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VETERINARY DIAGNOSTIC TEST KITS AND REAGENTS

vmrd

Veterinary Medical
Research & Development

For the 32 years I have been privileged to be part of VMRD, God has graciously blessed, prospered and protected us. We endeavor to let the words of Jesus Christ, “Do unto others as you would have them do unto you,” guide our daily activities and decisions. Consistent with this is our corporate mission *to provide high quality products, services, and support to our customers and a harmonious and rewarding work environment for our employees*. Should we fail to achieve this goal, please feel free to contact me personally.

Soli Deo gloria,

D. Scott Adams, D.V.M., Ph.D., President & CEO

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*Incubation period is 24 hours.

Sensitivity and Specificity in Perspective

Relative sensitivity and specificity values are calculated from data generated by diagnostic laboratory field testing. These values are provided as guidelines only and should not be construed as the absolute sensitivity and specificity of the test in question for any population subset.

VMRD's central research facility is located in Pullman, Washington.

ANAPLASMOSIS

USDA LICENSED

VMRD's *Anaplasma* Antibody Test Kit, cELISA							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
282-2	bovine	serum	95%	98%	130 minutes	2 stripwell plates	182
282-5						5 stripwell plates	455

Setting a New Standard in the Diagnosis of Anaplasmosis

VMRD's *Anaplasma* Antibody Test Kit is a competitive, enzyme-linked, immunosorbent assay (cELISA) for the detection of antibodies specific for *Anaplasma* in bovine serum samples. It is intended to provide results that will give guidance about the presence of *Anaplasma* infection in bovine species. Sensitivity and specificity are more than four-fold better than the complement fixation test (CFT) which was the former gold standard test. In the study presented in the sensitivity and specificity table on this page, CFT was able to detect only ~20% of positive samples in three independent laboratories.

This OIE-recommended cELISA is a breakthrough in diagnosis of anaplasmosis in persistently-infected animals. It detects antibodies to *Anaplasma marginale*, *Anaplasma ovis*, and *Anaplasma centrale*. Notwithstanding some recent publications, we do not believe that the assay should be relied upon for detection of antibodies to *Anaplasma phagocytophphila*. The kit is available in 2-plate and 5-plate formats; both formats use breakaway stripwells.

About Anaplasmosis

Anaplasmosis is a non-contagious, arthropod-borne, parasitic disease of ruminants that results in significant economic losses to the cattle industry. The disease in cattle is caused by *Anaplasma marginale*, recently classified in geno-group II of *Ehrlichiae*. *Anaplasma marginale* is an intra-erythrocytic parasite that causes severe anemia, abortion, weight loss, jaundice and death. Diagnosis of the acute disease is based upon clinical signs, anemia and finding of *Anaplasma* inclusion bodies in erythrocytes. Animals surviving the acute phase become lifelong carriers. Ticks transmit the infection from carriers to naive cattle, which develop clinical disease. Cycles of rickettsemia in carriers fluctuate between $10^{2.5}$ and 10^{7} infected erythrocytes per ml, levels generally undetectable by Giemsa staining. Carriers can be identified by detection of serum antibodies to *A. marginale* with VMRD's *Anaplasma* Antibody Test Kit.

		Nested PCR		
		+	–	Sum
VMRD cELISA	+	91	1	92
	–	5	40	45
	Sum	96	41	137
Sensitivity: 95% • Specificity: 98%†				

In-house data submitted to USDA in support of licensure, February 1998.

† See Sensitivity and Specificity In Perspective on page 4.

Kit Contents

Component	282-2	282-5
A. Antigen-Coated Plates	2 plates	5 plates
B. Coated Adsorption/Transfer Plates	2 plates	5 plates
C. Positive Control	3.6 ml	3.6 ml
D. Negative Control	3.6 ml	3.6 ml
E. 100X Antibody-Peroxidase Conjugate	0.3 ml	0.5 ml
F. Conjugate Diluting Buffer	30 ml	60 ml
G. 10X Wash Solution Concentrate	120 ml	2 x 120 ml
H. Substrate Solution	30 ml	60 ml
I. Stop Solution	30 ml	60 ml
Test Kit Insert		

Overview of the *Anaplasma* Kit Procedure

1. Place 70 µl of samples and controls into wells of Adsorption Plate
2. Incubate 30 minutes at room temperature
3. Transfer 50 µl of samples and controls into wells of Antigen Plate
4. Incubate 60 minutes at room temperature
5. Wash 2 times with Wash Solution
6. Add 50 µl of Conjugate
7. Incubate 20 minutes at room temperature
8. Wash 4 times with Wash Solution
9. Add 50 µl of Substrate Solution
10. Incubate 20 minutes at room temperature
11. Add 50 µl of Stop Solution
12. Read at 620-650 nm

Formula for calculating % inhibition: % I = 100 [1-(Sample OD ÷ NC OD)]

Samples producing <30% inhibition are negative. Samples producing ≥30% inhibition are positive.

For the test to be valid, the mean OD of the Negative Control must range from 0.40 to 2.10. The percent inhibition of the Positive Control must be ≥30%.

EQUINE PIROPLASMOSIS

USDA LICENSED

VMRD's *Babesia caballi* Antibody Test Kit, cELISA							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
273-2	equine	serum	see below	see below	105 minutes	2 stripwell plates	182
273-5						5 stripwell plates	455
VMRD's *Babesia equi* Antibody Test Kit, cELISA							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
274-2	equine	serum	see below	see below	105 minutes	2 stripwell plates	182
274-5						5 stripwell plates	455

About the *B. Caballi* and *B. equi* Test Kits

VMRD's *Babesia caballi* Antibody Test Kit, cELISA and VMRD's *Babesia equi* Antibody Test Kit, cELISA are competitive enzyme-linked immunosorbent assays which detect antibodies in equine sera to *B. caballi* or *B. equi*, respectively. Antibody to *B. caballi* or *B. equi* in sample serum inhibits binding of primary monoclonal antibody. The binding of primary monoclonal antibody to the antigen-coated plate is detected by binding of horseradish peroxidase (HRP)-labeled secondary antibody. Finally, binding of the HRP-labeled secondary antibody is quantified by the addition of enzyme substrate and subsequent color product development. Strong color development indicates little or no inhibition of primary monoclonal antibody binding and therefore the absence of *B. caballi* or *B. equi* antibody in sample sera. Weak color development due to inhibition of the primary monoclonal antibody binding to the antigen on the antigen-coated plate indicates the presence of *B. caballi* or *B. equi* antibodies in sample sera.

Sensitivity and Specificity of VMRD Equine Piroplasmosis Kits

Based on the work of Knowles[1], Kappmeyer[2], and Katz[3], cELISAs have recently been adopted by OIE as prescribed tests for equine piroplasmosis. Two protocols developed at NVSL, one for *B. caballi* and one for *B. equi*, were validated for OIE using a 36-sample panel provided to cooperating international equine piroplasmosis reference laboratories. VMRD's piroplasmosis cELISA kits are derived from these protocols and, when tested against the NVSL protocol with the same validation panel, gave 100% correct results (see Tables 1 and 3). In the spring and summer of 2005, NVSL conducted side-by-side tests comparing the VMRD kits with the NVSL protocols. Tables 2 and 4 show the results of that testing. In late August of 2005, NVSL adopted the VMRD kits as its primary screening tests for equine piroplasmosis import testing.

1 Knowles, D.P., et al. Antibody to a recombinant merozoite protein epitope identifies horses infected with *Babesia equi*. J. Clin. Microbiol. (30):3122–3126 (1992).

2 Kappmeyer, L.S., et al. Detection of equine antibodies to *Babesia caballi* recombinant *B. caballi* rhoptry-associated protein 1 in a competitive-inhibition enzyme-linked immunosorbent assay. J. Clin. Microbiol. (37):2285–2290 (1999).

3 Katz J., et al. Procedurally similar competitive immunoassay systems for the serodiagnosis of *Babesia equi*, *Babesia caballi*, *Trypanosoma equiperdum* and *Burkholderia mallei* infection in horses. J. Vet. Diagn. Invest. (12):46–50 (2000).

† See Sensitivity and Specificity In Perspective on page 4.

Table 1. Babesia caballi OIE check set

		NVSL cELISA		
		+	–	Sum
VMRD cELISA	+	10	0	10
	–	0	26	26
	Sum	10	26	36
Sensitivity: 100% • Specificity: 100%†				

Table 2. Babesia caballi import testing samples

		NVSL cELISA		
		+	–	Sum
VMRD cELISA	+	12	0	12
	–	0	417	417
	Sum	12	417	429
Sensitivity: 100% • Specificity: 100%†				

Table 3. Babesia equi OIE check set

		NVSL cELISA		
		+	–	Sum
VMRD cELISA	+	16	0	16
	–	0	20	20
	Sum	16	20	36
Sensitivity: 100% • Specificity: 100%†				

Table 4. Babesia equi import testing samples

		NVSL cELISA		
		+	–	Sum
VMRD cELISA	+	19	2**	21
	–	1*	407	408
	Sum	20	409	429
Sensitivity: 95% • Specificity: 99.5%†				

Note: CFT was positive on only 4 of 19 samples positive by both VMRD and NVSL cELISAs; CFT was positive on 1 sample negative by both VMRD and NVSL cELISAs.

*39.4% inhibition by the VMRD cELISA (0.6% below positive).

**1 sample 64.5% inhibition by the NVSL cELISA (6.4% below positive); 1 sample 70.8% inhibition by NVSL cELISA (0.1% below positive).

Kit Contents

Component		
A. Antigen-Coated Plates	2 plates	5 plates
B. Positive Control	2 ml	4 ml
C. Negative Control	2 ml	4 ml
D. 100X Primary Antibody	0.3 ml	0.5 ml
E. 100X Secondary Antibody-Peroxidase	0.3 ml	0.5 ml
F. Antibody Diluting Buffer	60 ml	120 ml
G. Serum Diluting Buffer	10.5 ml	25 ml
H. 10X Wash Solution Concentrate	120 ml	2 x 120 ml
I. Substrate Solution	30 ml	60 ml
J. Stop Solution	30 ml	60 ml
Test Kit Insert		

Overview of Kit Procedures

1. Place 50 µl of diluted samples and controls into wells of plate
2. Incubate 30 minutes at room temperature
3. Wash 3 times with Wash Solution
4. Add 50 µl of Primary Antibody
5. Incubate 30 minutes at room temperature
6. Wash 3 times with Wash Solution
7. Add 50 µl of Secondary Antibody-HRP Conjugate
8. Incubate 30 minutes at room temperature
9. Wash 3 times with Wash Solution
10. Add 50 µl of Substrate Solution
11. Incubate 15 minutes at room temperature
12. Add 50 µl of Stop Solution
13. Read at 620-650 nm

Formula for calculating % inhibition: % I = 100 [1-(Sample OD ÷ NC OD)]

Samples producing ≥40% inhibition are positive. Samples producing <40% inhibition are negative.

For the test to be valid, the mean of the Negative Controls must produce an OD >0.300 and <2.000. The mean of the Positive Controls must produce an inhibition ≥40%.

Note: Despite many similarities, components, including wash, are NOT interchangeable between the *Babesia caballi* and *Babesia equi* test kits. Substituting reagents between these kits can have adverse consequences.

