

Supplemental Table 1: List of the ARGs linked to multidrug efflux systems and beta-lactamases described in healthy individuals or in case of chronic respiratory diseases (CRDs)

Clinical context	ARGs*			References
	Multidrug efflux systems	Beta-lactamases	Additional genes	
Healthy individuals	<i>acrA-1, acrA-4, acrA-5, acrF, ceoA, emrD, mepA, mexF, mtrD-2, mtrD-3, oprD, oprJ, pmrA, qacEdelta1-2, qacH-1, tolC-2, tolC-3, yceL/mdtH-1, yidY/mdtL-1</i>	<i>ampC/bla_{DHA}, ampC-1, ampC-2, ampC-4, ampC-6, bla_{CMY}, bla_{CMY2-2}, bla_{CTX-M-1}, bla_{CTX-M-4}, bla_{CTX-M-5}, bla_{CTX-M-9}, bla_{LL1}, bla_{OXA-48}, bla_{OXA-255}, bla_{SFO}, bla_{TEM}, bla_{VIM}, bla_Z, cfxA, cfxA2, cphA-1, cphA-2, fox5</i>	<i>pbp2x</i>	[39, 53, 58]
CF	<i>acr, acrEF-tolC, adeABC, bcr-mfs, emrD, emrE, macAB, mdfA, mdtEF, mdtEF-tolC, mdtG, mdtH, mdtK, mdtL, mdtM, mdtnop, mexCD, mexEF, mexHI, mexVW, mexXY, mls-mfs, pmrA, qacA, qacE, robA, rosAB, smeABC, smeDEF, vexEF-tolC</i>	<i>ampC, blaA, blaC, blaD, bla_{AER-1}, bla_{ACT}, bla_{B1}, bla_{BRO}, bla_{BRO-1}, bla_{BRO-2}, bla_{CARB}, bla_{CIA}, bla_{CTX-M}, bla_{CTX-M-1}, bla_{CTX-M-9}, bla_{EBR}, bla_{IND}, bla_{LL1}, bla_{OXA}, bla_{OXA-48}, bla_{OXA-213}, bla_{OXA-286}, bla_{TEM}, bla_{TEM-1}, bla_{TEM-105}, bla_{TEM-116}, bla_{TEM-168}, bla_{TEM-171}, bla_{VIM}, bla_Z, cfxA3</i>	<i>mecA, mecR1, pbp</i>	[30, 47, 54, 58]
COPD	<i>acrA-1, acrA-4, acrA-5, acrF, ceoA, emrD, mepA, mexE, mexF, mtrD-2, mtrD-3, oprD, oprJ, pmrA, qacEdelta1-2, qacH-1, tolC-2, tolC-3, yceL/mdtH-</i>	<i>ampC/bla_{DHA}, ampC-1, ampC-2, ampC-4, ampC-6, ampC-7, ampC-9, bla_{CMY}, bla_{CMY2-1}, bla_{CMY2-2}, bla_{CTX-M-1}, bla_{CTX-M-2}, bla_{CTX-M-4}, bla_{CTX-M-5}, bla_{LL1}, bla_{NDM-1}, bla_{OCH}, bla_{OXA-255}, bla_{OXY}, bla_{PAO}, bla_{SFO},</i>	<i>mecA, pbp2x</i>	[39, 53]

	<i>l, yidY/mdtL-1</i>	<i>bla_{SHV-1}, bla_{SHV-2}, bla_{TEM}, bla_Z, cepA, cfiA, cfxA, cfxA2, cphA-1, cphA-2, fox5, penA</i>	
Severe Asthma		<i>bla_{OXA-255}, cfxA2</i>	[53]
BE	<i>acrB, acrD, adeB, adeH, baeR, bcrA, cdeA, cpxR, crp, efpA, emrA, emrE, emrK, evgA, evgS, golS, hmrM, hns, hpl181, leuO, macB, mdtB, mdtC, mdtD, mdtP, mexA, mexB, mexC, mexD, mexE, mexF, mexG, mexH, mexI, mexJ, mexK, mexL, mexM, mexN, mexP, mexQ, mexS, mexV, mexW, msbA, nalD, novA, opmD, opmE, opmH, oprA, oprJ, oprM, oprN, patA, pmrB, rosB, sav1866, sdiA, smeB, smeS, taeA, triB, triC, vgaE</i>	<i>bla_{OXA-255}, bla_{OXA-50}, bla_{LRA-10}, bla_{PDC-8}, bla_{PDC-10}, bla_{TEM-128}, bla_{TEM-220}, cfxA2, nmcR</i>	[40, 53]

* Data originated from sources with antibacterial resistance genes data available; ARGs: Antimicrobial resistance genes; CF: Cystic

Fibrosis; COPD: Chronic Obstructive Pulmonary Disease; BE: Bronchiectasis;

Supplemental Table 2: List of ARGs associated with the respiratory resistome for aminoglycosides (AG), chloramphenicol (CM), diaminopyrimidines (DA), fluoroquinolones (FQ), fosfomycin (FOS), lincosamide (L), macrolide (M), sulfamide (S) and tetracycline (T), polymyxin (P) and vancomycin (V) described in healthy individuals or in case of chronic respiratory diseases (CRDs)

