

Table 8a: List of new putative *Y. pestis* CO92 pseudogenes

<i>Y. pseudotuberculosis</i> IP32953 gene	<i>Y. pestis</i> KIM10+ gene	<i>Y. pestis</i> CO92 gene	Type of mutation	Product
YPTB0039	y0099	YPO0042	F/S	putative membrane protein
YPTB0142	y0343	YPO3891 and YPO3892	F/S	conserved hypothetical protein
YPTB0188	y0383	YPO3847	F/S	frataxin-like protein
YPTB0195	y0390	YPO3840	insertion	putative TetR-family regulatory protein
YPTB0196	y0391	YPO3839	inframe insertion	conserved hypothetical protein
YPTB0207	y0402	YPO3828	F/S	hypothetical
YPTB0221	y0416	YPO3814	inframe deletion	cell division protein
YPTB0243	y0439	YPO3791	F/S	putative membrane protein
YPTB0275	y0474	YPO3757	IS100 in promoter*	putative acetyltransferase
YPTB0315	y0517	YPO0260	F/S	putative AraC-family regulatory protein
YPTB0341	y0544	NC	F/S	HEMIN UPTAKE PROTEIN HEMP
YPTB0362	y0565	YPO0306	F/S	conserved hypothetical protein
YPTB0365	y0567	YPO0309	inframe insertion	ATP-binding component of transferase system
YPTB0368	y0570	YPO0312	inframe deletion	glycerol-3-phosphate acyltransferase
YPTB0389	y0594	YPO0335	inframe deletion	hypothetical protein
YPTB0427	y0633	YPO0375	inframe deletion	putative membrane protein
YPTB0453	y0661	YPO3523	inframe deletion	putative exported protein <i>YjFN</i>
YPTB0480	y0688	YPO3496	inframe deletion	translation initiation factor IF2-2
YPTB0545	y3776	YPO0405	inframe insertion	General PTS family, enzyme I, phosphohistidine domain
YPTB0630	NC	YPO0488	F/S	hypothetical protein
YPTB0649	y3665	YPO0508 and YPO0509	stop	Conserved hypothetical protein
YPTB0656	y3658	YPO0515	F/S	putative membrane protein
YPTB0672	y3645	YPO0533	IS1541 in promoter*	2-isopropylmalate synthase
YPTB0714	y0768	YPO3418	inframe deletion	pyruvate dehydrogenase, dihydrolipoyltransacetylase component
YPTB0733	y0789	YPO3398	inframe deletion	putative glutamyl t-RNA synthetase
YPTB0735	y0792	YPO3396	deletion	sugar fermentation stimulation protein; transcriptional regulator for maltose metabolism
YPTB0750	y0808	YPO3381	inframe deletion	bifunctional multimodular BarA: sensory histidine kinase, activates OmpR
YPTB0756	y0815	YPO3375	insertion	superoxide dismutase precursor (Cu-Zn)
YPTB0759	y0818	YPO3372	deletion	sulfite reductase, beta (flavo)protein subunit
YPTB0801	y0859	YPO3330	IS1541 in promoter*	putative sugar ABC transporter
YPTB0815	y0874	YPO3315	inframe insertion	putative sugar ABC transporter, permease protein
YPTB0824	y0882	YPO3306	Promoter deletion*	putative regulatory protein
YPTB0871	y0939	YPO3249	inframe insertion	putative N-carbamyl-L-amino acid amidohydrolase
YPTB0880	y0942 and y0943	YPO3247	F/S and deletion	putative adhesin; involved in the adherence of host cells