BLUETONGUE

USDA LICENSED

VMRD's Bluetongue Virus Antibody Test Kit, cELISA							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
287-2	ruminants	serum	100%	99%	40 minutes	2 stripwell plates	184
287-5						5 solid plates	460

VMRD's Bluetongue Virus Antibody Test Kit, AGID							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Format	Tests
288-100	ruminants	serum	100%	99%	30 minutes*	AGID	100

About Bluetongue Virus

Bluetongue is an infectious, non-contagious, arthropod-borne, viral disease of wild and domestic ruminants. In cattle it is usually a subclinical infection, while in sheep it is often characterized by acute catarrhal inflammation of mucous membranes and hyperemia of coronary bands. Degenerative changes are present in skeletal and coronary musculature, which lead to weakness, prolonged convalescence and significant economic losses.

Bluetongue Virus (BTV) belongs to the genus *Orbivirus*, family Reoviridae. Laboratory diagnosis of bluetongue is primarily established by isolation of the virus. Virus is isolated in Veros or BHK 21 cells, and its presence is confirmed by immunofluorescence. Serological methods used in diagnosis of this disease are AGID, ELISA, cELISA and immunofluorescence. Positive results confirm exposure to BTV but not necessarily carrier status.

VMRD's Bluetongue Virus AGID

VMRD's Bluetongue Virus agar gel immunodiffusion (AGID) test detects precipitating antibodies to bluetongue virus in sera of ruminants. Antibodies to Epizootic Hemorrhagic Disease Virus (EHDV) are also detected. If positive, test sera will form a line that fuses with reference lines or that cause deviation of the positive reference lines inward near the test serum well without necessarily forming a visible line. Negative sera will neither form a line nor cause deviation of the positive reference lines.

VMRD's Bluetongue Virus cELISA

VMRD's competitive, enzyme-linked immunosorbent assay (cELISA) detects antibody to bluetongue virus in ruminant sera. It has been demonstrated to detect all 24 known serotypes of Bluetongue Virus (BTV) and not to detect antibody to serotypes 1 or 2 of Epizootic Hemorrhagic Disease Virus (EHDV). The kit has demonstrated excellent sensitivity and specificity in comparison with various benchmarks in several studies. The economics of this competitively-priced assay are further enhanced by savings in technician time since sample dilution is unnecessary and the total incubation time is only 40 minutes. Another economic advantage of this test kit is its USDA-approved 18-month shelf life—also a testimony to the stability of the kit. VMRD has manufactured over 60,000 BTV cELISA plates—nearly six million test wells.

Overview of the cELISA Kit Procedure

1. Place 25 µl of samples and controls into wells of Antigen Plate
2. Incubate 15 minutes at room temperature
3. Add 25 µl of Conjugate
4. Incubate 15 minutes at room temperature
5. Wash 3 times with Wash Solution
6. Add 50 µl of Substrate Solution
7. Incubate 10 minutes at room temperature
8. Add 50 µl of Stop Solution
9. Read at 620-650 nm

Samples are positive if the produce an OD less than 50% of the mean of the Negative Controls.

Samples are positive if they produce an OD greater than or equal to 50% of the mean of the Negative Controls.

For test validation, the mean OD of the Negative Controls must be greater than 0.300 and less than 2.000. The mean OD of the Positive Controls must be less than or equal to 50% of the mean OD of the Negative Controls.

*Incubation period is 24 hours.

† See Sensitivity and Specificity In Perspective on page 4.

BOVINE LEUKOSIS

USDA LICENSED

VMRD's Bovine Leukemia Virus Antibody Test Kit, ELISA

Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
284	bovine	serum	98%	100%	60 minutes	1 stripwell plates	91
284-5						5 stripwell plates	455

VMRD's highly-sensitive and specific enzyme-linked immunosorbent assay (ELISA) kit detects antibodies to Bovine Leukemia Virus (BLV) glycoprotein 51 (gp51) in bovine sera. Sample serum antibodies bind to BLV gp51 molecules attached to the plastic wells of the microtiter plate. Binding of these serum antibodies is detected by reaction with horseradish peroxidase (HRP)-labeled, affinity-purified goat antibodies to bovine immunoglobulins. Attached HRP-labeled antibodies are detected by addition of enzyme substrate and quantitated by subsequent blue color product development. Strong color development indicates the presence of antibodies to BLV gp51 in the sample serum. Very weak or no color development indicates the absence of detectable antibodies to BLV gp51 in the sample serum. VMRD's Bovine Leukemia Virus Antibody Test Kit is USDA-approved for export testing and is available in breakaway stripwell format. The assay requires that an ELISA reader be used for accurate results.

About Bovine Leukosis

Enzootic Bovine Leukosis (EBL) is an infectious, non-contagious viral disease of cattle. It is caused by Bovine Leukemia Virus (BLV), an oncogenic delta retrovirus, which results in proliferation of B lymphocytes. Infection with BLV may lead to persistent lymphocytosis and in some adult cattle to the development of tumors with associated signs. The spread of disease from the introduction into a herd may take enzootic proportions. Transmission of BLV occurs between animals primarily by transfer of B lymphocytes. Trauma, use of common bleeding needles, and surgical procedures are the main means of transmission. It is rarely vertically transmitted. Most BLV infections are inapparent. Approximately 5% of animals develop clinical signs. AGID and ELISA tests are used to identify carrier cattle. Control programs for EBL include testing and removal of positive animals. Several European countries which have instituted eradication programs also require that imported cattle be free of BLV.

		Reference ELISA		
		+	–	Sum
VMRD ELISA	+	164	0	164
	–	4*	280	284
	Sum	168	280	448
Sensitivity: 98% • Specificity: 100%†				

Data generated by three independent laboratories during field trial testing of VMRD's BLV ELISA as required for USDA licensure, February 1999.

* All calves less than 8 months of age.

† Based on a specific sample set. However, no diagnostic test kit is always 100% specific on all sample populations. Since market introduction of our BLV kit, occasional false positives have been encountered. We therefore advise all users that when BLV prevalence is low, positive samples should be confirmed by some other method, particularly where valuable animals may be involved and/or when BLV status is used as the single criterion for disposition of animals. See Sensitivity and Specificity In Perspective on page 4.

Kit Contents

Component	284	284-5
A. Antigen-Coated Plates	1 plate	5 plates
B. Positive Control	3.6 ml	3.6 ml
C. Negative Control	3.6 ml	3.6 ml
D. 100X Antibody-Peroxidase Conjugate	0.15 ml	0.5 ml
E. Conjugate Diluting Buffer	14 ml	60 ml
F. 10X Wash Solution Concentrate	120 ml	2 x 120 ml
G. Serum Diluting Buffer	120 ml	2 x 120 ml
H. Substrate Solution	20 ml	60 ml
I. Stop Solution	20 ml	60 ml
Test Kit Insert		

Overview of Bovine Leukemia Virus Kit Procedure

1. Dilute serum samples 1/25 with Serum Diluting Buffer
2. Place 50 µl of each sample and controls into wells of the Antigen Plate
3. Incubate 20 minutes at room temperature
4. Wash 3 times with Wash Solution
5. Add 50 µl of Conjugate
6. Incubate 20 minutes at room temperature
7. Wash 3 times with Wash Solution
8. Add 50 µl of Substrate Solution
9. Incubate 20 minutes at room temperature
10. Add 50 µl of Stop Solution
11. Read at 620-650 nm

All samples with mean OD values greater than or equal to the mean OD of the Positive Controls are positive for BLV. All samples with mean OD values less than the mean of the Positive Controls are negative for BLV.

For test validation, the mean OD of the Negative Controls must be less than 0.200. The mean OD of the Positive Controls must be ≥0.250 and <2.000.

NEOSPOROSIS

USDA LICENSED

VMRD's *Neospora caninum* Antibody Test Kit, cELISA							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
280-2	multiple	serum	96%	99%	100 minutes	2 stripwell plates	184
280-5						5 stripwell plates	460

VMRD's *Neospora* test is a competitive, enzyme-linked immunosorbent assay (cELISA) that detects antibodies against *Neospora caninum* in cattle sera. Our competitive ELISA format allows other species to be tested, but validation has been completed only on cattle. An immunodominant surface protein of 65 kDa is captured on the antigen plate using a monoclonal antibody. Another horseradish peroxidase-conjugated monoclonal antibody competes with serum antibodies for a specific epitope on p65. Sensitivity and specificity studies confirm the high accuracy of this kit. In a mass screening of 4,323 sera of unknown serologic status, only 5% of sera fell within ±5% of the cut-off value, demonstrating a clear distinction between positive and negative sera (bimodal distribution).

VMRD's *Neospora* kit is available in a 2-plate and 5-plate fomat with breakaway stripwells.

About Neosporosis

Neosporosis has been identified across the world in various species, including dogs, cattle, sheep, goats, and horses. It is caused by *Neospora caninum*, a protozoan parasite closely related to *Toxoplasma gondii*. Even though the dog can be the definitive host for *Neospora*, it is not known if there are other definitive hosts. No signs of clinical illness are noted in cows that abort due to *Neospora* either prior to the abortion or post-abortion. Aborted fetuses are usually autolyzed with no gross lesions and placentas are not retained. Abortions have been diagnosed in both heifers and cows from 3 months gestation to term. A majority (78%) of *Neospora* abortions occur between 4 and 6 months gestation. This pattern of mid-gestation abortion is distinct from other diagnosed causes of infectious abortion in dairy cattle which tend to occur later in gestation. In dogs, *Neospora* infection causes neuromuscular paralysis. Identification of carrier animals is based upon detection of specific antibody with serological tests while diagnosis of abortions is based upon microscopic examination of the fetus and immunohistochemistry.

		Reference Assay		
		+	–	Sum
VMRD cELISA	+	131	4	135
	–	6	319	325
	Sum	137	323	460
Sensitivity: 96% • Specificity: 99%†				

VMRD cELISA Field Testing, 2001.

† See Sensitivity and Specificity In Perspective on page 4.

Kit Contents

Component	280-2	280-5
A. Antigen-Coated Plates	2 plates	5 plates
B. Positive Control	3.6 ml	3.6 ml
C. Negative Control	3.6 ml	3.6 ml
D. 100X Antibody-Peroxidase Conjugate	0.3 ml	0.5 ml
E. Conjugate Diluting Buffer	30 ml	60 ml
F. 10X Wash Solution Concentrate	120 ml	2 x 120 ml
G. Substrate Solution	30 ml	60 ml
H. Stop Solution	30 ml	60 ml
Test Kit Insert		

Overview of *Neospora caninum* Kit Procedure

1. Place 50 µl of samples and controls into wells of the Antigen Plate
2. Incubate 60 minutes at room temperature
3. Wash 3 times with Wash Solution
4. Add 50 µl of Conjugate
5. Incubate 20 minutes at room temperature
6. Wash 3 times with Wash Solution
7. Add 50 µl of Substrate Solution
8. Incubate 20 minutes at room temperature
9. Add 50 µl of Stop Solution
10. Read at 620-650 nm

Formula for calculating % inhibition: % I = 100 [1-(Sample OD ÷ NC OD)]

Samples producing <30% inhibition are negative. Samples producing ≥30% inhibition are positive.

