

Strain	Gene	Product	Classification	Antibiotics Class	Antibiotics
MODI-EC4326	CRP	Cyclic AMP receptor protein	efflux pump conferring antibiotic resistance, gene r		
MODI-EC4326		Translation elongation factor Tu	antibiotic resistant gene variant or mutant, elfamyc		
MODI-EC4326	mgrB	PhoP/PhoQ regulator MgrB	efflux pump conferring antibiotic resistance, gene a		
MODI-EC4326	YojI	ABC-type siderophore export system, fused ATPase	efflux pump conferring antibiotic resistance		microcin J25
MODI-EC4326	AcrAB-TolC	Transcriptional regulator of acrAB operon, AcrR	regulator modulating expression of antibiotic resis	Cephalosporins, Penams, Tetracyclines, Glycylcyclin	tigecycline; chloramphenicol; rifampin; tetracycline; s
MODI-EC4326	MacA	Macrolide-specific efflux protein MacA	efflux pump conferring antibiotic resistance	Macrolides	erythromycin
MODI-EC4326	mdfA	Multidrug efflux pump MdfA/Cmr (of MFS type), b	efflux pump conferring antibiotic resistance		Benzalkonium chloride; daunomycin; rhodamine
MODI-EC4326	acrD	Aminoglycosides efflux system AcrAD-TolC, inner-m	efflux pump conferring antibiotic resistance		
MODI-EC4326	emrB	Multidrug efflux system EmrAB-OMF, inner-membr	efflux pump conferring antibiotic resistance		nalidixic acid
MODI-EC4326	EmrAB-TolC	Multidrug resistance regulator EmrR (MprA)	regulator modulating expression of antibiotic resis	Fluoroquinolones Quinolones Quinolines	nalidixic acid
MODI-EC4326	parE	DNA topoisomerase IV subunit B (EC 5.99.1.3)	antibiotic resistant gene variant or mutant, fluoroq		
MODI-EC4326	emrD	Multidrug efflux pump EmrD (of MFS type)	efflux pump conferring antibiotic resistance		
MODI-EC4326	kdpE	DNA-binding response regulator KdpE	aminoglycoside resistance gene		kanamycin A
MODI-EC4326		Class C beta-lactamase (EC 3.5.2.6) => BlaEC family			
MODI-EC4326	Alr	Alanine racemase (EC 5.1.1.1)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
MODI-EC4326	mdtG	Multidrug resistance protein MdtG	efflux pump conferring antibiotic resistance		
MODI-EC4326	rho	Transcription termination factor Rho	antibiotic target in susceptible species	Bicyclomycins	bicyclomycin
MODI-EC4326	H-NS	DNA-binding protein H-NS	regulator modulating expression of antibiotic resis	Penams, Cephamycins, Cephalosporins, Fluoroquir	cloxacillin; oxacillin; ciprofloxacin; norfloxacin; erythr
MODI-EC4326	PgsA	CDP-diacylglycerol--glycerol-3-phosphate 3-phosph	protein altering cell wall charge conferring antibiot	Peptide antibiotics	daptomycin
MODI-EC4326	rpoC	DNA-directed RNA polymerase beta' subunit (EC 2.	antibiotic target in susceptible species	Myxopyronins Corallopyronins, Peptide antibiotics	daptomycin
MODI-EC4326	Ddl	D-alanine--D-alanine ligase (EC 6.3.2.4)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
MODI-EC4326	Iso-tRNA	Isoleucyl-tRNA synthetase (EC 6.1.1.5)	antibiotic target in susceptible species	Mupirocin	mupirocin (pseudomonic acid)
MODI-EC4326	mdtM	Multidrug efflux pump MdtM (of MFS type)	efflux pump conferring antibiotic resistance		
MODI-EC4326	mdtF	Multidrug efflux system MdtEF-TolC, inner-membr	antibiotic resistance gene cluster, cassette, or oper		erythromycin; cloxacillin; oxacillin; norfloxacin
MODI-EC4326	MdtEF-TolC	Multidrug efflux system MdtEF-TolC, inner-membr	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Macrolid	oxacillin; cloxacillin; erythromycin; norfloxacin ♦
MODI-EC4326	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin; enacyloxin IIa; pulvomycin
MODI-EC4326	arnA	UDP-4-amino-4-deoxy-L-arabinose formyltransfera	gene altering cell wall charge conferring antibiotic		colistin
MODI-EC4326	GlpT	Glycerol-3-phosphate transporter	antibiotic resistant gene variant or mutant, fosfom		
MODI-EC4326	gyrA	DNA gyrase subunit A (EC 5.99.1.3)	antibiotic target in susceptible species	Fluoroquinolones Quinolones Quinolines	clofazimine; ciprofloxacin; gatifloxacin; levofloxacin; r
MODI-EC4326	acrA	Multidrug efflux system AcrAB-TolC, membrane fus	efflux pump conferring antibiotic resistance		
MODI-EC4326	acrB	Multidrug efflux system AcrAB-TolC, inner-membr	efflux pump conferring antibiotic resistance		
MODI-EC4326	Ddl	D-alanine--D-alanine ligase (EC 6.3.2.4)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
MODI-EC4326	msbA	Lipid A export permease/ATP-binding protein MsbA	efflux pump conferring antibiotic resistance		ciprofloxacin; metronidazole
MODI-EC4326	nfxA	Oxygen-insensitive NADPH nitroreductase (EC 1.-.-)	antibiotic resistant gene variant or mutant, nitrofur		

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MODI-EC4326	MdfA/Cmr	Multidrug efflux pump MdfA/Cmr (of MFS type), b	efflux pump conferring antibiotic resistance	Multiple antibiotic resistance, Tetracyclines, Quate	tetracycline;rhodamine;benzalkonium chloride
MODI-EC4326	mdtC	Multidrug efflux system MdtABC-TolC, inner-memb	efflux pump conferring antibiotic resistance		novobiocin
MODI-EC4326	UhpT	Hexose phosphate transport protein UhpT	antibiotic resistant gene variant or mutant, fosfomy		
