

Table S6. Genes expressed at significantly higher levels in the flea by wild-type *Y. pestis* CO92 than by wild-type *Y. pseudotuberculosis* (IP strain)

Gene ID ^a	Gene name	Predicted gene function	Relative expression
1 day after infection:			
YPTB0110	YPO3927	<i>argC</i> N-acetyl-gamma-glutamyl-phosphate reductase	2.8
YPTB0111	YPO3925	<i>argB</i> acetylglutamate kinase	2.1
YPTB0145	YPO3888	<i>ilvC</i> ketol-acid reductoisomerase	2.4
YPTB0196	YPO3839	-- hypothetical protein	5.8
YPTB0197	YPO3838	-- hypothetical protein	4.5
YPTB0248	YPO3788	<i>metE</i> 5-methyltetrahydropteroyltriglutamate--homocysteine S-methyltransferase	4.6
YPTB0275	YPO3757	-- acetyltransferase	2.1
YPTB0307	YPO0252	-- membrane protein	3.1
YPTB0308	YPO0253	<i>rcs</i> acetyl-CoA synthetase	2.8
YPTB0343	YPO0285	-- heme utilization carrier protein	5.7
YPTB0344	YPO0286	-- putative heme utilization radical SAM enzyme	5.4
YPTB0483	YPO3493	<i>rpsO</i> 30S ribosomal protein S15	2.4
YPTB0519	YPO3454	<i>nrdD</i> anaerobic ribonucleoside triphosphate reductase	2.0
YPTB0547	YPO0407	<i>lsrG</i> autoinducer-2 (AI-2) modifying protein	8.0
YPTB0548	YPO0408	<i>lsrF</i> AI-2 aldolase	7.0
YPTB0549	YPO0409	<i>lsrB</i> AI-2 ABC transporter substrate-binding protein	10.2
YPTB0550	YPO0410	<i>lsrD</i> AI-2 import system permease	5.1
YPTB0551	YPO0411	<i>lsrC</i> AI-2 import system permease	27.8
YPTB0552	YPO0412	<i>lsrA</i> AI-2 import ATP-binding protein	17.7
YPTB0554	YPO0415	<i>lsrK</i> AI-2 kinase	7.0
YPTB0570	YPO0425	<i>hmsT</i> diguanylate cyclase	2.4
YPTB0571	YPO0426	-- hypothetical protein	2.9
YPTB0592	YPO0449	<i>hmsD</i> diguanylate cyclase	5.1
YPTB0593	YPO0450	<i>hmsC</i> periplasmic protein	2.8
YPTB0674	YPO0537	-- AMP-binding enzyme-family protein	2.0
YPTB0728	YPO3403	<i>panD</i> aspartate alpha-decarboxylase	2.5
YPTB1051	YPO2807	-- LysR family transcriptional regulator	3.2
YPTB1108	YPO2615	<i>ybeJ</i> glutamate and aspartate transporter subunit	2.4
YPTB1143	YPO1109	<i>sdhC</i> succinate dehydrogenase cytochrome b556 large membrane subunit	2.1
YPTB1144	YPO1110	<i>sdhD</i> succinate dehydrogenase cytochrome b556 small membrane subunit	2.1
YPTB1146	YPO1112	<i>sdhB</i> succinate dehydrogenase iron-sulfur subunit	2.2
YPTB1170	YPO1138	<i>galT</i> galactose-1-phosphate uridylyltransferase	2.4
YPTB1274	YPO1239	-- bacteriophage protein	2.1
YPTB1299	YPO1264	<i>rplY</i> 50S ribosomal protein L25	3.1
YPTB1352	YPO1321	<i>sdaC</i> HAAAP family serine/H(+) symporter	9.4