YPTB0932	y0997 and y0998	YPO3186 and YPO3185	F/S	Conserved hypothetical protein; putative membrane protein
YPTB0977	y1045	YPO3139	inframe deletion	putative 6-O-methylguanine DNA methyltransferase family protein
YPTB1051	y1123	YPO2807	IS100 in promoter*	LysR-family transcriptional regulator
YPTB1064	y1136	YPO2793	Mutation of STOP codon	putative membrane protein
YPTB1066	y1139	YPO2788	F/S	hypothetical
YPTB1087	y1165	YPO2594	F/S	hypothetical
YPTB1121	y1205	YPO2630	IS1541 in promoter*	glutamyl-tRNA synthetase
YPTB1181	y3032	YPO1150	inframe deletion	adenosylmethionine-8-amino-7-oxononanoate aminotransferase
YPTB1198	absent	YPO1168	inframe deletion	high-affinity choline transport protein
YPTB1256	y2972	YPO1216	inframe deletion	DNA gyrase subunit A
YPTB1271	y2951	YPO1236	partial deletion	putative class II aldolase-family protein
YPTB1286	y2935 and y2936	YPO1250a and YPO1251	F/S	putative bacteriophage protein
YPTB1308	y2909	YPO1274	F/S	putative membrane protein with Diguanylate cyclase/ phosphodiesterase domain 2
YPTB1346	y2870	YPO1315	stop	putative hydrolase
YPTB1370	y2839 and y2840	YPO1344	F/S	FecCD transport family protein
YPTB1401	y2800	YPO1376	inframe deletion	putative cell division protein
YPTB1422	y2775	YPO1397	inframe deletion	conserved hypothetical protein
YPTB1446	y2746	YPO1422	inframe deletion	putative lipoprotein protein
YPTB1458	y2730	YPO1440	inframe deletion	putative helicase IV
YPTB1533	y2650	YPO1518	F/S	putative membrane protein
YPTB1565	y2616	YPO1552	F/S	putative exported protein
YPTB1590	y2405 and y2406	YPO1905a and YPO1905	F/S	hypothetical protein
YPTB1635	y2549	YPO1759	F/S	putative membrane protein
YPTB1639	y2546	YPO1763	inframe deletion	5-carboxymethyl-2-hydroxymuconate semialdehyde dehydrogenase
YPTB1676	y2506	YPO1803	partial deletion	flagellar basal-body rod protein FlgF
YPTB1677	y2505	YPO1804	partial deletion	flagellar basal-body rod protein FlgG
YPTB1700	y2479	YPO1827	F/S	flagellum-specific ATP synthase
YPTB1721	y2457	YPO1849	F/S	conserved hypothetical
YPTB1880	y2440	YPO1868	F/S	putative transposase
YPTB1916	y2413 and y2414	YPO1896	F/S	putative binding-protein
YPTB1920	y2389	YPO1921	inframe deletion	probable pili assembly chaperone
YPTB1980	y2324	YPO1987	IS285	hypothetical protein
YPTB2024 and YPTB2025	y2270	YPO2042	fusion	conserved hypothetical AND virulence factor
YPTB2028	y2267	YPO2045	F/S	putative hemolysin
YPTB2075	y2173	YPO2148	inframe insertion	multidrug resistance protein
YPTB2101	y2146	YPO2175	inframe insertion	Hns DNA binding protein
YPTB2115	NC	NC	F/S	conserved hypothetical
YPTB2117	y2037	YPO2193	inframe insertion	TonB
YPTB2165	y2085	YPO2244	F/S	Fe-S binding NADH dehydrog.
