

**TABLE S2 Strains and plasmids**

Name	Genotype <sup>a</sup>	Deletion endpoints <sup>b</sup>	Source or reference <sup>c</sup>
14028	Wild type		ATCC <sup>d</sup>
JS564	<i>ΔhilD138::Kn</i>		(32)
JS253	<i>ΔhilD114::Cm</i>		(30)
JS749	<i>attλ::pDX1::hilA'-lacZ</i>		(54)
JS951	<i>ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		(20)
JS576	<i>ΔhilD114::Cm attλ::pDX1::hilA'-lacZ</i>		(32)
JS953	<i>tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		(20)
JS955	<i>ΔhilD138::Kn tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		(20)
JS488	Φ( <i>hilD'-lac<sup>+</sup></i> )114		
JS892	Φ( <i>hilD'-lacZ</i> ) <i>hyb139</i>		(20)
JS996	<i>ΔhilE115::Cm</i>	4763527- 4764108	
JS997	<i>ΔhilE115::Cm attλ::pDX1::hilA'-lacZ</i>		
JS998	<i>ΔhilE115::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS999	<i>ΔhilE115::Cm tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		
JS1000	<i>ΔhilE115::Cm ΔhilD138::Kn tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		
JS1001	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>ΔhilE115::Cm</i>		
JS1002	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 ΔhilE115::Cm</i>		
JS950	<i>ΔfliZ8042::Cm attλ::pDX1::hilA'-lacZ</i>		(20)
JS1003	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>ΔfliZ8042::Cm</i>		
JS1004	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 ΔfliZ8042::Cm</i>		
JS1006	<i>ΔenvZ182::Cm attλ::pDX1::hilA'-lacZ</i>		
JS1007	<i>ΔenvZ182::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1008	<i>ΔenvZ182::Cm tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		
JS1009	<i>ΔenvZ182::Cm ΔhilD138::Kn tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		
JS1010	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>ΔenvZ182::Cm</i>		
JS1011	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 ΔenvZ182::Cm</i>		
JS1012	<i>ΔfadD21::Kn</i>	1915235- 1916908	
JS1013	<i>ΔfadD21::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1014	<i>ΔfadD21::Kn ΔhilD114::Cm attλ::pDX1::hilA'-lacZ</i>		
JS1015	<i>ΔfadD21::Kn tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		
JS1016	<i>ΔfadD21::Kn ΔhilD114::Cm tetRA-rtsA attλ::pDX1::hilA'-lacZ</i>		
JS1017	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>ΔfadD21</i>		
JS1018	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 ΔfadD21</i>		
JS1019	<i>sirA3::Cm attλ::pDX1::hilA'-lacZ</i>		

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JS1020	<i>sirA3::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1021	<i>sirA3::Cm tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1022	<i>sirA3::Cm ΔhilD138::Kn tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1023	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>sirA3::Cm</i>		
JS1024	Φ( <i>hilD'-lacZ</i> ) <i>hybb139 sirA3::Cm</i>		
JS1025	<i>Δdam241::Cm</i>	3638689- 3639527	
JS1026	<i>Δdam241::Cm attλ::pDX1::hilA'-lacZ</i>		
JS1027	<i>Δdam241::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1028	<i>Δdam241::Cm tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1029	<i>Δdam241::Cm ΔhilD138::Kn tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1030	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>Δdam241::Cm</i>		
JS1031	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 Δdam241::Cm</i>		
JS1032	<i>Δ(ack-pta)4202::Cm</i>	2447938- 2451363	
JS1033	<i>Δ(ack-pta)4202::Cm attλ::pDX1::hilA'-lacZ</i>		
JS1034	<i>Δ(ack-pta)4202::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1035	<i>Δ(ack-pta)4202::Cm tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1036	<i>Δ(ack-pta)4202::Cm ΔhilD138::Kn tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1037	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>Δ(ack-pta)4202::Cm</i>		
JS1038	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 Δ(ack-pta)4202::Cm</i>		
JS1180	<i>ΔtrkA::Cm</i>	3579771- 3581196	
JS1181	<i>Δ trkA::Cm attλ::pDX1::hilA'-lacZ</i>		
JS1182	<i>Δ trkA::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1183	<i>Δ trkA::Cm tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1184	<i>Δ trkA::Cm ΔhilD138::Kn tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1185	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>ΔtrkA::Cm</i>		
JS1186	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 ΔtrkA::Cm</i>		
JS1039	<i>ΔyfgL611::Cm</i>	2653048- 2654226	
JS1040	<i>ΔyfgL611::Cm attλ::pDX1::hilA'-lacZ</i>		
JS1041	<i>ΔyfgL611::Cm ΔhilD138::Kn attλ::pDX1::hilA'-lacZ</i>		
JS1042	<i>ΔyfgL611::Cm tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1043	<i>ΔyfgL611::Cm ΔhilD138::Kn tetRA-rtxA attλ::pDX1::hilA'-lacZ</i>		
JS1044	Φ( <i>hilD'-lac<sup>+</sup></i> )114 <i>ΔyfgL611::Cm</i>		
JS1045	Φ( <i>hilD'-lacZ</i> ) <i>hyb139 ΔyfgL611::Cm</i>		

