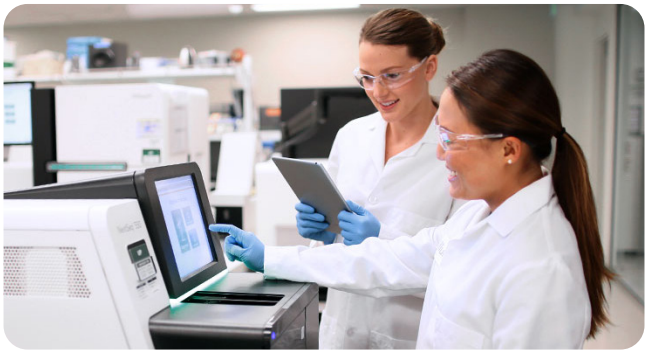
Illumina Respiratory Pathogen ID/AMR Panel

Comprehensive detection of common and rare respiratory pathogens and associated antimicrobial resistance (AMR) markers

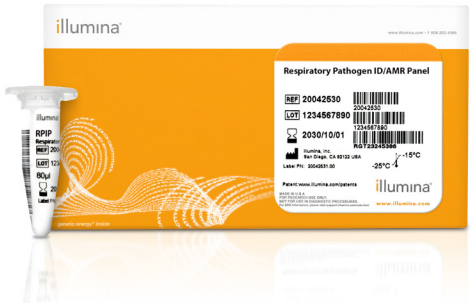


An unprecedented public health concern

- Respiratory coinfections are a critical global health concern accelerated by COVID-19
- High frequency of coinfections in COVID-19 patients[1-3]
- Increased antibiotic resistance is a global health threat

With the Respiratory Pathogen ID/AMR Panel, research labs can:

- Identify pathogens in samples where initial analysis did not find an etiological agent
- Detect coinfections in chronic respiratory conditions and complex samples
- Profile AMR gene expression to gain insights into pathogen antibiotic resistance



Streamlined, sample-to-results NGS workflow delivers results in under 24 hours

- Accurate, cost-effective detection of known and emerging respiratory pathogens with next-generation sequencing (NGS) combined with target enrichment and powerful, simple data analysis with the IDbyDNA Explify Platform

Prepare nucleic acid	Prepare cDNA	Prepare and enrich library	Sequence	Analyze data
Total nucleic acid extraction	Illumina RNA Prep with Enrichment with Illumina Respiratory Pathogen ID/AMR Panel		MiniSeq™ System Rapid Reagent Kit	IDbyDNA Explify Respiratory Pathogen ID/AMR Panel Platform

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Analysis powered by IDbyDNA

- Access in BaseSpace™ Sequence Hub
- Harness an easy-to-use solution for in-depth analysis with standardized interpretation using curated databases
- Issue results as a detailed text-based (JSON format) or PDF report

Pathogens targeted by the Respiratory Pathogen ID/AMR Panel

- Cost-effective detection of respiratory pathogens and associated antibiotic resistance genes in a single assay
- Broad targeting of DNA- and RNA-based pathogens, including 180 bacteria, 42 viruses, and 53 fungi
- Comprehensive genome coverage of critical viral pathogens, including SARS-CoV-2 and Influenza A and B virus

Top targets on the Respiratory Pathogen ID/AMR Panel

Top bacteria[a]	Top viruses[a]	Top fungi[a]	Antibiotics	
Bordetella pertussis (5)	Adenovirus B, C, E	*Aspergillus fumigatus* (5)	Amoxicillin	Gentamicin
Chlamydia pneumoniae (2)	Coronavirus 229E, HKU1, NL63, OC43	*Candida auris*	Amoxicillin-Clavulanate	Levofloxacin
Coxiella burnetii	Cytomegalovirus (CMV)	*Coccidioides immitis* (1)	Cefazolin	Meropenem
Enterobacter cloacae complex[b]	Enterovirus D68	*Fusarium solani* (3)	Cefepime	Oxacillin
Francisella tularensis	Influenza A virus (H1N1, H3N2, avian)	*Histoplasma capsulatum*	Ceftriaxone	Sulfamethoxazole
Klebsiella pneumoniae (4)[b]	Influenza B virus	*Mucor racemosus* (2)	Clindamycin	Tetracycline
Legionella pneumophila (5)	Metapneumovirus	*Paracoccidioides brasiliensis*	Colistin	Trimethoprim
Mycobacterium tuberculosis (9)	Parainfluenza virus 1-4	*Pneumocystis jirovecii*	Erthromycin	Vancomycin
Nocardia farcinica (9)	Respiratory syncytial virus A + B	*Rhizopus oryzae* (2)		
Pseudomonas aeruginosa (2)[b]	Rhinovirus A, B, C	*Sporothrix schenckii*		
Staphylococcus aureus[b]	SARS-CoV-2	*Talaromyces marneffei*		
Streptococcus pneumoniae (7)[b]				

