DNA/RNA Shield

For Safe, Rapid, Effective
COVID-19 Surveillance

DNA/RNA Shield™

Highlights

Immediate Pathogen Inactivation

(virus, bacteria, fungus, parasites)

Protect RNA at room temp. > 30 days
Protect DNA at room temp. for years

(cold-free)

Compatible with most DNA/RNA purification Platforms

(no reagent removal, universally compatible, automatable)

DNA/RNA Shield™

Regulatory Certifications

Class I, #20200003

Class I exempt, #3014173039

CE-IVD, Annex III
Self Declaration Directive 98/79/EC

Eurovir®

EN 14476:2017

Class I, #81742570001

Certified for in-flight use
(ISS, SpaceX, and Human Research Program in Space)

DNA/RNA Shield™

The following viruses have been tested for complete inactivation.

MERS – coronavirus
influenza
west nile virus
ebola
HIV
HSV 1 & 2
chikungunya
dengue
rhinovirus
Parvovirus

DNA/RNA Shield™

Inactivation of Toughest known Viruses

“Parvovirus is resistant to acids, bases, solvents and temperature up to 50 °C”

Conclusion: No residual test virus was detected after exposure to DNA/RNA Shield

Eurovir® EN 14476:2017

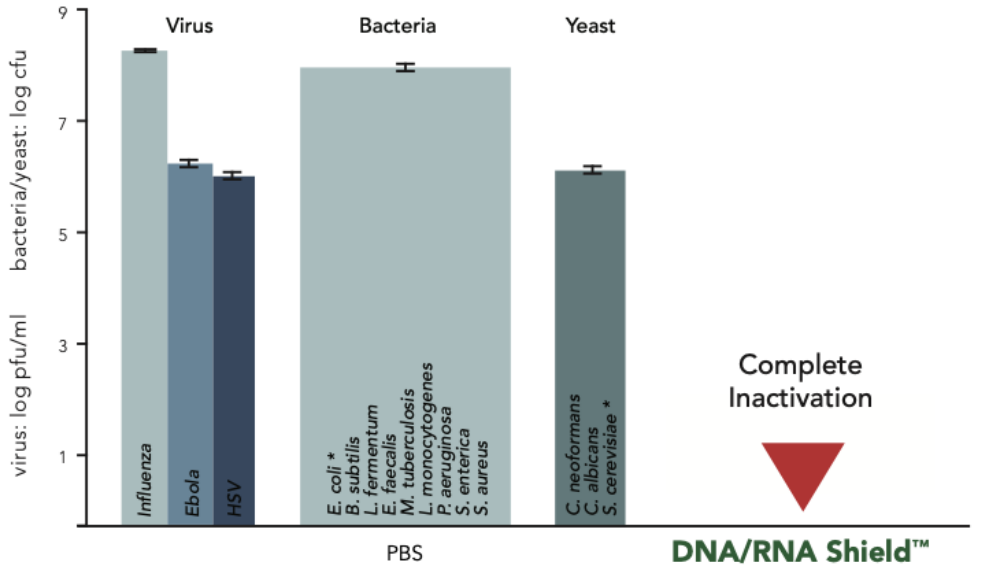
DNA/RNA Shield™

Microbial Inactivation

Used by scientists around the world for:

Bacteria	Viruses	Yeast & Eukaryotes
B. subtilis	Parvovirus	*C. albicans*
E. faecalis	Chikungunya Virus	*C. neoformans*
E. coli	Dengue Virus	*S. cerevisiae*
L. fermentum	Ebolavirus	*P. malariae*
L. monocytogenes	Herpes Simplex Virus-1	
M. tuberculosis	Herpes Simplex Virus-2	
P. aeruginosa	Influenza A	
S. enterica	Rhinovirus	
S. aureus	MERS-coronavirus	
S. pneumoniae	West Nile Virus	
X. fastidiosa		