For the test to be valid, the mean OD of the Negative Control must be ≥0.30 and <2.50. The inhibition of the Positive Control must be ≥30%.

CAPRINE ARTHRITIS-ENCEPHALITIS & OVINE PROGRESSIVE PNEUMONIA

USDA LICENSED

VMRD's Small Ruminant Lentivirus Antibody Test Kit, cELISA

Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
289-2	caprine / ovine	serum	100% / 95%	99.6% / 98%	110 minutes	2 stripwell plates	184
289-5						5 stripwell plates	460

The study of CAEV has a long history at VMRD. Dr. Scott Adams, President of VMRD, was a member of the team that initially isolated CAEV and characterized the disease and its control in the late 1970s and early 1980s.

VMRD's competitive enzyme-linked immunosorbent assay (cELISA) is licensed to detect antibodies to caprine arthritis-encephalitis virus (CAEV) in goat sera and antibodies to ovine progressive pneumonia virus (OPPV) in sheep sera. Our SRLV cELISA test utilizes a proprietary xeno-monoclonal antibody derived by fusion of goat splenocytes and mouse myeloma cells which has excellent characteristics for use in cELISA. This antibody is conjugated to horseradish peroxide and is used to compete with serum antibodies for antigen bound to the microtiter plate.

Validation studies, in addition to those summarized here, have confirmed the superior quality of VMRD's SRLV cELISA test kit.*

About CAE and OPP

CAE and OPP (also known as maedi-visna) are persistent lentivirus infections of goats and sheep, respectively. Molecular analysis indicates that CAE virus (CAEV) and OPP virus (OPPV) are very similar and they are often grouped together under the name small ruminant lentivirus (SRLV). Polyarthritis is the main clinical sign of CAEV infection, while OPP is typically manifest with labored breathing and emaciation caused by progressive pneumonitis. Most SRLV-infected sheep and goats show no clinical disease but remain persistent carriers of the virus. The major mode of viral transmission is vertically through milk and colostrum. Respiratory secretions and feces also harbor infectious virus. Good management practices, supported by a reliable diagnostic tool, are the best means of controlling the spread of disease.

CAPRINE		CAEV AGID and IP		
		+	–	Sum
VMRD cELISA	+	165	1	166
	–	0	250	250
	Sum	165	251	416
Sensitivity: 100% • Specificity: 99.6%†				

OVINE		OPPV IP		
		+	–	Sum
VMRD cELISA**	+	134	3	137
	–	7	188	195
	Sum	141	191	332
Sensitivity: 95% • Specificity: 98.4%†				

**35% cutoff

Kit Contents

Component	289-2	289-5
A. Antigen-Coated Plates	2 plates	5 plates
B. Positive Control	3.6 ml	3.6 ml
C. Negative Control	3.6 ml	3.6 ml
D. 100X Antibody-Peroxidase Conjugate	0.3 ml	0.5 ml
E. Conjugate Diluting Buffer	30 ml	60 ml
F. 10X Wash Solution Concentrate	120 ml	2 x 120 ml
G. Substrate Solution	30 ml	60 ml
H. Stop Solution	30 ml	60 ml
Test Kit Insert		

Overview of SRLV Kit Procedure

1. Place 50 µl of samples and controls into wells of the Antigen Plate
2. Incubate 60 minutes at room temperature
3. Wash 3 times with Wash Solution
4. Add 50 µl of Conjugate
5. Incubate 30 minutes at room temperature
6. Wash 3 times with Wash Solution
7. Add 50 µl of Substrate Solution
8. Incubate 20 minutes at room temperature
9. Add 50 µl of Stop Solution
10. Read at 620-650 nm

Formula for calculating % inhibition:% I = 100 [1-(Sample OD ÷ NC OD)]

Samples producing <35% inhibition are negative. Samples producing ≥35% inhibition are positive.

For the test to be valid, the mean OD of the Negative Controls must be ≥0.300. The mean of the Positive Controls must produce ≥35% inhibition.

*Herrmann, L.M., et al. Competitive-inhibition enzyme-linked immunosorbent assay for detection of serum antibodies to caprine arthritis-encephalitis virus: Diagnostic tool for successful eradication. Clin. Diagn. Lab. Immunol. 10(2):267-271 (2003).

Herrmann, L.M., et al. Detection of serum antibodies to ovine progressive pneumonia virus in sheep by using a caprine arthritis-encephalitis virus competitive-inhibition enzyme-linked immunosorbent assay. Iin. Diagn. Lab. Immunol.10(5):862-865 (2003).

† See Sensitivity and Specificity In Perspective on page 4.

EQUINE INFECTIOUS ANEMIA

USDA LICENSED

VMRD's Equine Infectious Anemia Virus Antibody Test Kit, AGID							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Format	Tests
400-200	equine	serum	99%	100%	30 minutes*	AGID	200

VMRD's Equine Infectious Anemia Virus (EIAV) agar gel immunodiffusion (AGID) test detects precipitating antibodies in sera of Equidae to purified recombinant EIAV core protein of 26,000 molecular weight (p26). Using highly purified recombinant p26 protein antigen reduces problems of interpretation associated with extraneous precipitin lines from contamination by non-relevant antigens. The antigen-antibody precipitation reaction takes place in agar gel using the 7-well standard procedure developed by John W. Black and described by Pearson (American Association of Veterinary Laboratory Diagnosticians, 22nd Annual Proceedings, pp. 449-462, 1979). Purified soluble EIAV p26 antigen is placed in the center well and reference positive control serum is placed in three alternating peripheral wells. Sample sera are placed in the three remaining wells. After incubation, reference lines form between the antigen well and the reference positive control serum wells. Sample sera, if positive, will form a line that fuses with reference positive control lines or that deviate the reference positive control lines inward near the sample well without formation of a visible line. Negative sera will neither form a line that fuses with the reference positive control line nor cause deviation of the reference positive control lines.

About Equine infectious Anemia

Equine Infectious Anemia (EIA) is caused by a lentivirus. It produces acute episodes of disease that are interspersed with clinically normal periods. The acute episodes usually last for a few days and are associated with fever, thrombocytopenia, and anemia. In most infected horses, the disease episodes occur with decreasing frequency until an inapparent carrier state develops. The infection is life-long and, if stressed, inapparent carrier horses may express recurrent viremia and disease. Transmission occurs by transfer of blood from one horse to another by biting insects or contaminated needles and instruments. Transmission is most likely during episodes of clinical disease when the virus titer is highest in the blood, and is least likely during the inapparent carrier stage. Unfortunately, it is difficult to know at what stage an infected horse may be and when another episode might occur. EIA can be diagnosed by detection of antibody to the capsid p26 protein of the virus. This internal viral protein is relatively conserved among EIA virus strains, allowing detection of antibody in virtually all infected horses.

EIAV Testing Regulations

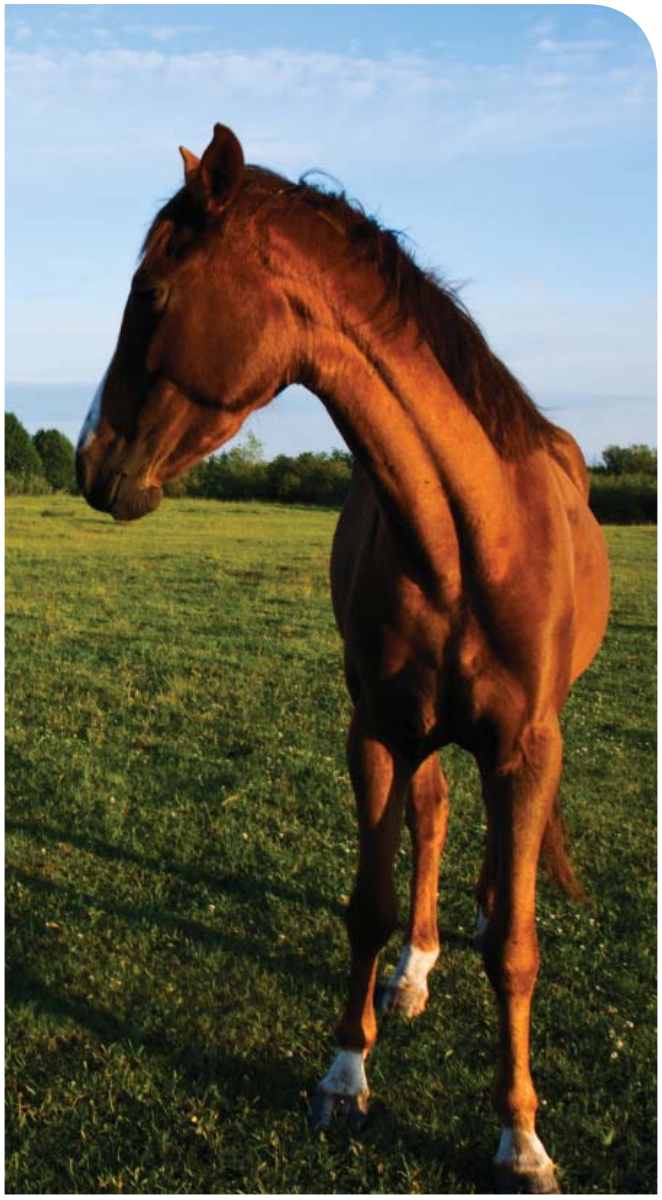
For USA Customers: VMRD, in compliance with Federal regulations, will only ship EIAV test kits to USDA-approved laboratories. The sale and use of EIAV test kits in the USA is restricted to laboratories approved by State and Federal (USDA) animal health officials. The National Veterinary Services Laboratories will periodically supply coded check test samples to evaluate the competency of the USDA-approved laboratories. For questions about becoming an EIAV-licensed testing lab contact the USDA.

		Reference Assay		
		+	–	Sum
VMRD AGID	+	131	0	131
	–	1	320	321
	Sum	132	320	452
Sensitivity: 99% • Specificity: 100%†				

Composite of all Field Tests, 1995.

† See Sensitivity and Specificity In Perspective on page 4.

*Incubation period is 24 hours.



EQUINE INFECTIOUS ANEMIA

USDA LICENSED

VMRD's Equine Infectious Anemia Virus Antibody Test Kit, ELISA

Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
290-1	equine	serum	100%	100%	35 minutes	1 stripwell plates	94
290-5						5 stripwell plates	470

VMRD's enzyme-linked, immunosorbent assay (ELISA) detects antibodies to Equine Infectious Anemia Virus (EIAV) in equine sera. Sample serum EIAV antibodies bind recombinant EIAV p26 antigen coated on the plastic wells. Non-specific antibody is washed away and plate-bound EIAV-specific antibody captures the HRP-labeled recombinant p26 protein conjugate via some free Fab antigen binding sites. Unbound conjugate is washed away and the presence of bound HRP-labeled conjugate is detected by the addition of an enzyme substrate with subsequent blue color product development. The addition of stop solution slows the enzyme reaction and changes the color product from blue to yellow. A cutoff positive control provides a color reference for visually reading results as well as an optical density (OD) reference for reading the assay with a microplate absorbance spectrophotometer. Yellow color or OD equal to or greater than the positive control indicates the presence of antibodies to EIAV p26 in sample sera. Color or OD lower than the positive control indicates the absence of detectable antibodies to EIAV p26.