YPTB2166	y2086	YPO2245	stop	Fe-S ferredoxin protein
YPTB2188	y2108	YPO2266	stop	multidrug R permease
YPTB2210	y2118	NC	partial deletion	putative taurine transport system ATP-binding
YPTB2211	y2119	YPO2288	deletion and F/S	ann = AMP nucleosidase
YPTB2212	y2121	YPO2289	inframe deletion	SrIA putative virulence factor in Salmonella
YPTB2213	y2122	YPO2290	inframe insertion	SrIB putative virulence factor in Salmonella
YPTB2217	y2127	YPO2294	deletion	ikN = acetolactate synthase
YPTB2219	y2129	YPO2296 and YPO2297	F/S	putative membrane protein
YPTB2231	y2140	YPO2309	F/S	two-component reg. system
YPTB2233	y2020 and y2019	YPO2312 and YPO2313	F/S	insecticidal toxin TccC
YPTB2294	absent	YPO2380	inframe insertion	insecticidal toxin
YPTB2403	y1835	YPO1673	inframe insertion	membrane protein
YPTB2406	y1826	YPO1665	inframe deletion	motB chemotaxis
YPTB2415	y1817	YPO1654	inframe deletion	LacZ
YPTB2439	y1788 and y1789	YPO1629	F/S	NAGC-like txn regulator
YPTB2446	y1779	YPO1619	stop	hypothetical
YPTB2486	y1741	YPO2449	inframe insertion	LuxR-like transcriptional regulator
YPTB2498	y1734	YPO2455	partial deletion	permease
YPTB2508	y1724	YPO2465	partial deletion	conserved hypothetical
YPTB2527	y1697	YPO2490	inframe deletion	putative hemolysin
YPTB2531	y1693	YPO2494	inframe insertion	BCCT-family transporter
YPTB2540	y1684	YPO2504	partial deletion	hypothetical protein
YPTB2551	y1672	YPO2515	IS100 insertion	putative chemotactic transducer
YPTB2591	NC	YPO2560	partial deletion	putative exported protein
YPTB2604	y1613	YPO2780	F/S	conserved hypothetical
YPTB2659	y1555	YPO2725	F/S	conserved hypothetical
YPTB2661	y1552	YPO2723	IS100 insertion	possible OmpA family
YPTB2731	y1470	YPO3011	F/S	cysteine synthase B
YPTB2778	y1424	YPO3056	F/S	putative acetyltransferase
YPTB2781	y1421	YPO3059	IS1541 in promoter*	phosphoribosylaminoimidazole-succinocarboxamide synthase
YPTB2823	y1375 and y1374	YPO2858	F/S	hypothetical protein
YPTB2826	y1370	YPO2863	IS285	putative membrane protein
YPTB2842	y1352	YPO2880	inframe deletion	putative DNA-binding protein

YPTB2893	y1294	YPO2715	F/S	putative membrane protein
YPTB3032	NC	YPO0782	F/S	Putative membrane protein
YPTB3052	y3191	YPO0803	F/S	hypothetical protein
YPTB3053	y3192	YPO0804	F/S	Putative regulatory membrane protein
YPTB3054	y3194	YPO0805	F/S	putative membrane protein
YPTB3069	y3208	YPO0820	F/S	hypothetical protein
YPTB3104	y3244	YPO0859	F/S	Sugar ABC transporter system, permease.
YPTB3119	y3258 and y3259	YPO0876 and YPO0877	F/S	No significant database hits.
YPTB3219	y3333	YPO0947	inframe insertion	hemolysin-like Ca binding domains, hits to RTX toxins and related Ca <sup>2+</sup> -binding proteins
YPTB3234	y3349	YPO0962	partial	conserved hypothetical
YPTB3243	y3359	YPO0968a	F/S	hypothetical protein
YPTB3273	y3433	YPO0761	Mutation of START codon	hypothetical protein
YPTB3282	y3432	YPO0762	F/S	Conserved hypothetical protein.
YPTB3296	y3416	YPO0776	insertion	putative siderophore biosynthesis protein
YPTB3297	y3410 and y3412	YPO0777 and YPO0778 and YPO1012	IS insertion	Putative siderophore biosynthesis protein.