MODI-EC4326	SugE	Small multidrug resistance (SMR) efflux transporte	efflux pump conferring antibiotic resistance	Quaternary ammonium compounds	cetylpyridinium;cetyldimethylethyl ammonium;cet
MODI-EC4326	mdtO	Membrane fusion component MdtO of tripartite n	efflux pump conferring antibiotic resistance		
MODI-EC4326	soxR	Redox-sensitive transcriptional activator SoxR	antibiotic resistant gene variant or mutant, efflux p		
MODI-EC4326	folP	Dihydropteroate synthase (EC 2.5.1.15)	antibiotic resistant gene variant or mutant, sulfona		
MODI-EC4326	AcrEF-TolC	Multidrug efflux system AcrEF-TolC, membrane fus	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Cephalo	ciprofloxacin
MODI-EC4326	kasA	3-oxoacyl-[acyl-carrier-protein] synthase, KASII (EC	antibiotic target in susceptible species	Isoniazid, Triclosan	isoniazid;triclosan
MODI-EC4326	MarB	Multiple antibiotic resistance protein MarB	antibiotic resistance gene cluster, cassette, or opero	Penems, Penams, Carbapenems, Cephamycins, Ce	cefalothin;chloramphenicol;tigecycline;ampicillin;t
MODI-EC4326	cpxA	Copper sensory histidine kinase CpxA	efflux pump conferring antibiotic resistance, gene r		
MODI-EC4326	OmpK36	Outer membrane porin OmpN	gene conferring resistance via absence, gene modu		
MODI-EC4326	EmrKY-TolC	Multidrug efflux system EmrKY-TolC, membrane fu	efflux pump conferring antibiotic resistance	Tetracyclines	tetracycline
MODI-EC4326	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin;enacyloxin IIa;pulvomycin
MODI-EC4326	KatG	Catalase-peroxidase KatG (EC 1.11.1.21)	antibiotic activation enzyme	Isoniazid	isoniazid
MODI-EC4326	EmrE	Small multidrug resistance (SMR) efflux transporte	efflux pump conferring antibiotic resistance	Aminoglycosides, Macrolides	gentamicin C;erythromycin
MODI-EC4326	leuO	LysR family transcriptional activator LeuO	gene modulating antibiotic efflux, sulfonamide resi		
MODI-EC4326	gadX	Transcriptional regulator GadX, AraC family	efflux pump conferring antibiotic resistance, gene r		
MODI-EC4326	GdpD	Glycerophosphoryl diester phosphodiesterase (EC	protein altering cell wall charge conferring antibiot	Peptide antibiotics	daptomycin
MODI-EC4326	PmrF	Undecaprenyl-phosphate 4-deoxy-4-formamido-L-	gene altering cell wall charge conferring antibiotic		colistin
MODI-EC4326	gyrA	DNA gyrase subunit A (EC 5.99.1.3)	antibiotic resistant gene variant or mutant, fluoroq		
MODI-EC4326	AcrAB-TolC	Multidrug efflux system AcrAB-TolC, inner-membra	efflux pump conferring antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcycli	ciprofloxacin;tigecycline;chloramphenicol;rifampin
MODI-EC4326	EmrAB-TolC	Multidrug efflux system EmrAB-OMF, membrane fu	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines	nalidixic acid
MODI-EC4326	parC	DNA topoisomerase IV subunit A (EC 5.99.1.3)	antibiotic resistant gene variant or mutant, fluoroq		
MODI-EC4326	baeS	Sensory histidine kinase BaeS	efflux pump conferring antibiotic resistance, gene r		
MODI-EC4326	mdtD	Uncharacterized transporter MdtD of major facilit	efflux pump conferring antibiotic resistance		
MODI-EC4326	PmrE	UDP-glucose 6-dehydrogenase (EC 1.1.1.22)	gene altering cell wall charge conferring antibiotic		colistin
MODI-EC4326	EmrD	Multidrug efflux pump EmrD (of MFS type)	efflux pump conferring antibiotic resistance	Macrolides, Aminoglycosides, Nitrofurans, Penams	azithromycin;gentamicin;nitrofurantoin;oxacillin;sg
MODI-EC4326	PmrC	Lipid A phosphoethanolamine transferase EptA/Pn	gene altering cell wall charge conferring antibiotic		colistin
MODI-EC4326	PmrB	Sensor protein BasS/PmrB (activates BasR/PmrA)			
MODI-EC4326	mdtN	Inner membrane component MdtN of tripartite m	efflux pump conferring antibiotic resistance		
MODI-EC4326	soxS	DNA-binding transcriptional dual regulator SoxS	antibiotic resistant gene variant or mutant, efflux p		
MODI-EC4326	folP	Dihydropteroate synthase (EC 2.5.1.15)	antibiotic target in susceptible species	Sulfonamides	sulfadiazine;sulfadimidine;sulfadoxine;sulfamethox
MODI-EC4326	murA	UDP-N-acetylglucosamine 1-carboxyvinyltransferas	antibiotic resistant gene variant or mutant, fosfomy		

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MODI-EC4326	MurA	UDP-N-acetylglucosamine 1-carboxyvinyltransferase	antibiotic target in susceptible species	Fosfomycin	fosfomycin
MODI-EC4326	acrF	Multidrug efflux system AcrEF-TolC, inner-membrane	efflux pump conferring antibiotic resistance		
MODI-EC4326	AcrEF-TolC	Multidrug efflux system AcrEF-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Cephalosporins	ciprofloxacin
MODI-EC4326	mdtH	Multidrug resistance protein MdtH	efflux pump conferring antibiotic resistance		
MODI-EC4326	evgA	Positive transcription regulator EvgA	efflux pump conferring antibiotic resistance, gene regulation		
MODI-EC4326	emrY	Multidrug efflux system EmrKY-TolC, inner-membrane	efflux pump conferring antibiotic resistance		tetracycline
MODI-EC4326	PhoP	Transcriptional regulatory protein PhoP	antibiotic resistant gene variant or mutant, efflux pump		
