

Supplementary Table 2: Profiling of virulence genes, base pair length, gene locus, and gene product

VFclass	Virulence factors	Gene	Product
Secretion system	T6SS-II	clpA	ATP-dependent Clp protease ATP-binding subunit ClpA
		clpB	Chaperone protein ClpB
		clpC	ATP-dependent Clp protease ATP-binding subunit ClpC
		clpP	ATP-dependent Clp protease proteolytic subunit
		clpS	ATP-dependent Clp protease adapter protein ClpS
		clpV1	Protein ClpV1
		clpX	ATP-dependent Clp protease ATP-binding subunit ClpX
Adherence	Type 3 fimbriae	ecpA	Common pilus major fimbriin subunit EcpA
		ecpB	fimbrial chaperone EcpB
		ecpC	outer membrane usher protein EcpC
		ecpD	Fimbria adhesin EcpD
		ecpE	fimbrial chaperone EcpE
		ecpR	HTH-type transcriptional regulator EcpR
Iron uptake	Ent siderophore	entA	2,3-dihydro-2,3-dihydroxybenzoate dehydrogenase
		entB	Enterobactin synthase component B
		entC	Isochorismate synthase EntC
		entD	Enterobactin synthase component D
		entE	Enterobactin synthase component E
		entF	Enterobactin synthase component F
		entH	Proofreading thioesterase EntH
		entS	Enterobactin exporter EntS
		fepA	Ferrienterobactin receptor
		fepA	Ferrienterobactin receptor
		fepB	Ferrienterobactin-binding periplasmic protein
		fepC	Ferric enterobactin transport ATP-binding protein FepC
		fepC	Ferric enterobactin transport ATP-binding protein FepC
		fepD	Ferric enterobactin transport system permease protein FepD
		fepG	Ferric enterobactin transport system permease protein FepG
		fes	Enterochelin esterase
Adherence	Type I fimbriae	fimA	Type-1 fimbrial protein, A chain
		fimC	Chaperone protein FimC
		fimD	Outer membrane usher protein FimD
		fimF	Protein FimF
		fimG	Protein FimG
		fimH	Type 1 fimbrin D-mannose-specific adhesin
Antiphagocytosis	Capsule	galA	Gallate dioxygenase
		galB	4-oxalomesaconate hydratase
		galC	4-carboxy-4-hydroxy-2-oxoadipic acid aldolase
		galD	4-oxalomesaconate tautomerase
		galE	UDP-glucose 4-epimerase
		galF	UTP--glucose-1-phosphate uridylyltransferase
		galK	Galactokinase
		galM	Aldose 1-epimerase
		galP	Galactose-proton symporter
		galR	HTH-type transcriptional regulator GalR
		galS	HTH-type transcriptional regulator GalS
		galT	Galactose-1-phosphate uridylyltransferase
		galU	UTP--glucose-1-phosphate uridylyltransferase
Adherence	Type 3 fimbriae	manA	Mannose-6-phosphate isomerase
		manP	PTS system mannose-specific EIIBCA component
		manX	PTS system mannose-specific EIIB component
		manY	PTS system mannose-specific EIIC component
		manZ	PTS system mannose-specific EIID component
		mrkF	Fimbria adhesin protein
		mrkH	Fimbria adhesin protein
		mrkI	Fimbria adhesin protein
		mrkJ	Fimbria adhesin protein
		mrkD	Fimbria adhesin protein

VFclass	Virulence factors	Gene	Product
Secretion system	T6SS-II	ompA	Outer membrane protein A
		ompC	Outer membrane porin C
		ompN	Outer membrane porin N
		ompR	Transcriptional regulatory protein OmpR
		ompW	Outer membrane protein W
		ompX	Outer membrane protein X
Regulation	RcsAB	rcaA	Transcriptional regulatory protein RcsA
		rcaB	Transcriptional regulatory protein RcsB
		rcaC	Sensor histidine kinase RcsC
		rcaD	Phosphotransferase RcsD
		rcaF	Outer membrane lipoprotein RcsF
	VirR/VirS	virB	Virulence regulon transcriptional activator VirB
		virB4	Type IV secretion system protein virB4
		virB8	Type IV secretion system protein virB8
		virB9	Type IV secretion system protein virB9
		virD4	Protein VirD4
Antiphagocytosis	Capsule	wzb	Low molecular weight protein-tyrosine-phosphatase Wzb
Antiphagocytosis	Capsule	wzx	Lipid III flippase
Iron uptake	Ent siderophore	ybdG	Minconductance mechanosensitive channel YbdG
		ybdG	Minconductance mechanosensitive channel YbdG
		ybdK	Putative glutamate--cysteine ligase 2
		ybdL	Methionine aminotransferase
		ybdM	putative protein YbdM
		ybdO	putative HTH-type transcriptional regulator YbdO
		ybdZ	Enterobactin biosynthesis protein YbdZ
		yclP	Petrobactin import ATP-binding protein YclP
Adherence	Streptococcal plasmin receptor/GAPDH (Streptococcus)	plr/gapA	Glyceraldehyde-3-phosphate dehydrogenase A
Efflux pump	AcrAB	acrA	RND efflux pump
		acrB	RND efflux pump
Iron uptake	Aerobactin	iucA	Ferric aerobactin receptor
		iucB	Ferric aerobactin receptor
		iucC	Ferric aerobactin receptor
		iucD	Ferric aerobactin receptor
		iutA	Ferric aerobactin receptor
	Salmochelin	iroB	glucosyltransferase
		iroC	putative ATP-binding cassette (ABC) transporter
		iroD	C-glucosylated enterobactin
		iroE	C-glucosylated enterobactin
		iroN	C-glucosylated enterobactin
	Yersiniabactin	fyuA	Pesticin receptor
		irp1	Yersiniabactin polyketide synthase HMWP1
		irp2	Yersiniabactin non-ribosomal peptide synthetase HMWP2
		ybtA	Yersiniabactin transcriptional regulator YbtA
		ybtE	Yersiniabactin biosynthesis salicyl-AMP ligase YbtE
		ybtP	Yersiniabactin ABC transporter ATP-binding/ permease protein YbtP
		ybtQ	Yersiniabactin ABC transporter ATP-binding/permease protein YbtQ
		ybtS	Yersiniabactin biosynthesis salicylate synthase YbtS
		ybtT	Yersiniabactin biosynthesis thioesterase YbtT
		ybtU	Yersiniabactin biosynthesis oxidoreductase YbtU
		ybtX	Yersiniabactin-associated zinc MFS transporter YbtX