YPTB3308	y3389	YPO0999 and YPO0998	stop	Conserved putative membrane protein
YPTB3322	absent	YPO0743	inframe insertion	flagellar hook-length control protein
YPTB3344	y3460	YPO0718	inframe deletion	Conserved hypothetical protein
YPTB3371	y3483	YPO0694	inframe deletion	Putative membrane protein
YPTB3397	y3513	YPO0666	F/S	Ice protein homologue
YPTB3419	y3539 and y3540	YPO0641a and YPO0642	F/S	hypothetical protein weakly homologous to the small subunit of phage terminases
YPTB3422	y3543	YPO0639	IS100 in promoter*	hypothetical protein
YPTB3424	y3547	YPO0631	stop	LysR-family regulatory protein - unknown function.
YPTB3429	NC	YPO0626	F/S	Conserved hypothetical
YPTB3465	y3585	YPO0594	F/S	Conserved hypothetical protein
YPTB3512	y0139	YPO3568	IS1541 in promoter*	Protase
YPTB3534	y0164	YPO3699	IS100 in promoter*	putative exported protein
YPTB3551	y0183	YPO3681	inframe insertion	Insecticidal toxin TcaA
YPTB3553	y0185	YPO3678	inframe insertion	Insecticidal toxin TcaC
YPTB3579	y0216	YPO3651	inframe deletion	Transcriptional regulator
YPTB3605	y0245	YPO3624	insertion	aliphatic sulfonates binding protein
YPTB3621	y0265 and y0266	YPO3608 and YPO3609	stop	putative exported protein
YPTB3624	y0269	YPO3604 and YPO3605	F/S	Conserved hypothetical protein
YPTB3655	y0018	YPO3724	Insertion in promoter*	isocitrate dehydrogenase kinase/phosphatase
YPTB3712	y3975	YPO0193	inframe deletion	peptidyl-prolyl-cis-trans isomerase
YPTB3737	y3948	YPO0164	inframe insertion	putative membrane receptor protein
YPTB3743	y3941	YPO0158	inframe deletion	siroheme synthase
YPTB3756	NC	NC	partial only	putative (AJ306977) glutenin HMW subunit 1Ay
YPTB3785	y3888	YPO3940	F/S	glucose-1-phosphate adenylyltransferase
YPTB3789	y3884	YPO3944	inframe deletion	possible Bacterial Ig-like domain (group 1). Putative invasin
YPTB3795	y3877	YPO3952	deletion	conserved hypothetical protein
YPTB3827	y3842	YPO3987	F/S	putative exported protein
YPTB3841	y3826 and y3827	YPO4002	F/S	dipeptide transport system permease protein

\* Genes with promoter anomalies were designated pseudogenes if the IS element, insertion or deletion occurred within -50bp or the ATG start

Table 8b: List of pseudogenes originally called in CO92 (modified from Parkhill et al. 2001)

<i>Y. pseudotuberculosis</i>	<i>Y. pestis</i> KIM10+ gene	<i>Y. pestis</i> CO92 gene	Type of mutation	Product
not a gene	NC	YPO2366	IS100	putative membrane protein
absent	y3787	YPO0395	Partial	transposase
absent	y3214	YPO0824A	IS100	transposase
absent	NC	YPO1086a	Partial	phage integrase
absent	y2690	YPO1480	Partial	transposase
absent	y2211	YPO2103	IS285	putative terminase
absent	y2209	YPO2106	F/S	putative phage protein
absent	absent	YPO3125	Fusion	insertion sequence IS100, transposase and ATP-binding fusion protein
absent	y0751	YPO3436	IS100	hypothetical protein
absent	IS1661	YPO3592A	IS100	insertion element IS1661 protein (split from YPO3702 by inversion)
