



Sample Preparation for Infectious Diseases

Extract viral DNA/RNA and bacterial
DNA for detection of infectious diseases

INVITEK
Molecular



Invitek Molecular produces the highest quality nucleic acid extraction products for infectious diseases, from research to diagnostics. Our extraction systems guarantee an excellent performance in downstream applications such as Next Generation Sequencing and multiplex PCR detection systems.

Invitek Molecular's product lines Universal and Ready-to-Prep (RTP®) for infectious diseases cover all requirements of daily routine labs. All kits guarantee reliable results and are CE certified.

UNIVERSAL KITS - All-rounder for the demanding diagnostic laboratory

- ✔ Isolation of viral DNA/RNA, bacterial DNA & genomic DNA
- ✔ Suitable for all clinically relevant starting materials (e.g. serum, plasma, urine, blood, stool suspension, bacterial enrichment culture)
- ✔ For every lab: From manual (spin column) to fully automated (magnetic beads) purification
- ✔ High throughput: established protocols available for common extraction platforms
- ✔ CE-certified, recommended for *in-vitro* diagnostic use

Kit overview



Kit	Invisorb® Spin Universal Kit	InviMag® Universal Kit /IG	InviMag® Universal Kit / KF96	InviMag® Universal Kit / Starlet	Invisorb® Universal HTS 96 Kit/Starlet
Method	Manual	Full automation	Semi automation	Full automation	Full automation
Technology	Spin filter column	Magnetic bead	Magnetic bead	Magnetic bead	Filter plate, vacuum
Sample capacity	small to medium throughput	1-12	1- 96	1- 96	1- 96
Processing time	~ 30 min/sample	70 min/12 samples	70 min/96 samples	150 min/96 samples	90 min/96 samples

Selection of pathogens and detection systems

Pathogen	Starting Material	Detection System
Viral RNA		
Norovirus	Supernatant from stool suspension	RIDA®GENE Norovirus (R-Biopharm AG, Darmstadt, Germany)
Viral DNA		
Adenovirus	Supernatant from stool suspension	RIDA®GENE Rotavirus/Adenovirus Duplex (R-Biopharm AG, Darmstadt, Germany)
human Cytomegalovirus (CMV)	Breast milk, serum, plasma, blood	CMV ELITe MGB Kit (ELITech, Puteaux, France), RealStar® CMV PCR Kit (Altona Diagnostics, Hamburg, Germany)
Ebstein-Barr-Virus (EBV)	Blood, plasma	EBV ELITe MGB Kit (ELITech, Puteaux, France), RealStar® EBV PCR Kit (Altona Diagnostics, Hamburg, Germany)
Bacterial DNA		
<i>Chlamydia trachomatis</i>	Urine	Cobas Taqman CT V2.0 (Roche Diagnostics, Rotkreuz, Switzerland)
<i>Chlostridium difficile</i>	Supernatant from stool suspension	RIDA®GENE CD Toxin A/B (R-Biopharm AG, Darmstadt, Germany)
MRSA	MRSA colony	RIDA®GENE MRSA (R-Biopharm AG, Darmstadt, Germany)
<i>Mycobacteria tuberculosis</i>	Buccal cells	MTB ELITe MGB Kit (ELITech, Puteaux, France)

(Data taken from internal validation reports)

READY-TO-PREP KITS - Maximum reproducibility with manual use



Extraction Tube

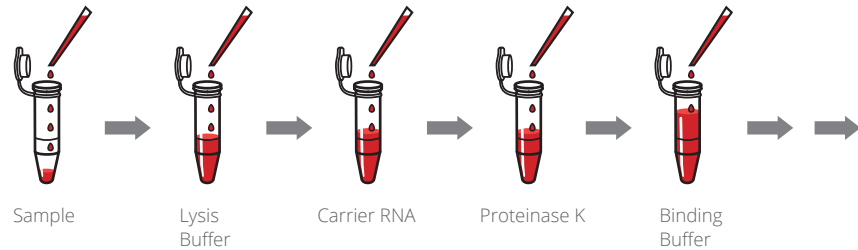
with lyophilized components

- ✓ Lysis Buffer
- ✓ Proteinase K / Lysozyme
- ✓ Carrier nucleic acids
- ✓ stable at RT