VMRD's EIAV ELISA is rapid and convenient—only 35 minutes total incubation time, no sample dilution, and only two washes—yet it is highly specific and sensitive.

VMRD's ELISA sensitivity is comparable or superior to other USDA-licensed ELISAs on titrations of positive samples and in detection of "weak samples." VMRD's kit contains no thimerosal and generates no hazardous waste.

EIA Reference Serum

VMRD offers EIA positive reference sera. These equine origin sera contain a level of antibody that gives off a strong, medium or weak positive reaction in VMRD's EIA ELISA. Each vial of serum comes complete with a certificate of analysis which includes a photograph of the reaction in AGID as well as the optical densities of the ELISA reaction as run in the VMRD laboratory. These reference sera are intended as reference samples for quality assurance of EIA ELISA tests.

EIA REFERENCE SERUM	SIZE	CAT. NO.
Weak Positive	0.5 ml	RS-EIA-EW-0.5ML
Medium Positive	0.5 ml	RS-EIA-EM-0.5ML
Strong Positive	0.5 ml	RS-EIA-ES-0.5ML

† See Sensitivity and Specificity In Perspective on page 4.

		Reference Assay		
		+	–	Sum
VMRD ELISA	+	122	0	122
	–	0	421	421
	Sum	122	421	543
Sensitivity: 100% • Specificity: 100%†				

Composite of all Field Tests, 2005.

Kit Contents

Component	290-1	290-5
A. Antigen-Coated Plates	1 plates	5 plates
B. Positive Control	2 ml	4 ml
C. Negative Control	2 ml	4 ml
D. 100X Antibody-Peroxidase Conjugate	0.15 ml	0.5 ml
E. Conjugate Diluting Buffer	15 ml	60 ml
F. 10X Wash Solution Concentrate	60 ml	2 x 120 ml
G. Substrate Solution	15 ml	60 ml
H. Stop Solution	15 ml	60 ml
Test Kit Insert		

Overview of EIAV ELISA Kit Procedure

1. Place 50 µl of samples and controls into wells of the Antigen Plate
2. Incubate 10 minutes at room temperature
3. Wash 1 time with Wash Solution
4. Add 50 µl of Conjugate
5. Incubate 10 minutes at room temperature
6. Wash 4 times with Wash Solution
7. Add 50 µl of Substrate Solution
8. Incubate 15 minutes at room temperature
9. Add 50 µl of Stop Solution
10. Read at 450 nm or by eye

Samples are positive if they produce an OD greater than or equal to the mean of the positive control.

Samples are negative if they produce an OD less than the mean of the positive control.

For the test to be valid, the OD of the Positive Control should be greater than or equal to 1.5 times the OD of the Negative Control. The OD of the Negative Control should be less than or equal to 0.15.

For the test to be valid when reading by eye, the Positive Control should have visible yellow color and the Negative Control should have no or faint visible color that is less than the Positive Control.

Samples producing positive test results are to be sent in to the National Veterinary Services Laboratories (NVSL) for verification.

EQUINE ARTERITIS

NEW PRODUCT

USDA LICENSED

VMRD's Equine Arteritis Virus Antibody Test Kit, cELISA							
Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Configuration	Tests
272-2	equine	serum	96%	99%	195 minutes	2 stripwell plates	182
272-5						5 stripwell plates	455

This competitive enzyme-linked immunosorbent assay (cELISA) detects antibodies to Equine Arteritis Virus (EAV) in equine sera. Sample serum EAV antibody inhibits binding of primary monoclonal antibody. The binding of primary monoclonal antibody to the antigen-coated plate is detected with HRP-labeled secondary antibody. Finally, the presence of HRP-labeled secondary antibody is quantified by the addition of enzyme substrate and subsequent color product development from blue to yellow. Strong color development indicates little or no inhibition of primary monoclonal antibody binding and therefore the absence of antibody in sample sera to the EAV epitope recognized by the primary monoclonal antibody. Weak color development due to inhibition of the primary monoclonal antibody binding to the antigen on the solid phase indicates the presence of EAV antibodies in sample sera. This assay offers a rapid and robust alternative to serum neutralization (SN) for detection of antibody to EAV while maintaining excellent correlation with SN. Additionally, the cELISA is unaffected by cytotoxic samples, which present substantial challenges in SN.

About Equine Arteritis Virus

Equine arteritis virus causes a contagious disease of horses, equine viral arteritis, with signs that include fever, anorexia, conjunctivitis, nasal discharge, dependent edema, abortion, and infrequently death in young foals. OIE defines a horse as seropositive if it has the serum neutralization antibody titer ≥1:4 for EAV. However, determining the SN titer is time-consuming and requires certain laboratory facilities, equipment, and technical expertise to perform. Furthermore, interpretation of the SN titer of some sera can be difficult because of non-specific cellular cytotoxicity of particular samples. The test also suffers from inter-laboratory variation common to other SN assays. Without all these difficulties, and in less than 4 hours, VMRD's EAV cELISA gives results having excellent correlation with SN. It is truly a breakthrough in EAV diagnosis.

		EAV SN		
		+	–	Sum
VMRD cELISA	+	160	4**	164
	–	6*	390	396
	Sum	166	394	560
Sensitivity: 96% • Specificity: 99%†				

*Two of these six samples were confirmed to be SN negative in two subsequent re-runs. One other of these six samples was twice negative and once positive by cELISA and twice positive and once negative by SN in subsequent testing.

**Two of these four samples were confirmed SN positive in two subsequent re-runs. One additional sample of these four samples was cytotoxic in SN.

† See Sensitivity and Specificity In Perspective on page 4.

Supported in ELISAWare™ 1.4.7 or Higher

Kit Contents

Component	272-2	272-5
A. Antigen-Coated Plates	2 plates	5 plates
B. Positive Control	4 ml	4 ml
C. Negative Control	4 ml	4 ml
D. 10X Primary Antibody	3 ml	5 ml
E. 100X Secondary Antibody	0.3 ml	0.5 ml
F. Antibody Diluting Buffer	60 ml	120 ml
G. 10X Wash Solution Concentrate	120 ml	2 x 120 ml
H. Substrate Solution	30 ml	60 ml
I. Stop Solution	30 ml	60 ml
Test Kit Insert		

Overview of EAV Kit Procedure

1. Place 50 µl of samples and controls into wells of the Antigen Plate
2. Incubate 120 minutes at room temperature
3. Wash 3 times with Wash Solution
4. Add 50 µl of diluted Primary Antibody
5. Incubate 30 minutes at room temperature
6. Wash 3 times with Wash Solution
7. Add 50 µl of diluted Secondary Conjugate
8. Incubate 30 minutes at room temperature
9. Wash 3 times with Wash Solution
10. Add 50 µl of Substrate Solution
11. Incubate 15 minutes at room temperature
12. Add 50 µl of Stop Solution
13. Read at 620-650 nm

Formula for calculating % inhibition:% I = 100 [1-(Sample OD ÷ NC OD)]

Samples causing <35% inhibition are negative. Samples causing ≥ 35% inhibition are positive.

For the test to be valid, the mean of the Negative Control O.D.s must be >0.200 and <2.000.The mean of the Positive Control O.D.s must be ≥ 35%.

BOVINE SPONGIFORM ENCEPHALOPATHY

USDA LICENSED

VMRD's Bovine Spongiform Encephalopathy Antigen Test Kit, Immunohistochemistry

Catalog No.	Species	Sample	Sensitivity†	Specificity†	Assay Time	Tests
298	bovine	obex	100%	100%	4 hours	50

VMRD's BSE IHC

VMRD's Bovine Spongiform Encephalopathy (BSE) Antigen Test Kit provides a standard operating procedure for detection of prion protein (PrP) in brain and lymphoid tissues of bovines using monoclonal antibody immunohistochemistry. Antibody F99/97.6.1 recognizes a conserved epitope (QYQRES) of the ruminant prion protein. VMRD's BSE test kit contains all critical reagents necessary to perform the assay. It includes target retrieval solution, antibody diluent, antibody F99/97.6.1, anti-mouse biotinylated secondary antibody, peroxidase-labeled streptavidin and AEC substrate.

About Transmissible Spongiform Encephalopathies

Transmissible Spongiform Encephalopathies (TSEs) are fatal neurodegenerative diseases. Included among them are Bovine Spongiform Encephalopathy (BSE) of cattle, Scrapie of sheep and goats, and Chronic Wasting Disease (CWD) of mule deer and elk. They are caused by prion proteins (proteinaceous infectious particles) that lack nucleic acid. Prions are composed largely, if not entirely, of an abnormal isoform of a normal cellular protein. TSEs occur worldwide. Laboratory diagnoses of TSEs are made by histopathology, ELISA, Western blot, and immunohistochemistry (IHC). The unique advantage of the latter is its ability to confirm specificity by architectural histologic distribution of prions. No other procedure currently available can do this.

† See Sensitivity and Specificity In Perspective on page 4.

ELISAWARE™ MICROPLATE READING SOFTWARE

VMRD ELISAWare™, microplate-reading software supports all VMRD ELISA test kits. It will retrieve data from a microplate absorbance reader, display the data, validate the assay, calculate qualitative results, display the results, store sample identifications and results, and generate reports. Report options include a detailed analytical report for internal laboratory use or a client report displaying only the information relevant to a particular client. Exporting OD values to Microsoft® Excel® is as easy as clicking your mouse!

Currently, ELISAWare™ supports microplate readers from four major manufacturers. If your reader is not supported, please contact VMRD by phone, fax, or e-mail and we will do our best to add your driver to ELISAWare.™

ELISAWare™ will validate and calculate results for all of VMRD's test kits. It can retrieve ODs from a plate reader for any given ELISA but will only validate and calculate results for VMRD's assays. As we bring new kits to market we will offer upgrades that keep your software current with all of our newest ELISAs.

ELISAWare™ displays its reports in your Internet browser, providing multiple options for displaying, exporting, and analyzing ELISA results.

ELISAWare™ was developed to be user-friendly, and VMRD is committed to offering professional and courteous technical support. We developed this software with our customers in mind, and we want it to work the way you want it to work. If you would like to see a change in ELISAWare™ please let us know! We need your input to make ELISAWare™ the perfect fit for your lab.

IMMUNOFLUORESCENCE REAGENTS

Fluorescent antibody (FA) techniques, direct and indirect, are standby procedures that remain unsurpassed for versatility and accurate detection of either antigen or antibodies. The FA technique offers rapid deployment of new assays with a minimum of development time. It has the distinct advantage over other assay methods of enabling the operator to visually distinguish between specific and non-specific reactions.

Essential equipment and facilities to perform FA:

- Quality epifluorescence microscope with a mercury or xenon lamp located in a dark room to obtain optimum visualization.
- Standard biomedical laboratory equipment.

VMRD's Immunofluorescence Reagents Are Set Apart by Quality, Consistency, Standardization and Support.

