Table S1. Source breakdown of carbapenem-resistant *Acinetobacter baumannii* from the Taiwan Surveillance of Antimicrobial Resistance (TSAR) biennial program by year

Strata (# of hospitals)	TSAR III (2002)		TSAR IV (2004)		TSAR V (2006)		TSAR VI (2008)		TSAR VII (2010)		TSAR III – VII combined	
	N	%	N	%	N	%	N	%	N	%	N	%
Hospital type												
Regional hospitals (15)	2	33.3	24	53.3	61	64.9	130	64.4	124	59.6	341	61.4
Medical centers (11)	4	66.7	21	46.7	33	35.1	72	35.6	84	40.4	214	38.6
Region												
North (7)	2	33.3	11	24.4	15	16.0	39	19.3	65	31.3	132	23.8
Central (8)	0	0	17	37.8	33	35.1	122	60.4	101	48.6	273	49.2
South (8)	0	0	8	17.8	24	25.5	20	9.9	27	13.0	79	14.2
East (3)	4	66.7	9	20.0	22	23.4	21	10.4	15	7.2	71	12.8
Patient location												
ICU	1	16.7	1	2.2	7	7.4	9	4.5	2	1.0	20	3.6
OPD/ER	2	33.3	26	57.8	46	48.9	93	46	111	53.4	278	50.1
Non-ICU	3	50.0	18	40.0	41	43.6	100	49.5	95	45.7	257	46.3
Specimen type												
Respiratory	3	50.0	32	71.1	48	51.1	120	59.4	127	61.1	330	59.5
Pus/discharge	2	33.3	2	4.4	15	16.0	18	8.9	22	10.6	59	10.6
Blood	0	0	2	4.4	5	5.3	20	9.9	20	9.6	47	8.5
Urine	0	0	3	6.7	16	17.0	29	14.4	25	12.0	73	13.2
Others	1	16.7	6	13.3	10	10.6	15	7.4	14	6.7	46	8.3

Age group[a]												
Pediatrics	0	0	2	4.4	0	0	2	1.0	7	3.4	11	2.0
Adult	2	33.3	11	24.4	27	28.7	37	18.3	63	30.3	140	25.2
Elderly	4	66.7	31	68.9	67	71.3	146	72.3	135	64.9	383	69.0
Class D carbapenemase genes[b]												
IS*Aba1-bla*$_{\text{OXA-51-like}}$	6	100	45	100	81	86.2	62	30.7	33	15.9	227	40.9
bla$_{\text{OXA-23-like}}$	0	0	0	0	4	4.3	124	61.4	164	78.8	292	52.6
bla$_{\text{OXA-24-like}}$	0	0	0	0	8	8.5	18	8.9	33	15.9	59	10.6
bla$_{\text{OXA-58-like}}$	0	0	1	2.2	0	0	4	2.0	1	0.5	6	1.1

[a] Data on age of some patients were missing

[b] More than one gene of class D carbapenemases were detected in some isolates.

Table S2. Distribution of *bla*$_{OXA}$ among 40 carbapenem-resistant *Acinetobacter baumannii* isolates carrying multiple carbapenem-hydrolyzing class D β-lactamases genes

Resistance mechanisms	Number
IS*Aba1-bla*$_{OXA\text{-}51\text{-}like}$ and *bla*$_{OXA\text{-}23\text{-}like}$	23
IS*Aba1-bla*$_{OXA\text{-}51\text{-}like}$ and *bla*$_{OXA\text{-}24\text{-}like}$	8
bla$_{OXA\text{-}23\text{-}like}$ and *bla*$_{OXA\text{-}24\text{-}like}$	4
IS*Aba1-bla*$_{OXA\text{-}51\text{-}like}$ and *bla*$_{OXA\text{-}58\text{-}like}$	4
IS*Aba1-bla*$_{OXA\text{-}51\text{-}like}$, *bla*$_{OXA\text{-}23\text{-}like}$, and *bla*$_{OXA\text{-}24\text{-}like}$	1

Table S3. Number (percentage) of class D β-lactamase genes in carbapenem-resistant *A. baumannii* isolates from different regions of Taiwan (as shown in Figure 1)

