

Minimal Significant			Cluster	High Scoring Segments									
K-12 start	K-12 end	Length	Gene	bnum	Gene Length	MSC span	Inter-section	Lerat List	SNPs	Score	K-12 start	K-12 end	
27810	27901	92	rihC	b0030	914	91	Insd	KO	53	321	27741		
27909	28059	151										28059	
32183	32657	475	carB	b0033	3221	474	Insd	OS	109	301	32183		
32735	33077	343										33962	
50468	53208	2741	apaH	b0049	842	2740	OvrR	*** OS	148	102	50468		
			apaG	b0050	377	2740	Span						
			ksgA	b0051	821	2740	Span	***					
			pdxA	b0052	989	2740	OvrL					53208	
64277	64400	124	polB	b0060	2351	123	Insd	KO	37	124	64238	64400	
64520	65380	861			2351	860	Insd	KS	86	190	64520	65726	
74646	75114	469	tbpA	b0068	983	468	Insd	KO	73	140	74562	75114	
79012	79811	800	leuD	b0071	605	799	OvrR	KS	138	177	79012		
			leuC	b0072	1400	799	OvrL					80015	
116889	117069	181	hofB	b0107	1385	180	Insd	OS	178	178	116508		
120438	120506	69	aroP	b0112	1373	68	Insd					120519	
133848	134217	370	acnB	b0118	2597	369	OvrR	KO	130	120	133728	134359	
159488	159596	109	yadB	b0144	926	108	Insd	KS	240	312	159484	160019	
213038	213481	444	tilS	b0188	1298	443	Insd	KO	80	144	212996	213481	
219270	219704	435	yaeB	b0195	707	434	OvrR	KS	253	203	216223	219704	
			rcsF	b0196	404	434	OvrL						
250391	250823	433	mbhA	b0230	785	432	Insd	OS	59	102	250391	250823	
406544	407113	570	aroM	b0390	677	569	OvrL	KS	104	256	404331	407235	
413193	413348	156	sbcC	b0397	3146	155	Insd	OS	138	220	412826	413678	
489640	489820	181	priC	b0467	527	180	Insd	KS	231	205	489411	489820	
501490	501532	43	ybaL	b0478	1676	42	Insd	KO	110	274	501487		
502036	502267	232										503047	
529754	530125	372	ybbB	b0503	1094	371	Insd	KO	146	170	529526	530800	
595235	596186	952	cusC	b0572	1373	951	Insd	KO	58	118	595193	596186	
608911	609029	119	entD	b0583	629	118	Insd	OS	117	160	608605	609068	
612294	613703	1410	fes	b0585	1124	1409	OvrR	OS	114	113	612135		
			entF	b0586	3881	1409	OvrL					613703	
631692	632049	358	ybdH	b0599	1088	357	Insd	OS	98	116	631607	632049	

694604	694746	143	ubiF	b0662	1175	142	Insd	OS	50	151	694604	694746
711803	713886	2084	ybfF	b0686	764	2083	OvrR	KO	88	104	711803	
			seqA	b0687	545	2083	Span					
			pgm	b0688	1640	2083	OvrL					713886
718837	718993	157	speF	b0693	2198	156	Insd	KS	39	242	718837	719050
719245	719413							KO		173	719188	719413
723858	724168	311	kdpC	b0696	572	310	Insd	KO	116	103	723858	724168
770403	770507	105						KS	18	207	770403	770507
771519	773178	1660	cydA	b0733	1571	1659	OvrR	KS	105	273	770605	
			cydB	b0734	1139	1659	OvrL					774716
785301	785664	364	aroG	b0754	1052	363	Insd	OS	58	108	785301	785664
794811	796429	1619	modA	b0763	773	1618	OvrR	KS	120	193	794811	
			modB	b0764	689	1618	Span					
			modC	b0765	1058	1618	OvrL					797018
805913	806426	514	ybhC	b0772	1283	513	Insd	OS	25	120	805913	806426
815366	815588	223	ybhK	b0780	908	222	Insd	KS	492	458	814995	
815591	816985	1395	moaA	b0781	989	1394	OvrL					817495
842204	843188	985	ybiN	b0807	1007	984	OvrR	KO	140	104	842204	
			ybiO	b0808	2360	984	OvrL					843188
853771	854082	312	ybiR	b0818	1118	311	OvrR	KO	119	106	853771	
			ybiS	b0819	920	311	OvrL					854082
893275	893998	724	potF	b0854	1112	723	Insd	KS	139	252	893254	895067
916657	916714	58	ybjD	b0876	1658	57	Insd	OS	179	310	916273	
916717	916807	91										916807
943833	944273	441	dmsC	b0896	863	440	OvrR	OS	88	136	943833	
			ycaC	b0897	626	440	OvrL					945371
952384	952501	118	pflB	b0903	2282	117	Insd	OS	162	178	951358	
955036	955168	133	ycaO	b0905	1769	132	Insd					953356
1007967	1008214	248	ycbY	b0948	2108	247	Insd	KO	81	122	1007878	1008232
1018943	1019017	75	ompA	b0957	1040	74	Insd	KO	46	278	1018943	
1019063	1019144	82										1019680
1084155	1084256	102	phoH	b1020	1064	101	OvrL	KO	56	384	1084119	
1084265	1084316	52										1084651
1127990	1132308	4319	mviN	b1069	1535	4318	OvrR	**** KS	160	258	1127681	
			flgN	b1070	416	4318	Span					
			flgM	b1071	293	4318	Span					