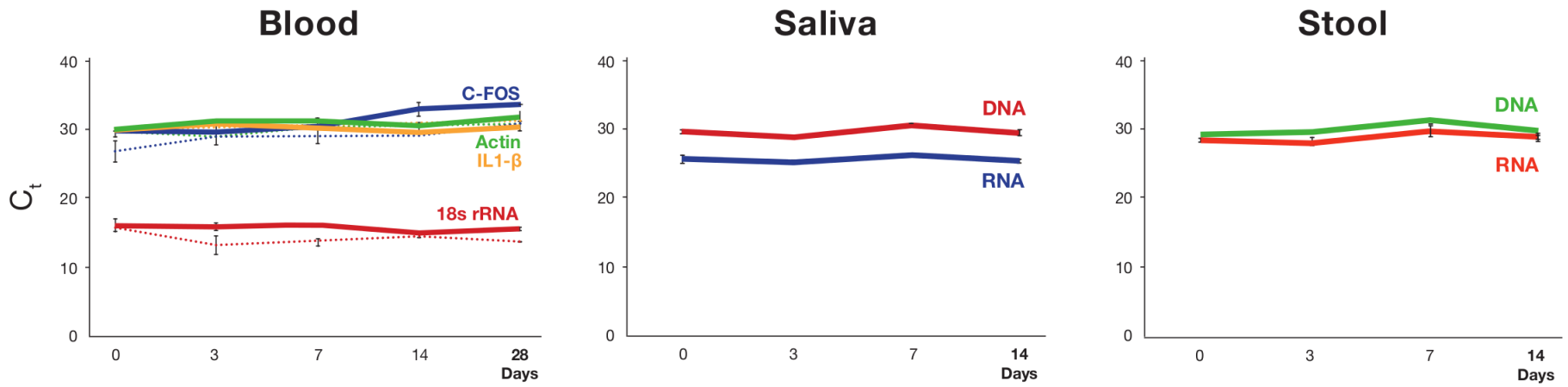
Microbial and viral inactivation



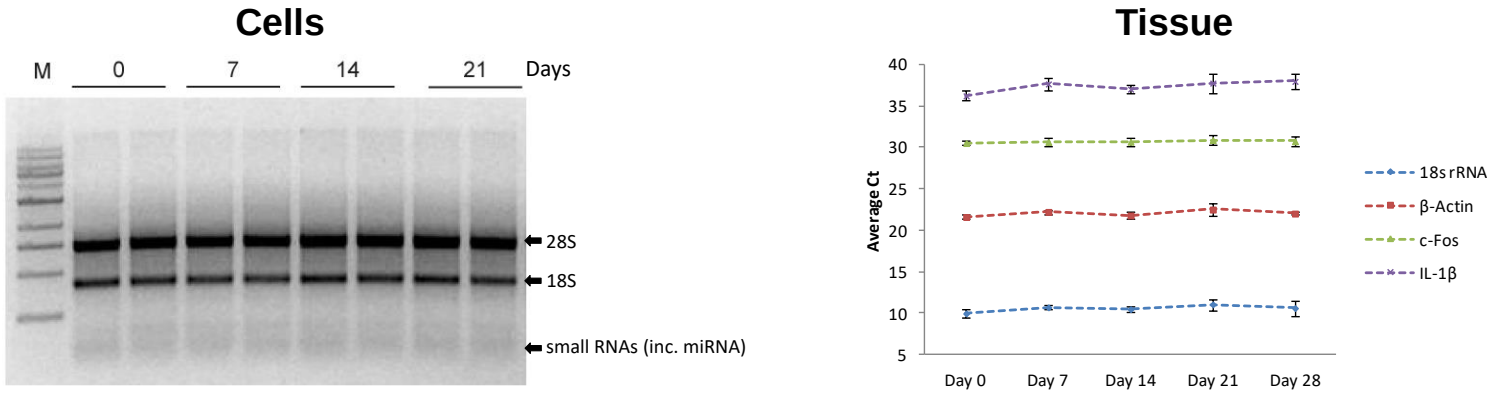
Samples containing the infectious agent (virus, bacteria, yeast) were treated for 5 minutes with DNA/RNA Shield™ or mock (PBS). Titer (PFU) was subsequently determined by plaque assay.