- Dilutions of our secondary antibody conjugates are optimized for use in all of the applicable IFA systems that we sell.
- Anti-pathogen conjugates, positive controls and negative controls are provided at ready-to-use concentrations.
- Diluents are tested in all of our systems in which they might be used to avoid problems with background, non-specificity, or lack of signal.
- Positive and negative controls are provided for virtually all of our IFA systems.
- Positive controls are adjusted to an antibody concentration two to four two-fold dilutions below endpoint to avoid an excessively strong positive control contaminating a negative sample.
- Great care is taken with every step of conjugate production from antibody development to purification to conjugation to maximize specificity.
- Detailed, lot-specific, certificates of analysis provide information such as the strain of the pathogen, screening dilution, and recommended procedure for performing the assay.
- Lot-specific photographs of positive reactions are provided on most certificates of analysis.
- Expert consulting and technical support are provided for all FA products.

Standardization of Substrate Slide Well Sizes and Centers

In the past we have used an assortment of slide formats. A systematic standardization of well diameters and centers is now nearly complete. Slides using monolayer cellular substrates have a 7 mm well diameter (50 µl volume). All other slides will have a well diameter of 4 mm (10 µl volume) for conservation of reagents. All slides will have their wells on centers compatible with microtiter plates so that multichannel equipment can be used to load the slides.

INDIRECT IMMUNOFLUORESCENCE

Indirect immunofluorescence also known as indirect fluorescent antibody (IFA), is used to detect antibodies in body fluids of diseased animals. Materials for indirect immunofluorescence (IFA) include:

- FA Substrate Slide
  Contains 12 wells spotted with an antigen.
- Positive & Negative Controls
  Used on each slide for the purpose of comparison.
- Serum Diluting Buffer
  Used to dilute samples to working dilution. (Catalog No. FASDB-100ML or SSDB-100ML)
- Anti-Immunoglobulin Conjugate
  Used to detect bound antibody on the slide.
- Rinse Buffer
  Used for washing off unbound antibodies and conjugates. (Catalog No. FARB-4X)
- Mounting Fluid
  Used to enhance visualization of fluorescence. (Catalog No. FAMF-10ML)

Recommended Procedure for IFA

1. Warm slide to room temperature before removing from foil pouch.
2. Dilute serum in serum diluting buffer, pH 7.2. Place diluted serum on the designated wells.
3. Incubate slide in humid chamber at 37°C for 30 minutes.
4. Using a wash bottle, gently rinse slide briefly in FA rinse buffer, pH 9.0, and then soak for 10 minutes in FA rinse buffer, pH 9.0.
5. Drain slide and dry around wells by pressing blotter (included in pouch) to front surface. Place FITC-labeled anti-IgG or -IgM conjugate on the wells.
6. Incubate as in step 3.
7. Rinse as in step 4.
8. Drain slide and dry back and edges with a paper towel.Do not allow stained surface to dry. Do not rinse with water.
9. Mount with mounting fluid and view with a good quality fluorescence microscope at 100-250X. Confirmation may be made at 400X.

DIRECT IMMUNOFLUORESCENCE

Direct immunofluorescence also known as direct fluorescent antibody (FA or DFA) is used to detect antigens. Materials for direct immunofluorescence (FA) include:

- Direct FA Conjugate
  Antibodies conjugated to FITC.
- Control Slide
  Used to check performance of a conjugate.
  Contains two wells: one positive and one negative.
- Rinse Buffer
  Used for washing off unbound antibodies and conjugates. (Catalog No. FARB-4X)
- Mounting Fluid
  Used to enhance visualization of fluorescence. (Catalog No. FAMF-10ML)

Recommended Procedure for direct FA

1. Warm slide to room temperature before removing from foil pouch.
2. Place direct FA conjugate on the designated wells.
3. Incubate slide in humid chamber at 37°C for 30 minutes.
4. Using a wash bottle, gently rinse slide briefly in FA rinse buffer, pH 9.0, and then soak for 10 minutes in FA rinse buffer, pH 9.0.
5. Drain slide and dry back and edges with a paper towel. Do not allow stained surface to dry. Do not rinse with water.
6. Mount with mounting fluid and view with good quality fluorescence microscope at 100-250X. Confirmation may be made at 400X.

BOVINE IMMUNOFLUORESCENCE REAGENTS

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Babesia bigemina	Positive Blood Slide	12 well	SLD-IFA-BBI
	Positive Control for IFA (bovine)	1 ml	PC-IFA-BBI
	Negative Control for IFA (bovine)	1 ml	NC-IFA-BBI
Babesia bovis	Positive Blood Slide	12 well	SLD-IFA-BBO
	Positive Control for IFA (bovine)	1 ml	PC-IFA-BBO
	Negative Control for IFA (bovine)	1 ml	NC-IFA-BBO
Bluetongue Virus (BTV)	FA Substrate Slide	12 well	SLD-IFA-BTV
	Positive Control for IFA (bovine)	1 ml	PC-IFA-BTV
	Negative Control for IFA (bovine)	1 ml	NC-IFA-BTV
	FITC Conjugate (murine)	1 ml	CJ-F-BTV-MAB-1ML
	FITC Conjugate (murine)	10 ml	CJ-F-BTV-MAB-10ML
Bovine Adenovirus Type 1 (BAV-1)	FITC Conjugate (caprine)	1 ml	CJ-F-BAV1-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-BAV1-10ML
Bovine Adenovirus Type 3 (BAV-3)	FA Control Slide	2 well	SLD-FAC-BAV3
	FA Substrate Slide	12 well	SLD-IFA-BAV3
	FITC Conjugate (caprine)	1 ml	CJ-F-BAV3-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-BAV3-10ML
Bovine Adenovirus Type 5 (BAV-5)	FA Control Slide	2 well	SLD-FAC-BAV5
	FITC Conjugate (bovine)	1 ml	CJ-F-BAV5-1ML
	FITC Conjugate (bovine)	10 ml	CJ-F-BAV5-10ML
Bovine Coronavirus (BCV)	FA Control Slide	2 well	SLD-FAC-BCV
	FITC Conjugate (bovine)	1 ml	CJ-F-BCV-1ML
	FITC Conjugate (bovine)	10 ml	CJ-F-BCV-10ML
Infectious Bovine Rhinotracheitis/Bovien Herpes Virus Type 1 (IBR/BHV-1)	FA Control Slide	2 well	SLD-FAC-IBR
	FA Substrate Slide	12 well	SLD-IFA-IBR
	Positive Control for IFA (bovine)	1 ml	PC-IFA-IBR
	Negative Control for IFA (bovine)	1 ml	NC-IFA-IBR
	FITC Conjugate (caprine)	1 ml	CJ-F-IBR-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-IBR-10ML
Bovine Leukemia Virus (BLV)	FA Control Slide	2 well	SLD-FAC-BLV
	FA Substrate Slide	12 well	SLD-IFA-BLV
	Positive Control for IFA (bovine)	1 ml	PC-IFA-BLV
	Negative Control for IFA (bovine)	1 ml	NC-IFA-BLV
Bovine Parainfluenza Virus Type 3 (PI-3)	FA Control Slide	2 well	SLD-FAC-PI3
	FA Substrate Slide	12 well	SLD-IFA-PI3
	Positive Control for IFA (bovine)	1 ml	PC-IFA-PI3
	Negative Control for IFA (bovine)	1 ml	NC-IFA-PI3
	FITC Conjugate (caprine)	1 ml	CJ-F-PI3-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-PI3-10ML
Bovine Parvovirus (BPV)	FA Control Slide	2 well	SLD-FAC-BPV
	FITC Conjugate (caprine)	1 ml	CJ-F-BPV-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-BPV-10ML
Bovine Respiratory Syncytial Virus (BRSV)	FA Control Slide	2 well	SLD-FAC-BRSV
	FA Substrate Slide	12 well	SLD-IFA-BRSV
	Positive Control for IFA (bovine)	1 ml	PC-IFA-BRSV
	Negative Control for IFA (bovine)	1 ml	NC-IFA-BRSV
	FITC Conjugate (caprine)	1 ml	CJ-F-BRSV-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-BRSV-10ML
Bovine Viral Diarrhea Virus (BVDV)	FA Control Slide	2 well	SLD-FAC-BVD
	FA Substrate Slide	12 well	SLD-IFA-BVD
	Positive Control for IFA (bovine)	1 ml	PC-IFA-BVD

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Bovine Viral Diarrhea Virus (BVDV) continued	Negative Control for IFA (bovine)	1 ml	NC-IFA-BVD
	FITC Conjugate (porcine)	1 ml	CJ-F-BVD-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-BVD-10ML
Clostridium chauvoei *Clostridium novyi* *Clostridium septicum* *Clostridium sordellii* *Clostridium* spp. 4-way	see page 22		
Neospora caninum	see page 22		
Reovirus	FA Control Slide	2 well	SLD-FAC-REO
	FITC Conjugate (caprine)	1 ml	CJ-F-REO-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-REO-10ML

CANINE IMMUNOFLUORESCENCE REAGENTS

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Borrelia burgdorferi Lyme Disease	see page 21		
Brucella canis Canine Brucellosis	FA Substrate Slide	12 well	SLD-IFA-CB
	Positive Control for IFA (canine)	1 ml	PC-IFA-CB
	Negative Control for IFA (canine)	1 ml	NC-IFA-CB
Canine Adenovirus (CAV-2) When necessary, CAV-1 and CAV-2 may be differentiated with our monoclonal antibodies, 2E10-H2 and 4H1-A7, respectively (page 27).	FA Control Slide	2 well	SLD-FAC-CAV2
	FA Substrate Slide	12 well	SLD-IFA-CAV2
	Positive Control for IFA (canine)	1 ml	PC-IFA-CAV
	Negative Control for IFA (canine)	1 ml	NC-IFA-CAV
	FITC Conjugate (porcine) Detects at least some isolates of CAV-1	1 ml	CJ-F-CAV-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-CAV-10ML
Canine Coronavirus (CCV)	FA Control Slide	2 well	SLD-FAC-CCV
	FA Substrate Slide	12 well	SLD-IFA-CCV
	FITC Conjugate (porcine)	1 ml	CJ-F-CCV-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-CCV-10ML
Canine Distemper Virus (CDV)	FA Control Slide	2 well	SLD-FAC-CDV
	FA Substrate Slide	12 well	SLD-IFA-CDV
	IgG Positive Control for IFA (canine)	1 ml	PC-IFA-CDV-G
	IgM Positive Control for IFA (canine)	1 ml	PC-IFA-CDV-M
	Polyclonal FITC Conjugate (caprine)	1 ml	CJ-F-CDV-1ML
	Polyclonal FITC Conjugate (caprine)	10 ml	CJ-F-CDV-10ML
	Monoclonal FITC Conjugate (murine)	1 ml	CJ-F-CDV-MAB-1ML
	Monoclonal FITC Conjugate (murine)	10 ml	CJ-F-CDV-MAB-10ML
	Positive Blood Smear	each	SLD-BSP-CDV
	Negative Blood Smear	each	SLD-BSN-CDV
Canine Herpesvirus (CHV)	FA Substrate Slide	12 well	SLD-IFA-CHV
	Positive Control for IFA (canine)	1 ml	PC-IFA-CHV
	FITC Conjugate (canine)	1 ml	CJ-F-CHV-1ML
	FITC Conjugate (canine)	10 ml	CJ-F-CHV-10ML
Canine Parainfluenza Type 2 (CPI)	FA Control Slide	2 well	SLD-FAC-CPI
	FA Substrate Slide	12 well	SLD-IFA-CPI
	Positive Control for IFA (canine)	1 ml	PC-IFA-CPI
	Negative Control for IFA (canine)	1 ml	NC-IFA-CPI
	FITC Conjugate (porcine)	1 ml	CJ-F-CPI-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-CPI-10ML
Canine Parvovirus (CPV)	FA Control Slide	2 well	SLD-FAC-CPV
	FA Substrate Slide	12 well	SLD-IFA-CPV
	IgG Positive Control for IFA (canine)	1 ml	PC-IFA-CPV-G