			flgA	b1072	659	4318	Span							
			flgB	b1073	416	4318	Span							
			flgC	b1074	404	4318	Span							
			flgD	b1075	695	4318	Span							
			flgE	b1076	1208	4318	OvrL							1132308
1142351	1142390	40	rne	b1084	3185	39	Insd	KO	119	143	1141585	1142390		
1153951	1154894	944	yceG	b1097	1022	943	OvrR	OS	122	110	1153951			
			tmk	b1098	641	943	OvrL							1155343
1280912	1281185	274	narG	b1224	3743	273	Insd	KS	141	223	1280876	1281323		
1314158	1315093	936	trpA	b1260	806	935	OvrL	KS	416	443	1314158			
1319366	1319791	426	trpD	b1263	1595	425	OvL							
			trpE	b1264	1562	425	OvR							1320726
1365045	1365159	115	pspF	b1303	992	114	Insd	KO	60	101	1365045	1365159		
1368754	1368793	40	ycjM	b1309	1706	39	Insd	OS	53	141	1368742	1368793		
1689270	1689389	120	ydgA	b1614	1508	119	OvrR	KS	53	202	1688108	1689389		
1697521	1699267	1747	malX	b1621	1592	1746	OvrR	KS	116	179	1697521			
			malY	b1622	1172	1746	OvrL							1699267
1706885	1709842	2958	rnfC	b1629	2222	2957	OvrR	KO	166	106	1706885			
			rnfD	b1630	1058	2957	Span							
			rnfG	b1631	620	2957	Span							
			rnfE	b1632	695	2957	Span							
			nth	b1633	635	2957	OvrL	***						1709842
1716454	1716525	72	ydhH	b1640	1109	71	OvrL	OS	143	150	1716440	1717164		
1765563	1765617	55	ydiJ	b1687	3056	54	Insd	KO	57	152	1765509	1765617		
1771703	1773005	1303	ydiN	b1691	1271	1302	OvrR	OS	82	125	1771461			
			ydiB	b1692	866	1302	Span							
			aroD	b1693	758	1302	OvrL							1773005
1821705	1821798	94	ydjQ	b1741	887	93	Insd	OS	158	152	1821705	1822010		
1830817	1831014	198	xthA	b1749	806	197	Insd	KS	170	280	1829519	1831014		
1838980	1839136	157	ynjF	b1758	626	156	Insd	KS	66	251	1838980	1839301		
1850992	1851360	369	ydjE	b1769	1358	368	Insd	KO	76	169	1850306	1851360		
1889486	1889942	457						KS	122	172	1889486	1889942		
1944717	1945449	733	yebB	b1862	701	732	OvrR	KO						
			ruvC	b1863	521	732	Span							
			yebC	b1864	740	732	OvrL							
1951402	1951659	258	yecO	b1870	743	257	OvrR	KO						