absent	IS1661	YPO3702	IS100	insertion element IS1661 protein (split from YPO3592A by inversion)
absent	y4050	YPO4029	F/S	IS903 transposase
YPTB0058	y0079	YPO0061	F/S	hypothetical protein
YPTB0085	y0048	YPO0089	Partial	GlpX protein
YPTB0086	y0047	YPO0090	Partial	glycerol kinase
YPTB0090	y0286	YPO0098	IS100	ABC-transport protein, ATP-binding component
YPTB0105	y0302	YPO0115	F/S (7G)	cystathionine gamma-synthase
YPTB0146	y0347	YPO3886	Partial	colicin
YPTB0148	NC	YPO3884	Partial	colicin
YPTB0164	y0358	YPO3870	F/S	guanosine-5'-triphosphate,3'-diphosphate pyrophosphatase
YPTB0261	y0455	YPO3775	IS100	deoxyribonuclease TatD
YPTB0269	y0467	YPO3763	IS1541	conserved hypothetical protein
YPTB0305	y0507	YPO0250	IS100	putative hydrolase
YPTB0390	y0595	YPO0336	Partial	insertion element protein
YPTB0394	NC	YPO0340	Partial	transposase
YPTB0436	y0644	YPO3541	IS100	conserved hypothetical protein
YPTB0524	y0738	YPO3448	F/S (7G)	putative extracellular solute-binding protein
YPTB0553	y3765	YPO0414	F/S	Putative transcriptional regulator
YPTB0582	y3742	YPO0437	F/S	thymidine phosphorylase
YPTB0590	y3734	YPO0446	F/S	ABC transporter ATP-binding protein
YPTB0668	y3649	YPO0526	IS100	sugar efflux transporter
YPTB0761	y0820	YPO3370	F/S	phosphoadenosine phosphosulfate reductase
YPTB0792	y0850	YPO3340	Stop codon	putative exogenous ferric siderophore receptor
YPTB0839	y0900	YPO3288	F/S	anaerobic C4-dicarboxylate transporter
YPTB0843	y0907	YPO3281	IS100	P-protein [includes: chorismate mutase and prephenate dehydratase]
YPTB0870	y0938	YPO3250	IS100	putative transaminase
YPTB0915	y0976	YPO3207	IS100	exonuclease SbcC
YPTB0924	y0986	YPO3198	F/S (10G)	Gamma-glutamyltranspeptidase precursor
YPTB0990	y1058	YPO3126	IS100	putative exported protein
YPTB1100	y1069	YPO3114	F/S (11C)	CDP-D-glucose-4,6-dehydratase
YPTB1105	y1075	YPO3108	F/S	putative glycosyltransferase
YPTB1107	y1077	YPO3105	F/S (9T)	putative O-unit polymerase protein
YPTB1109	y1079	YPO3102	F/S	probable GDP-mannose 4,6-dehydratase
YPTB1110	y1080	YPO3100	F/S (6G)	GDP-L-fucose synthetase
YPTB1118	y1088	YPO3090	F/S	UDP-sugar hydrolase
YPTB1042	NC	YPO2819	Partial	phage integrase
YPTB1059	y1133	YPO2798	IS285	conserved hypothetical protein
YPTB1068	y1141	YPO2572	IS285	penicillin-binding protein 1C (split from YPO2784 by inversion)
YPTB1068	y1141	YPO2784	IS285	penicillin-binding protein 1C (split from YPO2572 by inversion)
YPTB1073	y1148	YPO2579	F/S	putative myo-inositol dehydrogenase
YPTB1123	y1207	YPO2632	F/S	N-acetylglucosaminidase
YPTB1129	y1213	YPO2639	Partial	integrase
YPTB1131	y1215	YPO2641	Partial	phage family integrase
YPTB1165	y3049	YPO1130	IS100	phospho-2-dehydro-3-deoxyheptone aldolase, phe-sensitive
YPTB1168	y3046	YPO1135	F/S (6G)	aldose 1-epimerase
YPTB1202	absent	YPO1172	IS1541	xanthosine permease
YPTB1236	y2994	YPO1195	Stop codon	putative substrate-binding transport protein
YPTB1259	y2968	YPO1219	F/S (7T)	putative two component sensor kinase