Name	Genotype <sup>a</sup>	Deletion endpoints <sup>b</sup>	Source or reference <sup>c</sup>
JS1046	<i>Δfnr1::Cm</i>	1754380- 1755116	
JS1047	<i>Δfnr1::Cm attλ::pDX1::hila'-lacZ</i>		
JS1048	<i>Δfnr1::Cm ΔhilD138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1049	<i>Δfnr1::Cm tetRA-rtSA attλ::pDX1::hila'-lacZ</i>		
JS1050	<i>Δfnr1::Cm ΔhilD138::Kn tetRA-rtSA attλ::pDX1::hila'-lacZ</i>		
JS1051	$\Phi(hilD'-lac^+)$ 114 <i>Δfnr1::Cm</i>		
JS1052	$\Phi(hilD'-lacZ)hyb139$ <i>Δfnr1::Cm</i>		
JS1053	<i>ΔycfD612::Kn</i>	1316880	
JS1054	<i>phoQ24 ΔycfD612::Kn</i>		
JS1055	<i>phoQ24 ΔycfD612::Kn attλ::pDX1::hila'-lacZ</i>		
JS1056	<i>phoQ24 ΔycfD612::Kn ΔhilD114::Cm attλ::pDX1::hila'-lacZ</i>		
JS1057	<i>phoQ24 ΔycfD612::Kn tetRA-rtSA attλ::pDX1::hila'-lacZ</i>		
JS1058	<i>phoQ24 ΔycfD612::Kn ΔhilD114::Cm tetRA-rtSA attλ::pDX1::hila'-lacZ</i>		
JS1059	$\Phi(hilD'-lac^+)$ 114 <i>phoQ24 ΔycfD612</i>		
JS1060	$\Phi(hilD'-lacZ)hyb139$ <i>phoQ24 ΔycfD612</i>		
JS577	<i>ΔhilC113::Cm attλ::pDX1::hila'-lacZ</i>		
JS579	<i>ΔrtsA5 attλ::pDX1::hila'-lacZ</i>		
JS1061	<i>phoQ24 ΔycfD612::Kn ΔhilC113::Cm attλ::pDX1::hila'-lacZ</i>		
JS1062	<i>phoQ24 ΔycfD612::Kn ΔrtsA5 attλ::pDX1::hila'-lacZ</i>		
JS1063	<i>Δfnr2::Tet</i>	1754321- 1755129	
JS1064	<i>Δfnr2::Tet attλ::pDX1::hila'-lacZ</i>		
JS1065	<i>Δfnr2::Tet ΔhilD114::Cm attλ::pDX1::hila'-lacZ</i>		
JS1066	<i>Δfnr2::Tet ΔhilC113::Cm attλ::pDX1::hila'-lacZ</i>		
JS1067	<i>Δfnr2::Tet ΔrtsA5 attλ::pDX1::hila'-lacZ</i>		
JS1068	<i>ΔphoPQ::Cm</i>	1317242- 1319310	
JS1069	<i>ΔphoPQ::Cm attλ::pDX1::hila'-lacZ</i>		
JS1070	<i>Δfnr2::Tet ΔphoPQ::Cm attλ::pDX1::hila'-lacZ</i>		
JS1071	<i>Δhha1::Cm</i>	528131-528349	
JS1072	<i>Δhha1::Cm attλ::pDX1::hila'-lacZ</i>		
JS1073	<i>Δhha1::Cm ΔhilD138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1074	<i>Δhha1::Cm tetRA-rtSA attλ::pDX1::hila'-lacZ</i>		
JS1075	<i>Δhha1::Cm ΔhilD138::Kn tetRA-rtSA attλ::pDX1::hila'-lacZ</i>		
JS1076	$\Phi(hilD'-lac^+)$ 114 <i>Δhha1::Cm</i>		
JS1077	$\Phi(hilD'-lacZ)hyb139$ <i>Δhha1::Cm</i>		