YPTB1411	YPO1386	<i>ansB</i>	L-asparaginase II	5.7
YPTB1522	YPO1507	<i>mglB</i>	ABC transporter, periplasmic galactose-binding protein	3.7
YPTB1540	YPO1528	<i>ysuF</i>	ferric iron reductase involved in ferric hydroxamate transport	2.3
YPTB1579	YPO1570	<i>argG</i>	argininosuccinate synthase	5.8
YPTB1591	YPO1906	<i>fyuA</i>	OMR family pesticin/yersiniabactin receptor protein	11.6
YPTB1593	y2402	<i>ybtT</i>	yersiniabactin biosynthetic protein	4.1
YPTB1595	YPO1910	<i>irp1</i>	yersiniabactin biosynthetic protein	3.1
YPTB1596	YPO1911	<i>irp2</i>	yersiniabactin biosynthetic protein	2.7
YPTB1598	YPO1913	<i>ybtP</i>	lipoprotein inner membrane ABC-transporter	14.7
YPTB1599	YPO1914	<i>ybtQ</i>	inner membrane ABC-transporter	6.9
YPTB1600	YPO1915	<i>ybtX</i>	MFS superfamily transporter signal transducer	4.2
YPTB1601	YPO1916	<i>ybtS</i>	salicylate synthase Irp9	6.5
YPTB1624	YPO1746	<i>cspC</i>	cold shock-like protein	2.6
YPTB1636	YPO1760	<i>hpaR</i>	homoprotocatechuate degradative operon repressor	4.0
YPTB1923	YPO1925	<i>evg</i>	two-component response regulator	2.6
YPTB1934	YPO1936	--	aminotransferase	6.1
YPTB1940	YPO1942	--	iron transporter CDS	2.9
YPTB1944	YPO1946	--	ABC transporter, ATP-binding subunit	2.0
YPTB1946	YPO1948	--	cytochrome	2.3
YPTB1949	YPO1951	<i>hmsH</i>	poly-beta-1,6 N-acetyl-D-glucosamine export porin	7.3
YPTB1950	YPO1952	<i>hmsF</i>	poly-beta-1,6-N-acetyl-D-glucosamine N-deacetylase	6.1
YPTB1951	YPO1953	<i>hmsR</i>	poly-beta-1,6 N-acetyl-D-glucosamine synthase	7.6
YPTB1952	YPO1954	<i>hmsS</i>	poly-beta-1,6-N-acetyl-D-glucosamine biosynthesis	10.5
YPTB1956	YPO1958	<i>chaA</i>	calcium/sodium:proton antiporter	2.0
YPTB2019	YPO2037	--	phosphatase	2.4
YPTB2234	YPO2315	--	hypothetical protein	2.5
YPTB2363	YPO1718	--	oligogalacturonate specific porin	12.1
YPTB2500	YPO2457	<i>ypsR</i>	quorum-sensing transcriptional activator YpeR	3.3
YPTB2697	YPO2974	--	B-type cytochrome	2.2
YPTB2698	YPO2975	--	aminotransferase	6.5
YPTB2828	YPO2865	--	membrane protein	2.0
YPTB2835	YPO2873	--	hypothetical protein	3.4
YPTB2866	YPO2904	<i>hcaT</i>	3-phenylpropionic acid transporter	3.7
YPTB2867	YPO2905	<i>ail</i>	attachment invasion locus protein	4.5
YPTB3107	YPO0863	--	YaeF/YiiX family of permutated papain-like enzymes	2.4
YPTB3262	YPO0988	--	major facilitator superfamily efflux protein	3.8
YPTB3361	YPO0700	--	fimbrial protein	3.0
YPTB3421	YPO0640	--	hypothetical protein	8.3
YPTB3427	YPO0628	--	translational inhibitor protein	25.4
YPTB3428	YPO0627	--	translational inhibitor protein	14.8
YPTB3429	YPO0626	--	YheO-like PAS domain protein	12.8
YPTB3430	YPO0625	--	hypothetical protein	39.1

YPTB3431	YPO0624	--	NhaC family Na ⁺ /H ⁺ antiporter	30.8
YPTB3432	YPO0623	--	aminotransferase	26.3
YPTB3534	YPO3699	--	PliI-like periplasmic lysozyme inhibitor	10.1
YPTB3535	YPO3698	<i>treR</i>	trehalose repressor	4.1
YPTB3550	YPO3682	<i>yitR</i>	LysR family transcriptional regulator	18.6
YPTB3556	YPO3675	--	hypothetical protein	2.3
YPTB3580	YPO3650	--	major facilitator superfamily metabolite symporter	12.5
YPTB3581	YPO3649	--	gamma carboxymuconolactone decarboxylase	21.1
YPTB3642	YPO3711	<i>lamB</i>	maltoporin	3.7
YPTB3655	YPO3724	<i>aceK</i>	isocitrate dehydrogenase kinase/phosphatase protein	11.2
YPTB3656	YPO3725	<i>aceA</i>	isocitrate lyase	20.0
YPTB3657	YPO3726	<i>aceB</i>	malate synthase	11.2
YPTB3658	YPO3727	<i>metA</i>	homoserine O-succinyltransferase	3.4
YPTB3701	YPO0205	<i>bfd</i>	bacterioferritin-associated ferredoxin	2.3
YPTB3909	YPO4080	<i>malS</i>	periplasmic alpha-amylase precursor	2.1

14 days after infection:

