Table S2. Inactive genes or operons due to deletions or pseudogenes in the *Shigella* genomes

Gene	Product	Sd197	Sf301	Sb227	Ss046
Metabolism					
speF	ornithine decarboxylase isozyme, inducible	-	SF0603*	SBO0554	SSO0644
speC	ornithine decarboxylase isozyme	SDY3107	SF2962	SBO3024*	SSO3230
lacY	galactoside permease	SDY0376*	-	-	SSO0300*
lacZ	beta-D-galactosidase	SDY0378	-	-	SSO0299
lacI	transcriptional repressor of the lac operon	SDY0379	-	-	SSO0298
lyxK	L-xylulose kinase, cryptic	-	-	-	-
mhpR	transcriptional regulator for mhp operon	-	-	-	SSO0296*
mhpA	3-(3-hydroxyphenyl)propionate hydroxylase	-	-	-	SSO0297
mhpB	2,3-dihydroxyphenylpropionate 1,2-dioxygenase	-	-	-	SSO0295
mhpC	2-hydroxy-6-ketonona-2,4-dienedioic acid hydrolase	-	-	-	SSO0328*
mhpD	2-keto-4-pentenoate hydratase	-	-	-	SSO0329
mhpF	acetaldehyde dehydrogenase	-	-	-	SSO0330
mhpE	4-hydroxy-2-ketovalerate aldolase	-	-	-	SSO0331
srlA	PTS system, glucitol/sorbitol-specific II, C component	SDY2898	SF2725*	SBO2816	SSO2846
srlE	PTS system, glucitol/sorbitol-specific II, B component	SDY2899*	SF2726	SBO2815	SSO2847
srlD	glucitol (sorbitol)-6-phosphate dehydrogenase	SDY2902	SF2728	SBO2813	SSO2849*
xylA	D-xylose isomerase	-	SF3609*	SBO3573	SSO3820
xylB	xylulokinase	-	SF3608	SBO3572	SSO3821
xylE	xylose-proton symport	SDY4217*	SF4174	SBO4060*	SSO4209
xylF	xylose binding protein transport system	SDY4336*	SF3610	SBO3574	-
xylG	D-xylose transport system ATP-binding protein	-	SF3611	SBO3575	-
xylH	D-xylose transport system permease protein	-	SF3612	SBO3576	-
xylR	putative regulator of xyl operon	SDY3710	SF3613*	SBO3577	-
hcaD	ferredoxin reductase subunit of phenylpropionate dioxygenase	-	SF2589*	SBO2566*	SSO2624
glcF	glycolate oxidase iron-sulfur subunit	-	SF3017*	-	-
glcD	glycolate oxidase subunit D	-	SF3018*	-	-
dgoA	2-oxo-3-deoxygalactonate 6-phosphate aldolase and galactonate dehydratase	-	SF3771*	-	SSO3643*
bglB	phospho-beta-glucosidase B; cryptic	-	SF3734*	-	SSO3913*

Gene	Product	Sd197	Sf301	Sb227	Ss046
mtlA	PTS system, mannitol-specific enzyme IIABC components	-	SF3633	SBO3597	SSO3809
mtlD	mannitol-1-phosphate dehydrogenase	-	SF3634	SBO3598	SSO3808
cmtA	PTS system, mannitol-specific enzyme II component, cryptic	SDY3144	-	SBO3056	SSO3087*
cmtB	PTS system, mannitol-specific enzyme II component, cryptic	SDY3143	-	SBO3055	SSO3088
cpsG	phosphomannomutase	-	SF2111	SBO0875	SSO2101
cpsB	mannose-1-phosphate guanyltransferase	-	SF2112	SBO0876	SSO2102
tnaA	tryptophanase	-	SF3754	SBO3667*	-
cadA	lysine decarboxylase 1	SDY4466*	-	-	SSO4308*
cadB	transport of lysine/cadaverine	SDY4465*	SF4286	-	SSO4315*
cadC	transcriptional activator of cad operon	-	-	-	SSO4316*
ybbX	putative hydrolase	-	-	-	SSO0502*
ybbY	putative transport	-	-	-	SSO0501*
wcaL	putative colanic acid biosynthesis glycosyl transferase	-	SF2107	SBO0871	-
wcaK	putative galactokinase (EC 2.7.1.6).	-	SF2108	SBO0872	-
wcaJ	putative colanic acid biosynthsis UDP-glucose lipid carrier transferase	-	SF2110	SBO0874	-
wcaI	putative colanic biosynthesis glycosyl transferase	-	SF2113	SBO0877*	SSO2103
wcaH	GDP-mannose mannosyl hydrolase	-	SF2114	SBO0878	SSO2104
wcaF	putative transferase	-	SF2117	SBO0881	SSO2107
wcaE	putative colanic acid biosynthesis glycosyl transferase	-	-	SBO0882	SSO2108
wcaD	putative colanic acid polymerase	-	SF2120*	SBO0883	SSO2109
wcaC	putative glycosyl transferase		SF2121	SBO0884	SSO2110
wcaB	putative transferase	-	SF2122	SBO0885	SSO2111
wcaA	putative regulator	-	SF2123*	SBO0886	SSO2112
wcaG	putative nucleotide di-P-sugar epimerase or dehydratase	-	SF2115	SBO0879	SSO2105
phnP	phosphonate metabolism	SDY4124	-	SBO4118	SSO4268
phnO	putative regulator, phn operon	SDY4123	-	SBO4119	SSO4269
phnN	ATP-binding component of phosphonate transport	SDY4122	-	SBO4120	SSO4270
phnM	phosphonate metabolism	SDY4121	-	SBO4121	SSO4271
phnL	ATP-binding component of phosphonate transport	SDY4120	-	SBO4122	SSO4272
phnK	ATP-binding component of phosphonate transport	SDY4119	-	SBO4123	SSO4273

