Sample extraction

Widely used in pathogen detection workflows

The Applied Biosystems™ MagMAX™ CORE Nucleic Acid Purification Kit is a universal sample extraction solution for real-time PCR, sequencing, and genotyping applications for animal studies. This robust magnetic bead–based kit features reagents stored at room temperature and can be used in manual or automated workflows. The kit is often cited in publications that describe workflows for pathogen detection.

The following citation list reflects the flexibility of use for multiple pathogen-testing workflows. It captures the focus of the study, applications, and use of the MagMAX CORE kit in each of the publications.

The content is easy to search using animal name, disease name, application, or vector name.

Example search result using Ctrl+F (PC) or Command+F (Mac™ computer) and "WGS" as the search term:

Publication link	Disease or target	Application	Product usage
A novel *Canis lupus familiaris* reference genome improves variant resolution for use in breed-specific GWAS life-science-alliance.org/content/lsa/4/4/e202000902.full.pdf	*Canis lupus familiaris* (dog—Labrador Retriever)	Whole-genome sequencing (WGS) of canine samples	DNA was isolated from canine blood stored in PAXgene™ tubes and BD Vacutainer™ EDTA tubes. MagMAX CORE kit performance was compared with phenol/chloroform extraction and other blood-based DNA extraction kits for WGS applications.

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Citation list for the MagMAX CORE Nucleic Acid Purification Kit

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Inactivation of foot-and-mouth disease virus A/IRN/8/2015 with commercially available lysis buffers doi.org/10.1016/j.jvirom-et.2020.113835	Foot-and-mouth disease (FMD)	Cell culture analysis for FMD virus inactivation	Comparison of 3 commercial buffers, including the MagMAX CORE lysis solution, for FMD inactivation using samples such as bovine milk, epithelial tissues from bovine vesicles, and cell culture supernatant.
Evaluation of a high-throughput nucleic acid extraction method for the detection of *Mycobacterium avium* subsp. *paratuberculosis* in bovine fecal samples by PCR doi.org/10.1177/1040638721991118	*Mycobacterium avium* subspecies *paratuberculosis* (MAP)	PCR analysis of *Mycobacterium* from fecal samples	The MagMAX CORE kit was deployed using a manual mechanical lysis step for detection of MAP from bovine fecal samples. The established protocol identified all the positive and negative samples accurately.
Towards a sampling rationale for African swine fever virus detection in pork products doi.org/10.3390/foods9091148	African swine fever virus (ASFV)	Real-time PCR of ASFV in food matrices for food testing labs and surveillance using MagMAX CORE and Applied Biosystems™ VetMAX™ ASFV kits	Assessment of VetMAX qPCR assay with bone marrow, pork loin, or meat juice samples. Performance indicates greater sensitivity of VetMAX kit than the OIE-prescribed assay. The MagMAX CORE kit was used for extraction of nucleic acid from pork products.
Development of a genus-specific *Brucella* real-time PCR assay targeting the 16S-23S rDNA internal transcribed spacer from different specimen types doi.org/10.3390/vetsci7040175	*Brucella abortus* biovar in multiple matrices	Real-time PCR of the ribosomal internal transcribed spacer (ITS) in bovine samples	Spike-in analysis of *Brucella abortus* biovar 1 (B01988-18 strain) in bovine blood, milk, and tissues to analyze the best matrix for pathogen detection. The ranking for sensitivity of detection was found to be tissue, blood, then milk.
A novel *Canis lupus familiaris* reference genome improves variant resolution for use in breed-specific GWAS life-science-alliance.org/content/lsa/4/4/e202000902.full.pdf	*Canis lupus familiaris* (dog—Labrador Retriever)	Whole genome sequencing (WGS) of canine samples	DNA was isolated from canine blood stored in PAXgene™ tubes and BD Vacutainer™ EDTA tubes. MagMAX CORE kit performance was compared with phenol/chloroform extraction and other blood-based DNA extraction kits for WGS applications.
Choice of commercial DNA extraction method does not affect 16S sequencing outcomes in cloacal swabs doi.org/10.3390/ani11051372	Bird microbiome in cloacal samples from White Leghorn hens	16S rRNA microbial sequencing	Comparison of multiple commercial kits including the MagMAX CORE kit for 16S rRNA sequencing.
Development of a reference standard for the detection and quantification of *Mycobacterium avium* subsp. *paratuberculosis* by quantitative PCR doi.org/10.1038/s41598-021-90789-0	*Mycobacterium avium* subspecies *paratuberculosis* (MAP)	Real-time PCR of MAP	The MagMAX CORE kit with mechanical lysis module was used to isolate DNA from a lyophilized MAP standard. Real-time PCR analysis was performed using the Applied Biosystems™ VetMAX™-Gold MAP Detection Kit.
Investigation of bovine ephemeral fever virus transmission by putative dipteran vectors under experimental conditions doi.org/10.1186/s13071-020-04485-5 Other *Culicoides* citation: parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-018-3283-9 Flight and *Culicoides* surveillance: parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-020-04552-x	Bovine ephemeral fever virus (BEFV) in mosquito vectors	Detection of BEFV using RT-qPCR	The MagMAX CORE kit was used with the Thermo Scientific™ KingFisher™ Flex Purification System for nucleic acid extraction from 3 mosquito species (*Aedes aegypti*, *Culex pipiens*, and *Culex quinquefasciatus*) and *Culicoides*.
A rapid RT-LAMP assay for the detection of all four lineages of Peste des Petits Ruminants Virus doi.org/10.1016/j.jviromet.2019.113730	Peste des petits ruminants virus (PPRV)	RT-LAMP assay	Manual extraction of PPRV RNA from EDTA-treated blood, eye, and nasal swab samples was carried out using the MagMAX CORE kit.
Cell fusing agent virus (*Flavivirus*) infection in *Aedes aegypti* in Texas: seasonality, comparison by trap type, and individual viral loads doi.org/10.1007/s00705-020-04652-0	Cell fusing agent virus (CFAV) studies	Real-time PCR analysis on mosquito vectors to identify flaviviruses	Mosquito pools were homogenized in Hanks' balanced salt solution, and the resulting supernatant was used for RNA extraction with the MagMAX CORE kit.