Northern	Before 2004 N = 13	2006 N = 15	2008 N = 39	2010 N = 65
IS*Aba1-bla*$_{\text{OXA-51-like}}$	13 (100)	15 (100)	15 (38)	11 (17)
bla$_{\text{OXA-23-like}}$	0 (0)	0 (0)	23 (59)	60 (92)
bla$_{\text{OXA-24-like}}$	0 (0)	0 (0)	0 (0)	1 (2)
bla$_{\text{OXA-58-like}}$	0 (0)	0 (0)	1 (3)	0 (0)

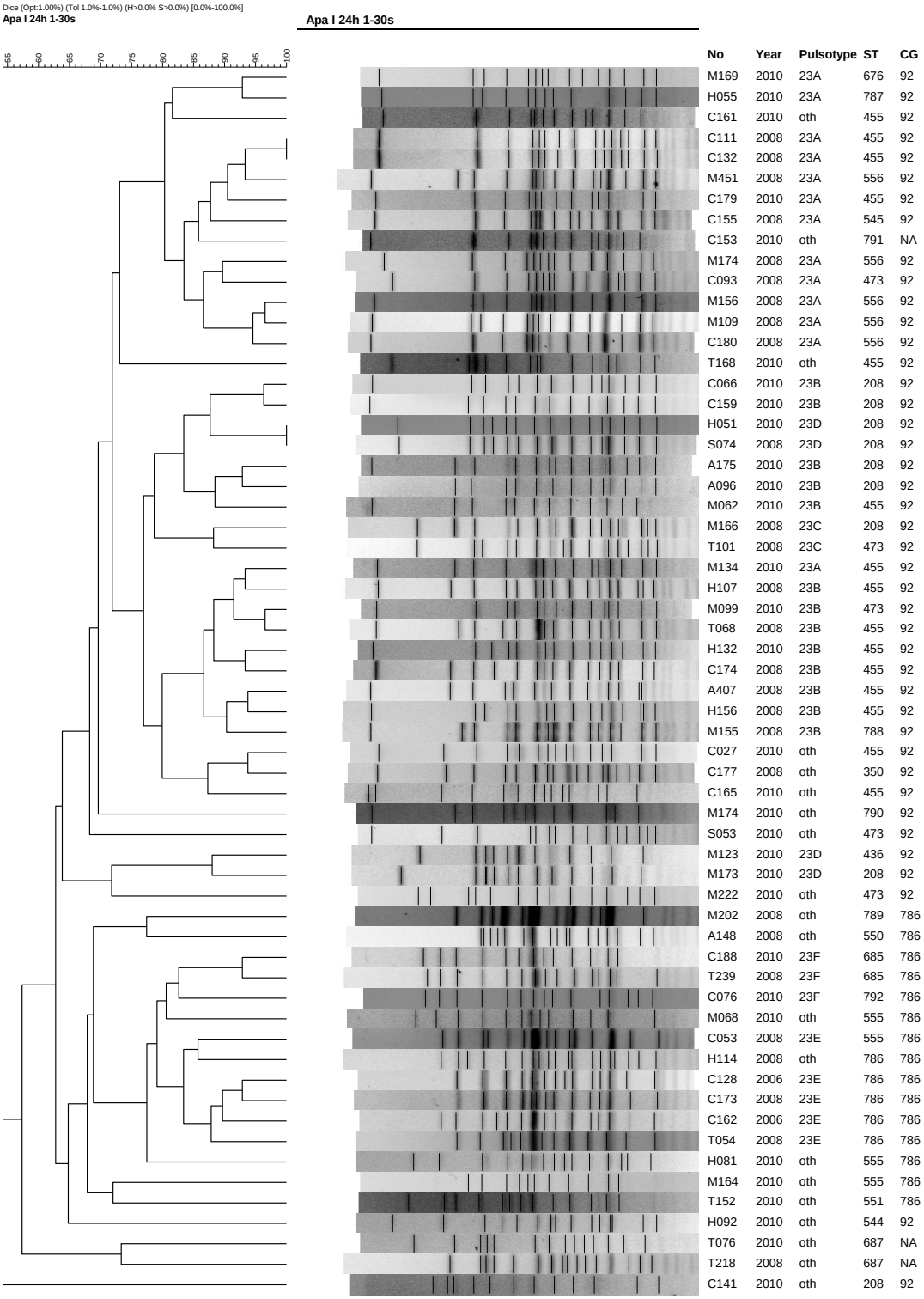
Central	Before 2004 N = 17	2006 N = 33	2008 N = 122	2010 N = 101
IS*Aba1-bla*$_{\text{OXA-51-like}}$	17 (100)	29 (88)	26 (21)	8 (8)
bla$_{\text{OXA-23-like}}$	0 (0)	4 (12)	97 (80)	96 (95)
bla$_{\text{OXA-24-like}}$	0 (0)	0 (0)	1 (1)	2 (2)
bla$_{\text{OXA-58-like}}$	1 (6)	0 (0)	3 (2)	1 (1)

