Table 2. Efflux and Inactivating Genes Modified **Feb. 14, 2024**
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Resistance Profile	Protein name	Genes	Genes included	% homology DNA	% homology aa	Plasmid /transposon	GenBank # *
ABC-F Protein Ribosomal Protection[e]							
Lincosamide Streptogramin A, Pleuromutilin	Lsa(A)	*lsa abc-23*	*lsa*(A)			Chromsome	AY225127, AY737526
Lincomycin Streptogramin A	Lsa(B)	*orf3*	*lsa*(B)			pSCFS1	AJ579365
Lincomycin	Lsa(C)		*lsa*(C)				HM990671
Lincomycin Streptogramin A Pleuromutilin	Lsa(D)		*lsa*(D)			Chromosome	AXF35727
Lincomycin Streptogramin A Pleuromutilin	Lsa(E)		*lsa*(E)[c]			pEF418	AF408195
Erythromycin & Streptogramin B	Msr(A)	*msr*(A)	*msr*(A) *msr*(SA)	98%	98%	pUL5054 pEP2104	X52085
			msr(SA')			pMS97	AB013298
			msr(B)				M81802
	Msr(C)	*msr*(C)	*msr*(C)	96%	95%	Chromsome	AY004350
							AF313494
							AJ243209
	Msr(D)[a]	*msr*(D)	*mel*	98%-100%	98%-100%	Tn*1207.2*	AF227521
	Msr(E)	*msr*(E)[g]	*mel*	99%	98%-100%	chromsomal	FR751518, EU294228
						pKP048, pKSMA0710	FJ628167.2, FJ917355.1
						pCOP1, pABIR	FJ187822.1, EU294228.1
						chromosomal, pRSB105	EF102240.1, DQ839391.1
						pMUR050, pCTX-M3	AY522431.4, AF550415.2

			orf5	Tn*1207.1*	AF227520
Erythromycin	Msr(F)	*msr*(F)[o]		Chromosome	MN728681, L130509[l]
	Msr(G)	*msr*(G)		Plasmid	CP046364
	Msr(H)	*msr*(H)		Chromosome	CP035309
	Msr(I)	*msr*(I)[p]		Chromosome	CP065927.1:1658158-1659615
Streptogramin A Pristinamycin II[d] Pleuromutilin, Lincosamides	Vga(A)	*vga*(A)	*vga*	pIP524 pCPS32	M90056 FN806791
Lincosamides	Vga(A)$_{LC}$	*vga*(A)$_{LC}$			DQ823382 GQ891882
Pleuromutilin Lincosamide	Vga(A)$_{v}$	*vga*(A)$_{v}$		Chromsome	NG_048553.1
Streptogramin A	Vga(B)	*vga*(B)	*vga*(B)	pIP1633	U82085
Streptogramin A Lincosamides Pleuromutilin[d]	Vga(C)	*vga*(C)	*vga*(C)	pKKS825 pCPS49 pKKS825	NC_013034 , FN377602 FN806792 FN377602
Streptogramin A	Vga(D)	*vga*(D)	*vga*(D)		GQ205627
Streptogramin A Pleuromutilin, Lincosamides	Vga(E)	*vga*(E)	*vga*(E)	Tn*6133*	FR772051
Streptogramin A Pleuromutilin, Lincosamides	Vga(F)	*vga*(F)[n]	*vga*(F)	Chromosome	MT431628.1
Streptogramin A Pleuromutilin, Lincosamids	Vga(G)	*vga*(G)[r]	*vga*(L) *lmo0919*	Chromosome Chromosome	**PRJA797842[u]**
Streptogramin A Pleuromutilin, Lincosamids	**Vga(H)**	***vga*(H)[t]**	***srpA***	**Chromosome**	**MT550884**
Oxazolidinones Florfenicol	OptrA	*optrA*	*optrA*	pE349	KP399637

Oxazolidinones Florfenicol	PoxtA	*poxtA*[q]	*poxtA*			Chromosome	MF095097
Lincomycin Streptogramin A Pleuromutilin	Eat(A)$_v$		*eat*(A)$_v$			Chromosome	gene EFAU004_00630 in *E. faecium* Aus0004
Lincomycin Streptogramin A, Pleuromutilin	Sal(A)		*sal*(A)			Chromosome	KC693025
Streptogramin A	VarM	*var*M	*var*M			Chromosome	AB03554**
Streptogramin A Pleuromutilin, Lincosamides	VmlR	*vml*R^h	*vml*R			Chromosome	NC_000964.3
ABC-F Protein [Mechanism unknown][f]							
Carbomycin	Car(A)	*car*(A)	*car*(A)			pOJ158,	M80346 AF274302
Oleandomycin	Ole(B)	*ole*(B)	*ole*(B)			pALOR26E	L36601
Oleandomycin	Ole(C)	*ole*(C)	*ole*(C)				L06249
Spiramycin	Srm(B)	*srm*(B)	*srm*(B)			pKC514	X63451
Tylosin	Tlr(C)	*tlc*(C)	*tlc*(C)				M57437
Lincosamides	LmrC	*lmr*(C)	*lmr*(C)			Chromosome	EU124663
MAJOR FACILITATORS[Efflux]							
Lincomycin	Lmr(A)	*lmr*(A)	*lmr*(A)			pLST21	X59926
Erythromycin	Mef(A)	*mef*(A)	*mef*(A)	90%-100%	91%-100%	p53-6	U70055
			mef(A)			Tn*1207.1*	AF227520
			mef(A)			Tn*1207.2*	AF227521
			mef(A)				AY064721
							AY064722

