

## Supplementary Materials

**Supplementary Material S1.** Isolates that carry a novel NTE<sub>KPC</sub>.

NTE <sub>KPC</sub> subtype	Genome location	Strain	Plasmid name	Access number	Length (bp)	Country	Number of <i>bla</i> <sub>KPC</sub> copies	MLST
NTE <sub>KPC</sub> -I	Plasmid	R31	pR31-KPC	CP061851.1	29,402	China	Single copy	NR
	Plasmid	PA2207	unnamed	CP080290	41,938	China	Single copy	ST463
	Plasmid	BH6	pBH6	CM003767	3,652	Brazil	Single copy	NR
	Plasmid	Not reported	YLH6_p3	MK882885.1	49,162	China	Double copy	NR
	Plasmid	P33	pP33-2	CP065414.1	48,306	China	Single copy	NR
	Plasmid	C79	p1	CP040685	40,180	China	Single copy	NR
	Plasmid	ZYPA	pZYPA01	MZ050803.1	41,104	China	Single copy	NR
	Chromosome	NDTH7329	-	CP078006.1	7,144,260	China	Six copies	ST463
	Plasmid	QZPH16	pQZPH16-KPC	CP078005.1	64,631	China	Single copy	ST463
	Plasmid	QZPH21	pQZPH21-KPC	CP078003.1	58,802	China	Single copy	ST463
	Plasmid	SRRSH1120	pSRRSH1120-KPC	CP078000.1	106,679	China	Single copy	ST463
	Chromosome	SRRSH1521	-	CP077997.1	6,594,602	China	Single copy	ST244
	Plasmid	SRRSH2790	pSRRSH2790-KPC	CP077995.1	62,848	China	Single copy	ST463
	Plasmid	NDTH10366	pNDTH10366-KPC	CP064402.1	392,244	China	Double copy	NR
	Chromosome	NDTH10366	-	CP064401.1	6,974,425	China	Three copies	ST463
	Plasmid	SRRSH1408	pSRRSH1408-KPC	CP064396.1	44,426	China	Single copy	ST463
	Plasmid	1011	p1011-KPC2	MH734334.1	62,793	China	Single copy	ST463
NTE <sub>KPC</sub> -II	Plasmid	10265	p10265-KPC	KU578314.1	38,939	China	Single copy	NR
	Plasmid	HdC	unnamed	OL780449.1	42,750	Argentina	Single copy	NR
	Plasmid	FAHZU40	pFAHZU40-KPC	CP078008.1	28,700	China	Single copy	ST234
	Plasmid	SE5419	pSE5419-3	CP081349.1	42,487	China	Double copy	ST697
	Plasmid	SE5416	pSE5416-KPC	MN894887.1	510,711	China	Single copy	ST697
	Plasmid	PA-2	pPA-2	KC609322.1	7,995	Colombia	Single copy	ST1006

NTE <sub>KPC</sub> -III	Plasmid	D5170990	pD5170990	KX169264.1	32,424	Brazil	Single copy	NR
NTE <sub>KPC</sub> -IV	Plasmid	CCBH28525	pCCBH28525_KPC	CP086065.1	60,312	Brazil	Double copy	NR

**Abbreviations:** MLST, Multi-Locus Sequence Type; NR, Information not founded in the NCBI report nor via PubMLST.

**Supplementary Material S2.** Advanced search strategy for PubMed and Embase databases

<b>PUBMED</b>		
<i>Search</i>	<i>Query</i>	<i>Items found</i>
<b>#1</b>	(((((Pseudomonas aeruginosa) OR (Bacterium aeruginosum)) OR (Bacillus aeruginosus)))	51,030
<b>#2</b>	((((((((((((((Carbapenems) OR (carbapenem)) OR (carbapenem antibiotics)) OR (antibiotics, carbapenem)) OR (doripenem)) OR (ertapenem)) OR (invanoz)) OR (invanz)) OR (ertapenem sodium)) OR (imipenem)) OR (imipemide)) OR (meropenem)) OR (merrem)) OR (ronem)) OR (penem)))	27,454
<b>#3</b>	(((((beta-lactamase KPC-2) OR (beta-lactamase KPC-3)) OR (blaKPC)) OR (bla KPC))) AND (((((((((((dissemination) OR (transposon resolvases)) OR (transposon)) OR (DNA transposable elements)) OR (integrons)) OR (integron)) OR (plasmids)) OR (plasmid)) OR (episomes)) OR (episome))	1,115
<b>Final search (#1 AND #2 AND #3)</b>	(((((Pseudomonas aeruginosa) OR (Bacterium aeruginosum)) OR (Bacillus aeruginosus)) AND (((((((((((((((Carbapenems) OR (carbapenem)) OR (carbapenem antibiotics)) OR (antibiotics, carbapenem)) OR (doripenem)) OR (ertapenem)) OR (invanoz)) OR (invanz)) OR (ertapenem sodium)) OR (imipenem)) OR (imipemide)) OR (meropenem)) OR (merrem)) OR (ronem)) OR (penem))) AND ((((((beta-lactamase KPC-2) OR (beta-lactamase KPC-3)) OR (blaKPC)) OR (bla KPC))) AND (((((((((((dissemination) OR (transposon resolvases)) OR (transposon)) OR (DNA transposable elements)) OR (integrons)) OR (integron)) OR (plasmids)) OR (plasmid)) OR (episomes)) OR (episome))	65

  