Southern	Before 2004 N = 8	2006 N = 24	2008 N = 20	2010 N = 27
IS*Aba1-bla*$_{\text{OXA-51-like}}$	8 (100)	15 (63)	9 (45)	9 (33)
bla$_{\text{OXA-23-like}}$	0 (0)	0 (0)	1 (5)	4 (15)
bla$_{\text{OXA-24-like}}$	0 (0)	8 (33)	10 (50)	19 (70)
bla$_{\text{OXA-58-like}}$	0 (0)	0 (0)	0 (0)	0 (0)

Eastern	Before 2004 N = 13	2006 N = 22	2008 N = 21	2010 N = 15
IS*Aba1-bla*$_{\text{OXA-51-like}}$	13 (100)	22 (100)	12 (57)	5 (33)
bla$_{\text{OXA-23-like}}$	0 (0)	0 (0)	3 (14)	4 (27)
bla$_{\text{OXA-24-like}}$	0 (0)	0 (0)	7 (33)	11 (73)
bla$_{\text{OXA-58-like}}$	0 (0)	0 (0)	0 (0)	0 (0)

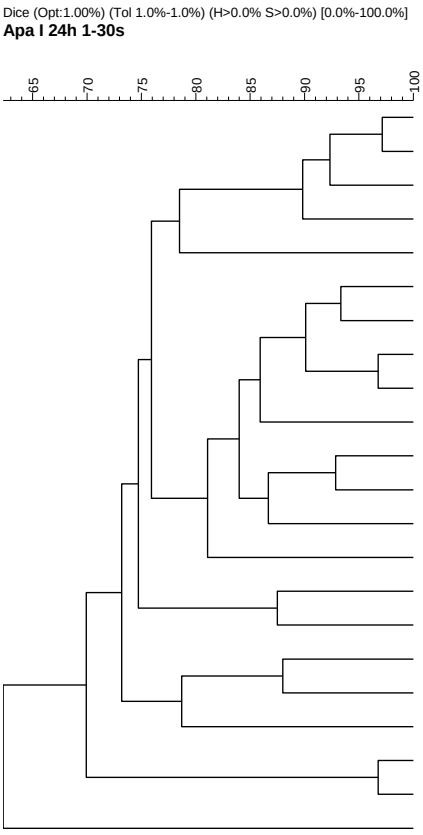
Figure S1. Dendrogram based on pulsed-field gel electrophoresis (PFGE), year of collection, multilocus sequence typing (MLST), and clonal group (CG) of selected carbapenem-resistant *Acinetobacter baumannii* with $bla_{\text{OXA-23-like}}$ (a) or $bla_{\text{OXA-24-like}}$ (b) from the Taiwan Surveillance of Antimicrobial Resistance program, 2002-2010. Pulsotypes were assigned according to the original dendrograms containing 292 and 59 isolates with $bla_{\text{OXA-23-like}}$ and $bla_{\text{OXA-24-like}}$, respectively. Oth, not belonging to major clusters.

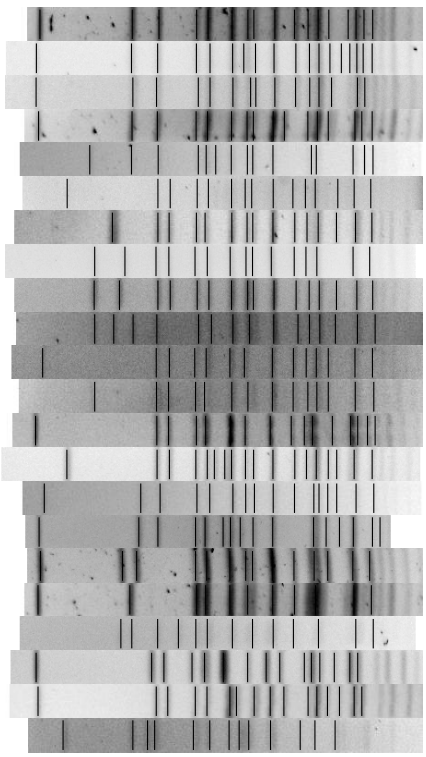
(a)