							AY071835
							AY071836
			mef(E)			pAT15-5	U83667
			mef(E)			Chromosome	AF274302, AF376746
			mef(I)	100%		Chromosome	AJ971089
			mef(G)	100%		Chromosome	HG423652
			mef(O)	97%		Chromosome	DQ016305
	Erythromycin	Mef(B)	*mef*(B)	*mef*(B)		pP286	FJ196385
	Erythromycin	Mef(C)	*mef*(C)	*mef*(C)		pAQU1	AB571865
	Erythromycin	Mef(D)	*mef*(D)	*mef*(D)		Chromosome	MN728681, LR130509[l]
	Erythromycin	Mef(F)	*mef*(F)	*mef*(F)		Plasmid	CP046364
	Erythromycin	Mef(H)	*mef*(H)[m]	*mef*(H)		Chromosome	MW269960.1
	Erythromycin	Mef(J)	*mef*(J)[p]	*mef*(J)		Chromosome	CP065927.1:1659729-1660922
ESTERASES							
	Erythromycin	Ere(A)	*ere*(A)	*ere*(A)	92%-100%	92%-100%	pI1100, pAT63	M11277
				ere(A2)	92%-100%	92%-100%	pLQ1723	AY183454
							pLQ1723	AF099140
							pIP1100	AY183453
								AF326209, DQ157752
								AF512546_2, AF512546
			ere(C) *		92%	93%	pLpANDM-1	FN396877
	Erythromycin	Ere(B)	*ere*(B)	*ere*(B)	99%	99%	pIP1527	A15097
				ere(B)			pAT72	X03988
		Ere(D)	*ere*(D)	*ere*(D)			Chromosome	KP265721

LYASES

Streptogramin B	Vgb(A)	*vgb*(A)	*vgb*			pIP524	M20129
Streptogramin B	Vgb(B)	*vgb*(B)	*vgb*(B)			pIP1714	AF015628

TRANSFERASES

Lincomycin	Lnu(A)	*lnu*(A)	*lin*(A') *lin*(A)			pIP856 pIP855	 M14039 JQ861959
Lincomycin	Lnu(B)	*lnu*(B)	*lin*(B)			pVM25	AJ238249
						Chromosome	JQ861959
Lincomycin	Lnu(C)	*lnu*(C)				MtnLNU	AY928180
						pHN61	FJ947048.1
Lincomycin	Lnu(D)	*lnu*(D)				Chromosome	EF452177
Lincomycin	Lnu(E)	*lnu*(E)				pStcfr	KF287643
Lincomycin	Lnu(F)	*lnu*(F) *lnu*(G)	*lnu*(F) *linF* *linG*	92%-100%	93-100%	class 1 integron	EU118119 AHK10349, DQ836009, AEC49683 AJ561197
Lincomycin	Lnu(G)	*lnu*(G)		100%	100%		KX470419, CP017962.1
Lincomycin	Lnu(H)	*lnu*(H)					AGC41079
Lincomycin	**Lun(I)**	***lun*(I)[s]**				**pRCAD0416 RA-1**	**CP073240.1**
						Chromosome	**CP004020[s]**
Lincomycin	Lnu(P)	*lnu*(P)				pJIR2774	FJ589781
Streptogramin A	Vat(A)	*vat*(A)	*vat*			pIP680	L07778
Streptogramin A	Vat(B)	*vat*(B)	*vat*(B)			pIP52	U19459
Streptogramin A	Vat C)	*vat*(C)	*vat*(C)			pIP1714	AF015628
Streptogramin A	Vat(D)	*vat*(D)	*sat*(A)	100%	100%	pAT15, pAT421	L12033 AF368302