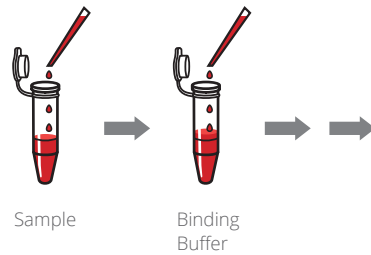
- ✓ Isolation of viral DNA/RNA and bacterial DNA
- ✓ Suitable for all clinically relevant starting materials (e.g. serum, plasma, blood, stool suspension, bacterial enrichment culture, tissue)
- ✓ Ready-to-Prep (RTP®) Technology: Pre-filled extraction tubes for one-step sample lysis, with storage of tubes at room temperature
- ✓ Perfect for manual use: convenient handling and maximum reproducibility
- ✓ CE-certified, recommended for *in-vitro* diagnostic use

Fast and convenient handling

Classical Method



RTP® Technology



- ✓ 40% reduced hands-on time
- ✓ 60% less pipette tips
- ✓ high reproducibility

Rapid extraction with RTP®-Technology: The extraction tube is prefilled with lyophilized buffer containing all components needed for extraction (e.g. Carrier RNA, Proteinase K). Simply add your sample and save up to 40% hands-on time compared to traditional manual extraction protocols.

Selection of pathogens and detection systems

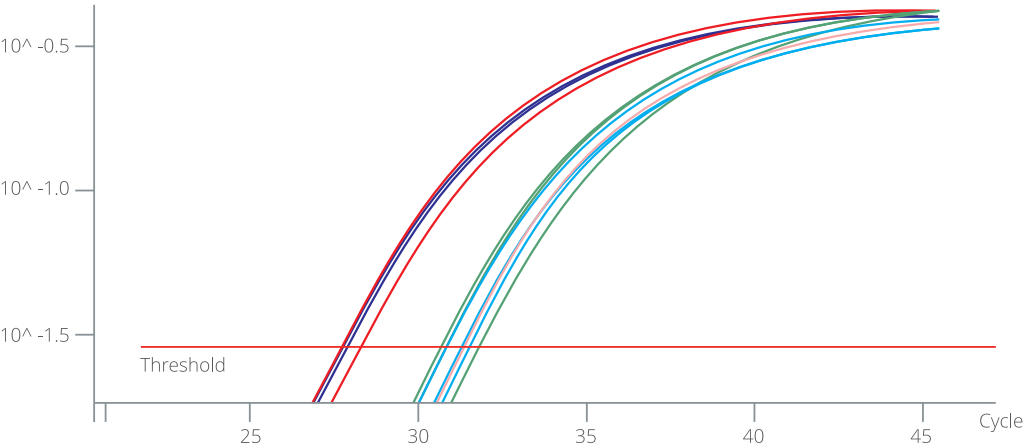
Pathogen	Starting Material	Downstream applications
Viral RNA		
Influenza A/B/C, H1N1, Para-influenza virus	Bronchoalveolar lavage, throat swab/nasal swab	FTD-RP33, FTD-RP21 plus (Fast-Track Diagnostics, Luxembourg) ^{1,2,3,4} , RealStar® Influenza RT-PCR Kit 1.0 (Altona Diagnostics, Hamburg, Germany) ⁵
Corona viruses	Bronchoalveolar lavage, throat swab/nasal swab	FTD-RP33, FTD-RP21 plus (Fast-Track Diagnostics, Luxembourg) ^{1,2,3,4}
Respiratorical Syntecial Virus (RSV)	Sputum, serum, nasal swab, throat swab	FTD-RP33, FTD-RP21 plus (Fast-Track Diagnostics, Luxembourg) ^{1,2,3,4} , RSV Serotype A and B kits (Roboscreen, Leipzig, Germany) ⁶

