

Authors

Abdulrahman A. Alghamdi^{1,2}, Sherif Edris Ahmed^{2,3}, Ahlam Alsaadi¹, Rashad R. Al-Hindi^{2,*}

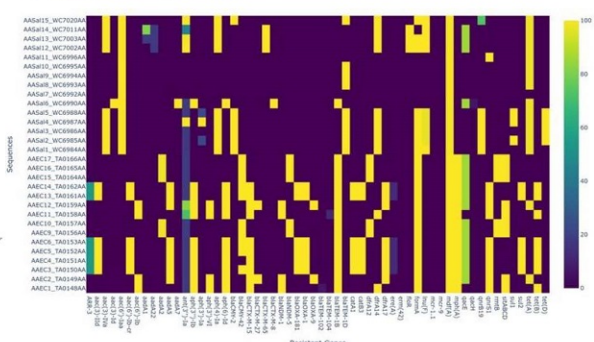
1. Research Aide at King Abdullah International Medical Research Center, post-graduate student at King Abdulaziz University
2. Department of Biological Sciences, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia
3. Princess Al Jawhara Albrahim Centre of Excellence in Research of Hereditary Disorders

Background

- Multidrug-resistant bacteria (MDR) refers to a type of microbe that are not affected by multiple antibiotics treatment.
- Antimicrobial Resistance (AMR) is a natural phenomenon occurring when microorganisms become resistant to antimicrobials they are exposed to.
- Whole Genome Sequencing (WGS) refers to a laboratory procedure used to identify the order of bases in an organism's genome through a single process.

Results

Heatmap of Resistant Genes Against Fasta Files



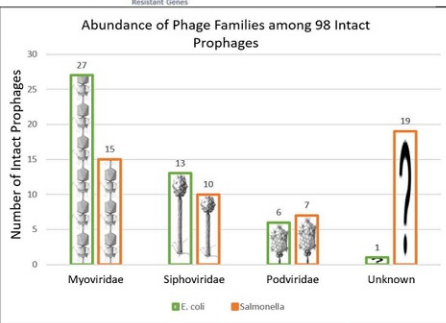
Objectives

Objective 1: Obtain WGS bacterial Genomes data from Saudi Arabia publicly available data biobanks.

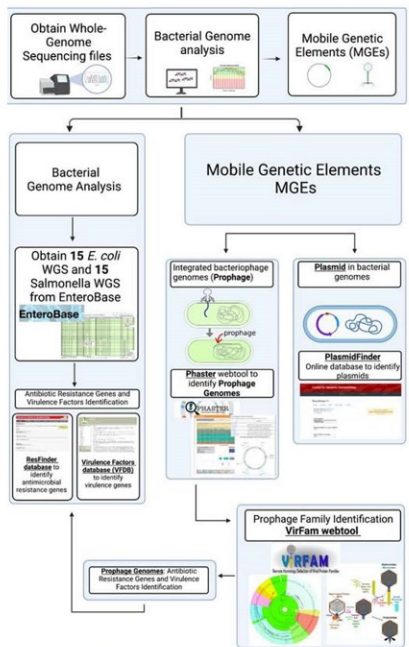
Objective 2: Identifying Antimicrobial resistance genes and strain type using Bioinformatics tools and WGS-Based characterization tools.

Objective 3: Identifying mobile genetic elements in obtained data from *E. coli* and *Salmonella* genomes (plasmids, and bacteriophages).

Strain	Prohages/ Qphages
<i>E. coli</i>	47/23
<i>Salmonella</i>	51/19
Total	140



Methods & Materials



Sequence	Database	Gene	Resistance	
AAEC1Q99	Resfinder	qnrS1	Ciprofloxacin Amoxicillin; Ampicillin; Aztreonam; Cefepime; Ceftriaxone; Cefazidime; Ceftriaxone; Piperacillin;Ticarcillin	
AAEC1R10	Resfinder	qnrS1		
AAEC1Q99	Resfinder	blaCTX-M-15		
AAEC1R10	Resfinder	blaCTX-M-15		
AAEC13R3	Resfinder	blaCTX-M-15		
AAEC14R2	Resfinder	blaCTX-M-15		
AAEC4R2	Resfinder	blaCTX-M-15		
AAEC6R1	Resfinder	blaCTX-M-15		
AAASp1J0R1	MEGares	CPXAR		Aminocoumarin, Aminoglycoside
AAASp1J2R9	MEGares	CPXAR		
AAASp1J2R9	MEGares	CPXAR		
AAASp1J3R1	MEGares	CPXAR		
AAASp1J3R1	MEGares	CPXAR		
AAASp1J4R5	MEGares	CPXAR	AMR gene carried by IncFIB and IncI plasmids is blaCTXM-15	
AAASp1J4R5	MEGares	CPXAR		
AAASp1J4R5	MEGares	CPXAR		
AAASp1J9B3	MEGares	CPXAR		
AAEC12OR2	PlasmidFinder	IncFIB		
AAEC10R1	PlasmidFinder	IncY		
AAEC15R1	PlasmidFinder	IncY		
AAEC16R1	PlasmidFinder	IncY		
AAEC17R2	PlasmidFinder	IncY		
AAEC9R1	PlasmidFinder	IncY		
AAEC1R3	VFDB	gtrA	Invade a host, evade host defences and cause disease through: Adherence factors; Invasion factors; Capsules; Toxins; Siderophores	
AAEC1R4	VFDB	gtrA		
AAASa10R5	VFDB	sodCI		
AAASa11R3	VFDB	sodCI		
AAASa16R1	VFDB	sodCI		
AAASa17R3	VFDB	sodCI		
AAASa18R2	VFDB	sodCI		
AAASa13OR6	VFDB	sopE2		

Conclusion

1. Mobile genetic elements are associated with antimicrobial resistance genes.
2. Analysis of mobile genetic elements that carry antimicrobial resistance genes shows enrichment of antimicrobial resistance genes in prophages.
3. The association allows for the rapid spread of antimicrobial resistance genes throughout a bacterial community.
4. The acquisition of AMR genes carried on mobile genetic elements can lead to establishing multidrug resistance.

Contacts

References

- Abdulrahman Alghamdi
- Abu.alghamdi93@gmail.com
- Alghamdi A

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