No	Year	Pulsotype	ST	CG
M169	2010	23A	676	92
H055	2010	23A	787	92
C161	2010	oth	455	92
C111	2008	23A	455	92
C132	2008	23A	455	92
M451	2008	23A	556	92
C179	2010	23A	455	92
C155	2008	23A	545	92
C153	2010	oth	791	NA
M174	2008	23A	556	92
C093	2008	23A	473	92
M156	2008	23A	556	92
M109	2008	23A	556	92
C180	2008	23A	556	92
T168	2010	oth	455	92
C066	2010	23B	208	92
C159	2010	23B	208	92
H051	2010	23D	208	92
S074	2008	23D	208	92
A175	2010	23B	208	92
A096	2010	23B	208	92
M062	2010	23B	455	92
M166	2008	23C	208	92
T101	2008	23C	473	92
M134	2010	23A	455	92
H107	2008	23B	455	92
M099	2010	23B	473	92
T068	2008	23B	455	92
H132	2010	23B	455	92
C174	2008	23B	455	92
A407	2008	23B	455	92
H156	2008	23B	455	92
M155	2008	23B	788	92
C027	2010	oth	455	92
C177	2008	oth	350	92
C165	2010	oth	455	92
M174	2010	oth	790	92
S053	2010	oth	473	92
M123	2010	23D	436	92
M173	2010	23D	208	92
M222	2010	oth	473	92
M202	2008	oth	789	786
A148	2008	oth	550	786
C188	2010	23F	685	786
T239	2008	23F	685	786
C076	2010	23F	792	786
M068	2010	oth	555	786
C053	2008	23E	555	786
H114	2008	oth	786	786
C128	2006	23E	786	786
C173	2008	23E	786	786
C162	2006	23E	786	786
T054	2008	23E	786	786
H081	2010	oth	555	786
M164	2010	oth	555	786
T152	2010	oth	551	786
H092	2010	oth	544	92
T076	2010	oth	687	NA
T218	2008	oth	687	NA
C141	2010	oth	208	92

(b)