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Canine Parvovirus (CPV) continued	IgM Positive Control for IFA (canine)	1 ml	PC-IFA-CPV-M
	FITC Conjugate (murine)	1 ml	CJ-F-CPV-MAB-1ML
	FITC Conjugate (murine)	10 ml	CJ-F-CPV-MAB-10ML
Ehrlichia canis	FA Substrate Slide	12 well	SLD-IFA-EC
	Positive Control for IFA (canine)	1 ml	PC-IFA-EC
	Negative Control for IFA (canine)	1 ml	NC-IFA-EC
Leishmania infantum	FA Substrate Slide	12 well	SLD-IFA-LSH
	Positive Control for IFA (canine)	1 ml	PC-IFA-LSH
	Negative Control for IFA (canine)	1 ml	NC-IFA-LSH
Neospora caninum	see page 22		
Rabies Recombinant Nucleoprotein	see page 22		
Rickettsia rickettsii Rocky Mountain Spotted Fever (RMSF)	FA Substrate Slide	12 well	SLD-IFA-RMSF
	Positive Control for IFA (canine)	1 ml	PC-IFA-RMSF
	Negative Control for IFA (canine)	1 ml	NC-IFA-RMSF

EQUINE IMMUNOFLUORESCENCE REAGENTS

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Equine Herpesvirus Type 1/ Equine Rhinopneumonitis Virus (EHV-1/ERV)	FA Control Slide	2 well	SLD-FAC-ERV
	FA Substrate Slide	12 well	SLD-IFA-ERV
	Positive Control for IFA (equine)	1 ml	PC-IFA-ERV-EQ
	Positive Control for IFA (llama)	1 ml	PC-IFA-ERV-LL
	FITC Conjugate (caprine)	1 ml	CJ-F-ERV-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-ERV-10ML
Influenza Virus Type A	FA Control Slide	2 well	SLD-FAC-FLUA
	FA Substrate Slide	12 well	SLD-IFA-FLUA
Neorickettsia risticii	FA Substrate Slide	12 well	SLD-IFA-NR
Rabies Recombinant Nucleoprotein	see page 22		

FELINE IMMUNOFLUORESCENCE REAGENTS

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Bartonella henselae	FA Substrate Slide	12 well	SLD-IFA-BH
	IgG Positive Control for IFA (feline)	1 ml	PC-IFA-BH-G
	IgM Positive Control for IFA (feline)	1 ml	PC-IFA-BH-M
Feline Calicivirus (FCV)	FA Control Slide	2 well	SLD-FAC-FCV
	FA Substrate Slide	12 well	SLD-IFA-FCV
	Positive Control for IFA (Feline)	1ml	PC-IFA-FCV
	Negative Control for IFA (Feline	1ml	NC-IFA-FCV
Feline Coronaviruses Feline Infectious Peritonitis (FIP-1 & FIP-2)	FIP-1 FA Control Slide	2 well	SLD-FAC-FIP1
	FIP-2 FA Control Slide	2 well	SLD-FAC-FIP2
	FIP-1 FA Substrate Slide	12 well	SLD-IFA-FIP1
	FIP-2 FA Substrate Slide	12 well	SLD-IFA-FIP2
	FIP-1 Positive Control for IFA (feline)	1 ml	PC-IFA-FIP1
	FIP-2 Positive Control for IFA (feline)	1 ml	PC-IFA-FIP2
	FIP-1 Negative Control for IFA (feline)	1 ml	NC-IFA-FIP1
	FIP-2 Negative Control for IFA (feline)	1 ml	NC-IFA-FIP2
	FITC Conjugate (feline & porcine)	1 ml	CJ-F-FIP-1ML
	FITC Conjugate (feline & porcine)	10 ml	CJ-F-FIP-10ML
Feline Herpesvirus/ Feline Viral Rhinotracheitis (FHV/FVR)	FA Control Slide	2 well	SLD-FAC-FVR
	FA Substrate Slide	12 well	SLD-IFA-FVR
	Positive Control for IFA (feline)	1 ml	PC-IFA-FVR
	FITC Conjugate (feline)	1 ml	CJ-F-FVR-1ML
	FITC Conjugate (feline)	10 ml	CJ-F-FVR-10ML

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Feline Leukemia Virus (FeLV)	FA Control Slide	2 well	SLD-FAC-FELV
	Primary Antibody for IFA (caprine)	10 ml	AB1-FELV
	Secondary Antibody for IFA (equine)	10 ml	AB2-FELV
	Positive Blood Smear	each	SLD-BSP-FELV
	Negative Blood Smear	each	SLD-BSN-FELV
Feline Panleukopenia Virus (FPLV)	FA Control Slide	2 well	SLD-FAC-FPL
	FA Substrate Slide	12 well	SLD-IFA-FPL
	FITC Conjugate (murine)	1 ml	CJ-F-FPL-MAB-1ML
	FITC Conjugate (murine)	10 ml	CJ-F-FPL-MAB-10ML
Toxoplasma gondii	see page 22		

PORCINE IMMUNOFLUORESCENCE REAGENTS

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Porcine Adenovirus (PAV)	FITC Conjugate (porcine)	1 ml	CJ-F-PAV-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-PAV-10ML
Porcine Circovirus Type 1 (PCV-1)	FA Control Slide	2 well	SLD-FAC-PCV1
	FA Substrate Slide	12 well	SLD-IFA-PCV1
Porcine Circovirus Type 2 (PCV-2)	FA Control Slide	2 well	SLD-FAC-PCV2
	FA Substrate Slide	12 well	SLD-IFA-PCV2
	Positive Control for IFA (porcine)	1 ml	PC-IFA-PCV2
	Negative Control for IFA (porcine)	1 ml	NC-IFA-PCV2
	FITC Conjugate (porcine)	1 ml	CJ-F-PCV2-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-PCV2-10ML
Porcine Circovirus Type 1 & 2 (PCV1&2)	FITC Conjugate (porcine)	1ml	CJ-F-PCV1&2-1ML
	FITC Conjugate (porcine)	10ml	CJ-F-PCV1&2-10ML
Porcine Hemagglutination Encephalomyelitis Virus (PHEV)	FA Substrate Slide	12 well	SLD-IFA-PHEV
	FITC Conjugate (porcine)	1 ml	CJ-F-PHEV-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-PHEV-10ML
Porcine Parvovirus (PPV)	FA Control Slide	2 well	SLD-FAC-PPV
	FA Substrate Slide	12 well	SLD-IFA-PPV
	FITC Conjugate (porcine)	1 ml	CJ-F-PPV-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-PPV-10ML
Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)	FA Control Slide	2 well	SLD-FAC-PRRS
	FA Substrate Slide	12 well	SLD-IFA-PRRS
	Positive Control for IFA (porcine)	1 ml	PC-IFA-PRRS
	Negative Control for IFA (porcine)	1 ml	NC-IFA-PRRS
Transmissible Gastroenteritis Virus (TGEV)	FA Control Slide	2 well	SLD-FAC-TGE
	FA Substrate Slide	12 well	SLD-IFA-TGE
	Positive Control for IFA (porcine)	1 ml	PC-IFA-TGE
	Negative Control for IFA (porcine)	1 ml	NC-IFA-TGE
	FITC Conjugate (porcine)	1 ml	CJ-F-TGE-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-TGE-10ML

MULTIPLE SPECIES IMMUNOFLUORESCENCE REAGENTS

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Anaplasma phagocytophila (formerly *Ehrlichia equi*)	FA Substrate Slide	12 well	SLD-IFA-AP
	Positive Control for IFA (equine)	1 ml	PC-IFA-AP
	Negative Control for IFA (equine)	1 ml	NC-IFA-AP
Borrelia burgdorferi Lyme Disease	FA Substrate Slide	12 well	SLD-IFA-LD
	Positive Control for IFA (canine)	1 ml	PC-IFA-LD
	Negative Control for IFA (canine)	1 ml	NC-IFA-LD

INFECTIOUS AGENT	PRODUCT TYPE (ORIGIN)	SIZE	CATALOG NUMBER
Clostridium chauvoei	FA Substrate Slide	12 well	SLD-IFA-CCO
	FITC Conjugate (caprine)	1 ml	CJ-F-CCO-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-CCO-10ML
Clostridium novyi	FA Substrate Slide	12 well	SLD-IFA-CNO
	FITC Conjugate (caprine)	1 ml	CJ-F-CNO-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-CNO-10ML
Clostridium septicum	FA Substrate Slide	12 well	SLD-IFA-CSE
	FITC Conjugate (bovine)	1 ml	CJ-F-CSE-1ML
	FITC Conjugate (bovine)	10 ml	CJ-F-CSE-10ML
Clostridium sordellii	FA Substrate Slide	12 well	SLD-IFA-CSO
	FITC Conjugate (caprine)	1 ml	CJ-F-CSO-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-CSO-10ML
Clostridium spp. 4-way	FA Substrate Slide	4 well	SLD-IFA-C4
Neospora caninum	FA Substrate Slide	12 well	SLD-IFA-NC
	Positive Control for IFA (bovine)	1 ml	PC-IFA-NC-BOV
	Positive Control for IFA (canine)	1 ml	PC-IFA-NC-CAN
	Negative Control for IFA (bovine)	1 ml	NC-IFA-NC-BOV
	Negative Control for IFA (canine)	1 ml	NC-IFA-NC-CAN
	FITC Conjugate (caprine)	1 ml	CJ-F-NC-1ML
	FITC Conjugate (caprine)	10 ml	CJ-F-NC-10ML
Rabies Recombinant Nucleoprotein	FA Control Slide	2 well	SLD-FAC-RAB
Toxoplasma gondii	FA Substrate Slide	12 well	SLD-IFA-TOXO
	IgG Positive Control for IFA (feline)	1 ml	PC-IFA-TOXO-FEL-G
	IgM Positive Control for IFA (feline)	1 ml	PC-IFA-TOXO-FEL-M
	Negative Control for IFA (feline)	1 ml	NC-IFA-TOXO-FEL
Vesicular Stomatitis Virus (VSV)	FITC Conjugate (porcine)	1 ml	CJ-F-VSV-1ML
	FITC Conjugate (porcine)	10 ml	CJ-F-VSV-10ML

IMMUNOFLUORESCENCE BUFFERS & MOUNTING FLUID

RINSE BUFFERS & MOUNTING FLUID	SIZE	CATALOG NUMBER
FA Conjugate Diluting Buffer with 1% BSA	100 ml	FACDB-100ML
FA Serum Diluting Buffer with 1% BSA	100 ml	FASDB-100ML
FA Special Serum Diluting Buffer with 10% Bovine Serum	100 ml	SSDB-100ML
FA Mounting Fluid	10 ml	FAMF-10ML
FA Rinse Buffer, powdered (makes 4 L)	1 pkg	FARB-4X