DNA/RNA Shield™

DNA & RNA Stabilization



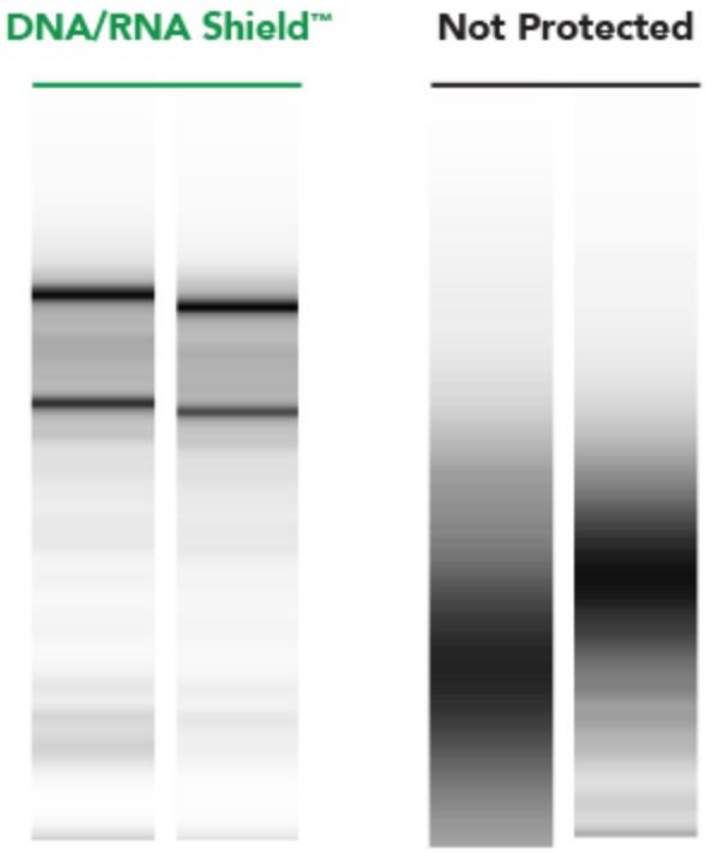
Nucleic acids from blood, saliva and stool are effectively stabilized in DNA/RNA Shield™ at ambient temperature. Graphs show: cellular RNA from human whole blood and spike-in DNA and RNA controls from saliva and stool purified at the indicated time points and analyzed by (RT)qPCR. Controls: HSV-1 and HIV (AcroMetrix, Life Technologies).



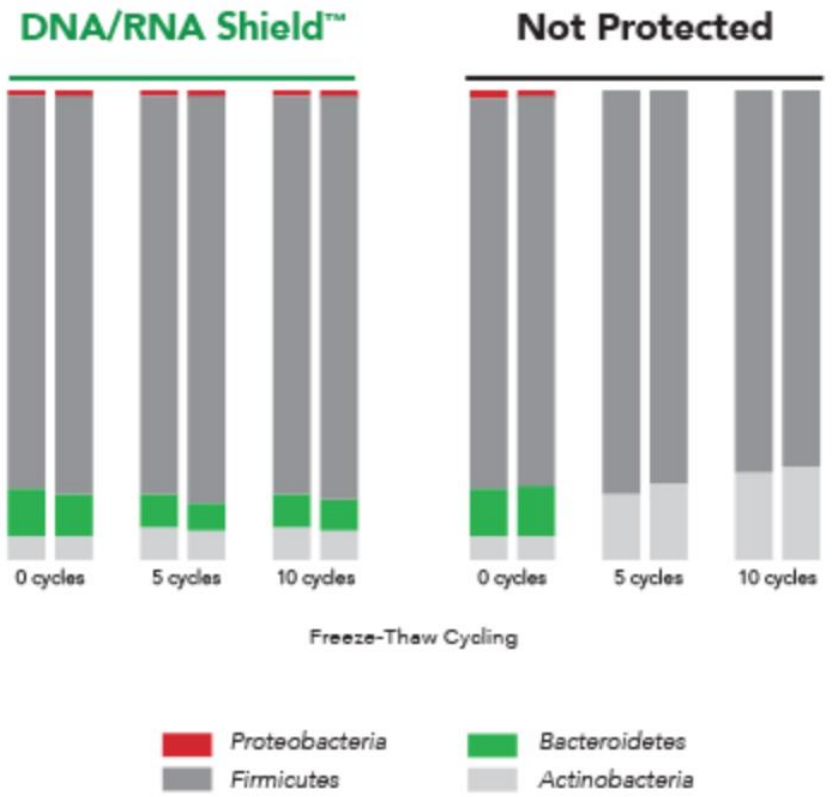
RNA from cells and tissue is effectively stabilized in DNA/RNA Shield™ at ambient temperature. Data show RNA from human cells and tissue purified at the indicated time points and visualized on agarose gel (HCT 116) or analyzed by (RT)qPCR (muscle tissue).

