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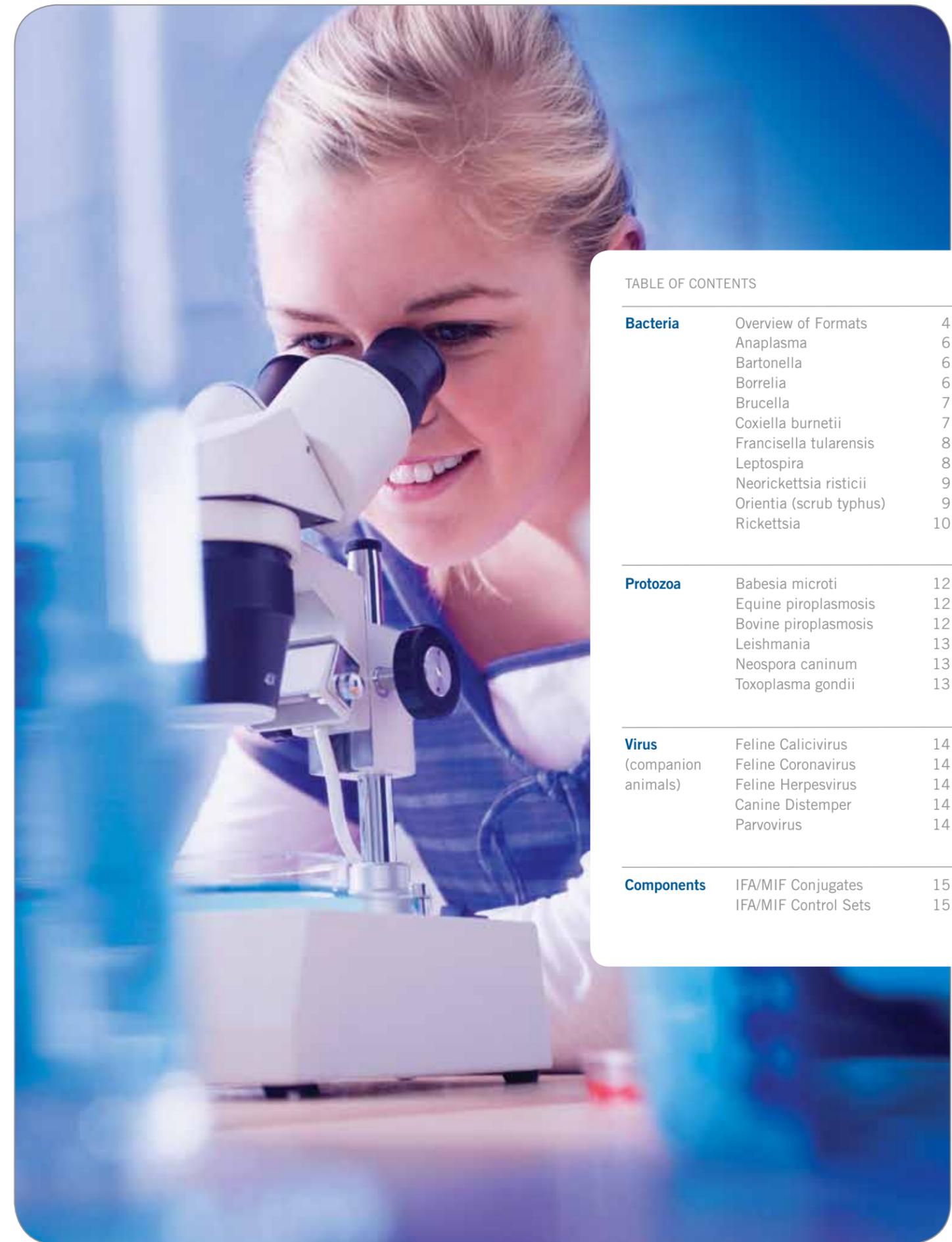
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Product Catalog

**Fuller Laboratories** opened in the city of Fullerton, in southern California, in 1990. Our focus has always been on providing superior technology to the reference-level diagnostic laboratories, especially with the vector-borne and zoonotic agents that form the basis for our multi-antigen panels. These panels are intended to make comprehensive testing more routine at the reference level and are amenable to custom formats as required in various localities.

Antigens are produced using in vitro cultivation in our BSL2 and BSL3 laboratories, and purified for application on-site. We are registered with the U.S. Food and Drug Administration and licensed as an In Vitro Diagnostics Manufacturer by the California Department of Health Services.