Gene	Product	Sd197	Sf301	Sb227	Ss046
phnJ	phosphonate metabolism	SDY4118	-	SBO4124	SSO4274
phnI	phosphonate metabolism	SDY4117	-	SBO4125	SSO4275
phnH	phosphonate metabolism	SDY4116	-	SBO4126	SSO4276
phnG	phosphonate metabolism	SDY4115*	-	SBO4127	SSO4277
Regulators					
atoS	sensor protein AtoS for response regulator AtoC	-	-	-	SSO2278
atoC	response regulator of ato, ornithine decarboxylase antizyme (sensor ATOS)	-	-	-	SSO2279
torS	sensor protein torS (regulator TorR)	SDY0967*	SF0995	SBO2238	SSO1001
torC	trimethylamine N-oxide reductase, cytochrome c-type subunit	SDY0970*	SF0997	SBO2235	SSO1004
torA	trimethylamine N-oxide reductase subunit	SDY0971*	SF0999*	SBO2234*	SSO1005*
torD	part of trimethylamine-N-oxide oxidoreductase	SDY0972	SF1000*	SBO2233	SSO1006*
yqeI	putative sensory transducer	-	-	-	SSO3007*
yiaU	putative transcriptional regulator LYSR-type	SDY4539*	-	-	-
Outer membrane proteins & Transporters					
ompG	outer membrane protein	-	SF1325*	-	SSO1820*
fhuE	outer membrane receptor for ferric iron uptake	SDY2048	SF1106*	SBO1961	SSO1122
fecB	citrate-dependent iron transport, periplasmic protein	SDY4296*	-	-	SSO4462
fecR	regulator for fec operon, periplasmic	SDY4298*	-	-	SSO4464
fecE	ATP-binding component of citrate-dependent iron(III) transport protein	SDY4293	-	-	SSO4459
fecD	citrate-dependent iron transport, membrane-bound protein	SDY4294	-	-	SSO4460
fecC	citrate-dependent iron(III) transport protein, cytosolic	SDY4295	-	-	SSO4461
fecA	outer membrane receptor; citrate-dependent iron transport, outer membrane receptor	SDY4297	-	-	SSO4463
fepE	ferric enterobactin (enterochelin) transport	SDY0518	SF0501*	SBO0448	SSO0538
flu	outer membrane fluffing protein, similar to adhesin	SDY4587*	SF2991	-	-
Flagellar					
fhiA	flagellar biosynthesis	-	SF0278	-	SSO0273
flhA	flagellar biosynthesis; possible export of flagellar proteins	SDY1184*	SF1923*	SBO1121	SSO1241*
flhB	putative part of export apparatus for flagellar proteins	-	SF1924	SBO1120	SSO1240
fliA	flagellar biosynthesis; alternative sigma factor 28; regulation of flagellar operons	SDY1095	SF1965*	SBO1084	SSO1194
fliC	flagellar biosynthesis; flagellin, filament structural protein	SDY1092*	SF1966	SBO1083	SSO1193