MODI-EC4326	KatG	Catalase-peroxidase KatG (EC 1.11.1.21)	antibiotic activation enzyme	Isoniazid	isoniazid
MODI-EC4326	S10p	SSU ribosomal protein S10p (S20e)	antibiotic target in susceptible species	Tetracyclines, Glycylcyclines	tetracycline;tigecycline
MODI-EC4326	emrE	Small multidrug resistance (SMR) efflux transporter	efflux pump conferring antibiotic resistance		
MODI-EC4326	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin;enacyloxin IIa;pulvomycin
MODI-EC4326	folA, Dfr	Dihydrofolate reductase (EC 1.5.1.3)	antibiotic target in susceptible species	Diaminopyrimidines	trimethoprim;brodimoprim;tetroxoprim;iclaprim
MODI-EC4326	MdtM	Multidrug efflux pump MdtM (of MFS type)	efflux pump conferring antibiotic resistance	Nucleoside antibiotics, Phenicol antibiotics, Lincosamides	chloramphenicol;norfloxacin;puromycin;lincomycin
MODI-EC4326	mdtE	Multidrug efflux system MdtEF-TolC, membrane fusion	antibiotic resistance gene cluster, cassette, or operon		erythromycin;cloxacillin;oxacillin;norfloxacin
MODI-EC4326	MdtEF-TolC	Multidrug efflux system MdtEF-TolC, membrane fusion	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Macrolides	oxacillin;cloxacillin;erythromycin;norfloxacin
MODI-EC4326	gadE	Transcriptional activator GadE	antibiotic resistance gene cluster, cassette, or operon		
MODI-EC4326	GadE	Transcriptional activator GadE	regulator modulating expression of antibiotic resistance	Multiple antibiotic resistance	
MODI-EC4326	ompF	Outer membrane porin OmpF	antibiotic resistant gene variant or mutant, beta-lactamase		
MODI-EC4326	MacB	Macrolide export ATP-binding/permease protein M	efflux pump conferring antibiotic resistance	Macrolides	erythromycin
MODI-EC4326	BcrC	Undecaprenyl-diphosphatase BcrC (EC 3.6.1.27), cell wall	antibiotic target protection protein	Peptide antibiotics	bacitracin
MODI-EC4326	alaS	Alanyl-tRNA synthetase (EC 6.1.1.7)	aminocoumarin resistance gene		
MODI-EC4326	EmrAB-TolC	Multidrug efflux system EmrAB-OMF, inner-membrane	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines	nalidixic acid
MODI-EC4326	emrA	Multidrug efflux system EmrAB-OMF, membrane fusion	efflux pump conferring antibiotic resistance		nalidixic acid
MODI-EC4326	emrR	Multidrug resistance regulator EmrR (MprA)	efflux pump conferring antibiotic resistance, gene regulation		
MODI-EC4326	patA	Putrescine aminotransferase (EC 2.6.1.82)	efflux pump conferring antibiotic resistance		
MODI-EC4326	bacA	Undecaprenyl-diphosphatase (EC 3.6.1.27)	gene conferring antibiotic resistance via molecular		bacitracin A;bacitracin B;bacitracin F
MODI-EC4326	tolC	Outer membrane channel TolC (OpmH)	efflux pump conferring antibiotic resistance		erythromycin;cloxacillin;tetracycline;oxacillin;novobiocin
MODI-EC4326	TolC/OpmH	Outer membrane channel TolC (OpmH)	efflux pump conferring antibiotic resistance	Penams, Cephamycins, Cephalosporins, Monobactams	
MODI-EC4326	MdtABC-TolC	Multidrug efflux system MdtABC-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Aminocoumarin antibiotics	novobiocin
MODI-EC4326	MdtABC-TolC	Multidrug efflux system MdtABC-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Aminocoumarin antibiotics	novobiocin
MODI-EC4326	MdtABC-TolC	Multidrug efflux system MdtABC-TolC, membrane fusion	efflux pump conferring antibiotic resistance	Aminocoumarin antibiotics	novobiocin
MODI-EC4326	gidB	16S rRNA (guanine(527)-N(7))-methyltransferase (GidB)	gene conferring resistance via absence	Aminoglycosides	streptomycin
MODI-EC4326	BlaEC family	Class C beta-lactamase (EC 3.5.2.6) => BlaEC family	antibiotic inactivation enzyme	Beta-lactam antibiotics	
MODI-EC4326	acrE	Multidrug efflux system AcrEF-TolC, membrane fusion	efflux pump conferring antibiotic resistance		

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MODI-EC4326	AcrEF-TolC	Multidrug efflux system AcrEF-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Cephalosporins	ciprofloxacin
MODI-EC4326	kasA	3-oxoacyl-[acyl-carrier-protein] synthase, KASII (EC 2.3.1.17)	antibiotic target in susceptible species	Isoniazid, Triclosan	isoniazid;triclosan
MODI-EC4326	marR	Multiple antibiotic resistance protein MarR	antibiotic resistant gene variant or mutant,efflux pump		
MODI-EC4326	MarR	Multiple antibiotic resistance protein MarR	antibiotic resistance gene cluster,cassette,or operon	Penams, Carbapenems, Cephamycins, Cephalosporins	cefalothin;chloramphenicol;tigecycline;ampicillin;tetracycline
MODI-EC4326	mfd	Transcription-repair coupling factor	antibiotic target protection protein,fluoroquinolones		ciprofloxacin
MODI-EC4326	kasA	3-oxoacyl-[acyl-carrier-protein] synthase, KASII (EC 2.3.1.17)	antibiotic target in susceptible species	Isoniazid, Triclosan	isoniazid;triclosan
MODI-EC4326	cysB	Cys regulon transcriptional activator CysB	aminocoumarin resistance gene		
MODI-EC4326	AcrZ	AcrZ membrane protein associated with AcrAB-TolC	efflux pump conferring antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcyclines	ciprofloxacin;tigecycline;chloramphenicol;rifampin