YPTB0049	YPO0052	<i>mutM</i>	formamidopyrimidine-DNA glycosylase	2.7
YPTB0145	YPO3888	<i>ilvC</i>	ketol-acid reductoisomerase	2.3
YPTB0196	YPO3839	--	UPF0261 family protein	24.7
YPTB0197	YPO3838	--	PEP hydrolase superfamily protein	3.6
YPTB0275	YPO3757	--	N-acetyltransferase	2.4
YPTB0340	YPO0283	<i>hmuR</i>	tonB dependent outer membrane hemin receptor	2.5
YPTB0342	YPO0284	--	hypothetical protein	3.7
YPTB0344	YPO0286	--	putative heme utilization radical SAM enzyme	5.3
YPTB0348	YPO0290	--	hypothetical protein	2.7
YPTB0461	YPO3515	<i>sfsB</i>	DNA-binding protein	2.1
YPTB0483	YPO3493	<i>rpsO</i>	30S ribosomal protein S15	2.1
YPTB0519	YPO3454	<i>nrdD</i>	anaerobic ribonucleoside triphosphate reductase	2.0
YPTB0547	YPO0407	<i>lsrG</i>	autoinducer-2 (AI-2) modifying protein	8.4
YPTB0548	YPO0408	<i>lsrF</i>	AI-2 aldolase	8.2
YPTB0549	YPO0409	<i>lsrB</i>	AI-2 ABC transporter substrate-binding protein	14.3
YPTB0550	YPO0410	<i>lsrD</i>	AI-2 import system permease	9.4
YPTB0551	YPO0411	<i>lsrC</i>	AI-2 import system permease	21.8
YPTB0552	YPO0412	<i>lsrA</i>	AI-2 import ATP-binding protein	14.0
YPTB0554	YPO0415	<i>lsrK</i>	AI-2 kinase	6.9
YPTB0567	YPO0422	--	hypothetical protein	3.3
YPTB0570	YPO0425	<i>hmsT</i>	diguanylate cyclase	3.0
YPTB0571	YPO0426	--	hypothetical protein	2.7
YPTB0592	YPO0449	<i>hmsD</i>	diguanylate cyclase	3.2
YPTB0593	YPO0450	<i>hmsC</i>	periplasmic protein	2.6
YPTB0625	YPO0483	--	RhtB/LysE family threonine efflux pump	2.0
YPTB0728	YPO3403	<i>panD</i>	aspartate alpha-decarboxylase	2.5
YPTB0750	YPO3381	<i>barA</i>	hybrid sensory histidine kinase	2.1