Clinical context	ARGs*											References	
	AG	CM	DA	FQ	FOS	L	M	S	T	P	V		
Healthy individuals	<i>aac(3)-VIIa, aph(3)-IIIa</i>	<i>catB8, catS</i>	<i>dfrA1</i>	<i>efrB, pmrA, qnrA, qnrS</i>		<i>lnuC</i>	<i>efrB, erm(36), ermA, ermB, ermC, ermF, ermX, matA/mel, mefA, mphA-1, mphA-2, msrD, pikR2</i>	<i>sulA/folP-1, sulA/folP-3</i>		<i>tet(32), tet(37), tetA(46), tetA-1, tetA-2, tetB(46), tetB-1, tetB-2, tetC-1, tetC-2, tetD, tetG-2, tetM, tetM-1, tetM-2, tetO, tetO-1, tetPB-2, tetQ, tetR-2, tetR-3, tetW,</i>		<i>vanC-3</i>	[26, 39, 53, 58]

									<i>tetW-1</i>		
CF	<i>aac</i> , <i>aac(6')</i> - <i>aph(2'')</i> , <i>aadD</i> , <i>ant(3'')</i> , <i>aph(3')</i> - <i>Ilc</i>	<i>catA</i> , <i>catB</i> , <i>cml</i> , <i>cmlA</i> , <i>cmx</i> ,	<i>dfrA</i> , <i>dfrG</i> , <i>folA</i>	<i>lfrA</i> , <i>qnrS</i>	<i>fos</i> , <i>fosD</i> ,	<i>lsaA</i> , <i>lsaC</i>	<i>erm</i> , <i>erm45</i> , <i>ermX</i> , <i>ksgA</i> , <i>macAB</i> , <i>mefA</i> , <i>mph</i> , <i>mphC</i> , <i>msrA</i> , <i>msrD</i>	<i>sul</i> , <i>sul1</i> ,	<i>tet42</i> , <i>tetA(46)</i> , <i>tetK</i> , <i>tetM</i> , <i>tetO</i> , <i>tetW</i> , <i>tet-efflux</i> , <i>tet-flavo</i> , <i>tet-rpp</i>	<i>arnA</i>	[30, 47, 54, 58]
COPD	<i>aac(3)</i> - <i>VIIa</i> , <i>aph(3)</i> - <i>IIIa</i>	<i>catB8</i> , <i>catS</i>	<i>dfrA1</i>	<i>efrB</i> , <i>pmrA</i>		<i>lnuC</i>	<i>efrB</i> , <i>erm(36)</i> , <i>ermA/ermTR</i> , <i>ermB</i> , <i>ermC</i> , <i>ermF</i> , <i>ermX</i> , <i>matA/mel</i> , <i>mefA</i> , <i>mphA</i> - <i>1</i> , <i>mphA</i> - <i>2</i> , <i>msrA</i> - <i>1</i> , <i>msrD</i> , <i>pikR2</i>	<i>sulA/folP</i> - <i>1</i> , <i>sulA/folP</i> - <i>3</i>	<i>tet(32)</i> , <i>tet(35)</i> , <i>tet(36)</i> , <i>tet(37)</i> , <i>tetA</i> <i>(46)</i> , <i>tetA</i> - <i>1</i> , <i>tetA</i> - <i>2</i> , <i>tetB</i> <i>(46)</i> , <i>tetB</i> - <i>1</i> , <i>tetB</i> - <i>2</i> , <i>tetC</i> - <i>1</i> , <i>tetC</i> - <i>2</i> , <i>tetD</i> , <i>tetG</i> - <i>1</i> , <i>tetG</i> - <i>2</i> , <i>tetH</i>	<i>vanB</i> - <i>1</i> , <i>vanC</i> - <i>3</i>	[39, 53]

									<i>tetK,</i> <i>tetL-2,</i> <i>tetM-1,</i> <i>tetM-2,</i> <i>tetO,</i> <i>tetO-1,</i> <i>tetPB-2,</i> <i>tetQ,</i> <i>tetR-2,</i> <i>tetR-3,</i> <i>tetT,</i> <i>tetW,</i> <i>tetW-1,</i> <i>tetX</i>	
Severe Asthma	<i>aac(3)-VIIa,</i> <i>aph(3)-IIIa</i>	<i>catS</i>	<i>dfrA1</i>	<i>efrB,</i> <i>pmrA,</i>	<i>lnuC</i>	<i>efrB, ermA,</i> <i>ermB, ermF,</i> <i>ermX, mefA,</i> <i>mel, msrC,</i> <i>msrD</i>		<i>tetA</i> (46), <i>tetB</i> (46), <i>tetD,</i> <i>tetM,</i> <i>tetO,</i> <i>tetW</i>	[23, 53]	
BE	<i>aac(3)-VIIa,</i> <i>amrA,</i> <i>amrB,</i> <i>aph(3)-IIIa,</i> <i>aph(3')-IIb,</i> <i>aph(3')-IIc</i>	<i>catS,</i> <i>catB7,</i> <i>cmlv</i>	<i>dfrA1,</i> <i>dfrA3</i>	<i>efrB,</i> <i>mfd,</i> <i>patA,</i> <i>pmrA</i>	<i>fosA</i>	<i>lnuC</i> <i>arlR, efrB,</i> <i>ermA, ermB,</i> <i>ermC, ermF,</i> <i>ermX, mef,</i> <i>msrA, msrD,</i> <i>rlmA(II)</i>		<i>tet(34),</i> <i>tet(35),</i> <i>tetA</i> (46), <i>tetA(48),</i> <i>tetB</i> (46), <i>tetD,</i> <i>tetM,</i> <i>tetO</i>	<i>vanF,</i> <i>vanG,</i> <i>vanRA,</i> <i>vanRC,</i> <i>vanRG,</i> <i>vanRI</i>	[26, 40, 53]

tetQ,
tetW

*Data originated from sources with antibacterial resistance genes data available; ARGs: Antimicrobial resistance genes; CF: Cystic Fibrosis;

COPD: Chronic Obstructive Pulmonary Disease; BE: Bronchiectasis