MODI-EC4326	evgS	Hybrid sensory histidine kinase in two-component system	efflux pump conferring antibiotic resistance,gene regulation		
MODI-EC4326	OxyR	Hydrogen peroxide-inducible genes activator => OxyR	regulator modulating expression of antibiotic resistance	Isoniazid	isoniazid
MODI-EC4326	rpoB	DNA-directed RNA polymerase beta subunit (EC 2.7.7.6)	antibiotic resistant gene variant or mutant,rifampin		
MODI-EC4326	mdtK	Uncharacterized transporter YeeO	efflux pump conferring antibiotic resistance		
MODI-EC4326		Translation elongation factor Tu	antibiotic resistant gene variant or mutant,elfamycin		
MODI-EC4326		Translation elongation factor Tu	antibiotic resistant gene variant or mutant,elfamycin		
MODI-EC4326	dxr	1-deoxy-D-xylulose 5-phosphate reductoisomerase	antibiotic target in susceptible species	Fosmidomycin	fosmidomycin
MODI-EC4326	gadW	Transcriptional regulator GadW, AraC family	efflux pump conferring antibiotic resistance,gene regulation		
MODI-EC4326	S12p	SSU ribosomal protein S12p (S23e)	antibiotic target in susceptible species	Aminoglycosides	streptomycin
MODI-EC4326	EF-G	Translation elongation factor G	antibiotic target in susceptible species	Fusidic acid	fusidic acid
MODI-EC4326	acrR	Transcriptional regulator of acrAB operon, AcrR	antibiotic resistant gene variant or mutant,efflux pump		
MODI-EC4326	AcrAB-TolC	Multidrug efflux system AcrAB-TolC, membrane fusion	efflux pump conferring antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcyclines	ciprofloxacin;tigecycline;chloramphenicol;rifampin
MODI-EC4326	MdfA/Cmr	Multidrug efflux pump MdfA/Cmr (of MFS type), binding	efflux pump conferring antibiotic resistance	Multiple antibiotic resistance, Tetracyclines, Quaternary	tetracycline;rhodamine;benzalkonium chloride
MODI-EC4326	AcrAD-TolC	Aminoglycosides efflux system AcrAD-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Aminoglycosides	amikacin;gentamicin C;tobramycin
MODI-EC4326	baeR	Response regulator BaeR	efflux pump conferring antibiotic resistance,gene regulation		
MODI-EC4326	mdtB	Multidrug efflux system MdtABC-TolC, inner-membrane	efflux pump conferring antibiotic resistance		novobiocin
MODI-EC4326	mdtA	Multidrug efflux system MdtABC-TolC, membrane	efflux pump conferring antibiotic resistance		novobiocin
MODI-EC4326	mdtL	Multidrug efflux pump MdtL (of MFS type)	efflux pump conferring antibiotic resistance		
MODI-EC4326	MdtL	Multidrug efflux pump MdtL (of MFS type)	efflux pump conferring antibiotic resistance	Multiple antibiotic resistance	
MODI-EC4326	gyrB	DNA gyrase subunit B (EC 5.99.1.3)	aminocoumarin resistance gene,antibiotic resistance		
MODI-EC4326	gyrB	DNA gyrase subunit B (EC 5.99.1.3)	antibiotic target in susceptible species	Fluoroquinolones Quinolones Quinolines, Aminocyclitol	clofazimine;gatifloxacin;ciprofloxacin;levofloxacin;moxifloxacin
MODI-EC4326	adiY	Transcriptional regulator of catabolic arginine decarboxylase	efflux pump conferring antibiotic resistance		
MODI-EC4326	mdtP	Multidrug resistance outer membrane protein MdtP	efflux pump conferring antibiotic resistance		
MODI-EC4326	acrS	Probable acrEF/envCD operon repressor EnvR	efflux pump conferring antibiotic resistance,gene regulation		
MODI-EC4326	acrF	Multidrug efflux system AcrEF-TolC, inner-membrane	efflux pump conferring antibiotic resistance		
MODI-EC4326	marA	Multiple antibiotic resistance protein MarA	efflux pump conferring antibiotic resistance,gene regulation		

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MODI-EC4326	MarA	Multiple antibiotic resistance protein MarA	antibiotic resistance gene cluster,cassette,or operon	Penems, Penams, Carbapenems, Cephamycins, Cephalosporins	cefalothin;chloramphenicol;tigecycline;ampicillin;tetracycline
MODI-EC4326	cpxR	Copper-sensing two-component system response regulator	efflux pump conferring antibiotic resistance, gene regulation		
MODI-EC4326	inhA, fabI	Enoyl-[acyl-carrier-protein] reductase [NADH] (EC 1.1.1.4)	antibiotic target in susceptible species	Isoniazid, Ethionamide, Triclosan	isoniazid;ethionamide;triclosan
MODI-EC4326	H-NS	DNA-binding protein H-NS	efflux pump conferring antibiotic resistance, gene regulation		
MODI-EC4326	emrK	Multidrug efflux system EmrKY-TolC, membrane fusion protein	efflux pump conferring antibiotic resistance		tetracycline
MODI-EC4326	EmrKY-TolC	Multidrug efflux system EmrKY-TolC, inner-membrane protein	efflux pump conferring antibiotic resistance	Tetracyclines	tetracycline
MODI-EC4326	rpoB	DNA-directed RNA polymerase beta subunit (EC 2.7.7.6)	antibiotic target in susceptible species	Rifamycins, Peptide antibiotics	rifamycin;daptomycin;rifabutin;rifampin
MODI-EC4326	Alr	Alanine racemase (EC 5.1.1.1)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
SCH10016.S.230	Ddl	D-alanine--D-alanine ligase (EC 6.3.2.4)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