YPTB0866	YPO3257	--	amino acid ABC transporter, periplasmic protein	2.4
YPTB0867	YPO3256	--	amino acid ABC transporter, permease protein	2.3
YPTB0868	YPO3255	--	amino acid ABC transporter, permease protein	4.5
YPTB0869	YPO3254	--	amino acid ABC transporter, ATP-binding protein	3.5
YPTB0883	YPO3244	<i>fadE</i>	acyl-CoA dehydrogenase	2.9
YPTB0887	YPO3240	<i>nqrA</i>	Na(+)-translocating NADH-quinone reductase subunit	2.1
YPTB1036	YPO2825	--	ribosome-associated protein	2.1
YPTB1051	YPO2807	--	LysR family transcriptional regulator	3.4
YPTB1107	YPO2614	<i>gltJ</i>	glutamate/aspartate ABC transporter permease	2.1
YPTB1108	YPO2615	<i>ybeJ</i>	glutamate and aspartate transporter subunit	2.5
YPTB1139	YPO1105	<i>recN</i>	recombination and repair protein	2.0
YPTB1198	YPO1168	<i>betT</i>	choline transport protein BetT	2.5
YPTB1227	YPO1186	--	ABC transporter ATP-binding protein	2.2
YPTB1274	YPO1239	--	bacteriophage protein	2.4
YPTB1277	YPO1242	--	bacteriophage tail sheath protein	3.9
YPTB1278	YPO1243	--	Bacteriophage tail protein	4.6
YPTB1279	YPO1244	--	bacteriophage protein	7.0
YPTB1281	YPO1246	--	bacteriophage protein	3.4
YPTB1282	YPO1247	--	bacteriophage tail protein	11.9
YPTB1283	YPO1248	--	bacteriophage (baseplate assembly) protein	4.1
YPTB1284	YPO1249	--	bacteriophage protein GP46	4.7
YPTB1285	YPO1250	--	bacteriophage protein	2.4
YPTB1299	YPO1264	<i>rplY</i>	50S ribosomal protein L25	3.7
YPTB1352	YPO1321	<i>sdaC</i>	HAAAP family serine/H(+) symporter SdaC	8.0
YPTB1408	YPO1383	<i>pflB</i>	formate acetyltransferase 1	3.1
YPTB1409	YPO1384	<i>focA</i>	formate transporter	2.8
YPTB1411	YPO1386	<i>ansB</i>	L-asparaginase II	3.4
YPTB1426	YPO1401	--	hypothetical protein	2.4
YPTB1454	YPO1436	<i>sula</i>	SOS cell division inhibitor	2.2
YPTB1591	YPO1906	<i>fyuA</i>	OMR family pesticin/yersiniabactin receptor protein	28.7
YPTB1592	YPO1907	<i>ybtE</i>	yersiniabactin siderophore biosynthetic protein	4.4
YPTB1593	YPO1908	<i>ybtT</i>	yersiniabactin biosynthetic protein YbtT	6.2
YPTB1594	YPO1909	<i>ybtU</i>	yersiniabactin biosynthetic protein YbtU	11.4
YPTB1595	YPO1910	<i>irp1</i>	yersiniabactin biosynthetic protein	4.7
YPTB1597	YPO1912	<i>ybtA</i>	transcriptional regulator YbtA	4.4
YPTB1598	YPO1913	<i>ybtP</i>	lipoprotein inner membrane ABC-transporter	3.9
YPTB1600	YPO1915	<i>ybtX</i>	MFS superfamily transporter signal transducer	4.1
YPTB1601	YPO1916	<i>ybtS</i>	salicylate synthase Irp9	2.7
YPTB1636	YPO1760	<i>hpaR</i>	homoprotocatechuate degradative operon repressor	5.3
YPTB1640	YPO1764	<i>hpaD</i>	3,4-dihydroxyphenylacetate 2,3-dioxygenase	2.5
YPTB1642	YPO1766	<i>hpaH</i>	2-oxo-hept-3-ene-1,7-dioate hydratase	3.8
YPTB1643	YPO1767	<i>hpaI</i>	2,4-dihydroxyhept-2-ene-1,7-dioic acid aldolase	4.6
YPTB1646	YPO1770	<i>hpaC</i>	4-hydroxyphenylacetate 3-monooxygenase coupling	2.1

YPTB1923	YPO1925	<i>evg</i>	two-component response regulator	3.9
YPTB1933	YPO1935	--	Na(+)-translocating NADH-quinone reductase subunit	4.1
YPTB1934	YPO1936	--	aminotransferase	7.8
YPTB1937	YPO1939	--	glutaminase	3.3
YPTB1939	YPO1941	--	high-affinity Fe ²⁺ /Pb ²⁺ permease	2.6
YPTB1940	YPO1942	--	iron transporter protein	2.6
YPTB1949	YPO1951	<i>hmsH</i>	poly-beta-1,6 N-acetyl-D-glucosamine export porin	13.0
YPTB1950	YPO1952	<i>hmsF</i>	poly-beta-1,6-N-acetyl-D-glucosamine N-deacetylase	7.1
YPTB1951	YPO1953	<i>hmsR</i>	poly-beta-1,6 N-acetyl-D-glucosamine synthase	12.0
YPTB1952	YPO1954	<i>hmsS</i>	poly-beta-1,6-N-acetyl-D-glucosamine biosynthesis	13.1
YPTB1959	YPO1962	<i>argD</i>	succinylornithine aminotransferase	2.2
YPTB1960	YPO1963	<i>astA</i>	arginine succinyltransferase	2.0
YPTB2019	YPO2037	--	hydrolase/phosphatase	3.4
YPTB2020	YPO2038	--	molecular chaperone protein	2.7
YPTB2084	YPO2158	--	methionine sulfoxide reductase B	2.0
YPTB2117	YPO2193	<i>tonB</i>	transport protein TonB	2.3
YPTB2234	YPO2315	--	hypothetical protein	2.0
YPTB2363	YPO1718	--	oligogalacturonate specific porin	31.6
YPTB2395	YPO1683	--	N-acetylmuramoyl-L-alanine amidase	2.3
YPTB2437	YPO1631	<i>pepT</i>	peptidase T	3.9
YPTB2500	YPO2457	<i>ypsR</i>	quorum-sensing transcriptional activator YpeR	5.0
YPTB2507	YPO2464	--	type I-F CRISPR-associated protein Csy2	2.0
YPTB2593	YPO2562	--	sugar phosphatase	2.1
YPTB2594	YPO2563	--	hypothetical protein	2.0
YPTB2596	YPO2565	--	hypothetical protein	2.2
YPTB2600	YPO2569	--	PTS system, IIA component, mannitol permease	2.0
YPTB2693	YPO2970	--	lipoprotein	2.9
YPTB2694	YPO2971	--	lipoprotein	2.5
YPTB2697	YPO2974	--	B-type cytochrome	3.0
YPTB2808	YPO2842	--	polyamine ABC transporter substrate-binding protein	2.5
YPTB2809	YPO2843	--	polyamine ABC transporter permease	2.2
YPTB2810	YPO2844	<i>goaG</i>	4-aminobutyrate aminotransferase	3.1
YPTB2835	YPO2873	--	hypothetical protein	2.4
YPTB2866	YPO2904	<i>hcaT</i>	3-phenylpropionic acid transporter	6.2
YPTB2867	YPO2905	<i>ail</i>	attachment invasion locus protein	3.8
YPTB2959	YPO2647	<i>proV</i>	ABC glycine/betaine/L-proline transporter	2.0
YPTB2960	YPO2646	<i>proW</i>	glycine betaine transporter membrane protein	2.3
YPTB2961	YPO2645	<i>proX</i>	glycine betaine transporter periplasmic subunit	2.2
YPTB3107	YPO0863	--	YaeF/YiiX family of permuted papain-like enzymes	2.1
YPTB3108	YPO0864	--	PadR family transcriptional regulator	2.1
YPTB3262	YPO0988	--	major facilitator superfamily efflux protein	4.5
YPTB3335	YPO0728	<i>flgG</i>	flagellar basal body rod protein	4.3
YPTB3361	YPO0700	--	fimbrial protein	2.4