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Streptogramin A	Vat(E)	*vat*(E)	*sat*(G)	99%	98-100%		AF139725, AF229200
			sat(G)			pIP1803	AF153312
			vat(E)			pLME300	NC_004566, AJ488494
			vat(E-3)				AF242872
			vat(E-4)				AY043211
			vat(E-5)				AY043209
			vat(E-6)				AY043210
			vat(E-7)				AY043212
			vat(E-8)				AY043213
Streptogramin A	Vat(F)		*vat*(F)			Chromosome	AF170730
Streptogramin A	Vat(G)		*vat*(G)				GQ205627
PHOSPHORYLASES							
Macrolides	Mph(A)	*mph*(A)	*mph*(A)	99%	93-99%	pTZ3519	D16251
			mph(K)			pGE64	U36578
Macrolides	Mph(B)	*mph*(B)	*mph*(B)			pTZ3714, pTZ3723	D85892
Macrolides	Mph(C)	*mph*(C)	*mph*(BM)	100%	100%	pMS97	AB013298
			mph(C)			pSR1	AF167161
Macrolides	Mph(D)	*mph*(D)	*mph*(D) partial sequence				AB048591
	Mph(E)	*mph*(E)	*mph*, *mph1* *mph2*	99%	99%-100%	Chromosome	FR751518
						pKP048, pKSMA0710	FJ628167.2, FJ917355.1
						pCOP1, pABIR	FJ187822.1, EU294228.1
						Chromosome, pRSB105	EF102240.1, DQ839391.1
						pMUR050, pCTX-M3 Chromosome	AY522431.4, AF550415.2 JF769133,
	Mph(F)	*mph*(F)	*mph*(E)	100%	100%	pRSB111	AM260957
	Mph(G)	*mph*(G)				pAQU1	AB571865
	Mph(H)[k]	*mph*(H)	*mph*(E)			Chromosome	NC_013172.1

Mph(I)[k]	*mph*(I)		Chromosome	KX531056.1
Mph(J)[j,k]	*mph*(J)		Chromosome	KY753883.1
Mph(K)[j,k]	*mph*(K)	*yebJ*	Chromosome	NC_000964.3
Mph(L)[k]	*mph*(L)		Plasmid	ACMJ01000036.1
Mph(M)[k]	*mph*(M)		Chromosome	AHFH01000066.1
Mph(N)[k]	*mph*(N)		Plasmid	NC_023287.1
Mph(O)[k]	*mph*(O)	*mph*(E)	Chromosome	NZ_AGSO01000004.1

Blue represents new or changes since last update

[**] DNA database bank of Japan; *Not all GenBank # are listed just representative ones: [*] Note *ere*(C) has been removed since the previously labeled *ere*(C) gene was 92% DNA identity with *ere* (A) gene

[a] Daly, M., R. Flamm, and V. Shortridge. 2003. The prevalence of *mef*(A) vs *mef*(E) in *S. pneumoniae* and the characterization of associated *msr*(A) homolog element. In: Abstract of the 43rd Interscience Conference on Antimicrobial Agents and Chemotherapy, C2-71, p. 112, Chicago IL; [b] Long et al., AAC 50:2500; [c] Yan et al., JAC 202075:868-872. doi:10:1093/jac/dkz545; [d] Kadlec et al., J Antimicrob Chemoth. 65:2692, 2010; ; [e] Sharkey**,** Edwards, O'Neill, MBio 2016; e01975-15 1-15; Sharkey, O'Neill, 2018 ACS Inf Dises 4:239-246 and Wilson MBio 2016; e00598-16. Demonstrated that *lsa*(A), and vga(A) are ABC-F proteins that confer resistance by ribosomal protection rather than efflux has been shown in the first paper; [f] These genes have been suggested to be ribosomal protection genes but no data to support the mechanism has been done and thus not clear of the mechanism of action **[**Sharkey, O'Neill, 2018 ACS Inf Dis 4:239-24].

[g] Su, Kumar, Ding et al., 2018, May 15, 2018. 115:5157-5162, www.pnas.org/cgi/doi/10.1073/pnas.1803313115.

[h] Ero et al., 2019 Protein Science 28:684; [j] Does not confer resistance in native host but does in heterologous host;

[k] Not named by nomenclature center [Pawlowski et al., 2018 Nature communications doi:10.1038/s41467-017-02680]**,** named by Wright lab which originally included naming multiple different genes *mph*(E);

[l] Found in GenBank do not know if it functions [Perreten]**;** [m] Imwattana et la. bioRxiv doi: https://doi.org/10.1101/2020.11.12.379040;

[n] Hadjirin, Miller, Murray et al., https://www.biorxiv.org/content/10.1101/2020.05.05.078493v2.full.pdf

[o] Fernandez, Perrenten, Schwendener 2021. JAC 76; 48-54. doi:10.1093/jac/dkaa405 ;

[p] Guglielmino manuscript in preparation**;** [q] Antonelli, D'Andrea et al. Jac 2018 73:1763-69. Doi:10.1093/jac/dky088;

[r] Oswaldi, Luth, Dzierzon et al. Microorganisms 2022 10, 512. https://doi.org/10.3390/microorganisms10030512

[s] D. Zhu *Riemerella anatipestifer* 2024, https://doi.org/10.1016/j.scitotenv.2023.167400 AWR41-00705 gene location 161,758-162,528;

[t]Zhang, Liu , Zhang et al. file:///C:/Users/Web%20Browsing/Favorites/Downloads/10.1016-j.eng.2020.12.015.pdf authors refused to follow the correct nomenclature even after contact. The use of *srpA* is not valid and should not be used

[u] BioProject accession number

More information on mobile macrolide resistance genes can be found in Feßler, Wang**,** Wu, Schwarz, 2018; Plasmid. 2018 June 19. pii: S0147-619X(18)30035-0. doi:10.1016/j.plasmid.2018.06.002, PMID:29932965