SCH10016.S.230	MacB	Macrolide export ATP-binding/permease protein M	efflux pump conferring antibiotic resistance	Macrolides	erythromycin
SCH10016.S.230	MdtABC-TolC	Multidrug efflux system MdtABC-TolC, inner-membrane protein	efflux pump conferring antibiotic resistance	Aminocoumarin antibiotics	novobiocin
SCH10016.S.230	Iso-tRNA	Isoleucyl-tRNA synthetase (EC 6.1.1.5)	antibiotic target in susceptible species	Mupirocin	mupirocin (pseudomonic acid)
SCH10016.S.230		Class C beta-lactamase (EC 3.5.2.6) => BlaEC family			
SCH10016.S.230	adiY	Transcriptional regulator of catabolic arginine decarboxylase	efflux pump conferring antibiotic resistance		
SCH10016.S.230	mdtO	Membrane fusion component MdtO of tripartite multidrug efflux pump	efflux pump conferring antibiotic resistance		
SCH10016.S.230	soxR	Redox-sensitive transcriptional activator SoxR	antibiotic resistant gene variant or mutant,efflux pump		
SCH10016.S.230	mdtG	Multidrug resistance protein MdtG	efflux pump conferring antibiotic resistance		
SCH10016.S.230	UhpT	Hexose phosphate transport protein UhpT	antibiotic resistant gene variant or mutant, fosfomycin		
SCH10016.S.230	mdtL	Multidrug efflux pump MdtL (of MFS type)	efflux pump conferring antibiotic resistance		
SCH10016.S.230	MdtL	Multidrug efflux pump MdtL (of MFS type)	efflux pump conferring antibiotic resistance	Multiple antibiotic resistance	
SCH10016.S.230	evgS	Hybrid sensory histidine kinase in two-component system	efflux pump conferring antibiotic resistance, gene regulation		
SCH10016.S.230	gyrA	DNA gyrase subunit A (EC 5.99.1.3)	antibiotic target in susceptible species	Fluoroquinolones Quinolones Quinolines	clofazimine;ciprofloxacin;gatifloxacin;levofloxacin;ofloxacin
SCH10016.S.230	GlpT	Glycerol-3-phosphate transporter	antibiotic resistant gene variant or mutant, fosfomycin		
SCH10016.S.230	arnA	UDP-4-amino-4-deoxy-L-arabinose formyltransferase	gene altering cell wall charge conferring antibiotic resistance		colistin
SCH10016.S.230	MdtEF-TolC	Multidrug efflux system MdtEF-TolC, membrane fusion protein	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Macrolides	oxacillin;cloxacillin;erythromycin;norfloxacin
SCH10016.S.230	GadE	Transcriptional activator GadE	regulator modulating expression of antibiotic resistance	Multiple antibiotic resistance	
SCH10016.S.230	EF-G	Translation elongation factor G	antibiotic target in susceptible species	Fusidic acid	fusidic acid
SCH10016.S.230		Translation elongation factor Tu	antibiotic resistant gene variant or mutant,elfamycin		
SCH10016.S.230	folP	Dihydropteroate synthase (EC 2.5.1.15)	antibiotic target in susceptible species	Sulfonamides	sulfadiazine;sulfadimidine;sulfadoxine;sulfamethoxazole
SCH10016.S.230	KatG	Catalase-peroxidase KatG (EC 1.11.1.21)	antibiotic activation enzyme	Isoniazid	isoniazid
SCH10016.S.230	MacB	Macrolide export ATP-binding/permease protein M	efflux pump conferring antibiotic resistance	Macrolides	erythromycin
SCH10016.S.230		Translation elongation factor Tu	antibiotic resistant gene variant or mutant,elfamycin		
SCH10016.S.230	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin;enacyloxin IIa;pulvomycin
SCH10016.S.230	AcrAB-TolC	Transcriptional regulator of acrAB operon, AcrR	regulator modulating expression of antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcyclines	tigecycline;chloramphenicol;rifampin;tetracycline;erythromycin

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SCH0016.S.230	kdpE	DNA-binding response regulator KdpE	aminoglycoside resistance gene		kanamycin A
SCH0016.S.230	BcrC	Undecaprenyl-diphosphatase BcrC (EC 3.6.1.27), c	antibiotic target protection protein	Peptide antibiotics	bacitracin
SCH0016.S.230	MdfA/Cmr	Multidrug efflux pump MdfA/Cmr (of MFS type), b	efflux pump conferring antibiotic resistance	Multiple antibiotic resistance, Tetracyclines, Quate	tetracycline;rhodamine;benzalkonium chloride
SCH0016.S.230	baeS	Sensory histidine kinase BaeS	efflux pump conferring antibiotic resistance, gene r		
SCH0016.S.230	mdtD	Uncharacterized transporter MdtD of major facilitat	efflux pump conferring antibiotic resistance		
SCH0016.S.230	mdtA	Multidrug efflux system MdtABC-TolC, membrane	efflux pump conferring antibiotic resistance		novobiocin
SCH0016.S.230	emrE	Small multidrug resistance (SMR) efflux transporte	efflux pump conferring antibiotic resistance		
SCH0016.S.230	marA	Multiple antibiotic resistance protein MarA	efflux pump conferring antibiotic resistance, gene r		
SCH0016.S.230	MarR	Multiple antibiotic resistance protein MarR	antibiotic resistance gene cluster, cassette, or opero	Penams, Carbapenems, Cephamycins, Cephalospo	cefalothin;chloramphenicol;tigecycline;ampicillin;t
SCH0016.S.230	emrB	Multidrug efflux system EmrAB-OMF, inner-memb	efflux pump conferring antibiotic resistance		nalidixic acid
SCH0016.S.230	emrR	Multidrug resistance regulator EmrR (MprA)	efflux pump conferring antibiotic resistance, gene r		