DNA/RNA Shield™

Stability w/ Repeated Freeze/Thawing



High-quality RNA from blood stored in DNA/RNA Shield™ that was freeze-thawed from -80°C to room temperature.[1]



High-quality DNA from stool stored in DNA/RNA Shield™ after up to 10 freeze-thaw cycles. Microbial composition profiling via 16S rRNA gene targeted sequencing.

DNA/RNA Shield™

Commercial Testing Labs Ordering Large Quantities

Quest Diagnostics™

uBiome

At-home Collection

myDNAge®

At-home Collection

MiDOG®

At-home Collection

BASECLEAR

TALIS

LabCorp

DNA/RNA Shield™

Government and Institutions

Academic

Over 250 Citations…

DNA/RNA Shield™

Available Formats

Stool

Swab

Blood

Tissue

Saliva

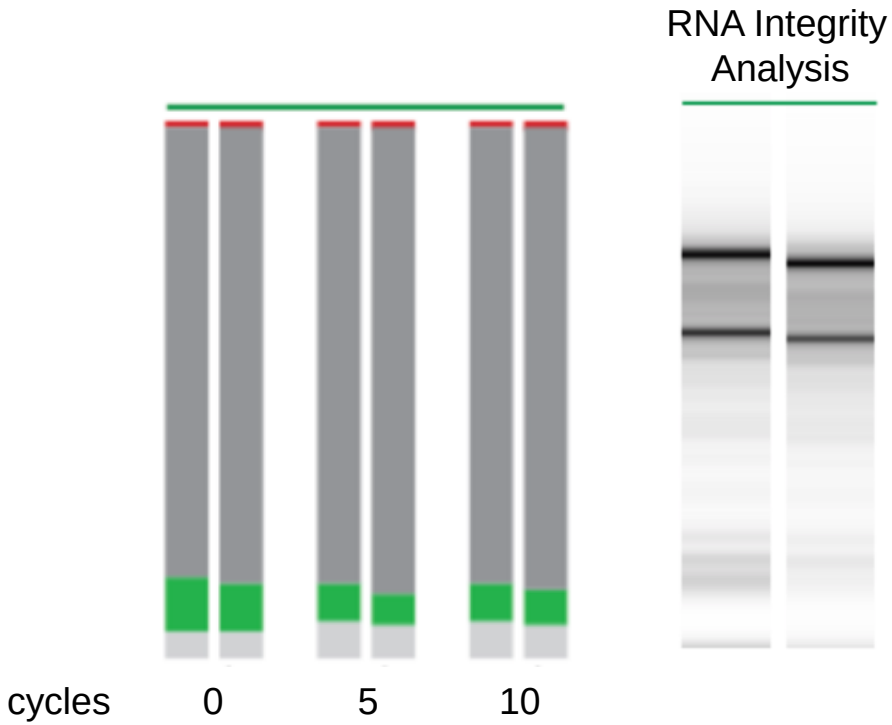
Urine

Supplemental Data

DNA/RNA Shield™

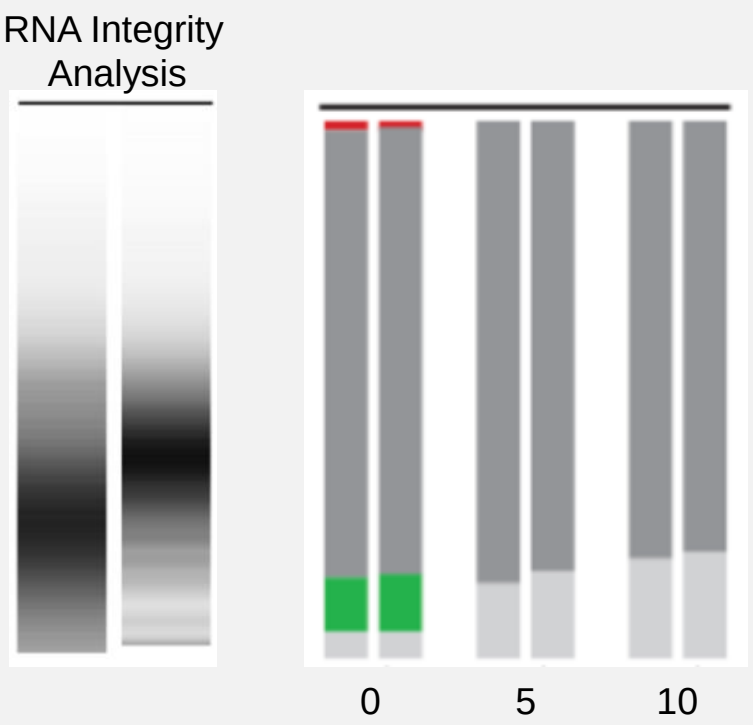
RNA Protection against Freeze/Thaw

DNA/RNA Shield



16S Microbiome profiling

UTM (VTM), M5 *etc.*



16S Microbiome profiling

cold chain required

freeze-thaw damage

Conclusion: Shield protects DNA and RNA against multiple freeze/thaw effects. UTM did not protect DNA and RNA.

Scientific Citations using DNA/RNA Shield™ for SARS, Coronavirus, and other viruses and pathogens:

1. Horsington, Jacquelyn, et al. "Inactivation of foot-and-mouth disease virus in epithelium samples for safe transport and processing in low-containment laboratories." Journal of virological methods 276 (2020): 113770.
2. Brunker, Kirstyn, et al. "rabies elimination programmes [version 1; peer review: awaiting."
3. Kenneth, P., and B. Nilo. "Exploratory Investigation on the Occurrence, Spatial Distribution, and Risk Factors of Selected Zoonotic Enteropathogens in Davao City Backyard Farms."
4. Pasookhush, Phongthana, et al. "Transcriptomic analysis of Macrobrachium rosenbergii (giant fresh water prawn) post-larvae in response to M. rosenbergii nodavirus (MrNV) infection: de novo assembly and functional annotation." BMC genomics 20.1 (2019): 762.
5. Wang, Zyi. "Comparing Gut Microbiome and Virome in the Breast Milk-and Formula-fed Late Preterm Infants." (2019).
6. Ishida, Yuji, et al. "Hepatic IFN-Induced Protein with Tetratricopeptide Repeats Regulation of HCV Infection." Journal of Interferon & Cytokine Research 39.3 (2019): 133-146.
7. Carrau, Lucía, et al. "Chikungunya virus vaccine candidates with decreased mutational robustness are attenuated in vivo and have compromised transmissibility." Journal of virology 93.18 (2019): e00775-19.
8. Tan, Susanna K., et al. "Impact of Pretransplant Donor BK Viruria in Kidney Transplant Recipients." The Journal of infectious diseases (2019).
9. Bryant, William Bart, et al. "Small RNA-Seq Analysis Reveals miRNA Expression Dynamics Across Tissues in the Malaria Vector, Anopheles gambiae." G3: Genes, Genomes, Genetics 9.5 (2019): 1507-1517.
10. Gardner, Jameson K., Alison Swaims-Kohlmeier, and Melissa M. Herbst-Kralovetz. "IL-36γ Is a Key Regulator of Neutrophil Infiltration in the Vaginal Microenvironment and Limits Neuroinvasion in Genital HSV-2 Infection." The Journal of Immunology (2019): ji1900280.
11. Chard, Anna N., et al. "Associations between soil-transmitted helminthiasis and viral, bacterial, and protozoal enteroinfections: a cross-sectional study in rural Laos." Parasites & vectors 12.1 (2019): 216.
12. Mendell, Nicole L., et al. "Detection of Rickettsiae, Borreliae, and Ehrlichiae in Ticks Collected from Walker County, Texas, 2017–2018." Insects 10.10 (2019): 315.
13. Talotta, R., et al. "Evaluation of salivary and plasma microRNA expression in patients with Sjögren's syndrome, and correlations with clinical and ultrasonographic outcomes." Clin Exp Rheumatol 37.Suppl 118 (2019): S70-77.
14. Galanti, M., et al. "Rates of asymptomatic respiratory virus infection across age groups." Epidemiology & Infection 147 (2019).
15. Murcia, Osiris, et al. "Presence of the point mutations Val1016Gly in the voltage-gated sodium channel detected in a single mosquito from Panama." Parasites & vectors 12.1 (2019): 62.
16. Jiwaji, Meesbah, et al. "Providence virus: An animal virus that replicates in plants or a plant virus that infects and replicates in animal cells?." PloS one 14.6 (2019): e0217494.
17. Lalitha, Prajna, et al. "Unbiased Pathogen Detection and Host Gene Profiling for Conjunctivitis." Ophthalmology (2019).
18. Galanti, Marta, et al. "Longitudinal active sampling for respiratory viral infections across age groups." Influenza and Other Respiratory Viruses 13.3 (2019): 226-232.
19. Bennett, Andrew J., et al. "Diverse RNA viruses of arthropod origin in the blood of fruit bats suggest a link between bat and arthropod viromes." Virology 528 (2019): 64-72.
20. Spiri, Andrea Monika, et al. "Environmental Contamination and Hygienic Measures After Feline Calicivirus Field Strain Infections of Cats in a Research Facility." Viruses 11.10 (2019): 958.
21. Grandjean, Frederic, et al. "A new bunya-like virus associated with mass mortality of white-clawed crayfish in the wild." Virology 533 (2019): 115-124.
22. Ronca, Shannon E., et al. "Phenotypic and Genotypic Characterization of West Nile Virus Isolate 2004Hou3." International journal of molecular sciences 20.8 (2019): 1936.
23. Retallack, Hanna, Susan Clubb, and Joseph L. DeRisi. "Genome Sequence of a Divergent Avian Metapneumovirus from a Monk Parakeet (Myiopsitta monachus)." Microbiol Resour Announc 8.16 (2019): e00284-19.

Cont.