Gene	Product	Sd197	Sf301	Sb227	Ss046
fliD	flagellar biosynthesis; filament capping protein; enables filament assembly	SDY1091	SF1967	SBO1082	SSO1190*
fliT	flagellar biosynthesis; repressor of class 3a and 3b operons (RflA activity)	SDY1089*	SF1969	SBO1080*	SSO1982
fliF	flagellar biosynthesis; basal-body MS(membrane and supramembrane)-ring and collar protein	-	SF1983*	SBO1070	SSO1996
fliE	flagellar biosynthesis; basal-body component, possibly at (MS-ring)-rod junction	-	SF1982	SBO1071	SSO1995
fliG	flagellar biosynthesis, component of motor switching and energizing, enabling rotation and determining its direction	-	SF1984	SBO1069*	SSO1997
fliH	flagellar biosynthesis; export of flagellar proteins?	-	SF1985	SBO1068*	SSO1998
fliI	flagellum-specific ATP synthase	-	SF1986	SBO1066*	SSO1999
fliJ	flagellar fliJ protein	-	SF1987	SBO1065	SSO2000
fliK	flagellar hook-length control protein	-	SF1988	SBO1064*	SSO2001
fliO	flagellar biosynthesis	-	SF1992	SBO1060	SSO2005
fliP	flagellar biosynthesis	-	SF1993	SBO1059*	SSO2006
fliQ	flagellar biosynthesis	-	SF1994	SBO1058	SSO2007
fliR	flagellar biosynthesis	-	SF1995	SBO1057	SSO2008
fliM	flagellar biosynthesis, component of motor switch and energizing, enabling rotation and determining its direction	-	SF1990	SBO1062	SSO2003
fliN	flagellar biosynthesis, component of motor switch and energizing, enabling rotation and determining its direction	-	SF1991	SBO1061	SSO2004
motA	proton conductor component of motor; no effect on switching	SDY1189	SF1939	-	SSO1227
yaiU	flagellar protein; similar to 3rd module of ATP-binding components of transporters	-	SF0239*	SBO0269	SSO0349
flgN	protein of flagellar biosynthesis	SDY2082*	SF1076	SBO1994	SSO1090
flgF	flagellar biosynthesis, cell-proximal portion of basal-body rod	SDY2074*	SF1081*	SBO1987	SSO1097
flgG	flagellar biosynthesis, cell-distal portion of basal-body rod	SDY2073*	SF1082	SBO1986	SSO1098*
flgJ	flagellar biosynthesis	SDY2070	SF1085	SBO1983*	SSO1101
flgK	flagellar biosynthesis, hook-filament junction protein 1	SDY2069*	SF1086*	SBO1982	SSO1102
flgL	flagellar biosynthesis; hook-filament junction protein	SDY2068	SF1087*	SBO1981	SSO1103
Fimbrial					
Z0022	putative usher protein	-	-	-	-
Z0023	putative chaperone protein	-	-	-	-

Gene	Product	Sd197	Sf301	Sb227	Ss046
Z0024	putative type-1 fimbrial protein	-	-	-	-
hofC	putative integral membrane protein involved in biogenesis of fimbriae, protein transport, DNA uptake	SDY0136*	SF0103	SBO0094	SSO0114
hofB	putative integral membrane protein involved in biogenesis of fimbriae, protein transport, DNA uptake	SDY0137	SF0104*	SBO0095*	SSO0115*
yadC	putative fimbrial protein	-	-	-	-
yadK	putative fimbrial protein	-	-	-	SSO0145
yadL	putative fimbrial protein	-	-	-	SSO0146
yadM	putative fimbrial protein	-	-	-	-
htrE	putative fimbrial usher protein	-	-	SBO0125*	SSO0151*
ecpD	putative fimbrial chaperone protein	-	-	SBO0126	SSO0152
yadN	putative fimbrial protein	-	-	SBO0128*	SSO0153
sfmA	putative fimbrial-like protein	-	SF0461	-	-
sfmC	putative chaperone	SDY0256	SF0462	-	-
sfmD	putative outer membrane protein, export function	-	-	-	SSO0505*
sfmH	involved in fimbrial asembly	-	-	-	SSO0506
sfmF	putative fimbrial protein	-	-	-	SSO0507
fimZ	fimbrial Z protein; probable signal transducer	-	-	SBO0429	SSO0510*
ybgO	orf, hypothetical protein	SDY0651	SF0581*	SBO0575*	SSO0667
ybgP	putative chaperone	SDY0652	SF0580	-	SSO0668
ybgQ	putative outer membrane usher protein	SDY0654*	SF0579	-	SSO0669*
ybgD	putative fimbriae structural protein	SDY0655	SF0578	-	SSO0670
ycbM	putative transport system permease protein	SDY2323	SF0931	SBO2225*	SSO0937
ycbQ	putative fimbrial-like protein	-	-	SBO2229*	SSO0942
ycbR	putative chaperone	-	-	-	SSO0943
ycbS	putative outer membrane protein	-	SF0941	SBO3652*	SSO0944*
Z1290	homolog of *Salmonella* FimH protein	SDY0914	SF0942	-	SSO0945
Z1291	putative fimbrial-like protein	SDY0915	SF0943	-	SSO0946
Z1292	putative fimbrial-like protein	SDY0916	SF0944	-	SSO0947
ycbF	PapD-like chaperone involved in fimbrial biogenesis	SDY0917	SF0945	SBO2287	SSO0948