YPTB1295	y2926	YPO1259	Partial	putative bacteriophage protein
YPTB1367	y2844	YPO1337	IS100	arginine-binding periplasmic protein 2 precursor
YPTB1449	y2741	YPO1428	IS100	3-oxoacyl-(acyl-carrier-protein) synthase II
YPTB1466	y2722	YPO1448	Partial	transposase

YPTB1468	y2719	YPO1449	Partial	cytotoxic necrotizing factor
YPTB1566	y2614	YPO1554	F/S	sugar transport ATP-binding protein
YPTB1572	y2605	YPO1562	IS285	putative intimin
YPTB1609	y2581	YPO1582	IS285	lactose permease
YPTB1610	y2579	YPO1728	IS100	Putative transcriptional regulator of sugar transport
YPTB1628	y2559	YPO1752	IS100	hypothetical protein
YPTB1637	y2547	YPO1761	F/S	4-hydroxyphenylacetate degradation bifunctional isomerase/decarboxylase
YPTB1668	y2515	YPO1793	IS200-like	invasin
YPTB1709	y2472	YPO1835	F/S	putative chemotaxis protein
YPTB1878	y2439	YPO1869	Partial	phage replicative DNA helicase
YPTB1894	y2434	YPO1875	Partial	putative major tail sheath protein
YPTB1903	y2426	YPO1883	IS285	hypothetical protein
YPTB1904	y2425	YPO1884	F/S	transposase
YPTB1908	NC	YPO1888	Partial	putative transposase
YPTB1909	NC	YPO1889	Partial	putative transposase
YPTB1922	y2387	YPO1923	F/S	Putative sensor protein
YPTB1964	y2344	YPO1967	IS100	porin
YPTB1971	y2335	YPO1977	F/S	3-oxoacyl-[acyl-carrier-protein] synthase III
YPTB2011	y2285	YPO2027	IS100	conserved hypothetical protein
YPTB2016	y2278	YPO2034	IS1541	Putative ABC transporter ATP-binding protein
YPTB2097	y2150	YPO2171	IS285	formyltetrahydrofolate deformylase
YPTB2120	y2041	YPO2197	F/S	putative integral membrane protein
YPTB2169	y2090	YPO2249	F/S	putative toxin transport protein
YPTB2170	y2092	YPO2250	F/S	putative toxin secretion protein
YPTB2204	y2115	YPO2285	Partial	putative ribose-binding periplasmic protein
YPTB2308	y1840	YPO2398	IS100	Putative exported protein
YPTB2321	y1927	YPO2412	Stop codon	Conserved hypothetical protein
YPTB2355	y1888	YPO1726	IS285	pectin degradation protein
YPTB2394	y1846	YPO1684	F/S (9G)	putative membrane protein
YPTB2400	y1838	YPO1676	Stop codon	methyl-accepting chemotaxis protein
YPTB2409	NC	YPO1662	F/S	Flagellar biosynthesis regulatory protein
YPTB2412	y1819	YPO1657	F/S	methyl-accepting chemotaxis protein
YPTB2484	NC	YPO1584	IS285	conserved hypothetical protein
YPTB2601	y1617	YPO2570	IS285	phosphotransferase enzyme II, B component
YPTB2661	y1552	YPO2933	IS100	hypothetical protein
YPTB2668	y1543	YPO2943	IS285	outer membrane usher protein
YPTB2725	y1477	YPO3004	F/S	putative aminopeptidase
YPTB2740	y1460	YPO3021	F/S (8C)	putative outer membrane protein
YPTB2798	y1403	YPO2831	F/S (6A)	putative flagellar associated lysine-N-methylase
YPTB2817	y1382	YPO2851	F/S (7G)	two-component system, sensor kinase
YPTB2826	y1370	YPO2861	IS285	hypothetical protein
YPTB2849	y1345	YPO2887	F/S	putative autotransporter protein
YPTB2871	y1318	YPO2909	F/S (10A)	conserved hypothetical protein
YPTB2910	y1273	YPO2698	Stop codon	conserved hypothetical protein
