1,83%	1150
ACINETOBACTER BAUMANNII COMPLEX	84	8,83%	850	89,38%	6	0,63%	11	1,16%	951
ENTEROBACTER CLOACAE COMPLEX	103	38,72%	58	21,80%	13	4,89%	92	34,59%	266

Count of ORGANISM_NAME	TIGECYCLINE								
ORGANISM_NAME	SENSITIVE	%	RESISTANT	%	NULL	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	1786	73,99%	37	1,53%	551	22,82%	40	1,66%	2414
PSEUDOMONAS AERUGINOSA	1	0,08%	977	84,95%	170	14,78%	2	0,17%	1150
ACINETOBACTER BAUMANNII COMPLEX	795	83,60%	10	1,05%	92	9,67%	54	5,68%	951
ENTEROBACTER CLOACAE COMPLEX	131	49,25%	4	1,50%	127	47,74%	4	1,50%	266

Count of ORGANISM_NAME	TRIMETHOPRIM_SULFAMETHOXAZOLE										
ORGANISM_NAME	RESISTANT	%	NULL	%	SENSITIVE	%	INTERMEDIATE	%	SENSITIVE DOSE DEPENDANT	%	Grand Total
KLEBSIELLA PNEUMONIAE	1481	61,35%	308	12,76%	620	25,68%	4	0,16%	1	0,04%	2414
PSEUDOMONAS AERUGINOSA	8	0,70%	1137	98,87%	4	0,35%	1	0,09%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	801	84,23%	55	5,78%	93	9,78%	2	0,21%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	84	31,58%	94	35,33%	88	33,08%	0	0%	0	0%	266

Count of ORGANISM_NAME	CEFUROXIME_ORAL								
ORGANISM_NAME	NULL	%	RESISTANT	%	SENSITIVE	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	457	18,93%	1421	58,86%	501	20,75%	35	1,45%	2414
PSEUDOMONAS AERUGINOSA	1148	99,83%	2	0,17%	0	0%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	949	99,79%	2	0,21%	0	0%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	120	45,11%	95	35,71%	27	10,15%	24	9,02%	266

Count of ORGANISM_NAME	CEFUROXIME_PARENTERAL								
ORGANISM_NAME	NULL	%	RESISTANT	%	SENSITIVE	%	INTERMEDIATE	%	Grand Total
KLEBSIELLA PNEUMONIAE	453	18,76%	1420	58,82%	513	21,25%	28	1,16%	2414
PSEUDOMONAS AERUGINOSA	1144	99,48%	6	0,52%	0	0%	0	0%	1150
ACINETOBACTER BAUMANNII COMPLEX	948	99,68%	2	0,21%	1	0,11%	0	0%	951
ENTEROBACTER CLOACAE COMPLEX	118	44,36%	97	36,47%	28	10,53%	23	8,65%	266

Appendix E (Proof if linguistic editing)

CORNELIA GELDENHUYS

✆083 2877088
corrieg@mweb.co.za

15 August 2024

TO WHOM IT MAY CONCERN

Herewith I, **Cornelia Geldenhuys (ID 521114 0083 088)** declare that I am a qualified, accredited language practitioner and that I have edited the following Master's dissertation:

ANTIMICROBIAL SUSCEPTIBILITY ANALYSIS OF GRAM-NEGATIVE ESKAPE ORGANISMS AT INKOSI ALBERT LUTHULI CENTRAL HOSPITAL AND MAHATMA GANDHI MEMORIAL HOSPITAL FROM 2018 TO 2022

by

Ayanda Chiliza
Student number: 223052462

All changes were indicated by track changes and comments **for the author to verify, clarify aspects that are unclear, make the necessary adjustments and finalise.** The editor takes no responsibility in the instance of this not being done. The document remains the final responsibility of the author.

.....
C GELDENHUYS
MA (Lin) cum laude, MA (Mus), BA Hons (French), HED, HDL, UELM

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Antimicrobial susceptibility analysis of Gram-negative ESKAPE organisms at Inkosi Albert Luthuli Central Hospital and Mahatma Gandhi Memorial Hospital from 2018 to 2022.