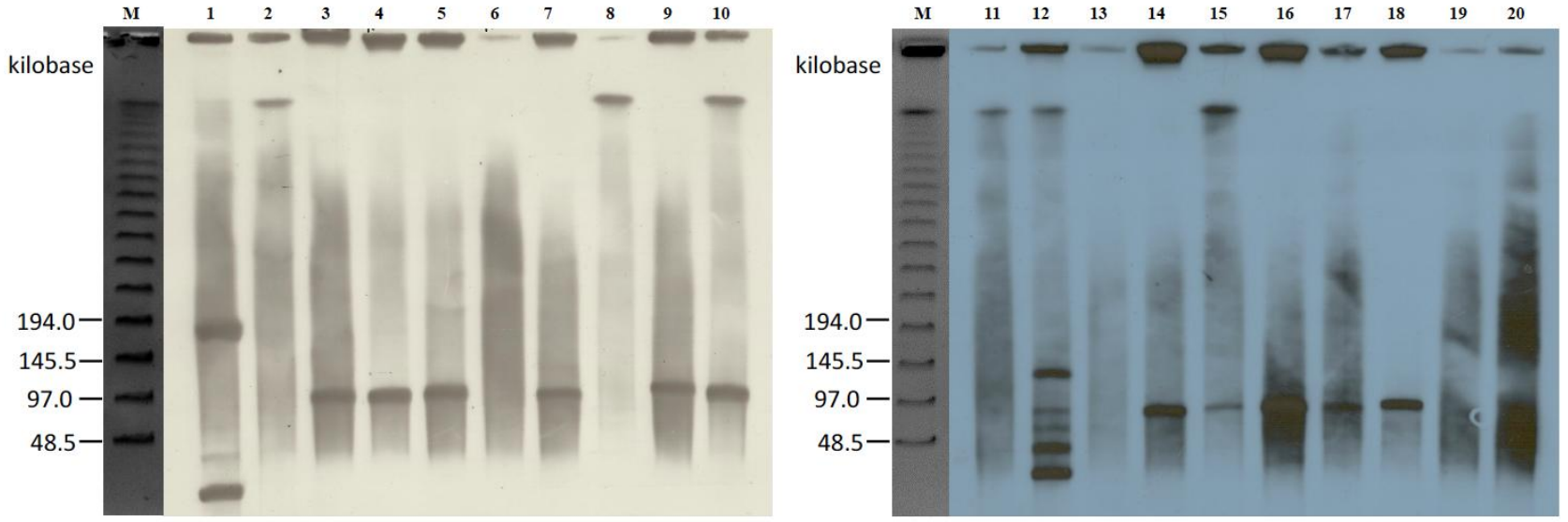




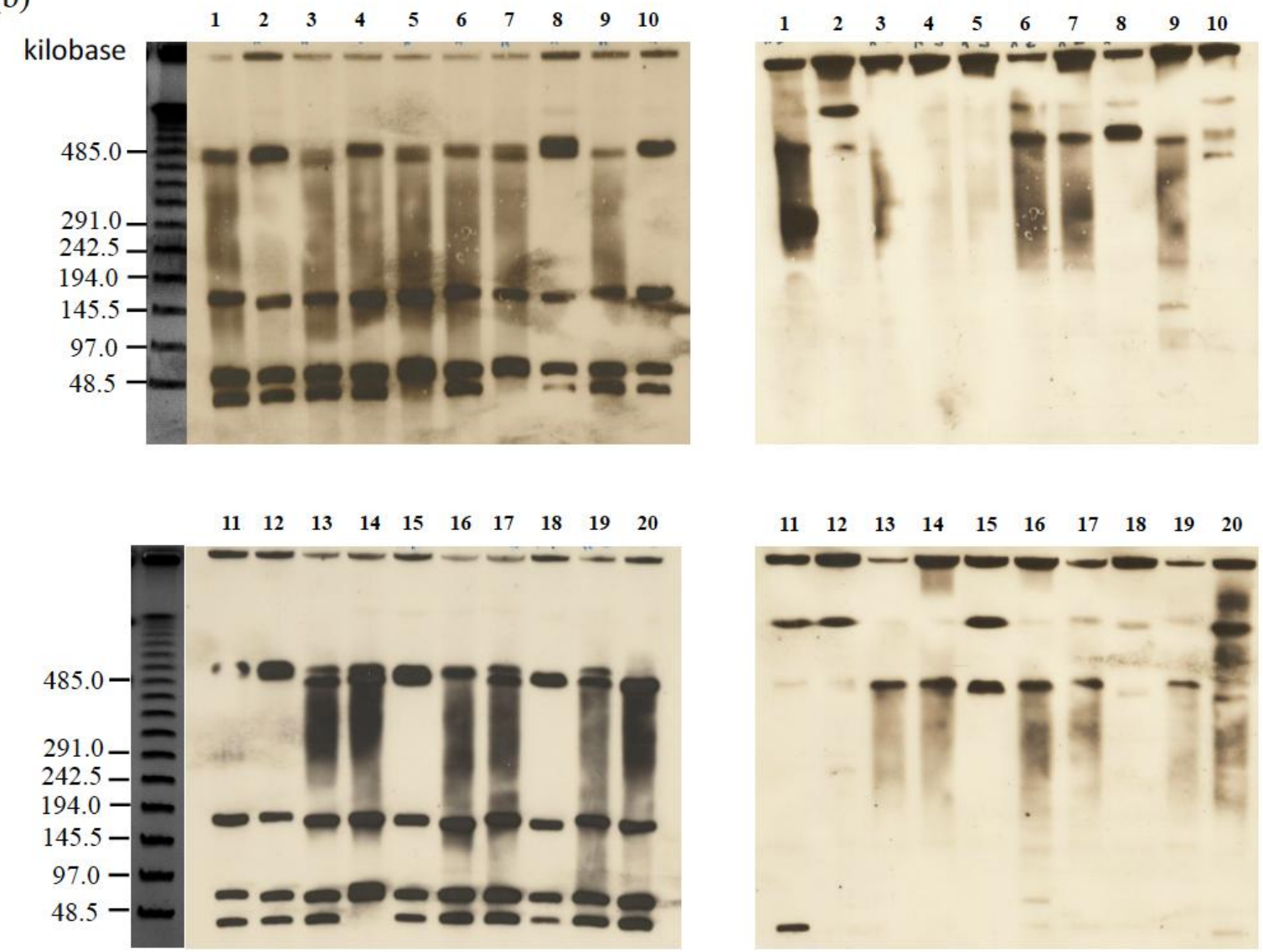
No	Year	Pulsotype	ST	CG
S082	2006	24B	218	92
S090	2008	24B	218	92
L015	2008	24B	218	92
S120	2006	24B	218	92
S081	2010	oth	684	92
P194	2010	24A	218	92
K163	2008	24A	218	92
K122	2010	24A	218	92
K089	2010	24A	218	92
H173	2010	24A	218	92
L145	2010	24A	473	92
M180	2010	24A	218	92
K179	2008	24B	208	92
M179	2008	24A	208	92
S086	2010	oth	473	92
K073	2006	oth	787	92
H151	2006	oth	473	92
S101	2006	oth	218	92
S136	2010	oth	436	92
L157	2008	24C	686	92
K069	2008	24C	686	92
P152	2010	oth	793	92