24. Zhang, Jiayi, et al. "Comparison of Three Different Pretreatment Methods for Blood RNA Extraction." Forensic Science International: Genetics Supplement Series (2019).
25. Hazeleger, Wilma C., et al. "Wild, insectivorous bats might be carriers of Campylobacter spp." PloS one 13.1 (2018): e0190647.
26. Littwitz-Salomon, Elisabeth, et al. "The cytotoxic activity of natural killer cells is suppressed by IL-10+ regulatory T cells during acute retroviral infection." Frontiers in immunology 9 (2018): 1947.
27. Stamps, Blake Warren, et al. "Characterization of the microbiome at the world's largest potable water reuse facility." Frontiers in Microbiology 9 (2018): 2435.
28. Orenbuch, Rose, et al. "arcasHLA: high resolution HLA typing from RNA seq." bioRxiv (2018): 479824.
29. Knutie, Sarah A., and Kiyoko M. Gotanda. "A non-invasive method to collect fecal samples from wild birds for microbiome studies." Microbial ecology 76.4 (2018): 851-855.
30. Gardner, Jameson K., and Melissa M. Herbst-Kralovetz. "IL-36γ induces a transient HSV-2 resistant environment that protects against genital disease and pathogenesis." Cytokine 111 (2018): 6371.
31. Hepp, Crystal M., et al. "Phylogenetic analysis of West Nile Virus in Maricopa County, Arizona: Evidence for dynamic behavior of strains in two major lineages in the American Southwest." PloS one 13.11 (2018): e0205801.
32. Birger, Ruthie, et al. "Asymptomatic shedding of respiratory virus among an ambulatory population across seasons." mSphere 3.4 (2018): e00249-18.
33. Shaman, Jeffrey, et al. "Asymptomatic summertime shedding of respiratory viruses." The Journal of infectious diseases 217.7 (2018): 1074-1077.
34. Goldberg, Tony L., and Samuel D. Sibley. "Methods and systems for isolating and identifying nucleic acid from a plurality of microorganisms and viruses." U.S. Patent Application No. 15/694,249.
35. Dornfeld, Dominik, et al. "SMARCA2-regulated host cell factors are required for MxA restriction of influenza A viruses." Scientific reports 8.1 (2018): 2092.
36. Šimić, Ivana, et al. "Molecular and serological survey of lyssaviruses in Croatian bat populations." BMC veterinary research 14.1 (2018): 274.
37. Zainabadi, Kayvan, et al. "A novel method for extracting nucleic acids from dried blood spots for ultrasensitive detection of low-density Plasmodium falciparum and Plasmodium vivax infections." Malaria journal 16.1 (2017): 377.