By

Ayanda Chiliza

Student number: 223052462

Thesis submitted for the fulfilment of the requirements for the Master of Health Sciences in Biomedical Technology

At the

Central University of Technology, Free State

Faculty of Health and Environmental Sciences

Department of Health Sciences

Bloemfontein

South Africa

Supervisor: Prof P Makhoahle (D_HSc: Biomedical Technology, CUT)

Co-Supervisor: Prof S Mashele (Dean: Faculty of Health and Environmental Sciences, CUT)

Co-Supervisor: Me A Van der Spoel van Dijk (Principal Medical Scientist Masters: Medical Microbiology, NHLS Universitas, UFS)

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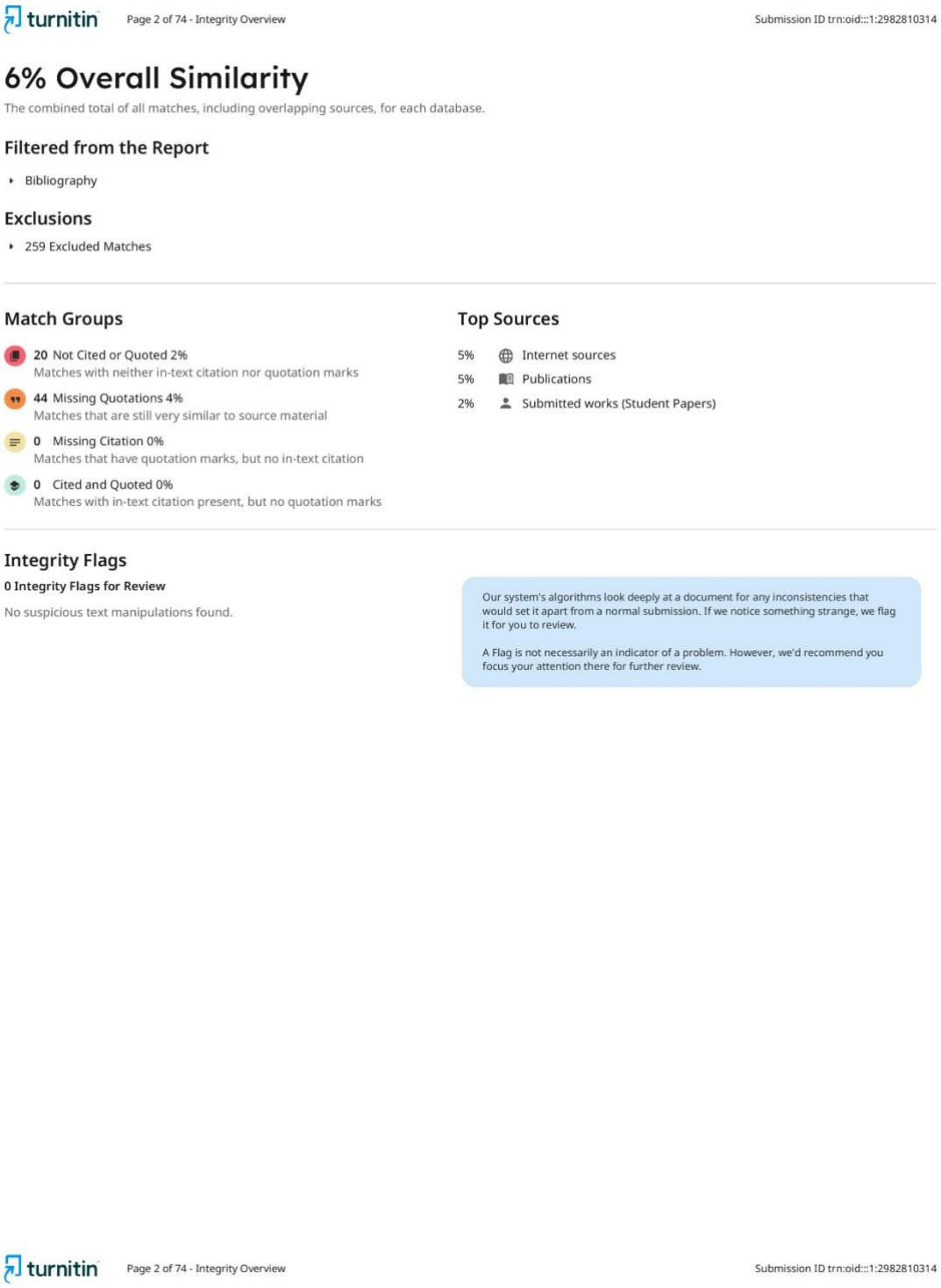

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