SCH0016.S.230	BlaEC family	Class C beta-lactamase (EC 3.5.2.6) => BlaEC family	antibiotic inactivation enzyme	Beta-lactam antibiotics	
SCH0016.S.230	H-NS	DNA-binding protein H-NS	efflux pump conferring antibiotic resistance, gene r		
SCH0016.S.230	H-NS	DNA-binding protein H-NS	regulator modulating expression of antibiotic resis	Penams, Cephamycins, Cephalosporins, Fluoroquir	cloxacillin;oxacillin;ciprofloxacin;norfloxacin;erythr
SCH0016.S.230	mdtH	Multidrug resistance protein MdtH	efflux pump conferring antibiotic resistance		
SCH0016.S.230	gyrB	DNA gyrase subunit B (EC 5.99.1.3)	antibiotic target in susceptible species	Fluoroquinolones Quinolones Quinolines, Aminoc	clofazimine;gatifloxacin;ciprofloxacin;levofloxacin;t
SCH0016.S.230	gidB	16S rRNA (guanine(527)-N(7))-methyltransferase (I	gene conferring resistance via absence	Aminoglycosides	streptomycin
SCH0016.S.230	acrD	Aminoglycosides efflux system AcrAD-TolC, inner-n	efflux pump conferring antibiotic resistance		
SCH0016.S.230	EmrKY-TolC	Multidrug efflux system EmrKY-TolC, inner-membra	efflux pump conferring antibiotic resistance	Tetracyclines	tetracycline
SCH0016.S.230	gadE	Transcriptional activator GadE	antibiotic resistance gene cluster, cassette, or oper		
SCH0016.S.230	acrF	Multidrug efflux system AcrEF-TolC, inner-membra	efflux pump conferring antibiotic resistance		
SCH0016.S.230	OxyR	Hydrogen peroxide-inducible genes activator => Oxy	regulator modulating expression of antibiotic resis	Isoniazid	isoniazid
SCH0016.S.230	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin;enacyloxin IIa;pulvomycin
SCH0016.S.230	S10p	SSU ribosomal protein S10p (S20e)	antibiotic target in susceptible species	Tetracyclines, Glycylcyclines	tetracycline;tigecycline
SCH0016.S.230	rpoB	DNA-directed RNA polymerase beta subunit (EC 2.	antibiotic target in susceptible species	Rifamycins, Peptide antibiotics	rifamycin;daptomycin;rifabutin;rifampin
SCH0016.S.230	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin;enacyloxin IIa;pulvomycin
SCH0016.S.230	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin;enacyloxin IIa;pulvomycin
SCH0016.S.230	acrB	Multidrug efflux system AcrAB-TolC, inner-membra	efflux pump conferring antibiotic resistance		
SCH0016.S.230	acrA	Multidrug efflux system AcrAB-TolC, membrane fus	efflux pump conferring antibiotic resistance		
SCH0016.S.230	nfsA	Oxygen-insensitive NADPH nitroreductase (EC 1.-.-	antibiotic resistant gene variant or mutant, nitrofur		
SCH0016.S.230	msbA	Lipid A export permease/ATP-binding protein MsbA	efflux pump conferring antibiotic resistance		ciprofloxacin;metronidazole
SCH0016.S.230	mdtC	Multidrug efflux system MdtABC-TolC, inner-memb	efflux pump conferring antibiotic resistance		novobiocin
SCH0016.S.230	MdtABC-TolC	Multidrug efflux system MdtABC-TolC, inner-memb	efflux pump conferring antibiotic resistance	Aminocoumarin antibiotics	novobiocin
SCH0016.S.230	MdtABC-TolC	Multidrug efflux system MdtABC-TolC, membrane	efflux pump conferring antibiotic resistance	Aminocoumarin antibiotics	novobiocin

Strain	Gene	Product	Classification	Antibiotics Class	Antibiotics
SCHI0016.S.230	fyuA	iron acquisition outer membrane yersiniabactin receptor	aminoglycoside resistance gene, tetracycline resistance		streptomycin; tetracycline; ampicillin
SCHI0016.S.230	PgsA	CDP-diacylglycerol--glycerol-3-phosphate 3-phosphatidyltransferase	protein altering cell wall charge conferring antibiotic resistance	Peptide antibiotics	daptomycin
SCHI0016.S.230	mgrB	PhoP/PhoQ regulator MgrB	efflux pump conferring antibiotic resistance, gene		
SCHI0016.S.230	marR	Multiple antibiotic resistance protein MarR	antibiotic resistant gene variant or mutant, efflux pump		
SCHI0016.S.230	Ddl	D-alanine--D-alanine ligase (EC 6.3.2.4)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
SCHI0016.S.230	leuO	LysR family transcriptional activator LeuO	gene modulating antibiotic efflux, sulfonamide resistance		
SCHI0016.S.230	alaS	Alanyl-tRNA synthetase (EC 6.1.1.7)	aminocoumarin resistance gene		
SCHI0016.S.230	EmrAB-TolC	Multidrug resistance regulator EmrR (MprA)	regulator modulating expression of antibiotic resistance	Fluoroquinolones Quinolones Quinolines	nalidixic acid
SCHI0016.S.230	PmrC	Lipid A phosphoethanolamine transferase EptA/PmrC	gene altering cell wall charge conferring antibiotic resistance		colistin
SCHI0016.S.230	Alr	Alanine racemase (EC 5.1.1.1)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
SCHI0016.S.230	PhoP	Transcriptional regulatory protein PhoP	antibiotic resistant gene variant or mutant, efflux pump		
SCHI0016.S.230	mfd	Transcription-repair coupling factor	antibiotic target protection protein, fluoroquinolone		ciprofloxacin
SCHI0016.S.230	emrD	Multidrug efflux pump EmrD (of MFS type)	efflux pump conferring antibiotic resistance		
SCHI0016.S.230	evgA	Positive transcription regulator EvgA	efflux pump conferring antibiotic resistance, gene		
SCHI0016.S.230	emrY	Multidrug efflux system EmrKY-TolC, inner-membrane	efflux pump conferring antibiotic resistance		tetracycline