<b>EMBASE</b>		
<i>Search</i>	<i>Query</i>	<i>Items found</i>
<b>#1</b>	'pseudomonas aeruginosa'/exp/	93,588
<b>#2</b>	('carbapenem'/exp OR 'carbapenem' OR 'doripenem'/exp OR 'doribax' OR 'doripenem' OR 'finibax' OR 'ertapenem'/exp OR 'ertapenem' OR 'ertapenem sodium' OR 'invanoz' OR 'invanz' OR 'imipenem'/exp OR 'formiminothienamycin' OR 'imipemide' OR 'imipenem' OR 'meropenem'/exp OR 'mepem' OR 'meronem' OR 'meropen' OR 'meropenem' OR 'merrem' OR 'merrem i.v.')	87,342
<b>#3</b>	('blakpc gene'/exp OR 'blakpc 2 gene'/exp OR 'blakpc 3 gene'/exp OR kpc) AND ('transposon'/exp OR 'tes (transposable elements)' OR 'jumping gene' OR 'transposable element' OR 'transposable elements' OR 'transposon' OR 'dissemination'/exp OR 'integron'/exp OR 'plasmid'/exp OR 'bacterial plasmid' OR 'gene, plasmid' OR 'plasmid' OR nte OR 'gene cassette'/exp)	1,255
<b>Final search (#1 AND #2 AND #3)</b>	'pseudomonas aeruginosa'/exp AND ('carbapenem'/exp OR 'carbapenem' OR 'doripenem'/exp OR 'doribax' OR 'doripenem' OR 'finibax' OR 'ertapenem'/exp OR 'ertapenem' OR 'ertapenem sodium' OR 'invanoz' OR	113

'invanz' OR 'imipenem'/exp OR 'formiminothienamycin' OR 'imipemide' OR 'imipenem' OR 'meropenem'/exp OR 'mepem' OR 'meronem' OR 'meropen' OR 'meropenem' OR 'merrem' OR 'merrem i.v.') AND ('blakpc gene'/exp OR 'blakpc 2 gene'/exp OR 'blakpc 3 gene'/exp OR kpc) AND ('transposon'/exp OR 'tes (transposable elements)' OR 'jumping gene' OR 'transposable element' OR 'transposable elements' OR 'transposon' OR 'dissemination'/exp OR 'integron'/exp OR 'plasmid'/exp OR 'bacterial plasmid' OR 'gene, plasmid' OR 'plasmid' OR nte OR 'gene cassette'/exp)

**Supplementary Material S3.** Excluded studies with reason for exclusion.

First author	Year	Reason for exclusion
Nordmann	2002	Review article
Poirel	2002	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Poirel	2002	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Bedenić	2005	Review article
Livermore	2006	Review article
LaBombardi	2007	Review article
Poirel	2007	Review article
Pitout	2008	Review article
Goldfarb	2009	Irrelevant pathogen
Pfeifer	2009	Non-relevant studies
Walsh	2009	Review article
Pfeifer	2010	Review article
Cuzon	2010	Review article
AmbrožičAvguštin	2010	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Walsh	2010	Review article
Nordmann	2010	Review article
Nath	2010	Non-relevant studies
Tian	2011	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Hrabák	2011	Irrelevant pathogen
Castanheira	2011	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Richter	2011	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Naas	2011	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Jánvári	2011	Irrelevant pathogen
Drieux	2011	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Mataseje	2012	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Hong	2012	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Castanheira	2012	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Damjanova	2012	Irrelevant pathogen

Castanheira	2012	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Bryant	2013	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Kaase	2013	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Chen	2013	Irrelevant pathogen
Liu	2014	Language
Martínez	2014	Irrelevant pathogen
Zheng	2015	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
ND	2015	Review article
Khatun	2015	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Ruppé	2015	Review article
Sun	2016	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Vanegas	2016	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Martinez	2016	Irrelevant pathogen
Nachimuthu	2016	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Rolain	2016	Review article
Ng	2017	Non-human study
Manohar	2017	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Beyrouthy	2017	Irrelevant pathogen
ALI	2017	Non-human study
Nascimento	2017	Non-human study
Manohar	2017	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Bloemberg	2017	Non-relevant studies
Bush	2017	Review article
Kocsis B	2017	Review article
Mathlouthi	2017	Review article
Lamba	2017	Non-human study
Khurana	2017	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Jaillard	2017	Non-relevant studies
Johnning	2018	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Zowawi	2018	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Castanheira	2018	Non-relevant studies
Castanheira	2018	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Singh-Moodley	2018	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Wen	2018	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Karampatakis	2018	Review article
Alves	2018	Irrelevant pathogen
Yoon	2018	Irrelevant pathogen
Wyres	2018	Irrelevant pathogen
Pournajaf	2018	Non-relevant studies

Gomez-Gamboa	2019	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Mangat	2019	Non-relevant studies
Lee	2019	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Ortiz de la Rosa	2019	Non-relevant studies
Zhu	2019	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Song	2019	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
O'Neill	2020	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Silva Júnior	2020	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Beirão	2020	Non-relevant studies
Botelho	2020	Non-relevant studies
Lima	2020	Irrelevant pathogen
Nishida	2020	Irrelevant pathogen
AlAmri	2020	Irrelevant pathogen
Silva	2020	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Bush	2020	Review article
Halat	2020	Review article
Pathak	2020	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Ramirez	2020	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Janse	2021	Non-relevant studies
Yan	2021	Irrelevant pathogen
Yee	2021	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Majlander	2021	Non-human study
Al-Zahrani	2021	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Nafplioti	2021	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Sanou	2021	Irrelevant pathogen
Borelli	2021	Isolates of <i>Pseudomonas aeruginosa</i> without KPC
Dos Santos	2021	Non-human study
Janssen	2021	Non-human study
Huang	2021	Irrelevant pathogen
Nirwan	2021	Irrelevant pathogen
Jean	2022	Review article
Ayoub Moubareck	2022	Review article