YPTB2938	y1243	YPO2671	F/S (7G)	urease accessory protein
YPTB2951	y1229	YPO2657	IS285	putative mobilization protein
YPTB2962	y3092	YPO1084	IS100	conserved hypothetical protein
YPTB2962	y1218	YPO2644	IS100	conserved hypothetical protein
YPTB3031	y3170	YPO0781	IS100	putative surface structure protein
YPTB3063	y3202	YPO0814	F/S	general secretion pathway protein F
YPTB3096	y3236	YPO0851	Partial	PIS transport protein
YPTB3127	y3268	YPO0886	Partial	insertion sequence protein
YPTB3178	y3288	YPO0902	Partial	putative surface protein
YPTB3220	y3335	YPO0948	F/S (5A)	conserved hypothetical protein
YPTB3233	NC	YPO0961	Partial	integrase
YPTB3240	y3356	YPO0967A	Partial	insertion sequence protein
YPTB3253	NC	YPO0979	Partial	insertion element protein
YPTB3254	NC	YPO0980A	Partial	insertion element protein
YPTB3263	y3380	YPO0989	F/S	putative siderophore biosynthesis protein IucA
YPTB3269	y3438	YPO0757	IS1661	hypothetical protein
YPTB3285	y3429	YPO0765	F/S	putative adhesin
YPTB3297	y3406	YPO1012	IS100	putative peptide/polyketide synthase subunit
YPTB3313	absent	YPO0752	F/S (9G)	putative lipoprotein
YPTB3336	y3451	YPO0727	IS100	putative flagellar basal-body rod protein
YPTB3357	y3473	YPO0704	F/S	flagellar assembly protein
YPTB3372	y3484	YPO0692	F/S	putative membrane protein
YPTB3389	y3503	YPO0674	F/S	conserved hypothetical protein
YPTB3423	y3545	YPO0632	F/S	hypothetical protein
YPTB3450	y3575	YPO0603	Partial	putative hemagglutinin/hemolysin-related protein
YPTB3489	y0112	YPO3544	IS100	conserved hypothetical protein
YPTB3527	y0155	YPO3583	Stop codon	probable sigma (54) modulation protein
YPTB3545	y0176	YPO3687	F/S (6G)	putative aldehyde dehydrogenase
YPTB3552	y0184	YPO3679	F/S (6A)	insecticidal toxin complex protein TcaB
YPTB3635	y0281	YPO3593	Partial	hypothetical protein
YPTB3635	y0040	YPO3704	IS166	conserved hypothetical protein
YPTB3654	y0019	YPO3723	F/S (5G+5C)	acetate operon repressor
YPTB3659	y4029	YPO0247	IS100	putative transferase
YPTB3716	y3970	YPO0188	F/S	binding protein dependent ABC-transport protein
YPTB3731	y3854	YPO0170	IS100	acetylmethine aminotransferase
YPTB3775	y3901	YPO0124	F/S	maltodextrin phosphorylase
YPTB3782	y3891	YPO3937	Partial	Aerobic glycerol-3-phosphate dehydrogenase
YPTB3837	y3831	YPO3998	F/S (7T)	endoglucanase
YPTB3846	y3820	YPO4008	IS100	two-component system, sensor kinase
YPTB3861	y4047	YPO4026	Partial	phage hypothetical protein
YPTB3895	y4062	YPO4042	F/S	fimbrial usher protein
YPTB3902	y4104	YPO4087	F/S	conserved hypothetical protein
YPTB3927	y4078	YPO4058	Opal codon	Formate dehydrogenase-O, major subunit
YPTB3932	y4073	YPO4052	F/S (10G)	selenocysteine-specific elongation factor
YPTB3933	y4071	YPO4051	Partial	transposase

F/S = frameshift

NC = present but not called

not a pseudogene

a pseudogene or absent from the genome

a pseudogene but previously called as a functional, or missed in the annotation