Supplementary Table 1. Oligonucleotides used in this study

Oligonucleotide	Sequence (5'-3')	Relevant description
BAP3247	GACTTTGTCGACTTTGATGCCGTTTATGGA	*gatA* internal forward primer for mutagenesis
BAP3248	GGTTTTGTCGACCGAGCTAAGCGATATCTTTCTG	*gatA* internal reverse primer for mutagenesis
BAP3727	AATTACGGATCCGGACGGATCAAATGGAACAGTT	*gctC* flanking forward primer for *gctC* and *hptE* expression, contains BamHI site
BAP3330	GTTTAGTGATAGGTCGACGAAATAGTTTCTATTGCC	*hptE* flanking reverse primer for *gctC* and *hptE* expression, contains SalI site
BAP5358	GTTCGATATCGCGAAACGATCCTCATCCTG	For amplification of pAL99 minus *aph3* (Kan^R), contains an EcoRV site
BAP5359	CCGTGATATCGCTGAAGAGCTTGGCGGC	For amplification of pAL99 minus *aph3* (Kan^R), contains an EcoRV site
BAP5360	CGAAGATATCAGACATTATTTGCCGACTACC	Amplification of *aadA* ($Spec^R$) from pUA826, contains an EcoRV site
BAP5361	AATGGATATCGCGTATGCGCTCACGCAAC	Amplification of *aadA* ($Spec^R$) from pUA826, contains an EcoRV site
BAP5477	GGGACAGTCGACCAAGTGTAGGACTATTGGAATGG	*gatF* flanking forward primer for *gatF* expression, contains SalI site
BAP5478	GGTTGAGTCGACTAGCTCATAACGACATCCC	*gatF* flanking reverse primer for *gatF* expression, contains SalI site
BAP5752	TTATCCAAGCTTATAAATATGAATCTGTATTGTGAG	*gatG* flanking forward primer for *gatG* expression, contains HinDIII site
BAP5753	CTCCTTAAGCTTTTGAAGAAATCAGCACTATACTC	*gatG* flanking reverse primer for *gatG* expression, contains HinDIII site
BAP5757	TTATTTCAGCTGTGTCGTTATGAGCTATTTGGATC	*natB* flanking forward primer for *natB* expression, contains PvuII site
BAP5758	CAACCACCCGGGGTCTAGCATAAACATCATCAG	*natB* flanking reverse primer for *natB* expression, contains SmaI site
BAP6796	GGCTTACGCGTCGATAGCTAGACTGGG	*aph3* (Kan^R) flanking forward primer, contains MluI site
BAP6797	TTGGGACGCGTTTGGTCGGTCATTTCG	*aph3* (Kan^R) flanking reverse primer, contains MluI site
BAP6851	AAAAAAGCTTATAATTATCCTTAACATACATCCTAG TGCGCCCAGATAGGGTG	TargeTron IBS primer specific for *natB*
BAP6852	CAGATTGTACAAATGTGGTGATAACAGATAAGTCAT CCTAAATAACTTACCTTTCTTTGT	TargeTron EBS1d primer specific for *natB*
BAP6853	TGAACGCAAGTTTCTAATTTCGATTTATGTTCGATAG AGGAAAGTGTCT	TargeTron EBS2 primer specific for *natB*
BAP6854	AAAAAAGCTTATAATTATCCTTAATATTCAATATCGT GCGCCCAGATAGGGTG	TargeTron IBS primer specific for *gatG*
BAP6855	CAGATTGTACAAATGTGGTGATAACAGATAAGTCAA TATCCTTAACTTACCTTTCTTTGT	TargeTron EBS1d primer specific for *gatG*
BAP6856	TGAACGCAAGTTTCTAATTTCGGTTAATATCCGATA GAGGAAAGTGTCT	TargeTron EBS2 primer specific for *gatG*
BAP6864	CAGATTGTACAAATGTGGTGATAACAGATAAGTCCA CATATTTAACTTACCTTTCTTTGT	TargeTron EBS1d primer specific for *gatF*
BAP6865	TGAACGCAAGTTTCTAATTTCGATTAGCGCTCGATA GAGGAAAGTGTCT	TargeTron EBS2 primer specific for *gatF*
BAP6866	AAAAAAGCTTATAATTATCCTTAAGCAGCTCCCAAG TGCGCCCAGATAGGGTG	TargeTron IBS primer specific for *gatF*

BAP7134	CCTTGATATCGTGATTCTAAAGTATCCGG	*tetM* flanking forward primer, contains EcoRV site.
BAP7135	TAACGATATCCTCCTTTACACTTTAATTCAAAT	*tetM* flanking reverse primer, contains EcoRV site.
EBS Universal	CGAAATTAGAAACTTGCGTTCAGTAAAC	TargeTron Universal primer for retargeting intron.

Supplementary Table 2.

Negative ion CE-ES-MS data and proposed compositions of O-deacylated LPS from the *P.multocida* Australian field isolates.