1981435	1983659	2225	yecP	b1871	971	257 OvrL				
			araH	b4460	989	2224 OvrR	KS	280	206	1979715
			araG	b1900	1514	2224 Span				
			araF	b1901	989	2224 OvrL				1984062
****	The Atypical Region									
		478	sdiA	b1916	722	477				
		258			722	257				
		604	fliY	b1920	800	603				
		298	fliT	b1926	365	297				
		238	amyA	b1927	1487	237				
		227	-	b1936	278	226				
		227	fliE	b1937	314	226				
		126	fliH	b1940	707	125				
		601	fliI	b1941	1373	600				
		286	fliN	b1946	413	285				
		442	fliP	b1948	737	441				
		388	fliR	b1950	785	387				
		574	rcaA	b1951	623	573				
		302	yedP	b1955	815	301				
		415	yedQ	b1956	1709	414				
		715	yodC	b1957	182	714				
		4	yedA	b1959	920	3				
		460	dcm	b1961	1418	459				
		361	yedU	b1967	851	360				
		253	yedV	b1968	1358	252				
		298	yedX	b1970	413	297				
		668	yedY	b1971	1004	667				
		98	yedZ	b1972	635	97				
		259	yodA	b1973	650	258				
		490	yeeI	b1976	836	489				
		292	amn	b1982	1454	291				
		760	yeeN	b1983	716	759				
		509	yeeO	b1985	1643	508				
		691	cbl	b1987	950	690				
		691	nac	b1988	917	690				
		272	erfK	b1990	932	271				



2396135	2396360	226	nuoG	b2283	2732	225	Insd	OS	56	119	2396135	2396387	
2426850	2427804	955	purF	b2312	1517	954	Insd	KS	70	228	2426543	2427981	
2440958	2441323	366	-	b2324	2066	365	Insd	KS	440	246	2440636	2441767	
2482733	2483117	385	evgS	b2370	3593	384	Insd	KS	634	820	2482733		
2483545	2484134	590											
2484419	2484524	106											
2488826	2490805	1980	yfdU	b2373	1694	1979	OvrR						
			yfdW	b2374	1250	1979	OvrL					2492111	
2496433	2496538	106						KO	40	121	2496433	2496588	
2497381	2498754	1374	ypdA	b2380	1697	1373	OvrR	KS	317	276	2497381	2501661	
			ypdB	b2381	734	1373	OvrL						
2500257	2501661	1405	ypdD	b2383	2495	1404	Insd						
2517242	2518412	1171	gltX	b2400	1415	1170	OvrL	***	KS	53	216	2517242	2518802
2538203	2538290	88	cysA	b2422	1097	87	Insd	KO	113	102	2538203	2538290	
2539365	2540012	648	cysU	b2424	833	647	OvrL	KS	104	174	2539365	2540012	
2549048	2549547	500	yfeY	b2432	575	499	OvrR	KO	92	113	2548971	2549547	
			yfeZ	b2433	455	499	OvrL						
2577878	2578703	826	tktB	b2465	2003	825	Insd	KS	94	208	2577878	2579387	
2631069	2631372	304	guaB	b2508	1466	303	Insd	OS	164	126	2630826	2631426	
2656345	2656738	394	hscA	b2526	1850	393	Insd	KO	78	119	2656345	2657261	
2673624	2674019	396	yphC	b2545	1094	395	OvrR	KS	198	210	2673624	2674181	
			yphD	b2546	998	395	OvrL						
2688733	2689535	803	yfhK	b2556	1490	802	OvrR	OS	49	106	2688733	2689535	
			??	b4441	148	802	Span						
2695690	2696331	642	tadA	b2559	536	641	OvrR	KS	70	227	2695681	2697520	
			yfhB	b2560	572	641	OvrL	KS	319	645	2697876	2698684	
2698155	2698552	398											
2699661	2700517	857	pdxJ	b2564	731	856	OvrR	KO	127	113	2699661	2700889	
			recO	b2565	728	856	Span						
			era	b2566	905	856	OvrL						
2709565	2710024	460	nadB	b2574	1622	459	Insd	KO	71	134	2708886	2710024	
2710558	2711627	1070	yfiC	b2575	857	1069	OvrR	OS	70	102	2710558	2711627	
			srmB	b2576	1334	1069	OvrL						
2792079	2792594	516	gabP	b2663	1400	515	OvrL	KO	165	179	2791841	2792630	
2800301	2800970	670		b2675	2144	669	Insd	KO	124	124	2800118	2800970	
2806623	2808012	1390	-	b2681	917	1389	OvrR	OS	88	105	2806623	2808012	