IMMUNOFLUORESCENCE REAGENT SECONDARY CONJUGATES

FITC ANTI-IMMUNOGLOBULIN CONJUGATES	SIZE	CATALOG NUMBER
Anti-Bovine $IgG_{1,2}$, affinity purified, heavy and light chains (caprine origin)	1 ml	CJ-F-BOVG-AP-1ML
	10 ml	CJ-F-BOVG-AP-10ML
Anti-Canine IgG (caprine origin)	1 ml	CJ-F-CANG-1ML
	10 ml	CJ-F-CANG-10ML
Anti-Canine IgG, affinity purified (rabbit origin)	1 ml	CJ-F-CANG-AP-1ML
	10 ml	CJ-F-CANG-AP-10ML
Anti-Canine IgM, affinity purified, heavy chain specific (caprine origin)	1 ml	CJ-F-CANM-AP-1ML
	10 ml	CJ-F-CANM-AP-10ML
Anti-Equine IgG (caprine origin)	1 ml	CJ-F-EQUG-1ML
	10 ml	CJ-F-EQUG-10ML

FITC ANTI-IMMUNOGLOBULIN CONJUGATES	SIZE	CATALOG NUMBER
Anti-Equine IgG, affinity purified (caprine origin)	1 ml 10 ml	CJ-F-EQUG-AP-1ML CJ-F-EQUG-AP-10ML
Anti-Feline IgG (caprine origin)	1 ml 10 ml	CJ-F-FELG-1ML CJ-F-FELG-10ML
Anti-Feline IgM, affinity purified, heavy chain specific (caprine origin)	1 ml 10 ml	CJ-F-FELM-AP-1ML CJ-F-FELM-AP-10ML
Anti-Goat IgG (rabbit origin)	1 ml 10 ml	CJ-F-CAPG-1ML CJ-F-CAPG-10ML
Anti-Llama IgG, affinity purified, heavy and light chains (caprine origin)	1 ml 10 ml	CJ-F-CAMG-AP-1ML CJ-F-CAMG-AP-10ML
Anti-Mouse IgG, affinity purified (rabbit origin)	1 ml 10 ml	CJ-F-MURG-AP-1ML CJ-F-MURG-AP-10ML
Anti-Mouse IgM, affinity purified (rabbit origin)	1 ml 10 ml	CJ-F-MURM-AP-1ML CJ-F-MURM-AP-10ML
Anti-Pig IgG, affinity purified, heavy and light chains (caprine origin)	1 ml 10 ml	CJ-F-PORG-AP-1ML CJ-F-PORG-AP-10ML

ANTI-SPECIES IMMUNOFLUORSCENSE REAGENTS

FITC ANTI-CELL CONJUGATES	SIZE	CATALOG NUMBER
Anti-Bovine Cell (porcine origin)	1 ml 10 ml	CJ-F-BOVC-1ML CJ-F-BOVC-10ML
Anti-Canine Cell (caprine origin)	1 ml 10 ml	CJ-F-CANC-1ML CJ-F-CANC-10ML
Anti-Equine Cell (caprine origin)	1 ml 10 ml	CJ-F-EQUC-1ML CJ-F-EQUC-10ML
Anti-Feline Cell (caprine origin)	1 ml 10 ml	CJ-F-FELC-1ML CJ-F-FELC-10ML
Anti-Porcine Cell, (caprine origin)	1 ml 10 ml	CJ-F-PORC-1ML CJ-F-PORC-10ML

.

POLYCLONAL ANTIBODIES

MONOCLONAL ANTIBODIES

ANTIBODY PRICING

Most of VMRD's monoclonal antibodies are produced in mice and sold as clarified and filtered ascites fluid which is preserved with sodium azide. Mouse ascites monoclonals are packaged in liquid form, usually at a concentration of 1.0 mg/ml.

VMRD's monoclonals are available in three sizes: 0.1 ml; 0.5 ml; and 1.0 ml. To order simply choose the cell line and amount you require. The prices are determined accordingly.

SHIPPING OF ANTIBODIES

Monoclonal Antibodies will be shipped within one business day when the order is received before 12 pm (Pacific Time Zone). If the order is received after this time the order will be shipped the following day.

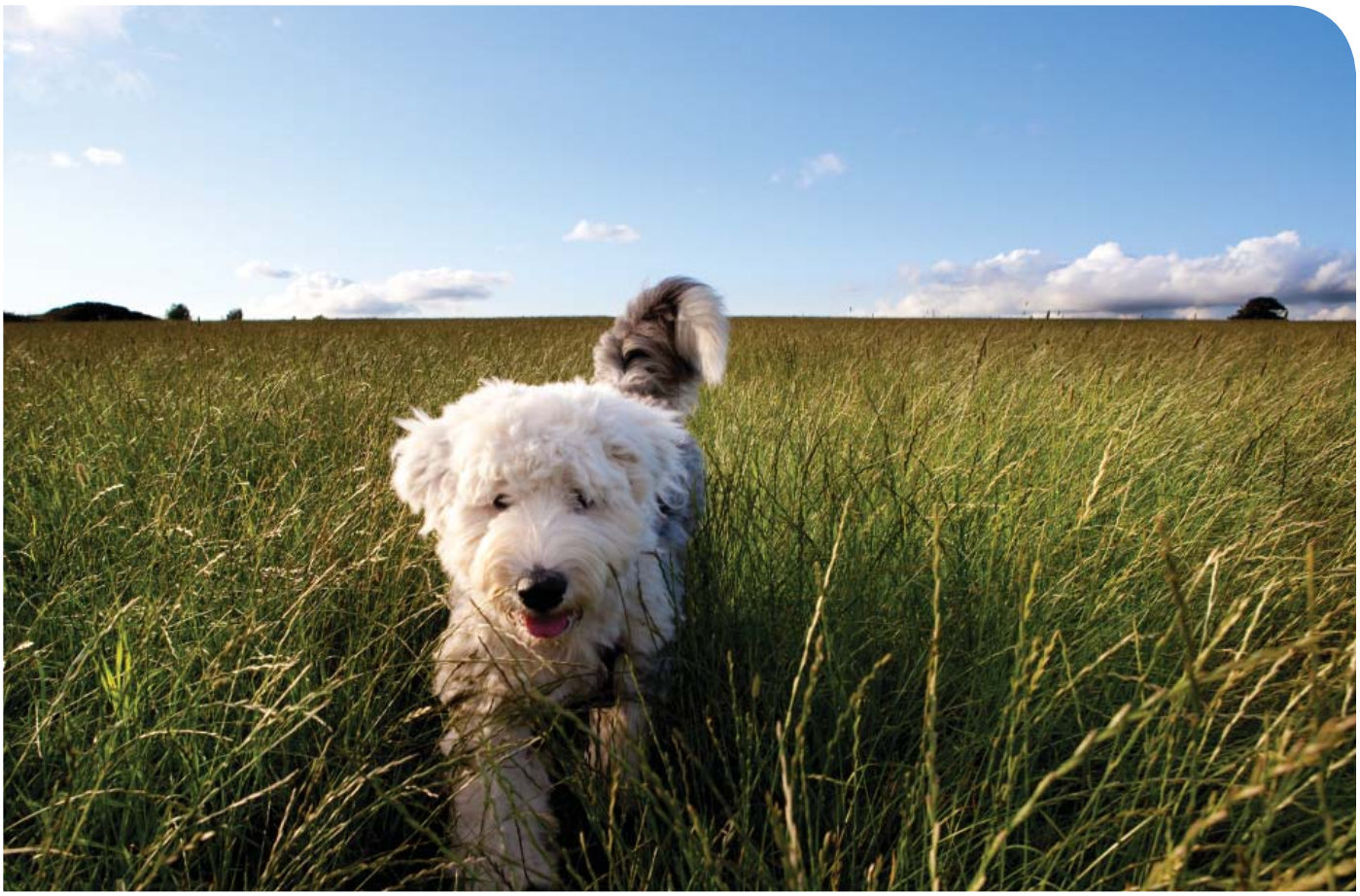
CUSTOM ANTIBODY PRODUCTION

In addition to offering the antibodies listed on the following pages, VMRD, Inc. provides expert custom antibody production services to scientific investigators and clinical diagnosticians. You may have purified an antigen or have access to an antigen, yet find antiserum production inconvenient, logistically impossible, or prohibitively expensive. Our objective is to produce the highest-quality antiserum possible against the antigen you provide. Antisera are produced in a USDA-approved licensed facility and in full compliance with the Animal Welfare Act.

POLYCLONAL ANTIBODIES

POLYCLONAL ANTISERA TO INFECTIOUS AGENTS

SPECIFICITY	SIZE	CATALOG NUMBER
Bluetongue Virus (BTV/EHDV), porcine origin	2 ml	PAB-BTV
Bovine Adenovirus Type 1 (BAV-1), caprine origin	2 ml	PAB-BAV1
Bovine Herpesvirus Type 1/Infectious Bovine Rhinotracheitis Virus (IBR/BHV-1), caprine origin	2 ml	PAB-IBR
Bovine Leukemia Virus (BLV), bovine origin	2 ml	PAB-BLV
Bovine Parainfluenza Virus Type 3 (PI-3), caprine origin	2 ml	PAB-PI3
Bovine Parvovirus (BPV), caprine origin	2 ml	PAB-BPV
Bovine Respiratory Syncytial Virus (BRSV), caprine origin	2 ml	PAB-BRSV
Bovine Viral Diarrhea Virus (BVDV), caprine origin	2 ml	PAB-BVD
Canine Coronavirus (CCV), porcine origin	2 ml	PAB-CCV
Canine Distemper Virus (CDV), caprine origin	2 ml	PAB-CDV
Canine Parainfluenza Virus (CPI-2), porcine origin	2 ml	PAB-CPI
Equine Herpesvirus Type 1/Equine Rhinopneumonitis Virus (EHV-1/ERV), caprine origin	2 ml	PAB-ERV
Feline Infectious Peritonitis Virus Type 1 (FIP-1), feline origin	2 ml	PAB-FIP1
Feline Infectious Peritonitis Virus Type 2 (FIP-2), feline origin	2 ml	PAB-FIP2
Neospora caninum, caprine origin	2 ml	PAB-NC
Porcine Circovirus Type 1&2 (PCV1&2), porcine origin	2 ml	PAB-PCV1&2
Porcine Circovirus (PCV-2), porcine origin	2 ml	PAB-PCV2
Porcine Parvovirus (PPV), porcine origin	2 ml	PAB-PPV
Toxoplasma gondii, caprine origin	2 ml	PAB-TOXO
Transmissible Gastroenteritis Virus (TGEV), feline origin	2 ml	PAB-TGE