VFclass	Virulence factors	Gene	Product
Nutritional factor	Allantoin utilization	allA	Ureidoglycolate hydrolase
		allB	Allantoinase
		allC	Allantoate amidohydrolase
		allD	Ureidoglycolate dehydrogenase
		allR	DNA-binding transcriptional repressor AllR
		allS	HTH-type transcriptional activator AllS
Regulation	RcsAB	rcaA	Transcriptional regulatory protein RcsA
		rcaB	Transcriptional regulatory protein RcsB
		rcaF	Outer membrane lipoprotein RcsF
Secretion system	RmpA	rmpA	Regulator of mucoid phenotype RmpA2
	T6SS-I	clpV/tssH	Type VI secretion system ATPase TssH
		dotU/tssL	Type VI secretion system protein, DotU/TssL family
		hcp/tssD	Major exported protein
		icmF/tssM	Type VI secretion protein TssM
		impA/tssA	Type VI secretion system protein TssA
		ompA	OmpA family protein
		sciN/tssJ	Type VI secretion system lipoprotein TssJ
		tle1	Type VI secretion system effector
		tli1	Type VI secretion system immunity protein
		tssF	Type VI secretion system baseplate subunit TssF
		tssG	Type VI secretion system baseplate subunit TssG
		vasE/tssK	Type VI secretion system baseplate subunit TssK
		vgrG/tssI	Type VI secretion system tip protein VgrG
		vipA/tssB	Type VI secretion system contractile sheath small subunit VipA
		vipB/tssC	Type VI secretion system contractile sheath large subunit VipB
	T6SS-II	clpV	Protein disaggregation chaperone
		dotU	Type VI secretion system protein TssL, short form
		icmF	Type VI secretion protein VasK
		impF	Type VI secretion system baseplate subunit TssE
		impH	Type VI secretion system baseplate subunit TssG
		impJ	Type VI secretion system baseplate subunit TssK
		sciN	Type VI secretion system lipoprotein TssJ
		vasA/impG	Type VI secretion system baseplate subunit TssF
		vgrG	Type VI secretion system tip protein VgrG
	T6SS-III	impA	Type VI secretion system ImpA family N-terminal domain-containing protein
		impG	Type VI secretion system baseplate subunit TssF
		lysM	LysM peptidoglycan-binding domain-containing protein
Toxin	Colibactin	clbA	Colibactin biosynthesis phosphopantetheinyl transferase ClbA
		clbB	Colibactin hybrid non-ribosomal peptide synthetase/type I polyketide synthase ClbB
		clbC	Colibactin polyketide synthase ClbC
		clbD	Colibactin biosynthesis dehydrogenase ClbD
		clbE	Colibactin biosynthesis, aminomalonyl-acyl carrier protein ClbE
		clbF	Colibactin biosynthesis dehydrogenase ClbF
		clbG	Colibactin biosynthesis acyltransferase ClbG
		clbH	Colibactin non-ribosomal peptide synthetase ClbH
		clbI	Colibactin polyketide synthase ClbI
		clbJ	Colibactin non-ribosomal peptide synthetase ClbJ
		clbK	Colibactin hybrid non-ribosomal peptide synthetase/type I polyketide synthase ClbK
		clbL	Colibactin biosynthesis amidase ClbL
		clbM	Precolibactin export MATE transporter ClbM
		clbN	Colibactin non-ribosomal peptide synthetase ClbN
		clbO	Colibactin polyketide synthase ClbO
		clbP	Precolibactin peptidase ClbP
		clbQ	Colibactin biosynthesis thioesterase ClbQ
		clbS	Colibactin self-protection protein ClbS
Bile resistance	Bile-salt hydrolase	bsh	Bile salt hydrolase

VFclass	Virulence factors	Gene	Product
Immune evasion	Capsule	capL	
	Capsule	rmlB	dTDP-glucose 4,6-dehydratase
	LPS	fabZ	3-hydroxyacyl-(acyl-carrier-protein) dehydratase FabZ
Manganese uptake	Pneumococcal surface antigen A / Metal binding protein SloC	ssaB	Manganese ABC transporter substrate-binding lipoprotein
Surface protein anchoring	Lipoprotein diacylglycerol transferase	lgt	Glyceraldehyde-3-phosphate dehydrogenase A