



ANNUAL REPORT 01.Sep. 2019

National University Biomedical Research institute
(NUBRI)



Logo
Name

TABLE OF CONTENTS

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ _____	4
workshops _____	5
Pan African Bioinformatics Network (H3ABIONET) _____	5
International training activities for staff _____	5
Practical part at NUBRI for external students _____	6
Academic participations _____	7
Molecular Biology practical sessions _____	7
Teaching in National University-Sudan _____	7
Trainers and attachments _____	8
Trainee list _____	8
Attaché list _____	8
Post graduate _____	9
Genome _____	12
Ongoing projects _____	13
Grants _____	14
Grants Submission _____	14
Annual research Grants from the national university Sudan _____	14
post graduate programs _____	15
Publications _____	16
Submitted papers _____	18
Accepted papers _____	19

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

WORKSHOPS

Pan African Bioinformatics Network (H3ABIONET)

1. Workshop on Introduction to Bioinformatics (IBT) (3/9 to 15/12/ 2019).
2. Workshop on African Genomic Medicine Training (AGMT) (3/3 to 26/6/ 2019).
3. 16S rRNA Intermediate Bioinformatics (20/8 to 20/10/2019)

International training activities for staff

Course title: NGS bioinformatics

Period-Duration: 26 Jan to 2 feb

Type of Fund: Fully Funded Scholarship

Funding agency: Welcome Genome Campus

Staff involved: Abdalla Munir

Practical part at NUBRI for external students

1. Salma Abdelrahman Mohammed –Faculty of Medical Laboratory Science –University of Khartoum
Research topic: The role of host genetic factors in susceptibility to tuberculosis infection
(PhD student)
2. Sahar Abdalla Elssideeg Mohammed - Faculty of Medical Laboratory Science –University of Khartoum
Research topic: Polymorphism of VDR gene in TB patients in Khartoum state –Sudan
(Master student)
3. Hanadi Abdelbagi Albala -Faculty of Medical Laboratory Science –University of Khartoum
Research topic: Association of CYPZE1 and NQO1 genes polymorphism in Sudanese Acute lymphocytic patients **(PhD student)**
4. Emad abdelhaleem - Faculty of Medical Laboratory Science –University of Khartoum
Research topic: Detection of DNA methylation in pregnant woman and their association for apportion **(PhD student)**

ACADEMIC PARTICIPATIONS

Molecular Biology practical sessions

Practical sessions for undergraduates and post graduate students from the National University (MLS, Pharmacy, Bioinformatics master program) and outside (individual training from different disciplines) are conducted in the molecular biology department at NUBRI.

Teaching in National University-Sudan

- Teaching Research Methodology course for undergraduate students in different faculties at NUSU (Dr. Rihab Ali Omer).
- Teaching Bioinformatics course at the Faculty of Computer Science and Information technology, National University, Sudan (Dr. Sofia Bashir Mohamed)
- Teaching molecular biology and research methodology Courses for postgraduates in bioinformatics master at the Faculty of Medicine and Surgery, National University, Sudan (Dr. Sofia Bashir Mohamed)
- Teaching Health System Research Course at the Faculty of Computer Science and Information Technology, National University, Sudan (Dr. Sofia Bashir Mohamed)
- Teaching Molecular Genetics Course at the Faculty of Nursing, National University, Sudan (Mohamed Ahmed Bashir, Abdalla Elseer)

Trainers and attachments

Trainee list

No	Name	Affiliation	Area of required training	Training period
1	Mohamed Almokashfi Shamseldeen	University of Khartoum - Faculty of Medicine	Molecular Bioinformatics	Biology/ One month
2	Mohamed Alsiddig Alagib Almahal	University of Khartoum - Faculty of Medicine	Molecular Bioinformatics	Biology/ Two weeks
3	Huda Faisal Sidamed Salih	University of Khartoum - Faculty of Medicine	Molecular Bioinformatics	Biology/ Two weeks
4	Zinab Mohamed Shrif Osman	University of Khartoum - Faculty of Science	Molecular Bioinformatics	Biology/ Three months
5	Rayan Haroun Mohammed Abdalla	AL-Baladya pharmacy	Molecular Bioinformatics	Biology/ 6 weeks
6	Suaad Balla Khalafalla	Dr.Rania pharmacy	Molecular Bioinformatics	Biology/ Three months