MONOCLONAL ANTIBODIES

MONOCLONAL ANTIBODIES TO INFECTIOUS AGENTS

SPECIFICITY	ORIGIN	ISOTYPE	CELL LINE
Anaplasma marginale (MSP1)	Mouse Ascites	IgG_3	15D2
Anaplasma marginale (MSP2)	Mouse Ascites	IgG_1	O50A2
Babesia bigemina (p36, p20 and p16)	Mouse Ascites	IgG_1	14.52.3.4
Babesia bigemina (p58)	Mouse Ascites	IgG_1	14.16.1.7
Babesia bigemina (p72)	Mouse Ascites	IgG_1	14.29
Bovine Herpesvirus Type 5 (BHV-5) (gC)	Mouse Ascites	IgM	L6G
Bovine Leukemia Virus (BLV) (gp51 - G)	Mouse Ascites	IgG_1	BLV1
Bovine Leukemia Virus (BLV) (gp51 - D-D')	Mouse Ascites	IgG_1	BLV2
Bovine Leukemia Virus (BLV) (p24)	Mouse Ascites	IgG_1	BLV3
Bovine Parainfluenza Virus Type 3 (PI-3) (p69)	Mouse Ascites	IgG_2a	1B6
Bovine Parainfluenza Virus Type 3 (PI-3) (p69)	Mouse Ascites	IgG_2a	2A2
Bovine Viral Diarrhea Virus (BVDV) (gp55)	Mouse Ascites	IgG_2a	D89
Bovine Viral Diarrhea Virus Type 1 (BVDV) E2 (gp53)	Mouse Ascites	IgG_2a	157
Bovine Viral Diarrhea Virus Type 2 (BVDV) E2 (gp53) Type 1&2	Mouse Ascites	IgG_2a	BA-2
Bovine Viral Diarrhea Virus Type 2 (BVDV) E2 (gp53)	Mouse Ascites	IgG_2a	BA-29
Bovine Viral Diarrhea Virus Types 1 & 2 (BVDV) E2 (gp53)	Mouse Ascites	IgG_1	BA-26(a)
Bovine Viral Diarrhea Virus Types 1 & 2 (BVDV) E2 (gp53)	Mouse Ascites	IgG_2b	348
Bovine Viral Diarrhea Virus Types 1 & 2 (BVDV)	Mouse Ascites	IgG_1	3.12F1

MONOCLONAL ANTIBODIES TO INFECTIOUS AGENTS

SPECIFICITY	ORIGIN	ISOTYPE	CELL LINE
Canine Adenovirus Type 1 (CAV-1)	Mouse Ascites	IgG_1	2E10-H2
Canine Adenovirus Type 2 (CAV-2)	Mouse Ascites	IgG_2a	4H1-A7
Canine Distemper Virus (CDV) (nucleoprotein)	Mouse Ascites	IgG_2b	CDV-NP
Canine Distemper Virus (CDV) (envelope)	Mouse Ascites	IgG_1	1C42H11
Canine Parainfluenza Virus Type 2 (CPI-2)	Cell Culture	IgG_2b, k light chain	CPI-A-CA
Canine Parvovirus (CPV)	Mouse Ascites	IgG_2a	A3B10
(CAEV-63, CAEV-Co, MVV, OPPV)	Mouse Ascites	IgG_1	CAEP5A1
(CAEV-63, CAEV-Co, MVV)	Mouse Ascites	IgG_1	CAEP10A1
(CAEV-63, CAEV-Co, MVV)	Mouse Ascites	IgG_1	CAEP8B1
(CAEV-63, CAEV-Co)	Mouse Ascites	IgG_1	CAEP13B1
(CAEV-63)	Mouse Ascites	IgG_1	CAEP12A1
Cryptosporidium parvum	Mouse Ascites	IgM	16.87.16
Equine Arteritis Virus (EAV) (nucleocapsid)	Mouse Ascites	IgG_1	17D3
Equine Infectious Anemia Virus (EIAV) (p26)	Mouse Ascites	IgG_1	EIAP6A1
Infectious Bovine Rhinotracheitis (IBR/BHV-1) (gB - gI)	Mouse Ascites	IgG_2b	D9E7
Infectious Bovine Rhinotracheitis (IBR/BHV-1)(gB - gI)	Mouse Ascites	IgG_2b	H2
Infectious Bovine Rhinotracheitis (IBR/BHV-1)(gC - gIII)	Mouse Ascites	IgG_1	G2
Infectious Bovine Rhinotracheitis (IBR/BHV-1) (gC - gIII)	Mouse Ascites	IgG_2b	F2
Infectious Bovine Rhinotracheitis (IBR/BHV-1) (gD - gIV)	Mouse Ascites	IgG_1	1B8-F11
Leptospira interrogans serovar australis	Mouse Ascites	IgG_3	F90 C6
Leptospira interrogans serovar canicola	Mouse Ascites	IgM	F152 C11
Leptospira interrogans serovar copenhageni	Mouse Ascites	IgG_1	F70 C24
Leptospira interrogans serovar hardjo	Mouse Ascites	IgG_1	F22 C6
Leptospira interrogans serovar icterohaemorrhagiae	Mouse Ascites	IgG_3	F70 C14
Leptospira interrogans serovar pomona	Mouse Ascites	IgM	F48 C6
Malignant Catarrhal Fever Virus (MCFV)	Cell Culture	IgG_2b	15-A
Malignant Catarrhal Fever Virus (MCFV)	Mouse Ascites	IgG_2b	15-A-AC
Malignant Catarrhal Fever Virus (MCFV)	Mouse Ascites	IgG_2a	N10-A
Malignant Catarrhal Fever Virus (MCFV) (p24)	Mouse Ascites	IgG_1	36-A
Malignant Catarrhal Fever Virus (MCFV)	Mouse Ascites	IgM	N55-A
Neospora caninum (gp65)	Mouse Ascites	IgG_1	5B6-25
Porcine Parvovirus (PPV)	Mouse Ascites	IgG_1	3C9D11H11
Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) (nucleocapsid)	Mouse Ascites	IgG_2b	2D6
Prion Protein (IHFG)	Mouse Ascites	IgG_1	F89/160.1.5
Prion Protein (QYQRES)	Cell Culture	IgG_1	F99/97.6.1
Prion Protein (QYQRES)	Mouse Ascites	IgG_1	F99/97.6.1-AC
Pseudorabies Virus (gp50)	Mouse Ascites	IgG_2b	6D8-MB4
Psuedorabies Virus (gIII)	Mouse Ascites	IgG_2b	3G9F3

COOMBS REAGENTS

The Coombs test, also called direct antiglobulin test, is designed to detect immune-mediated erythrocyte destruction which occurs in autoimmune hemolytic anemias, and in some cases with infections and neoplastic disorders. Hemolysis in these diseases is caused by the erythrocytes being coated with antibody (IgG, IgM) and/or complement components (C3). Coated erythrocytes are either lysed in the blood-stream or removed by phagocytes.

VMRD's Coombs reagent is a caprine-origin antiserum against IgG, IgM, and C3. It does not agglutinate normal erythrocytes, but does agglutinate erythrocytes coated with IgG, IgM, and/or C3. Agglutination, which may be observed macroscopically or microscopically, is indicative of a Coombs positive.

CANINE COOMBS

All dogs with anemia (including that caused by intravascular and extravascular hemolysis) of unknown origin are reasonable candidates for evaluation by Coombs testing. VMRD's Canine Anti-Sheep Red Blood Cell (SRBC) reagent is used to prepare a positive control.

CANINE COOMBS TEST	SIZE	CATALOG NUMBER
Canine Coombs	2 ml	392-2
Canine Coombs	5 ml	392-5
Canine Anti-Sheep Red Blood Cells (SRBC)	1 ml	372-2

EQUINE COOMBS

All horses with anemia (including that caused by intravascular and extravascular hemolysis) of unknown origin are reasonable candidates for evaluation by Coombs testing. Foals with neonatal isoerythrolysis are often Coombs positive. VMRD's Equine Anti-Sheep Red Blood Cell (SRBC) reagent is used to prepare a positive control.

EQUINE COOMBS TEST	SIZE	CATALOG NUMBER
Equine Coombs	2 ml	492-2
Equine Anti-Sheep Red Blood Cells (SRBC)	1 ml	472-2

FELINE COOMBS

All cats with anemia (including that caused by intravascular and extravascular hemolysis) of unknown origin are reasonable candidates for evaluation by Coombs testing.

FELINE COOMBS TEST	SIZE	CATALOG NUMBER
Feline Coombs	2 ml	592-2

ORDERING INFORMATION

Orders may be placed by E-mail, FAX, telephone or mail/post.

E: order@vmrd.com

P: 509-334-5815

P: 800-222-8673 (toll free)

F: 509-332-5356

Mailing Address:

VMRD, Inc.
P.O. Box 502
Pullman, WA 99163, USA

Business Hours

Monday-Friday, 7 am - 4 pm (Pacific Time Zone)

Backorders

Out-of-stock items are placed on backorder and shipped as soon as available.

Custom Orders

Custom orders are prepared on a contract basis only. Please contact us for information.

Returns

Call for authorization prior to returning any item. Returns are subject to a 25% restock fee. Custom orders may not be returned.

Technical Assistance

Our staff is available to assist as needed. Consulting and research services are available on a contract basis.

Product Information

For information throughout the year on VMRD products visit our website, www.vmrd.com; send an e-mail to order@vmrd.com or techserve@vmrd.com; or call 800-222-8673.

Ordering Procedures

When placing an order, please supply the appropriate customer identification number, catalog number(s), quantity of the items needed, and a brief description of each product.

Invoicing Procedures

Billing invoices are mailed separately following shipment. Payment terms are Net 30 days, payable in U.S. Dollars. Please inquire to arrange payment by wire transfer. Payment may also be made by Visa, MasterCard, or American Express credit cards. Please specify payment by credit card when the order is placed. Do not use e-mail to send credit card information; please use telephone of fax. Invoice questions may be directed to our Customer Service Department at 509-334-5815 or 800-222-8673.

Shipping Procedures

Most items ship within one business day from the date the order is received, except where special certificates are required. Monoclonal Antibodies will be shipped within one business day when the order is received before 12 pm (Pacific Time Zone). If the order is received after this time the order will be shipped the following day. Shipping fees are prepaid and added to the invoice, unless the recipient provides courier account information.

International Orders

International orders should include a copy of any necessary import permits or other documentation required for customs clearance. Payment of duties and taxes are the responsibility of the recipient.

Please Print Form at www.vmrd.com or Photocopy for Future Use

Order date _____ Customer ID No._____

Credit Card No._____Exp. Date_____CID/CCV No._____

Name as it appears on card_____ Purchase Order No. _____

Special Instructions _____

_____

Shipping Address

Company _____

Address _____

_____

City _____

State_____Zip _____

Attention_____

Phone _____

Fax_____

E-mail _____

Billing Address

Company _____

Address _____

_____

City _____

State_____Zip _____

Attention_____

Phone _____

Fax_____

E-mail _____

CATALOG NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
			***TOTAL:**	

*Shipping Charges will be prepaid and added to the invoice total.

Orders are shipped F.O.B. Pullman.

Washington State customers please add sales tax.

E-mail: **order@vmrd.com**
Phone **509-334-5815**
800-222-8673 (toll free)
FAX **509-332-5356**
Mail: **VMRD, Inc.**
P.O. Box 502
Pullman, WA 99163, USA

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