Pathogen	Starting Material	Downstream applications
Viral DNA		
Adenovirus	Water, sediments, stool suspension, sputum, serum, urine, bronchoalveolar lavage, throat swab/nasal swab	FTD-RP33, FTD-RP21 plus (Fast-Track Diagnostics, Luxembourg) ^{1,2,3,4} , Adenoplex [®] multiplex PCR kit (Gen-Probe Prodesse Inc., Waukesha, USA) ⁶
Human Cytomegalovirus (CMV), Epstein-Barr-Virus (EBV), Human Papilloma Virus (HPV)	Tissue	In-house PCR ^{7,8,9}
Herpes Simplex Virus 1 & 2, Varicella-zoster virus (VZV)	Cell culture supernatant, CSF, vesicle fluid samples	In-house PCR ^{10,11,12,13}
Bacterial DNA		
MRSA	Bacterial culture, bronchoalveolar lavage, throat swab/nasal swab	FTD-RP33 (Fast-Track Diagnostics, Luxembourg) ¹ , EVIGENE MRSA detection kit (EVIGENE; Statens Serum Institut, Copenhagen, Denmark) ¹⁴
<i>E.coli</i> , EHEC, EPEC	Bacterial enrichment culture	Illumina whole-genome resequencing (GATC Biotech, Eurofins Genomics, Luxembourg) ¹⁵ , Gene-Disc [®] arrays (Pall, Port Washington, USA) ¹⁶
<i>Helicobacter pylori</i>	Bacterial enrichment culture	Pacific Biosciences RS sequencing technology (Pacific Biosciences, Menlo Park, USA) ¹⁷

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Comparison - RTP® Pathogen Kit with Invisorb® Universal Spin Kit

To compare the performance of the RTP® Pathogen Kit and Invisorb® Spin Universal Kit, RNA was prepared from 0.1 µl and 0.01 µl Influenza A virus stock spiked in 200 µl serum. Three replicates each were purified with both extraction kits. PCR was performed with SureFast® Influenza A Virus Kit (Congen, Berlin, Germany) according to the manufacturer’s instructions. Results show (see below) equivalent results for both extraction kits.



PCR assay SureFast® Influenza A (Congen, Berlin, Germany), FAM Channel. RNA was extracted from Influenza A spiked serum in two dilution levels with RTP® Pathogen and Invisorb® Spin Universal Kit, Blue/light blue: extraction with RTP® Pathogen. Red/light red: extraction with Invisorb® Spin Universal Kit. Green: PTC.

Ct values for samples spiked with Influenza A in two dilutions. RNA was extracted with RTP® Pathogen Kit and Invisorb® Spin Universal Kit.

RTP® Pathogen Kit			Invisorb® Spin Universal Kit		
0.1 µl Influenza A			0.1 µl Influenza A		
Sample	Ct	CV [%]	Sample	Ct	CV [%]
1	27.31	0.08	1	27.67	0.27
2	27.23		2	27.35	
3	27.38		3	27.14	
0.01 µl Influenza A			0.01 µl Influenza A		
Sample	Ct	CV [%]	Sample	Ct	CV [%]
1	30.96	0.40	1	31.09	0.40
2	30.18		2	30.31	
3	30.75		3	30.84	
PTC	30.08		PTC	31.22	

Ordering information

Kit		Package sizes	Catalogue number
Ready-to-order			
Invisorb® Spin Universal Kit	CE	50 preps	1050100200
		250 preps	1050100300
InviMag® Universal Kit/ IG (for use on the InviGenius® PLUS, Invitek Molecular GmbH)	CE	8 x 12 preps	2450120100
InviMag® Universal Kit/ KF96 (for use on KingFisher™ 96 and KingFisher™ Flex, Thermo Fisher Scientific)	CE	5 x 96 preps	7450300200
InviMag® Universal Kit/ KF96 (without KingFisher™ plastic)	CE	5 x 96 preps	7450300250
On request			
Invisorb® Universal HTS 96 Kit/ STARlet (for use on MICROLAB® STARlet, Hamilton)		4 x 96 preps	7150330300
		24 x 96 preps	7150330400
InviMag® Universal Kit/ KFDuo w/o plastic (for use on KingFisher™ Duo, Thermo Fisher Scientific)	CE	8 x 12 preps	2450130150
		40 x 12 preps	2450130250
InviMag® Universal Kit/ STARlet (for use on MICROLAB® STARlet, Hamilton)	CE	24 x 96 preps	7450330400

Kit		Package sizes	Catalogue number
Membrane adsorption			
RTP® Pathogen Kit	CE	50 preps	1040500200
		250 preps	1040500300
Automated using magnetic beads			
InviMag® Pathogen Kit/ KF96 (for use on KingFisher™ 96 and KingFisher™ Flex, Thermo Fisher Scientific)		5 x 96 preps	7444050200



Compliance with EU Directive 98/79/EC on in vitro medical devices.
Not for in-vitro diagnostic use in countries where the EU Directive 98/79/EC on in vitro medical devices is not recognized.

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