YPTB3363	YPO0698	--	outer membrane fimbrial usher porin	2.3
YPTB3415	YPO0646	<i>gcp</i>	DNA-binding/iron metalloprotein/AP endonuclease	2.8
YPTB3421	YPO0640	--	hypothetical protein	9.8
YPTB3427	YPO0628	--	translational inhibitor protein	26.2
YPTB3428	YPO0627	--	translational inhibitor protein	10.7
YPTB3429	YPO0626	--	YheO-like PAS domain protein	11.9
YPTB3430	YPO0625	--	hypothetical protein	26.5
YPTB3431	YPO0624	--	NhaC family Na ⁺ /H ⁺ antiporter	29.7
YPTB3432	YPO0623	--	aminotransferase	30.0
YPTB3534	YPO3699	--	Plil-like periplasmic lysozyme inhibitor	9.7
YPTB3550	YPO3682	<i>yitR</i>	LysR family transcriptional regulator	12.5
YPTB3578	YPO3652	--	hypothetical protein	5.6
YPTB3579	YPO3651	--	GntR family transcriptional regulator	8.9
YPTB3580	YPO3650	--	major facilitator superfamily metabolite symporter	22.2
YPTB3581	YPO3649	--	gamma carboxymuconolactone decarboxylase	48.7
YPTB3582	YPO3648	--	2-hydroxy-3-oxopropionate reductase	11.6
YPTB3583	YPO3647	--	hypothetical protein	7.8
YPTB3642	YPO3711	<i>lamB</i>	maltoporin	2.6
YPTB3643	YPO3712	<i>malk</i>	maltose/maltodextrin transporter ATP-binding protein	2.3
YPTB3655	YPO3724	<i>aceK</i>	isocitrate dehydrogenase kinase/phosphatase protein	11.3
YPTB3656	YPO3725	<i>aceA</i>	isocitrate lyase	17.6
YPTB3657	YPO3726	<i>aceB</i>	malate synthase	11.5
YPTB3701	YPO0205	<i>bfd</i>	bacterioferritin-associated ferredoxin	4.0
YPTB3736	YPO0165	--	LacI family transcriptional regulator	2.0
YPTB3753	YPO0148	--	hypothetical protein	3.6
YPTB3825	YPO3985	--	inner membrane protein YhjD	2.7
YPTB3833	YPO3993	--	hypothetical protein	3.3
YPTB3848	YPO4013	<i>yhjW</i>	phosphoethanolamine transferase	2.0
YPTB3934	YPO4050	--	hypothetical protein	3.0
YPTB3961	YPO4115	<i>pstA</i>	phosphate transporter permease subunit	2.0

^a Annotation numbers of the *Y. pseudotuberculosis* IP32953 (YPTB) and *Y. pestis* CO92 (YPO) homologs
Criteria: ≥ 2 -fold difference; p -value ≤ 0.01 ; $\geq 98\%$ nucleotide sequence identity between the homologs