Attaché list

No	Name	Affiliation	Area of required training	Training period
1	Dania Abdelnasir Mohamed	National University Sudan	Bioinformatics	Four months
2	Ail Ibrahim Al Soied	University of Khartoum/ institute of endemic disease	Molecular Biology	Six months
3	Hla Faisal Abdalla	National University/Master of Bioinformatics	Molecular Biology	Three months
4	Musab Elgaili Ali	-	Molecular Biology	Three months
5	Mawda Ibrahim Osman	Nabta college	Bioinformatics	Four months
6	Tarteel Hussein Ali	-	Molecular Biology	Three months
7	Sabah Abdalla Elhag	-	Bioinformatics	Four months
8	Ali Awad Allah Ali	National University Sudan	Molecular biology	Four months
9	Amal Abbas Ibrahim	NUBRI	Molecular biology	Three months
10	Esra Alsadig Abdalwhed	Ibn Sena University	Bioinformatics	Four months
11	Sara Abdulrahman Mohamed	-	Bioinformatics	Three months

POST GRADUATE

A total of 12 M.Sc. and one Ph.D. students were trained and accomplished their research's from the data of NUBRI projects under supervision by Dr. Sofia Bashir

- Ph.D. Thesis of: Fatima Elshaikh Ahmed

Title: **Genetic mapping of Methicillin-Resistant Staphylococcus aureus isolated from Sudan.**

Institution: National University, Faculty of Graduate studies and Scientific Research.

Khartoum, Sudan.

1. M.Sc. Thesis of: Belgees Yousef Ahmed Mohamed

Title: **Whole genome sequencing in the prediction of antimicrobial resistant *Escherichia coli* strain NUBRI-E.**

Institution: National University, Faculty of Graduate studies and Scientific Research.

Khartoum, Sudan.

2. M.Sc. Thesis of: Sahar Omer Abd-Alghani Taha

Title: **Bioinformatics analysis of the variation in anti-resistance genes in *Klebsiella pneumonia* strain, NUBRI-K.**

Institution: National University, Faculty of Graduate studies and Scientific Research.

Khartoum, Sudan.

3. M.Sc. Thesis of: Ahmed Abubakar Ibrahim

Title: **Structural and functional annotation of *Pseudomonas aeruginosa* strain, P-NUBRI-P hypothetical proteins - in silico Approach.**

Institution: National University, Faculty of Graduate studies and Scientific Research.

Khartoum, Sudan.

4. M.Sc. Thesis of: Athar Ahmed Hassan Musa

Title: **Whole-Genome for Detecting Antimicrobial Resistance in *Acinetobacter baumannii* strain NUBRI-A.**

Institution: National University, Faculty of Graduate studies and Scientific Research.

Khartoum, Sudan.

5. M.Sc. Thesis of: Ammar Yasir Mohamed ELhassan

Title: **Prediction of *Pseudomonas aeruginosa* strain, P-NUBRI-P antimicrobial resistance by whole genome sequencing.**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan.

6. M.Sc. Thesis of: Basma Abdelhafeez Abdelrahman

Title: **Computational analysis of variation in anti-resistance genes in *Acinetobacter baumannii* strain, NUBRI-A.**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan.

7. M.Sc. Thesis of: Lina Murtada Abd Elrasheed

Title: **In silico Analyses of variation in anti-resistance genes in *Pseudomonas aeruginosa* strain, NUBRI-P.**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan.

8. M.Sc. Thesis of: Maab Adil Sharief Mohammed

Title: **Bioinformatics Approach to identified and validated novel hypothetical proteins in *Klebsiella pneumonia* strain, NUBRI-K**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan.

9. M.Sc. Thesis of: Najm AL Deen Mosa

Title: **In silico characterization of hypothetical proteins from *Acinetobacter baumannii* strain, NUBRI-A isolated from Sudan**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan.

10. M.Sc. Thesis of: Najm AL Deen Mosa

Title: **Identification of antibiotic resistance genes in the multidrug resistant in *Klebsiella pneumonia* strain, NUBRI-K using whole genome sequencing**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan.