Gene	Product	Sd197	Sf301	Sb227	Ss046
Z1534	putative chaperone	-	-	-	-
Z1536	putative usher protein	-	-	-	-
Z1537	putative chaperone	-	-	-	-
Z1538	putative pilin subunit	-	-	-	-
Z2200	putative major fimbrial subunit	-	-	-	-
Z2201	putative fimbrial chaperone protein	-	-	-	-
Z2203	putative fimbrial usher protein	-	-	-	-
Z2204	putative fimbrial-like protein	-	-	-	-
Z2205	putative fimbrial-like protein	-	-	-	-
Z2206	putative adhesin; similar to FimH protein	SDY1657	SF1539	-	SSO1621
yehA	putative type-1 fimbrial protein	-	SF2170	-	SSO2156
yehB	putative outer membrane protein	SDY2287	SF2171	-	SSO2158*
yehC	putative chaperone	-	SF2174*	-	SSO2159
yehD	putative fimbrial-like protein	-	SF2175	-	SSO2160
Z3596	putative fimbrial-like protein	SDY2532	SF2409	SBO2372	SSO2391
Z3597	putative minor fimbrial subunit	SDY2533	SF2410	SBO2373	SSO2392
Z3598	putative fimbrial protein	SDY2534	SF2411	SBO2374	-
yfcS	putative fimbrial chaperone	SDY2535	SF2412*	SBO2375	SSO2393
yfcU	PapC-like porin protein involved in fimbrial biogenesis	SDY2536*	SF2414*	SBO2376	SSO2394
Z3601	putative fimbrial-like protein	SDY2538	SF2415	SBO2377*	SSO2395
yraH	putative fimbrial-like protein	-	SF3178*	-	-
yraI	putative chaperone	-	SF3181	-	-
yraJ	putative outer membrane protein	-	SF3182*	SBO3240	SSO3289
Z4965	putative fimbrial subunit	-	-	-	-
Z4966	putative fimbrial protein	-	-	-	-
Z4968m	PapC-like porin protein involved in fimbrial biogenesis	SDY4570	-	-	-
Z4969	putative fimbrial chaperone	-	-	-	-
Z4971	putative major fimbrial subunit	-	-	-	-
Z5220	putative fimbrial protein	-	-	-	-
Z5221	putative fimbrial protein	-	-	-	-

Gene	Product	Sd197	Sf301	Sb227	Ss046
Z5222	putative fimbrial usher	-	-	-	-
Z5223	putative fimbrial chaperone	-	-	-	-
Z5224	putative fimbrial chaperone	-	-	-	-
Z5225	putative major fimbrial subuit	-	-	-	-
fimB	recombinase involved in phase variation; regulator for fimA	-	SF4210	SBO4362	-
fimE	recombinase involved in phase variation; regulator for fimA	-	SF4209	SBO4363	-
fimA	major type 1 subunit fimbrin (pilin)	-	SF4208	SBO4364	-
fimI	fimbrial protein	-	SF4207	SBO4365	-
fimC	periplasmic chaperone, required for type 1 fimbriae	-	SF4206	SBO4366	-
fimD	outer membrane protein; export and assembly of type 1 fimbriae, interrupted	-	SF4205*	SBO4367*	-
fimF	fimbrial morphology	-	SF4202	SBO4368	-
fimG	fimbrial morphology	-	SF4201	SBO4369	-
fimH	minor fimbrial subunit, D-mannose specific adhesin	-	SF4200	SBO4370	-
Others					
hlyE	hemolysin E	SDY1219*	SF1171*	SBO1890*	SSO1173*
sohA	putative protease; htrA suppressor protein	-	-	-	SSO3286*
eaeH	attaching and effacing protein, pathogenesis factor	-	-	SBO0222*	-
hipA	persistence to inhibition of murein or DNA biosynthesis, DNA-binding regulator	-	-	-	SSO1614*
yheE	putative general secretion pathway for protein export (GSP)	-	-	-	-
yheF	putative general protein secretion protein	-	-	-	-
yheG	putative general secretion pathway for protein export (GSP) (type II traffic warden ATPase)	-	-	-	-
hofF	putative general protein secretion protein	-	-	-	-
hofG	putative general protein secretion protein	-	-	-	-
hofH	putative general protein secretion protein	-	-	-	-
yheH	putative export protein for general secretion pathway (GSP)	-	-	-	-
yheI	putative export protein I for general secretion pathway (GSP)	-	-	-	-
yheJ	putative export protein J for general secretion pathway (GSP)	-	-	-	-
yheK	putative general protein secretion protein	-	-	-	-
pshM	putative general secretion	-	-	-	-