Name	Genotype <sup>a</sup>	Deletion endpoints <sup>b</sup>	Source or reference <sup>c</sup>
JS1078	<i>fis-3::Cm</i>		(72), listed as JG1160)
JS1079	<i>fis-3::Cm attλ::pDX1::hila'-lacZ</i>		
JS1080	<i>fis-3::Cm Δhild138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1081	<i>fis-3::Cm tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1082	<i>fis-3::Cm Δhild138::Kn tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1083	Φ( <i>hild'-lac<sup>+</sup></i> )114 <i>fis-3::Cm</i>		
JS1084	Φ( <i>hild'-lacZ</i> ) <i>hyb139 fis-3::Cm</i>		
JS1085	<i>ΔhupA121::Cm</i>	4386709- 4386981	
JS1086	<i>ΔhupB122::Cm</i>	508105-508378	
JS1087	<i>ΔhupA121:: ΔhupB122::Cm attλ::pDX1::hila'-lacZ</i>		
JS1088	<i>ΔhupA121:: ΔhupB122::Cm Δhild138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1089	<i>ΔhupA121:: ΔhupB122::Cm tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1090	<i>ΔhupA121:: ΔhupB122::Cm Δhild138::Kn tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1091	Φ( <i>hild'-lac<sup>+</sup></i> )114 <i>ΔhupA121:: ΔhupB122::Cm</i>		
JS1092	Φ( <i>hild'-lacZ</i> ) <i>hyb139 ΔhupA121:: ΔhupB122::Cm</i>		
JS1093	<i>ΔrfaH4531::Cm</i>	4182923- 4183411	
JS1094	<i>ΔrfaH4531::Cm attλ::pDX1::hila'-lacZ</i>		
JS1095	<i>ΔrfaH4531::Cm Δhild138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1096	<i>ΔrfaH4531::Cm tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1097	<i>ΔrfaH4531::Cm Δhild138::Kn tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1098	Φ( <i>hild'-lac<sup>+</sup></i> )114 <i>ΔrfaH4531::Cm</i>		
JS1099	Φ( <i>hild'-lacZ</i> ) <i>hyb139 ΔrfaH4531::Cm</i>		
JS1100	<i>ΔrelA81::Kn</i>	3102853- 3105080	
JS1101	<i>ΔrelA81 ΔspoT292::Cm attλ::pDX1::hila'-lacZ</i>		
JS1102	<i>ΔrelA81 ΔspoT292::Cm Δhild138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1103	<i>ΔrelA81 ΔspoT292::Cm tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1104	<i>ΔrelA81 ΔspoT292::Cm Δhild138::Kn tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1105	Φ( <i>hild'-lac<sup>+</sup></i> )114 <i>ΔrelA81 ΔspoT292::Cm</i>		
JS1106	Φ( <i>hild'-lacZ</i> ) <i>hyb139 ΔrelA81 ΔspoT292::Cm</i>		
JS1107	<i>Δfur41::Cm attλ::pDX1::hila'-lacZ</i>		
JS1108	<i>Δfur41::Cm Δhild138::Kn attλ::pDX1::hila'-lacZ</i>		
JS1109	<i>Δfur41::Cm tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		

Name	Genotype <sup>a</sup>	Deletion endpoints <sup>b</sup>	Source or reference <sup>c</sup>
JS1110	<i>Δfur41::Cm ΔhilD138::Kn tetRA-rtsA attλ::pDX1::hila'-lacZ</i>		
JS1111	<i>Φ(hilD'-lac<sup>+</sup>)114 Δfur41::Cm</i>		
JS1112	<i>Φ(hilD'-lacZ)hyb139 Δfur41::Cm</i>		
JS1113	<i>attλ::pDX1::hila'-lacZ hilD138</i>		
JS1114	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042</i>		
JS1115	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ</i>		
JS1116	<i>attλ::pDX1::hila'-lacZ hilD138 Δhile115::Cm</i>		
JS1117	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 Δhile115::Cm</i>		
JS1118	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ Δhile115::Cm</i>		
JS1119	<i>attλ::pDX1::hila'-lacZ hilD138 ΔenvZ182::Cm</i>		
JS1120	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 ΔenvZ182::Cm</i>		
JS1121	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ ΔenvZ182::Cm</i>		
JS1122	<i>attλ::pDX1::hila'-lacZ hilD138 ΔfadD21::Kn</i>		
JS1123	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 ΔfadD21::Kn</i>		
JS1124	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ ΔfadD21::Kn</i>		
JS1125	<i>attλ::pDX1::hila'-lacZ hilD138 sirA3::Cm</i>		
JS1126	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 sirA3::Cm</i>		
JS1127	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ sirA3::Cm</i>		
JS1128	<i>attλ::pDX1::hila'-lacZ hilD138 Δdam241::Cm</i>		
JS1129	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 Δdam241::Cm</i>		
JS1130	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ Δdam241::Cm</i>		
JS1131	<i>attλ::pDX1::hila'-lacZ hilD138 Δ(ack-pta)4202::Cm</i>		
JS1132	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 Δ(ack-pta)4202::Cm</i>		
JS1133	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ Δ(ack-pta)4202::Cm</i>		
JS1134	<i>attλ::pDX1::hila'-lacZ hilD138 ΔyfgL611::Cm</i>		
JS1135	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 ΔyfgL611::Cm</i>		
JS1136	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ ΔyfgL611::Cm</i>		
JS1137	<i>attλ::pDX1::hila'-lacZ hilD138 Δhha1::Cm</i>		
JS1138	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 Δhha1::Cm</i>		
JS1139	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ Δhha1::Cm</i>		
JS1140	<i>attλ::pDX1::hila'-lacZ hilD138 fis-3::Cm</i>		
JS1141	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 Δfis::Cm</i>		
JS1142	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ fis-3::Cm</i>		
JS1143	<i>attλ::pDX1::hila'-lacZ hilD138 ΔhupA121 ΔhupB122::Cm</i>		
JS1144	<i>attλ::pDX1::hila'-lacZ ΔfliZ8042 ΔhupA121 ΔhupB122::Cm</i>		
JS1145	<i>attλ::pDX1::hila'-lacZ ΔflhDC8045 tetRA-fliZ ΔhupA121 ΔhupB122::Cm</i>		
JS1146	<i>attλ::pDX1::hila'-lacZ hilD138 Δrfah4531::Cm</i>		