11. M.Sc. Thesis of: Ali Mohammed Tawfik Ali

Title: **Insilico- analysis of plasmid resistance genes in *Pseudomonas aeruginosa* strain NUBRI-P, Isolated from Khartoum, Sudan**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan

12. M.Sc. Thesis of: Nehal Abd Elkareem Jubartallah

Title: **Computational analysis of plasmid resistance genes in *Escherichia coli* strain NUBRI-E, Isolated from Khartoum, Sudan**

Institution: National University, Faculty of Graduate studies and Scientific Research.
Khartoum, Sudan

GENOME

- First complete genome sequence of *Acinetobacter baumannii* strain NUBRI-A isolated from Khartoum, Sudan. BioSample: SAMN11096027, BioProject: PRJNA526336
- First complete genome sequence of *Escherichia coli* strain NUBRI-E isolated from Khartoum, Sudan. BioSample: SAMN11096255, BioProject: PRJNA526349
- First complete genome sequence of *Klebsiella pneumoniae* strain NUBRI-K isolated from Khartoum, Sudan. BioSample: SAMN11098619, BioProject: PRJNA526408
- First Complete genome sequence of *Pseudomonas aeruginosa* strain NUBRI-P isolated from Khartoum, Sudan. SMZF00000000, BioProject: PRJNA526441, BioSample: SAMN11098871

ONGOING PROJECTS

1. Development of Linux System for Bioinformatics Analysis.
2. Molecular Epidemiological of Methicillin-Resistant *Staphylococcus aureus* from Wound Infections in Sudan.
3. Whole-Genome Sequencing for Detecting Antimicrobial Resistance in Gram Negative Bacterial isolated from Sudan.
4. Epidemiologic and metagenome analysis of human cystic echinococcosis in Sudan.
5. Synthesis and evaluation of PknE inhibitors as potential anti- tuberculosis. Screening for a good lead molecule as anti- tuberculosis using in silico tools.
6. Single Nucleotide Polymorphism in IL17A among Rheumatoid Arthritis Sudanese Patients, Arthritis & Rheumatology.
7. Prevalence Distribution of IL-17AG197A (rs2275913) and IL-17FA7488G (rs763780) Polymorphisms among Sudanese Population.
8. Population genetics of the principal vector *Aedes aegypti* mosquitoes and Dengue virus in Sudan.

GRANTS

Grants Submission

- FLAIR Fellowships 2020

Molecular Characterization of Antimicrobial Resistance and Virulence Factors in Gram-negative Pathogenic Bacteria Isolated from Sudan

Annual research Grants from the national university Sudan

1. Development of Linux System for Bioinformatics Analysis (3,000.00 \$)
2. Molecular Epidemiological of Methicillin-Resistant *Staphylococcus aureus* from Wound Infections in Sudan (37,000.00 \$)
3. Whole-Genome Sequencing for Detecting Antimicrobial Resistance in Gram Negative Bacterial isolated from Sudan (5,000.00\$)

POST GRADUATE PROGRAMS

1. Msc of Bioinformatics
2. Diploma of Bioinformatics
3. 3.Diploma of Molecular Genetics

PUBLICATIONS

1. Sofia B. Mohamed, Mohamed M. Hassan, Abdalla Munir K.A, Nusiba I. Abdalla, Talal Adlan, Aisha K. Babiker. **Re-annotation of hypothetical protein CA803_03125 of Methicillin-Resistant *Staphylococcus aureus* strain SO-1977 isolated from Sudan.** *Bioinformatics*.15(3): 160-164 (2019). doi:10.6026/97320630015160
2. Mohamed S. Ali, Nurulfiza M. Isa, Faisal M. Abedelrhman, Tahani B. Alyas, Sara E. Mohammed, Abdallah E. Ahmed, Zainab S. A. Ahmed, Nyok-Sean Lau, Mohamed I. Garbi, Abdullah Al-Ashraf Amirul, Almeen O. Seed, Rihab A. Omer and Sofia B. Mohamed. **Genomic analysis of methicillin-resistant *Staphylococcus aureus* strain SO-1977 from Sudan.** *BMC Microbiology*. 11;19(1):126 (2019). <https://doi.org/10.1186/s12866-019-1470-2>
3. Sofia B. Mohamed, Talal A. Adlan, Nagla A. Khalafalla, Nusiba I. Abdalla, Zainab SA. Ali, Abdella Munir K.A, Mohamed M. Hassan, Mohammed-Ahmed B. Elnour. **Proteomics and docking study targeting Penicillin-Binding Protein and Penicillin-Binding Protein2a of Methicillin-Resistant *Staphylococcus aureus* strain SO-1977 isolated from Sudan.** *Evolutionary Bioinformatics*. 16;15:1176934319864945 (2019). doi: 10.1177/1176934319864945
4. Madinna Mustafa, Fatima Fathy, Abubaker Mirghani, Mona A. Mohamed, Mohamed S. Muneer, Abdallah E. Ahmed, Mohamed Siralkhatim Ali, Rihab A. Omer, Emmanuel E. Siddig, Nuh Saad Mohamed, Amjed M. Abd Elkareem. **Prevalence and risk factors profile of seropositive *Toxoplasmosis gondii* infection among apparently immunocompetent Sudanese women.** *BMC Research Notes*. 16;12(1):279 (2019). doi: 10.1186/s13104-019-4314-0.
5. SM Eltaher, AB Idris, AH Mahmoud, MYM Yousif. **Genetic analysis of TP53 gene mutations in exon 4 and exon 8 among esophageal cancer patients in Sudan.** *BioRxiv*. 1:572214. (2019).
6. Mohamed SB, Kambal S, Munir A, et al. **First Whole-Genome Sequence of a Highly Resistant *Klebsiella pneumoniae* Sequence Type 14 Strain Isolated from Sudan.** *Microbiol Resour Announc*. 8;8(32) (2019) pii: e00552-19. doi:10.1128/MRA.00552-19.