Number in parentheses indicates additional targeted species of the same genus
a. Denotes leading causes of respiratory infections whether viral, fungal, or bacterial. Additional organisms that are known to cause infections are also targeted.
b. AMR markers included.

AMR markers targeted by the Respiratory Pathogen ID/AMR Panel

- Extensive profiling of over 1200 AMR alleles to provide insights for 16 classes of antibiotics

AMR markers on the Respiratory Pathogen ID/AMR Panel

Gene Families	16S-RMTase	AAC(2')	AAC(3)	AAC(6')	ABC-F	ANT(3'')	ANT(4')	ANT(6)	ANT(9)	APH(2'')	APH(3')	APH(4)	blaACC blaADC blaAIM blaBIC blaCARB blaCGB blaCMY blaCphA blaGOB blaIND blaSCO blaGES blaKPC	blaCTX-M blaDHA blaGIM blaIMI blaNmcA blaOXA blaSHV blaSME blaSPM blaIMP blaNDM blaOXA-48-like blaIVM	blaTEM	blaZ	Cfr	CrpP	cyp51A	Dfr	EreA/B	Erm	parC	KHM	LNU	MCR	MPH	mec	PBP	Qnr	Sul	Tet (inactivation enzyme)	Tet (ribosomal protection protein)	Van	ahpC eis embA embB embC embR ethA mabA folC gidB gyrA gyrB	lnhA kasA katG murA ndh pncA ribD rpoB rpsA rpsL rrs thyA
Gram-positive bacteria																																				
S. aureus				✓	✓		✓			✓	✓				✓	✓	✓		✓		✓					✓	✓	✓				✓				
S. pneumoniae											✓								✓	✓						✓						✓				
E. faecium				✓	✓	✓	✓			✓	✓						✓		✓		✓										✓				
E. faecalis				✓	✓	✓				✓	✓						✓		✓		✓														
Gram-negative bacteria																																				
K. pneumoniae	✓			✓		✓	✓				✓		✓		✓				✓		✓					✓										
E. coli	✓		✓	✓		✓	✓			✓	✓		✓		✓			✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
E. cloacae complex			✓	✓		✓	✓			✓	✓				✓		✓									✓										
A. baumannii		✓		✓	✓	✓							✓		✓				✓		✓											✓				
P. aeruginosa	✓		✓	✓		✓	✓						✓		✓			✓			✓										✓					
S. maltophilia				✓		✓																														
Mycobacteria																																				
M. tuberculosis complex		✓																	✓												✓				✓	
M. abscessus																			✓																	
Fungi																																				
A. fumigatus																	✓																			

A checkmark indicates a combination of pathogen (row) and AMR marker (column) that is assessed by the Respiratory Pathogen ID/AMR Panel.
Orange checkmarks indicate an AMR marker that is not currently supported but will be available soon.

Learn more

To explore the full list of targets on the Respiratory Pathogen ID/AMR Panel, see www.illumina.com/content/dam/illumina/gcs/assembled-assets/marketing-literature/respiratory-pathogen-panel-table-470-2020-013/respiratory-pathogen-id-amr-panel-table-470-2020-013.pdf

For more information, visit www.illumina.com/products/by-type/sequencing-kits/library-prep-kits/respiratory-pathogen-id-panel.html

Learn more about the IDbyDNA Explify Platform at www.idbydna.com/explify-platform/

References

1. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet*. 2020;395(10229):1054–1062.
2. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet*. 2020;395(10223):507–513.
3. Kim D, Quinn J, Pinksy B, Shah N, Brown I. Rates of co-infection between SARS-CoV-2 and other respiratory pathogens. *JAMA*. 2020;323(20):2085–2086.

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