

## MRR annotated genes of Fig.S1

Location	Size(bp)	Feature	Directionality
76,425...76,561	137	$\Delta$ Tn2	
76,562...77,380	819	$\Delta$ IS26	
77,381...78,715	1335	$\Delta$ Tn2	
78, 851...80,195	1345	$\Delta$ TnAs3	
80,383...81,202	820	IS26	→
81,242...81,748	507	hypothetical protein	→
81,748...82,374	627	hypothetical protein	→
82,380...82,574	195	hypothetical protein	←
82,610...82,732	123	hypothetical protein	→
82,879...83,754	876	<i>bla</i> CTX-M-65	→
83,760...84,813	1054	$\Delta$ IS903B	
84,886...85,911	1026	tonB-dependent receptor <i>yncD</i> precursor	→
85,886...86,335	450	Methyl-accepting chemotaxis sensor/transducer	←
86,456...87,274	819	IS1006	←
87,275...88,119	845	$\Delta$ ISVsa3	
88,137...89,021	885	Type IV secretory pathway	→
89,238...90,452	1215	Chloramphenicol/florfenicol resistance <i>flor</i>	→
90,480...90,785	306	LysR family	→
91,427...92,403	977	ISVsa3	→
92,566...92,868	303	Phosphoglucosamine mutase	←
92,955...93,818	864	<i>sulI</i>	←
93,789...94,968	1180	ISAbal	→
95,147...95,632	486	<i>dmpL</i>	←
95,670...95,804	135	<i>dmpK</i>	←
95,825...97,359	1535	$\Delta$ Tn5393	
97,360...98,250	891	ISEc59	→
98,617...99,642	1026	<i>aph(4)-Ia</i>	←
99,629...99,850	222	hypothetical protein	←
99,871...100,647	777	<i>aac(3)-VI</i>	←
100,698...101,517	820	IS26	→
101,564...102,163	600	<i>aac(6')-II</i>	→
102, 294...103,124	831	<i>bla</i> OXA-1	→
103,262...103,894	633	<i>catB</i>	→
103,979...104,431	453	<i>arr3</i>	→
104,654...105,001	348	<i>qacE</i> $\Delta$ 1	→
104,995...105,834	840	<i>sulI</i>	→
105,962...106,165	204	hypothetical protein	→
106,231...107,050	820	IS26	←
107,051...108,598	1548	$\Delta$ TnAs1	
108,623...108,865	243	$\Delta$ Tn3	
108,897...109,547	651	<i>tetR</i>	←
109,653...110,852	1200	<i>tetA</i>	→

110,884...111,768	885	putative inner membrane transporter YedA	←
111,906...112,298	393	hypothetical protein	←
112,301...114,086	1786	<i>ΔTnAs1</i>	

### MRR annotated genes of Fig.S2

Location	Size(bp)	Feature	Directionality
1..375	375	<i>repB</i>	→
551..913	363	hypothetical protein	→
1032..1454	423	DNA distortion protein 3	→
1475..1759	285	hypothetical protein	←
1795..2106	312	hypothetical protein	←
2312..2623	312	hypothetical protein	←
2696..3358	663	hypothetical protein	←
3739..4401	663	resolvase	→
4462..5777	1316	<i>ISKox3</i>	←
6054..6410	357	hypothetical protein	→
6392..7211	820	<i>IS26</i>	←
7346..8377	1032	<i>tat</i>	→
8388..9026	639	<i>trpF</i>	←
9031..9396	366	<i>ble</i>	←
9400..10212	813	<i>blaNDM-5</i>	←
10306..10355	50	IRR of <i>ISAba125</i>	
10379..11573	1195	<i>IS5</i>	→
11574..12591	1018	<i>ΔISAba125</i>	
12542..12591	50	IRL of <i>ISAba125</i>	
12681..15916	3236	<i>IS3000</i>	←
15917..16496	580	<i>ΔTn2</i>	
16682..16807	126	hypothetical protein	←
17209..17409	201	hypothetical protein	→
17439..17585	147	hypothetical protein	←
17582..17860	279	hypothetical protein	←
17857..18132	276	hypothetical protein	←
18150..18404	255	hypothetical protein	←
18514..19335	822	zinc metalloproteinase Mpr protein	←
19508..19684	177	hypothetical protein	←
19784..20434	651	hypothetical protein	→
20472..20927	456	hypothetical protein	←
20939..23266	2328	<i>topB</i>	←
23270..24532	1263	<i>ftsH</i>	←
24581..25108	528	putative nuclease	←
25105..25431	327	hypothetical protein	←
25590..25802	213	<i>kikA</i>	←
25961..26278	318	hypothetical protein	←
26297..28132	1836	<i>virD4</i>	←