Citation list for the MagMAX CORE Nucleic Acid Purification Kit (cont.)

Publication link	Disease or target	Application	Product usage
Seroprevalence of *Borrelia burgdorferi* in stray dogs from southern Italy doi.org/10.3390/microorganisms8111688	*Borrelia burgdorferi* (spirochete) in stray dogs, which causes Lyme disease in humans and dogs	Real-time PCR analysis for detection of pathogen	DNA was extracted from canine whole blood with the MagMAX CORE kit for real-time PCR analysis of the *ospA* gene from *Borrelia*.
Geometric morphometric wing analysis represents a robust tool to identify female mosquitoes (Diptera: Culicidae) in Germany nature.com/articles/s41598-020-72873-z Other citations (*Culicoides* and *Aedes*): parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-018-3283-9 sciencedirect.com/science/article/pii/S0001706X18315766	Mosquito identification (*Aedes* species)	Cytochrome oxidase subunit I (COI) gene sequencing	DNA isolation was performed from whole mosquito body using the MagMAX CORE kit.
Distribution of avian influenza viruses according to environmental surveillance during 2014–2018, China doi.org/10.1186/s40249-021-00850-3	AIV surveillance in China	RT-PCR detection of AIV and WGS analysis	DNA isolation from poultry-related materials, including poultry feces, drinking water, sewage, and swabs from poultry cages. Also cites Applied Biosystems™ AgPath-ID™ and Invitrogen™ SuperScript™ III products.
Characterization of winter dysentery bovine coronavirus isolated from cattle in Israel doi.org/10.3390/v13061070	Winter dysentery bovine coronavirus (BCoV) in cattle with hemorrhagic diarrhea and a significant decrease in milk production	RT-qPCR analysis	Fecal and rectal swabs from animals with BCoV symptoms were used to extract RNA using the MagMAX CORE kit.
Host bloodmeal identification in cave-dwelling *Ornithodoros turicata* Dugès (Ixodida: Argasidae), Texas, USA ncbi.nlm.nih.gov/pmc/articles/PMC7917080/	Pathogen transmission and management strategies for tick-borne disease; comparing soft tick (Argasidae) to hard ticks (Ixodidae)	PCR and Sanger sequencing for identifying the bloodmeal hosts of soft ticks	DNA was extracted using the MagMAX CORE kit. Assays included negative and positive controls such as blood from sheep, tiger, and crane not seen in a cave environment.
Detection of *Coxiella burnetii* and equine herpesvirus-1, but not *Leptospira* spp. or *Toxoplasma gondii*, in cases of equine abortion in Australia: a 25-year retrospective study journals.plos.org/plosone/article?id=10.1371/journal.pone.0233100 Other citation for pathogenic groups I and II identification: frontiersin.org/articles/10.3389/fmicb.2020.00457/full	Prevalence of *Coxiella burnetti*, *Leptospira* spp., and *Toxoplasma gondii* in 600 aborted equine fetal tissues	qPCR analysis of pathogens in equine tissues	DNA was extracted from 600 aborted equine fetal tissues from the University of Melbourne collection (1994–2019), using the MagMAX CORE kit.
Not gone but forgotten: *Tritrichomonas foetus* in extensively managed bulls from Australia's Northern Territory doi.org/10.1016/j.crpvbd.2021.100012	*Tritrichomonas foetus*	Multiplex real-time PCR assay	DNA was extracted from 109 bull samples using the MagMAX CORE kit with an automated protocol. Publication also cites Applied Biosystems™ VetMAX™ Xeno Control DNA and the Applied Biosystems™ QuantStudio™ 5 Real-Time PCR System.
Apparent lack of spill-over of parasites from an invasive anuran: PCR detects *Entamoeba* in cane toads (*Rhinella marina*) but not in sympatric Australian native frogs sciencedirect.com/science/article/pii/S221322442030064X	*Entamoeba* in cane toads; 173 samples were collected from multiple species of cane toads	Real-time PCR analysis of 16S rRNA regions	Total genomic DNA was extracted from approximately 0.05–0.25 g of each fecal sample using the MagMAX CORE kit.