Figure S2. Localization and genetic environments of *bla*$_{\text{OXA-23-like}}$ in *Acinetobacter baumannii*. The S1 nuclease assay (a) and I-CeuI assay (b) showed simultaneous localization of *bla*$_{\text{OXA-23-like}}$ in the plasmids and chromosome in some isolates. In figure (b), left panel represents hybridization with 23S rRNA genes and right panel, hybridization with *bla*$_{\text{OXA-23-like}}$. (c) PCR mapping showing *bla*$_{\text{OXA-23-like}}$ carried by two subtypes of AbGRI1. More than one AbGRI1 subtypes may be present in each isolate. Only the results of 20 isolates are presented.

(a)



(b)


1 2 3 4 5 6 7 8 9 10
kilobase
485.0
291.0
242.5
194.0
145.5
97.0
48.5
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
485.0
291.0
242.5
194.0
145.5
97.0
48.5
11 12 13 14 15 16 17 18 19 20

(c)

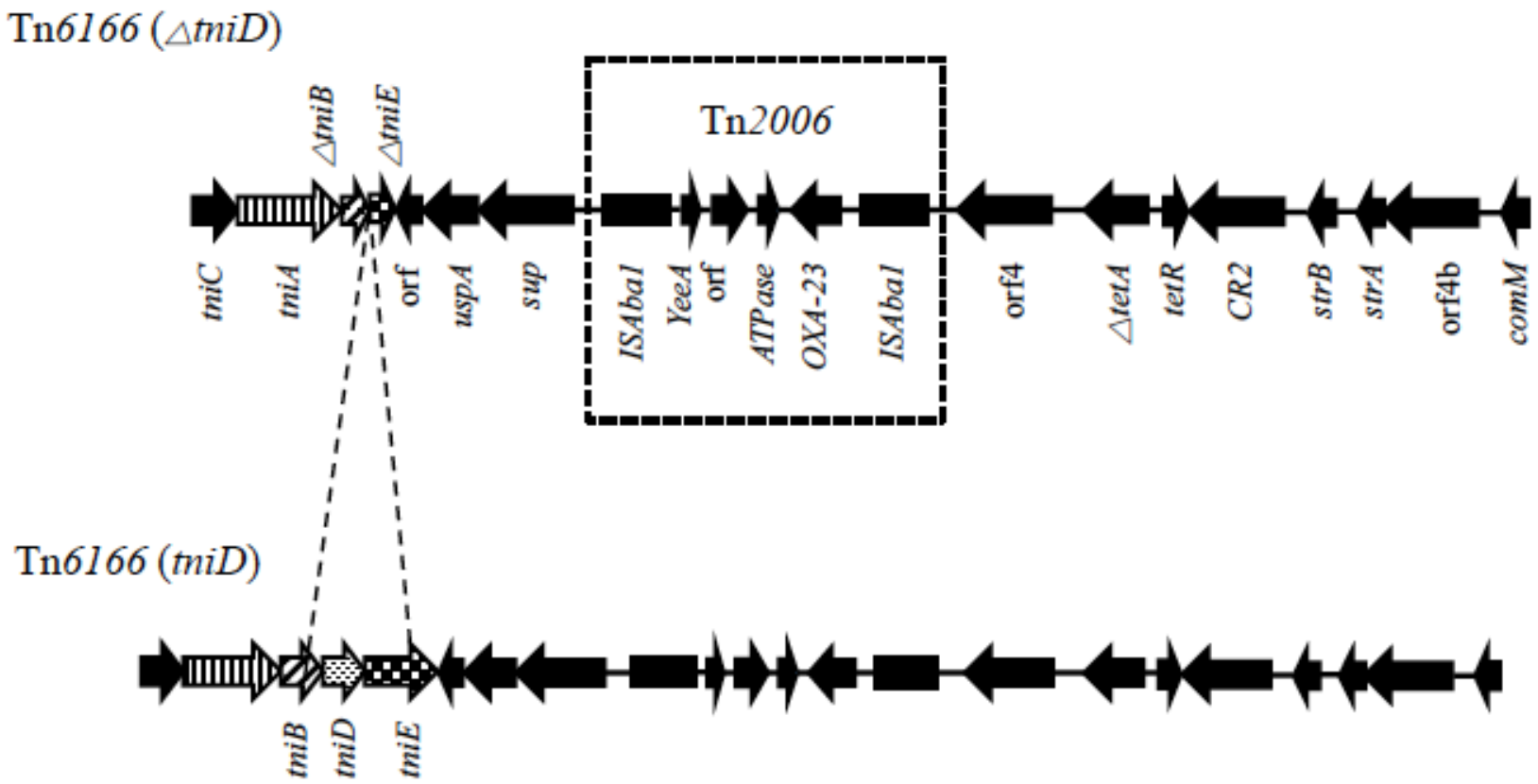

Tn6166 (△tmiD)
Tn2006
△tmiB
△tmiE
tmiC
tmiA
orf
uspA
sup
ISAba1
YeeA
orf
ATPase
OXA-23
ISAba1
orf4
△tetA
tetR
CR2
strB
strA
orf4b
comM
Tn6166 (tmiD)
tmiB
tmiD
tmiE

Figure S3. Localization of *bla*$_{\text{OXA-24-like}}$ in various plasmids in *Acinetobacter baumannii*. The S1 nuclease assay showed different patterns of plasmids. The Roman numerals above the wells denote the patterns of plasmids.

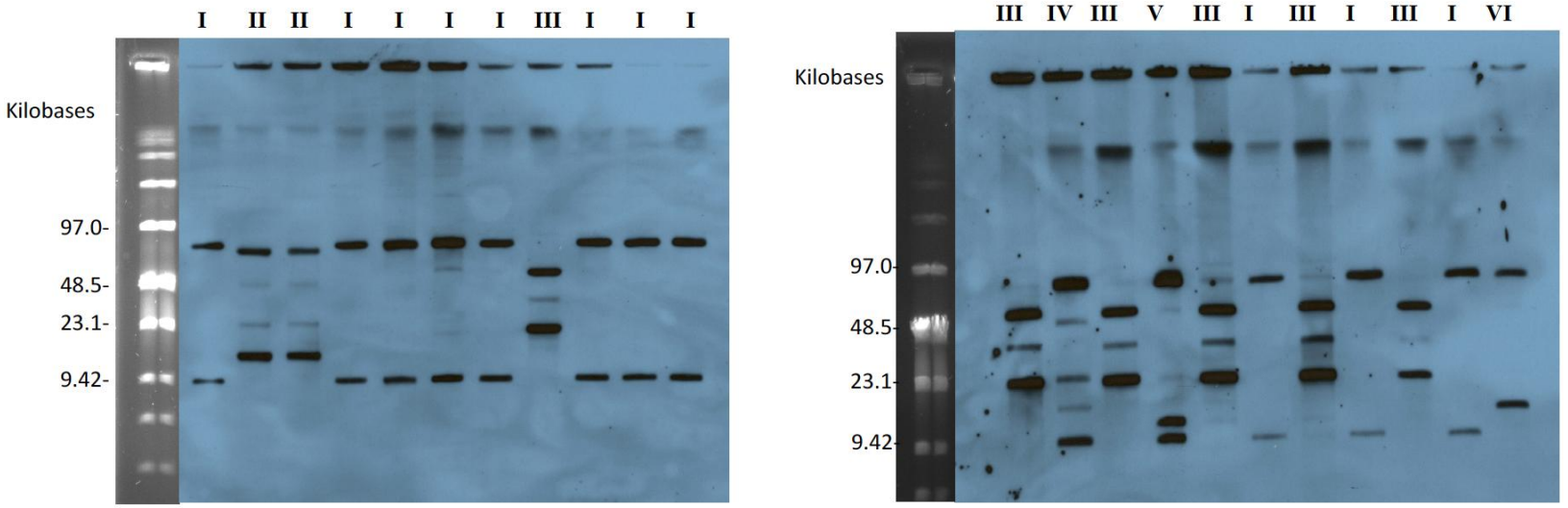


Figure S4. Flow chart of isolate selection and experiments performed in this study.