SCHI0016.S.230	YojI	ABC-type siderophore export system, fused ATPase	efflux pump conferring antibiotic resistance		microcin J25
SCHI0016.S.230	mdtF	Multidrug efflux system MdtEF-TolC, inner-membrane	antibiotic resistance gene cluster, cassette, or operon		erythromycin; cloxacillin; oxacillin; norfloxacin
SCHI0016.S.230	EF-Tu	Translation elongation factor Tu	antibiotic target in susceptible species	Elfamycins	kirromycin; enacyloxin IIa; pulvomycin
SCHI0016.S.230	AcrEF-TolC	Multidrug efflux system AcrEF-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Cephalosporins	ciprofloxacin
SCHI0016.S.230	murA	UDP-N-acetylglucosamine 1-carboxyvinyltransferase	antibiotic resistant gene variant or mutant, fosfomycin		
SCHI0016.S.230	tolC	Outer membrane channel TolC (OpmH)	efflux pump conferring antibiotic resistance		erythromycin; cloxacillin; tetracycline; oxacillin; novobiocin
SCHI0016.S.230	parC	DNA topoisomerase IV subunit A (EC 5.99.1.3)	antibiotic resistant gene variant or mutant, fluoroquinolone		
SCHI0016.S.230	patA	Putrescine aminotransferase (EC 2.6.1.82)	efflux pump conferring antibiotic resistance		
SCHI0016.S.230	rpoC	DNA-directed RNA polymerase beta' subunit (EC 2.7.7.6)	antibiotic target in susceptible species	Myxopyronins Coralopyronins, Peptide antibiotics	daptomycin
SCHI0016.S.230		Translation elongation factor Tu	antibiotic resistant gene variant or mutant, elfamycin		
SCHI0016.S.230	AcrAB-TolC	Multidrug efflux system AcrAB-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcyclines	ciprofloxacin; tigecycline; chloramphenicol; rifampin
SCHI0016.S.230	MacA	Macrolide-specific efflux protein MacA	efflux pump conferring antibiotic resistance	Macrolides	erythromycin
SCHI0016.S.230	baeR	Response regulator BaeR	efflux pump conferring antibiotic resistance, gene		
SCHI0016.S.230	mdtB	Multidrug efflux system MdtABC-TolC, inner-membrane	efflux pump conferring antibiotic resistance		novobiocin
SCHI0016.S.230	EmrE	Small multidrug resistance (SMR) efflux transporter	efflux pump conferring antibiotic resistance	Aminoglycosides, Macrolides	gentamicin C; erythromycin
SCHI0016.S.230	MarB	Multiple antibiotic resistance protein MarB	antibiotic resistance gene cluster, cassette, or operon	Penams, Penams, Carbapenams, Cephamycins, Cephalosporins	cefalothin; chloramphenicol; tigecycline; ampicillin; ticarcillin
SCHI0016.S.230	folA, Dfr	Dihydrofolate reductase (EC 1.5.1.3)	antibiotic target in susceptible species	Diaminopyrimidines	trimethoprim; brodimoprim; tetraoxoprim; iclaprim
SCHI0016.S.230	EmrAB-TolC	Multidrug efflux system EmrAB-OMF, inner-membrane	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines	nalidixic acid
SCHI0016.S.230	emrA	Multidrug efflux system EmrAB-OMF, membrane fusion	efflux pump conferring antibiotic resistance		nalidixic acid

Strain	Gene	Product	Classification	Antibiotics Class	Antibiotics
SCH0016.S.230	SugE	Small multidrug resistance (SMR) efflux transporter	efflux pump conferring antibiotic resistance	Quaternary ammonium compounds	cetylpyridinium;cetyltrimethylammonium;cetyltrimethylammonium
SCH0016.S.230	PmrB	Sensor protein BasS/PmrB (activates BasR/PmrA)			
SCH0016.S.230	mdtP	Multidrug resistance outer membrane protein MdtP	efflux pump conferring antibiotic resistance		
SCH0016.S.230	soxS	DNA-binding transcriptional dual regulator SoxS	antibiotic resistant gene variant or mutant,efflux pump		
SCH0016.S.230	Alr	Alanine racemase (EC 5.1.1.1)	antibiotic target in susceptible species	Cycloserine	D-cycloserine
SCH0016.S.230	cysB	Cys regulon transcriptional activator CysB	aminocoumarin resistance gene		
SCH0016.S.230	kasA	3-oxoacyl-[acyl-carrier-protein] synthase, KASII (EC 2.3.1.17)	antibiotic target in susceptible species	Isoniazid, Triclosan	isoniazid;triclosan
SCH0016.S.230	gyrB	DNA gyrase subunit B (EC 5.99.1.3)	aminocoumarin resistance gene,antibiotic resistant		
SCH0016.S.230	emrK	Multidrug efflux system EmrKY-TolC, membrane fusion	efflux pump conferring antibiotic resistance		tetracycline
SCH0016.S.230	EmrKY-TolC	Multidrug efflux system EmrKY-TolC, membrane fusion	efflux pump conferring antibiotic resistance	Tetracyclines	tetracycline
SCH0016.S.230	gadW	Transcriptional regulator GadW, AraC family	efflux pump conferring antibiotic resistance, gene		
SCH0016.S.230	MdtEF-TolC	Multidrug efflux system MdtEF-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Macrolides	oxacillin;cloxacillin;erythromycin;norfloxacin
SCH0016.S.230	GdpD	Glycerophosphoryl diester phosphodiesterase (EC 3.1.3.42)	protein altering cell wall charge conferring antibiotic	Peptide antibiotics	daptomycin
SCH0016.S.230	CRP	Cyclic AMP receptor protein	efflux pump conferring antibiotic resistance, gene		
SCH0016.S.230	S12p	SSU ribosomal protein S12p (S23e)	antibiotic target in susceptible species	Aminoglycosides	streptomycin
SCH0016.S.230	AcrEF-TolC	Multidrug efflux system AcrEF-TolC, membrane fusion	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines, Cephalosporins	ciprofloxacin