Name	Genotype <sup>a</sup>	Deletion endpoints <sup>b</sup>	Source or reference <sup>c</sup>
JS1147	<i>attλ::pDX1::hilA'-lacZ ΔfliZ8042 ΔrfaH4531::Cm</i>		
JS1148	<i>attλ::pDX1::hilA'-lacZ ΔflhDC8045 tetRA-fliZ ΔrfaH4531::Cm</i>		
JS1149	<i>attλ::pDX1::hilA'-lacZ hild138 ΔrelA81::Kn ΔspoT292::Cm</i>		
JS1150	<i>attλ::pDX1::hilA'-lacZ ΔfliZ8042 ΔrelA81::Kn ΔspoT292::Cm</i>		
JS1151	<i>attλ::pDX1::hilA'-lacZ ΔflhDC8045 tetRA-fliZ ΔrelA81::Kn ΔspoT292::Cm</i>		
JS1152	<i>attλ::pDX1::hilA'-lacZ hild138 Δfur41::Cm</i>		
JS1153	<i>attλ::pDX1::hilA'-lacZ ΔfliZ8042 Δfur41::Cm</i>		
JS1154	<i>attλ::pDX1::hilA'-lacZ ΔflhDC8045 tetRA-fliZ Δfur41::Cm</i>		
JS1155	<i>ΔflhDC8045::Cm</i>	2022064- 2021175	
JS1156	<i>attλ::pDX1::hilA'-lacZ ΔflhDC8045::Cm</i>		
JS1157	<i>attλ::pDX1::hilA'-lacZ hild138 ΔflhDC8045::Cm</i>		
JS1158	<i>attλ::pDX1::hilA'-lacZ ΔfliZ8042 ΔflhDC8045::Cm</i>		
JS1159	<i>ΔtdcA51::Cm</i>	3412473- 3413411	
JS1160	<i>attλ::pDX1::hilA'-lacZ ΔtdcA51::Cm</i>		
JS1161	<i>attλ::pDX1::hilA'-lacZ hild138 ΔtdcA51::Cm</i>		
JS1162	<i>attλ::pDX1::hilA'-lacZ ΔfliZ8042 ΔtdcA51::Cm</i>		
JS1163	<i>attλ::pDX1::hilA'-lacZ ΔflhDC8045 tetRA-fliZ ΔtdcA51::Cm</i>		
<b>Plasmids</b>	<b>Relevant Characteristics</b>	<b>Cloned End Points</b>	
pKD46	<i>bla</i> P <sub>BAD</sub> <i>gam bet exo</i> pSC101 oriTS		(24)
pCP20	<i>bla cat cI857 λP<sub>R</sub> flp</i> pSC101 oriTS		(18)
pKD3	<i>bla</i> FRT <i>cat</i> FRT PS1 PS2 oriR6K		(24)
pKD4	<i>bla</i> FRT <i>aph</i> FRT PS1 PS2 oriR6K		(24)
pWKS30	pSC101 ori, Ap <sup>f</sup>		(106)
pRfaH		4182924-	
(pKG115)	pWKS30:: <i>rfaH</i> <sup>+</sup>	4183440	

<sup>a</sup> All strains are isogenic derivatives of ATCC 14028.

<sup>b</sup> The numbers indicate the base pairs that are deleted (strains) or cloned (plasmids) (inclusive) as defined in the *S. enterica* serovar Typhimurium LT2 genome sequence in the National Center for Biotechnology Information database.

<sup>c</sup> This study unless specified otherwise.

<sup>d</sup> ATCC, American Type Culture Collection.