28135..29169	1035	<i>virB11</i>	←
29166..29363	198	hypothetical protein	←
29365..29619	255	<i>virB10</i>	←
29616..30578	963	hypothetical protein	←
30575..31498	924	<i>virB9</i>	←
31510..32238	729	<i>virB8</i>	←
32433..33488	1056	hypothetical protein	←
33500..33757	258	<i>traG</i>	←
33767..34537	771	<i>virB5</i>	←
34547..35734	1188	<i>virB4</i>	←
35757..36290	534	<i>virB4</i>	←
36467..37294	828	hypothetical protein	←
37319..37609	291	<i>virB2</i>	←
37720..38235	516	<i>virB1</i>	←
38514..39116	603	hypothetical protein	←
39328..40107	780	<i>traR</i>	←
40119..40484	366	<i>traR</i>	←
40468..41100	633	<i>taxA</i>	←
41372..41629	258	hypothetical protein	←
41865..42203	339	hypothetical protein	←
42529..42798	270	hypothetical protein	←
42807..43199	393	hypothetical protein	←
43416..43607	192	hypothetical protein	←
43709..44062	354	<i>dnaJ</i>	←
44205..44414	210	hypothetical protein	→
44475..44630	156	hypothetical protein	→
44982..46685	1704	<i>ISSboI</i>	→
47262..47525	264	hypothetical protein	→

### MRR annotated genes of Fig.S3

Location	Size(bp)	Feature	Directionality
1..873	873	<i>repA</i>	→
886..1290	405	hypothetical protein	→
1425..1952	528	hypothetical protein	→
2343..3065	723	<i>pap</i>	←
3137..4612	1476	<i>mcr-1</i>	←
4936..5565	630	hypothetical protein	←
5726..5995	270	hypothetical protein	←
6070..6717	648	cobyrinic acid a,c-diamide synthase	←
7131..7310	180	hypothetical protein	←
7855..7974	120	hypothetical protein	←
8206..8255	50	<i>IRR of IS26</i>	
8304..8930	627	<i>ΔIS26</i>	←
8944..8993	50	<i>IRL of IS26</i>	

9017..9481	465	DNA-binding protein H-NS	←
9499..9705	207	Haemolysin expression modulating protein	←
9702..11855	2154	<i>topB</i>	←
11860..12432	573	DNA topoisomerase III	←
12436..12582	147	<i>ftsH</i>	←
12743..13048	306	IncN plasmid KikA protein	←
13032..13451	420	cag pathogenicity island Cag12 family protein	←
13463..15325	1863	<i>traG</i>	←
15312..16340	1029	<i>virB11</i>	←
16342..17460	1119	<i>virB10</i>	←
17453..18358	906	<i>virB9</i>	←
18358..19044	687	hypothetical protein	←
19037..19165	129	conjugal transfer protein	←
19178..19381	204	hypothetical protein	←
19383..19562	180	hypothetical protein	←
19559..20653	1095	<i>triE</i>	←
20665..21381	717	<i>virB5</i>	←
21393..24140	2748	<i>virB4</i>	←
24159..24485	327	<i>triB</i>	←
24499..25119	621	<i>virB1</i>	←
25122..25298	177	hypothetical protein	←
25475..25690	216	<i>traG</i>	←
25687..25980	294	LuxR family transcriptional regulator	←
26057..27286	1230	<i>traR</i>	←
27290..27793	504	<i>orf8</i>	←
28016..28141	126	hypothetical protein	→
28154..28501	348	DNA repair protein HicB	←
28498..28746	249	<i>hicA</i>	←
28838..28975	138	hypothetical protein	←
29051..29401	351	hypothetical protein	←
29492..29791	300	hypothetical protein	←
29793..30152	360	<i>dnaJ</i>	←
30245..30472	228	hypothetical protein	←
30459..30710	252	hypothetical protein	←
30707..31249	543	hypothetical protein	←
31354..31869	516	<i>dnaJ</i>	←
32007..32159	153	hypothetical protein	←
32704..32829	126	hypothetical protein	→
33073..33189	117	hypothetical protein	←