How To: Identify carbapenem-resistant isolates without common acquired carbapenem resistance genes

NCBI Pathogen Detection https://www.ncbi.nlm.nih.gov/pathogens

U.S. National Library of Medicine
National Center for Biotechnology Information

At a glance

- Use the Isolates Browser
  https://www.ncbi.nlm.nih.gov/pathogens/isolates
- Use `AST_phenotypes:` and `AMR_genotypes:` search fields
- Download table and/or assemblies
- Use cross-browser selection to identify AMRFinderPlus results for those isolates

- You can also use Filters to search

https://www.ncbi.nlm.nih.gov/pathogens

Pathogen Detection BETA

NCBI Pathogen Detection integrates bacterial and fungal pathogen genomic sequences from numerous ongoing surveillance and research efforts whose sources include food, environmental sources such as water or production facilities, and patient samples. Foodborne, hospital-acquired, and other clinically infectious pathogens are included.

The system provides two major automated real-time analyses: 1) it quickly clusters related pathogen genome sequences to identify potential transmission chains, helping public health scientists investigate disease outbreaks, and 2) as part of the National Database of Antibiotic Resistant Organisms (NDARO), NCBI screens genomic sequences using AMRFinderPlus to identify the antimicrobial resistance, stress response, and virulence genes found in bacterial genomic sequences, which enables scientists to track the spread of resistance genes and to understand the relationships among antimicrobial resistance, stress response, and virulence.

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How To

1. Click Isolates Browser

Data Resources

Isolates Browser

Microbial Browser for Identification of Genetic and

Health > Pathogen Detection > Isolates Browser

https://www.ncbi.nlm.nih.gov/pathogens/isolates

Help

Search

AST_phenotypes:*penem=R AND NOT AMR_genotypes:(blaKPC* OR blaNDM* OR blaIMP* OR blaVIM*) AND taxgroup_name:("E.coli and Shi

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2. Enter search string using 'AST_phenotypes:' e.g.:

`AST_phenotypes:*penem=R AND NOT AMR_genotypes:(blaKPC* OR blaNDM* OR blaIMP* OR blaVIM*)`

This will exclude all isolates with KPC, NDM, IMP, or VIM carbapenemases.

Matched Clusters count:14

#	Organism group						min-diff	Minimal min-same	Latest update
1	E.coli and Shigel						27	3	2022-06-01
2	E.coli and Shigella	PDS000033517.24	1	1	0	46	38	34	2022-05-31
3	E.coli and Shigella	PDS0			0	3			1
4	E.coli and Shigella	PDS0			0				
5	E.coli and Shigella	PDS0			0				
6	E.coli and Shigella	PDS0			0				
7	E.coli and Shigella	PDS0			0				

3. Download table of results and/or isolate assemblies

4. Use Cross-browser selection to view the results of AMRFinderPlus for these isolates in MicroBIGG-E

Matched Isolates

Page 1 of 3 | Records per Page 20 | Choose columns | Download | Hide plus AMR genotypes | Expand all | Cross-browser selection | Displaying 1 - 20 of 41

#	Organism group	Isolate	Create date	Location	Isolation source	SNP cluster	Min-diff	BioSample	Assembly	AMR genotypes	Virulence genot...	Stress genotypes	Computed types
1	E.coli and Shige...	PDT000926468.1	2021-01-01				n/a	SAMN16887362		Complete (9) acrF aph(3")-Ib aph(6)-Id Point (4) gyrA_D87N gyrA_S83L parC_S80I Show all 13 genes	Complete (5) espX1 fdeC iss Show all 5 genes	Complete (1) ymgB	
2	E.coli and Shige...	PDT000926456.1	2021-01-01			PDS000078386.1	n/a	SAMN16887373		Complete (17) aac(3)-IIe aac(6')-Ib3 aadA5 Partial end of conti sul1 Point (5) cyaA_S352T gyrA_D87N	Complete (6) air eilA espX1 Show all 6 genes	Complete (3) emrE qacEdelta1 ymgB	

https://www.ncbi.nlm.nih.gov/pathogens/isolates

Help

2. An alternative method of search is to use the filters feature. Click the bar to bring up filters

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Filters 6

Available filters

Filter

- Min-diff
- BioSample
- AMR genotypes
- Computed types
- Min-same
- Assembly
- AMR genotypes core
- IFSAC category
- Source type
- Host
- K-mer group
- Scientific name
- AST phenotypes
- Virulence genotypes
- Stress genotypes

6 AST phenotypes

Search penem

- Susceptible 18006
  - meropenem 8097
  - imipenem 1413
  - ertapenem 663
  - doripenem 491
  - meropenem-vaborbactam 53
- Resistant 12061
  - imipenem 591
  - meropenem 573
  - doripenem 276
  - ertapenem 231
  - meropenem-vaborbactam 6
  - imipenem-relebactam 2
- Not determined 943
  - meropenem 140
  - ertapenem 112
  - imipenem 69

4. Use the substring search to identify the phenotypes of interest

5. Select the drugs under “Resistant” to select isolates tested resistant to those drugs.

3. Select the field you want to search

Matched Clu… count:178

#	Organ…		…tched clinical isolates	Matched environmental isolates	Total isolates	Minimal min-diff	Minimal min-same	Latest update
1	Acinetobacter baumannii	PDS000005033.15	56	3	53	89	0	0	2022-05-07
2	Acinetobacter baumannii	PDS000005672.26	22	13	9	45	0	0	2021-08-04
3	Acinetobacter baumannii	PDS000005666.15	19	5	14	155	0	0	2021-07-14

More information

- For full help documentation of the Isolates Browser see: https://www.ncbi.nlm.nih.gov/pathogens/pathogens_help/#isolates-browser
- For details about filters see: https://www.ncbi.nlm.nih.gov/pathogens/pathogens_help/#filters
- For details about the solr search syntax used to search the browsers see: https://www.ncbi.nlm.nih.gov/pathogens/pathogens_help/#solr

Questions and further help: email pd-help@ncbi.nlm.nih.gov