7. Mohamed SB, Hassan M, Munir A, et al. **Whole-Genome Sequence of *Acinetobacter baumannii* Strain NUBRI-A, Isolated from a Hospitalized Patient in Khartoum, Sudan.** *Microbiol Resour Announc.* 8;8(32) (2019). pii: e00542-19. doi:10.1128/MRA.00542-19.

8. Amanda G Elgoraish, Salah Eldin G Elzaki, Rania TagElsir Ahmed, Arwa Ibrahim Ahmed, Huda A Fadlalmula, Shymaa Abdalgader Mohamed, Nusiba I Abdallah, Osman Abdelgadir, Tellal B Ageep, Badria B El-Sayed, **Epidemiology and distribution of *Plasmodium vivax* malaria in Sudan.** *Transactions of The Royal Society of Tropical Medicine and Hygiene.* (2019). pii: trz044. <https://doi.org/10.1093/trstmh/trz044>.

SUBMITTED PAPERS

1. Nouh S. Mohamed, Musab M. Ali Albsheer, Hanadi Abdelbagi, Emanuel E. Siddig, Mona A. Mohamed, Abdallah E. Ahmed, Rihab Ali Omer, Mohamed M. Elbasheir, **Genetic polymorphism of the N-terminal region in circumsporozoite surface protein of Plasmodium falciparum field isolates from Sudan.**
2. Mohamed Hassan Mohamed, Mohamed A. Hussain, Ahmed A. Elshikh, Osama R. Gendeel, Siddig A. Ahmed, Rami A. Altayeb, Abdelhafiz M.A. Muhajir, Sofia Bashir Ali. **NeoCoV is closer to MERS-CoV than SARS-CoV'**
3. Rgda Mohamed Osman, Mounkaila Noma, Abdallah Elssir Ahmed, Rihab Ali Omer, Nouh Saad Mohamed, Musab M. Ali Albsheer, Ayman Ali Mohammed, Ali Mahmoud Edris, Emmanuel Edwar Siddig. **Single Nucleotide Polymorphism in IL17A among Rheumatoid Arthritis Sudanese Patients, Arthritis & Rheumatology Submitted.**

ACCEPTED PAPERS

1. Sofia B. Mohamed, Abdalla Munir, Sumaya Kambal, Nusiba I. Abdalla, Ahmed Hamad, Sara E. Mohammed, Fatima E. Ahamed, Omnia Hamid, Mohamed M. Hassan, Arshad Ismail, Mushal Allam . **Whole Genome Sequence of a Pan-resistant and High-risk Clone ST111 of *Pseudomonas aeruginosa* NUBRI-P Strain Isolated from a Hospitalized Patient in Sudan.**
2. Aisha Babiker, Ahmed Suleiman, Nadia Eldawi, Sofia Bashir. **Detection of Micro Invasion in Sudanese Oral Verrucous Carcinoma Samples Using Syndecan-1 Stain.**
BIC-(2019)-0001