			ygaZ	b2682	737	1389	OvrL												
2816836	2817920	1085	csrA	b2696	185	1084	Span	OS	74	138	2816836	2818296							
			alaS	b2697	2630	1084	OvrL	***											
2822179	2822734	556	ygaD	b2700	497	555	OvrR	KS	333	230	2822179	2826441							
			mltB	b2701	1085	555	OvrL												
2829735	2830215	481	ygaA	b2709	1589	480	Insd	KS	68	181	2829735	2830215							
2855806	2856025	220	mutS	b2733	2561	219	Insd	KO	92	176	2855665	2856025							
2857015	2857216	202			2561	201	Insd	KS	188	229	2856172	2857606							
2857996	2858044	49	pphB	b2734	656	48	Insd	OS	42	115	2857995	2858044							
2885479	2886097	619	cysH	b2762	734	618	OvrL	KO	125	133	2885477	2886133							
2887764	2887877	114	cysI	b2763	1712	113	Insd	OS	61	118	2887518	2887877							
2892468	2892897	430	ygcP	b2768	575	429	OvrR	OS	94	115	2892468	2892949							
2955379	2955757	379	ptr	b2821	2888	378	Insd	KS	216	243	2955379								
2959033	2959700	668	recC	b2822	3368	667	Insd												2956039
3037483	3040087	2605	xerD	b2894	896	2604	OvrR	KS	95	197	3037483								
			fldB	b2895	521	2604	Span												
			ygfX	b2896	407	2604	Span												
			ygfY	b2897	266	2604	Span												
			ygfZ	b2898	980	2604	OvrL												3040290
3054888	3055427	540		b4446	150	539	OvrR	OS	67	111	3054888								
			serA	b2913	1232	539	OvrL												3055718
3065823	3066533	711	yggE	b2922	740	710	OvrR	OS	68	260	3065472								
			yggA	b2923	635	710	OvrL												
3066623	3066920	298																	3067574
3078508	3078811	304	tktA	b2935	1991	303	Insd	OS	85	106	3078508	3078811							
3086049	3086697	649	galP	b2943	1394	648	OvrL	KO	70	115	3086049	3086697							
3092781	3092871	91	yggR	b2950	1025	90	Insd	KO	58	143	3092781	3092871							
3107479	3107525	47						OS	30	103	3107479	3107525							
3150361	3150535	175	metC	b3008	1187	174	Insd	OS	128	157	3150361	3151435							
3157365	3157686	322	ygiQ	b4469	2219	321	Insd	OS	82	133	3157365	3157686							
3173190	3173881	692	parE	b3030	1892	691	OvrR	KO	66	117	3173064								
			yqiA	b3031	581	691	OvrL												3173881
3193548	3193680	133	rfaE	b3052	1433	132	Insd	KO	101	104	3193548	3193761							
3195707	3195878	172	glnE	b3053	2840	171	Insd	KO	183	195	3195647	3196208							
3217880	3218417	538	ygjG	b3073	1490	537	Insd	OS	125	127	3217859	3218417							
3222285	3222879	595	ebgA	b3076	3092	594	Insd	KS	130	225	3221757	3222879							