Strain name	Observed Ions(*m/z*) $(M-3H)^{3-}$ $(M-4H)^{4-}$ $(M-2H)^{2-}$		Mol Mass(Da) [a] Observed	Calculated	Proposed Composition
PM1	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0		3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1079.0		3240.0	3239.8	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1106.0		3321.0	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1146.5	860.0	3442.5	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM3	-	1315	2632.0	2630.3	3Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	918.0	1376.5	2756.0	2753.3	3Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	972.0	1458.0	2918.5	2915.5	4Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1013.0	-	3042.0	3038.5	4Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
PM8	822.0	-	2469.0	2468.2	2Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	863.0	-	2592.0	2591.2	2Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	876.0	-	2631.0	2630.3	3Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	917.0	-	2754.0	2753.4	3Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	930.0	-	2793.0	2792.5	4Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	971.5	-	2917.5	2915.5	4Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM18	930.0	-	2793.0	2792.5	4Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	970.9	-	2915.7	2915.5	4Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM48	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0		3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1079.0		3240.0	3239.8	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1106.0		3321.0	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1146.5		3442.5	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM72	984.5		2956.5	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.5		3079.5	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0		3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1080.0		3243.0	3239.8	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1106.5		3322.5	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1147.5		3445.5	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1174.0		3525.0	3523.2	2HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1215.0		3648.0	3646.2	2HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM146	930.0		2793.0	2792.5	4Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	971.0		2916.0	2915.5	4Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1011.5		3037.5	3038.6	4Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
PM1075		1075.5	2153.0	2152.9	2Hex,3Hep,Kdo-P,LipidA-OH
		1137.0	2276.0	2276.0	2Hex,3Hep,Kdo-P,PEtn,LipidA-OH
		1198.5	2399.0	2399.0	2Hex,3Hep,Kdo-P,2PEtn,LipidA-OH
PM1098	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH

Strain name	Observed Ions(*m/z*) $(M-3H)^{3-}$ $(M-4H)^{4-}$ $(M-2H)^{2-}$		Mol Mass(Da) [a] Observed	Calculated	Proposed Composition
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1099	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0		3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1079.0		3240.0	3239.8	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1106.0		3321.0	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1146.5	860.0	3442.5	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1103	997.0	-	2994.0	2993.8	6Hex,4Hep,Kdo-P,LipidA-OH
	1038.0	-	3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1065.0	-	3198.0	3197.0	HexNAc,6Hex,4Hep,Kdo-P,LipidA-OH
	1079.0	809.5	3241.0	3239.9	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1105.5	-	3319.5	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1146.5	860.0	3443.3	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1120		1076.0		2152.9	2Hex,3Hep,Kdo-P,LipidA-OH
		1138.0		2276.0	2Hex,3Hep,Kdo-P,PEtn,LipidA-OH
		1199.5		2399.0	2Hex,3Hep,Kdo-P,2PEtn,LipidA-OH
PM1153	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1079.0	799.5	3240.0	3239.8	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1120.5	840.5	3364.5	3362.9	6Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
	1188.5		3568.5	3566.1	HexNAc,6Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
	1256.0		3771.0	3769.3	2HexNAc,6Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
PM1205	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1066.0	-	3201.0	3200.8	5Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
PM1258		1076.0		2152.9	2Hex,3Hep,Kdo-P,LipidA-OH
		1138.0		2276.0	2Hex,3Hep,Kdo-P,PEtn,LipidA-OH
		1199.5		2399.0	2Hex,3Hep,Kdo-P,2PEtn,LipidA-OH
PM1268	971.0		2916.0	2915.5	4Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1025.0		3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1066.0		3201.5	3200.8	5Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
PM1320	971.0		2916.0	2915.5	4Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	983.5		2953.5	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1012.0		3039.0	3038.5	4Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
	1025.0		3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1066.0	799.5	3201.5	3200.8	5Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
PM1369	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0	-	3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1079.0	-	3241.0	3239.9	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1434	1106.0	829.0	3320.5	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1147.0	860.0	3444.0	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1439	1025.5			3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH

Strain name	Observed Ions(*m/z*) $(M-3H)^{3-}$ $(M-4H)^{4-}$ $(M-2H)^{2-}$		Mol Mass(Da) [a] Observed	Calculated	Proposed Composition
	1066.5	800.5		3200.8	5Hex,4Hep,Kdo-P,3PEtn,LipidA-OH
	1107.5				5Hex,4Hep,Kdo-P,4PEtn,LipidA-OH
PM1441	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0		3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1079.0		3240.0	3239.8	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1106.0		3321.0	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1146.5	860.0	3442.5	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1470	1105.5	829.0	3319.5	3320.0	HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1146.5	860.0	3443.8	3443.0	HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1173.5	879.5	3522.7	3523.2	2HexNAc,6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
		910.5	3646.0	3646.2	2HexNAc,6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
PM1474	984.0	-	2955.0	2954.6	5Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1025.0	-	3078.0	3077.7	5Hex,4Hep,Kdo-P,2PEtn,LipidA-OH
	1038.0	-	3117.0	3116.8	6Hex,4Hep,Kdo-P,PEtn,LipidA-OH
	1079.0	-	3241.0	3239.9	6Hex,4Hep,Kdo-P,2PEtn,LipidA-OH

[a] Average mass units were used for calculation of molecular weight based on proposed composition as follows: Lipid A-OH, 952.00; Hex, 162.15; Hep, 192.17; Kdo, 220.18; PEtn, 123.05; P,79.95. All data obtained from Precursor ion scanning for *m/z*951^{-}.