SCH0016.S.230	MurA	UDP-N-acetylglucosamine 1-carboxyvinyltransferase	antibiotic target in susceptible species	Fosfomycin	fosfomycin
SCH0016.S.230	TolC/OpmH	Outer membrane channel TolC (OpmH)	efflux pump conferring antibiotic resistance	Penams, Cephamycins, Cephalosporins, Monobactams	
SCH0016.S.230	bacA	Undecaprenyl-diphosphatase (EC 3.6.1.27)	gene conferring antibiotic resistance via molecular		bacitracin A;bacitracin B;bacitracin F
SCH0016.S.230		Translation elongation factor Tu	antibiotic resistant gene variant or mutant,elfamycin		
SCH0016.S.230	AcrAB-TolC	Multidrug efflux system AcrAB-TolC, membrane fusion	efflux pump conferring antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcyclines	ciprofloxacin;tigecycline;chloramphenicol;rifampin
SCH0016.S.230	acrR	Transcriptional regulator of acrAB operon, AcrR	antibiotic resistant gene variant or mutant,efflux pump		
SCH0016.S.230	AcrZ	AcrZ membrane protein associated with AcrAB-TolC	efflux pump conferring antibiotic resistance	Cephalosporins, Penams, Tetracyclines, Glycylcyclines	ciprofloxacin;tigecycline;chloramphenicol;rifampin
SCH0016.S.230	mdfA	Multidrug efflux pump MdfA/Cmr (of MFS type), beta-lactamase	efflux pump conferring antibiotic resistance		Benzalkonium chloride;daunomycin;rhodamine
SCH0016.S.230	ompF	Outer membrane porin OmpF	antibiotic resistant gene variant or mutant,beta-lactamase		
SCH0016.S.230	PmrE	UDP-glucose 6-dehydrogenase (EC 1.1.1.22)	gene altering cell wall charge conferring antibiotic		colistin
SCH0016.S.230	mdtK	Uncharacterized transporter YeeO	efflux pump conferring antibiotic resistance		
SCH0016.S.230	MarA	Multiple antibiotic resistance protein MarA	antibiotic resistance gene cluster,cassette,or operon	Penams, Penams, Carbapenams, Cephamycins, Cephalosporins	cefalothin;chloramphenicol;tigecycline;ampicillin;tetracycline
SCH0016.S.230	dxr	1-deoxy-D-xylulose 5-phosphate reductoisomerase	antibiotic target in susceptible species	Fosmidomycin	fosmidomycin
SCH0016.S.230	EmrAB-TolC	Multidrug efflux system EmrAB-OMF, membrane fusion	efflux pump conferring antibiotic resistance	Fluoroquinolones Quinolones Quinolines	nalidixic acid
SCH0016.S.230	inhA, fabI	Enoyl-[acyl-carrier-protein] reductase [NADH] (EC 1.1.1.14)	antibiotic target in susceptible species	Isoniazid, Ethionamide, Triclosan	isoniazid;ethionamide;triclosan
SCH0016.S.230	EmrD	Multidrug efflux pump EmrD (of MFS type)	efflux pump conferring antibiotic resistance	Macrolides, Aminoglycosides, Nitrofurans, Penams	azithromycin;gentamicin;nitrofurantoin;oxacillin;spiramycin
SCH0016.S.230	AcrAD-TolC	Aminoglycosides efflux system AcrAD-TolC, inner-membrane	efflux pump conferring antibiotic resistance	Aminoglycosides	amikacin;gentamicin C;tobramycin
SCH0016.S.230	gyrA	DNA gyrase subunit A (EC 5.99.1.3)	antibiotic resistant gene variant or mutant,fluoroquinolones		



Strain	Gene	Product	Classification	Antibiotics Class	Antibiotics
SCH10016.S.230	PmrF	Undecaprenyl-phosphate 4-deoxy-4-formamido-L-	gene altering cell wall charge conferring antibiotic		colistin
SCH10016.S.230	gadX	Transcriptional regulator GadX, AraC family	efflux pump conferring antibiotic resistance,gene r		
SCH10016.S.230	mdtE	Multidrug efflux system MdtEF-TolC, membrane fu	antibiotic resistance gene cluster, cassette, or oper		erythromycin;cloxacillin;oxacillin;norfloxacin
SCH10016.S.230	acrE	Multidrug efflux system AcrEF-TolC, membrane fus	efflux pump conferring antibiotic resistance		
SCH10016.S.230	acrS	Probable acrEF/envCD operon repressor EnvR	efflux pump conferring antibiotic resistance,gene r		
SCH10016.S.230	folP	Dihydropteroate synthase (EC 2.5.1.15)	antibiotic resistant gene variant or mutant,sulfona		
SCH10016.S.230	parE	DNA topoisomerase IV subunit B (EC 5.99.1.3)	antibiotic resistant gene variant or mutant,fluoroq		
SCH10016.S.230	cpxA	Copper sensory histidine kinase CpxA	efflux pump conferring antibiotic resistance,gene r		
SCH10016.S.230	cpxR	Copper-sensing two-component system response r	efflux pump conferring antibiotic resistance,gene r		
SCH10016.S.230	rho	Transcription termination factor Rho	antibiotic target in susceptible species	Bicyclomycins	bicyclomycin
SCH10016.S.230	TEM-1	Class A beta-lactamase (EC 3.5.2.6) => TEM family	antibiotic inactivation enzyme,beta-lactam resistan		
SCH10016.S.230		Class A beta-lactamase (EC 3.5.2.6) => TEM family			
SCH10016.S.230	TEM family	Class A beta-lactamase (EC 3.5.2.6) => TEM family	antibiotic inactivation enzyme	Penems, Cephalosporins, Penams, Monobactams	amoxicillin/clavulanic acid;amoxicillin;ampicillin;ce
SCH10016.S.230	MacA	Macrolide-specific efflux protein MacA	efflux pump conferring antibiotic resistance	Macrolides	erythromycin
SCH10016.S.230		Translation elongation factor Tu	antibiotic resistant gene variant or mutant,elfamyc		
SCH10016.S.230	rpoB	DNA-directed RNA polymerase beta subunit (EC 2.	antibiotic resistant gene variant or mutant,rifampi		