3265686	3265744	59							KO	27	128	3265686	3265744
3302942	3304043	1102	mtr	b3161	1244	1101 OvrR			KO	108	105	3302942	
			deaD	b3162	1940	1101 OvrL							3304043
3320864	3320979	116	glmM	b3176	1337	115 Insd			KS	180	263	3320864	3324171
3355874	3356426	553	gltB	b3212	4553	552 Insd			KO	161	118	3355442	3356426
3419785	3420597	813	yhdY	b3270	1106	812 OvrR			KO	65	101	3419785	
			yhdZ	b3271	758	812 OvrL							3420597
3430138	3430351	214	smg	b3284	473	213 Insd			KS	180	317	3426691	3430672
3493780	3494548	769	nirB	b3365	2543	768 Insd			KO	138	146	3493780	3495194
3519180	3519937	758	yrfB	b3393	440	757 OvrR			KS	435	319	3510784	
			yrfC	b3394	539	757 OvrL							3519937
3536917	3537593	677	yhgF	b3407	2222	676 Insd			OS	63	124	3536635	3537754
3552671	3552839	169	malT	b3418	2705	168 Insd			OS	66	107	3552671	3553193
3561021	3561282	262	glpD	b3426	1505	261 Insd			KO	57	109	3561021	3561282
3584065	3584693	629	ggT	b3447	1742	628 Insd			KS	65	202	3583883	
3606869	3607457	589	sirA	b3470	245	588 OvrR							3584747
			yhhQ	b3471	665	588 OvrL			KS	166	320	3606765	
3614669	3615363	695	nikC	b3478	833	694 OvrR							3609546
			nikD	b3479	764	694 OvrL			KS	206	239	3614383	3615911
3679057	3684376	5320	yhjJ	b3527	1496	5319 OvrR			KS	190	173	3679057	
			dctA	b3528	1286	5319 Span							
			yhjK	b3529	1955	5319 Span							
			yhjL	b3530	3422	5319 OvrL							3684832
3721289	3721394	106	glyS	b3559	2069	105 Insd	***		OS	143	179	3720653	3721478
3732275	3732797	523	xylH	b3568	1181	522 Insd			KS	76	226	3732054	3733837
3755843	3756747	905	yiaY	b3589	1151	904 OvrR			OS	77	120	3755843	3756747
3773387	3773434	48	selB	b3590	1844	904 OvrL			OS	75	171	3773246	3773434
3779988	3780132	145	mtlD	b3600	1148	47 Insd			OS	309	189	3779683	
3783097	3783935	839	cysE	b3607	821	144 Insd							
3789683	3790136	454	yibO	b3612	1544	838 OvrL							3784997
3815811	3815844	34	kbl	b3617	1196	453 Insd			KO	53	120	3789683	3790202
3818503	3818564	62	dinD	b3645	836	33 Insd			KS	29	350	3815811	3815866
3824658	3824941	284	yicF	b3647	1688	61 Insd			KO	107	114	3817312	3818564
3824974	3825142	169	recG	b3652	2081	283 Insd			OS	33	116	3824545	3824941
				b3652	2081	168 Insd			KS	24	234	3824974	3825142
3831783	3833355	1573	yicI	b3656	2318	1572 OvrR			KS	128	283	3830436	





4200742	4202298	1557	zraS	b4003	1397	1556 OvrR	KS	270	214	4200742	
			zraR	b4004	1325	1556 OvrL					
4203201	4203816	616	purD	b4005	1289	615 Insd					4203816
4281350	4281575	226	actP	b4067	1649	225 Insd	KO	47	104	4281350	4281575
4281860	4283077	1218		b4067	1649	1217 OvrR	KS	93	212	4281686	4283077
			yjcH	b4068	314	1217 OvrL	KS	125	199	4386769	
4386769	4387825	1057	yjeP	b4159	3323	1056 OvrR					
			psd	b4160	968	1056 OvrL					4388797
4416990	4417578	589	yjfR	b4192	1070	588 Insd	KO	135	132	4415186	4417578
4418313	4418403	91	sgaT	b4193	1454	90 Insd	KO	308	435	4417966	
4418487	4418718	232									
4419978	4420465	488	ptxA	b4195	464	487 OvrR					
			sgaH	b4196	650	487 OvrL					4420819
4430428	4430593	166	ytfF	b4210	974	165 Insd	KO	90	134	4430409	4431261
4449322	4449636	315	ytfR	b4485	1502	314 Insd	KO	116	131	4449322	4450053
4464876	4465744	869	treR	b4241	947	868 OvrR	KO	237	658	4464564	
			mgtA	b4242	2696	868 OvrL					
4465895	4466108	214									
4466114	4466628	515									
4466867	4468061	1195									
4468163	4468368	206									
4469338	4469896	559	pyrI	b4244	461	558 OvrR					
			pyrB	b4245	935	558 OvrL					4469896
4486901	4487030	130	yjgR	b4263	1502	129 Insd	KO	118	130	4486643	4487030
4538498	4538826	329					KO	90	106	4538498	4538826
4623864	4624660	797	serB	b4388	968	796 OvrR	KO	69	115	4623864	
			sms	b4389	1382	796 OvrL					4624695
4626218	4626503	286					KO	69	187	4625456	4626503

total MSC length 128515