38. Karavina, C., and A. Gubba. "AN AFRICAN PERSPECTIVE ON TOSPOVIRUSES." Journal of Plant Pathology 99.1 (2017): 5-16.
39. Kolawole, Olatunji, et al. "Etiology of respiratory tract infections in the community and clinic in Ilorin, Nigeria." BMC research notes 10.1 (2017): 712.
40. Elmasry, Sandra, et al. "Detection of occult hepatitis C virus infection in patients who achieved a sustained virologic response to direct-acting antiviral agents for recurrent infection after liver transplantation." Gastroenterology 152.3 (2017): 550-553.
41. Tan KS, et al. Stability of Zika Virus in Urine: Specimen processing considerations and implications for the detection of RNA targets in urine. Journal of Virological Methods. 2017. http://dx.doi.org/doi:10.1016/j.jviromet.2017.04.018
42. Nowotny N, Kolodziejek J. Middle East respiratory syndrome COVID-19 (MERS-CoV) in dromedary camels, Oman, 2013. Euro Surveill. 2014;19(16):pii=20781.
43. Kolodziejek J, Seidel B, Jungbauer C, Dimmel K, Kolodziejek M, Rudolf I, et al. (2015) West Nile Virus Positive Blood Donation and Subsequent Antomological Investigation, Austria, 2014. PLoS ONE 10(5): e0126381. doi:10.1371/journal.pone.0126381
44. Adams M, Joshi SN, Mbambo G, et al. An ultrasensitive reverse transcription polymerase chain reaction assay to detect asymptomatic low-density Plasmodium falciparum and Plasmodium vivax infections in small volume blood samples. Malar J. 2015;14:520.
45. Elbadry MA, Al-khedery B, Tagliamonte MS, et al. High prevalence of asymptomatic malaria infections: a cross-sectional study in rural areas in six departments in Haiti. Malar J. 2015;14:510.
46. Garigliany M, Linden A, Gilliau G, et al. Usutu virus, Belgium, 2016. Infect Genet Evol. 2016;48:116119.
47. Phommanivong V, Kanda S, Shimono T, et al. Co-circulation of the dengue with chikungunya virus during the 2013 outbreak in the southern part of Lao PDR. Trop Med Health. 2016;44:24.

DNA/RNA Shield™

Shield was deployed in the first emergency response for Wuhan outbreak

READY TO HELP - Zymo Research Corporation's (China Branch) donates scientific reagents to a hospital in Wuhan as "Reagents for combating virus pneumonia" in an effort to thwart the coronavirus outbreak in that region.
#coronavirus #outbreak #virus #wuhan