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International proficiency trial demonstrates reliable Schmallenberg virus infection diagnosis in endemic and non-affected countries journals.plos.org/plosone/article?id=10.1371/journal.pone.0219054	Schmallenberg virus (SBV), an orthobunyavirus infecting ruminants	PCR analysis	Extensive analysis of multiple commercial kits, including the MagMAX CORE kit, tested in a total of 38 approaches. The Applied Biosystems™ VetMAX™ Schmallenberg Virus Kit is also cited.
Malakoplakia in the urinary bladder of 4 puppies journals.sagepub.com/doi/abs/10.1177/03009858211009779	Malakoplakia affects the urinary bladder in humans and other animals and is observed with von Hansemann–type macrophages, with or without Michaelis-Gutmann bodies, and is frequently associated with *E. coli* infection.		Nucleic acid was extracted using the MagMAX CORE kit.
Effects of dicopper oxide and copper sulfate on growth performance and gut microbiota in broilers doi.org/10.1016/j.psj.2021.101224	Effect of copper on gut microbiome in chicken	16S rRNA gene analysis	Bacterial DNA isolation from ileal content using the MagMAX CORE kit.
A longitudinal study of parasitosis with genotypes of *Theileria orientalis* in calves and introduced cattle at Dorrigo, New South Wales, and the effect on weight gains doi.org/10.21203/rs.3.rs-93408/v1	Study of *Theileria orientalis* (tick) in cattle	Real-time PCR analysis of *Theileria* to understand susceptibility of newborn calves and new stock to clinical disease with tick infestation	DNA was extracted from ticks using the MagMAX CORE kit.
Rabbit enteropathies on commercial farms in the Iberian Peninsula: etiological agents identified in 2018–2019 doi.org/10.3390/ani9121142	Enteropathogenic *E. coli* (EPEC), *Clostridium spiroforme*, *Clostridium perfringens*, and group A rotavirus	Bacterial cultures and RT-PCR analysis of pathogens such as EPEC, *Clostridium*, and rotavirus	Total nucleic acids were extracted from digestive organs or caecal swabs using an automated protocol with the MagMAX CORE kit.
Targeted-release organic acids and essential oils improve performance and digestive function in broilers under a necrotic enteritis challenge doi.org/10.3390/ani10020259	Necrotic enteritis (NE), a threat to poultry	Studies of the V3–V4 regions of microbes and analysis of the impact of feed on the gut microbiome in broilers	DNA was isolated from ileal and caecal contents from poultry, using the MagMAX CORE kit.
The uropygial gland microbiome of house sparrows with malaria infection onlinelibrary.wiley.com/doi/full/10.1111/jav.02686	House sparrow microbiome and malaria	16S rRNA gene analysis using the Ion 16S™ Metagenomics Kit	DNA isolation was performed using the MagMAX CORE kit on uropygial gland excretions collected on swabs. DNA was analyzed using the Ion 16S Metagenomics Kit.
Ecology of West Nile virus in the Danube Delta, Romania: phylogeography, xenosurveillance, and mosquito host-feeding patterns doi.org/10.3390/v11121159	West Nile virus	Sanger sequencing and IgG antibody analysis	Mosquito pools between 1 and 250 specimens were pooled, and RNA was extracted with the KingFisher Flex instrument and MagMAX CORE kit.
Pathologic and immunohistochemical findings in an outbreak of systemic toxoplasmosis in a mob of red kangaroos journals.sagepub.com/doi/abs/10.1177/10406387211001869	*Toxoplasma gondii* is a zoonotic protozoan pathogen that infects vertebrates, including humans, cats, and kangaroos	Real-time PCR and immunohistochemical analysis of *T. gondii*	

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A sensitive method for the recovery of *Escherichia coli* serogroup O55 including Shiga toxin–producing variants for potential use in outbreaks doi.org/10.1111/jam.14345	Shiga toxin–producing *E. coli* (STEC) causes bloody diarrhea, kidney failure, and occasionally death	Use of NGS, latex agglutination, and NGS sequencing applications	Fresh growth of *E. coli* O55 from cattle samples was carried out on CHROMagar™ ECC medium, and the lysate after heat denaturation was subjected to DNA isolation using the MagMAX CORE kit.
First report of cystic echinococcosis in rhinos: A fertile infection of *Echinococcus equinus* in a Southern white rhinoceros (*Ceratotherium simum simum*) of Kruger National Park, South Africa sciencedirect.com/science/article/pii/S2213224421000213	The first reported case of *E. granulosus sensu lato* in African rhinos		DNA was isolated using the MagMAX CORE kit on the Thermo Scientific™ KingFisher™ Duo Prime instrument (sample was protoscoleces from the inner germinal layer).

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