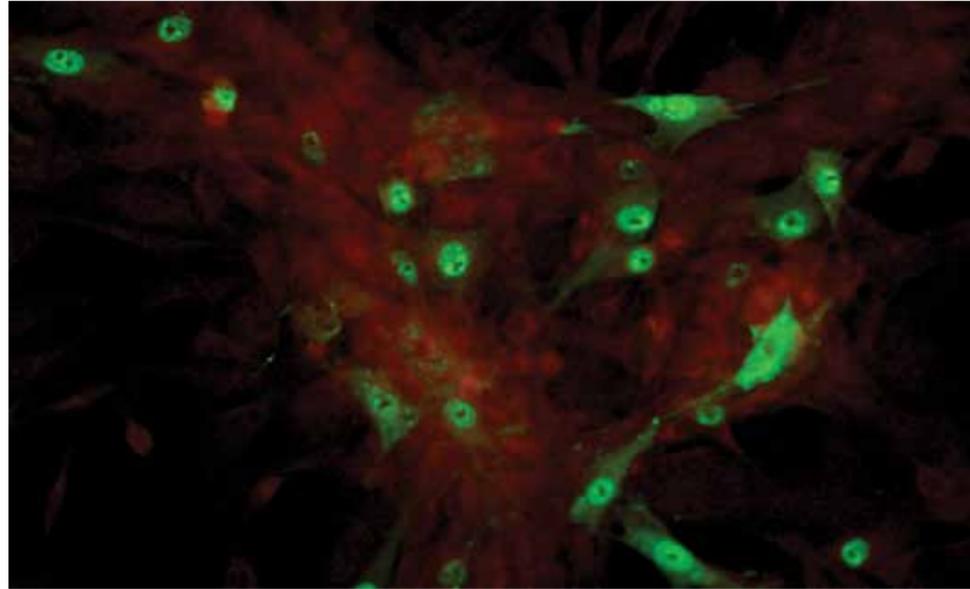
If the product line described in this catalog is new to you, please ask the distributor in your area or our staff in California for more information. Please visit our web site at [www.fullerlabs.com](http://www.fullerlabs.com) for the most current information and additions to our product line.



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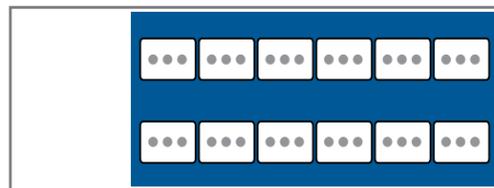
## Overview of Formats



### IFA

12-well substrate slides, the most traditional format, have full-field displays of pathogen-infected cells. The pathogens are intact and display characteristic cytopathology within the host cells. Depending upon the need for IgM testing and esthetic effects, the cells are either fixed before application or propagated *in situ* within the slide wells.

### MIF



12-well substrate slides contain multiple purified antigens in each well. These are particulate antigens, blended with a background matrix to visually define the location of each antigen. Combinations are defined in many ways, often based upon custom screening requirements of our client laboratories. The rectangular slide wells (above) can accommodate up to 6 antigens, although the more popular format is 2 antigens within 4 mm round wells.

MIF Antigens available:

- Anaplasma
- Ehrlichia
- Neorickettsia
- Rickettsia
- Bartonella
- Brucella
- Leishmania
- Neospora
- Toxoplasma
- Coxiella
- Francisella
- Orientia

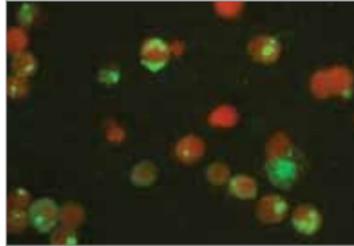
### ELISA

This automatable format utilizes very specific immunodominant solid-phase antigens. Depending upon antigen characteristics, ELISA assays use the most sensitive and specific protein, whether recombinant or native. Results rely upon a cut-off serum, which is experimentally determined to be within a narrow indeterminate range of reactivity, between true positive and true negative.

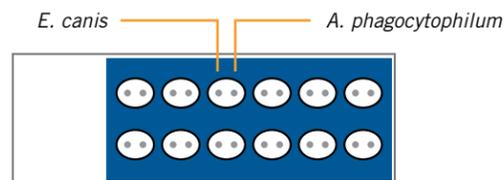
In the area of spotted fever group rickettsial disease, we have balanced multiple antigens within 8-well ELISA strips to determine the clade-specificity of serum antibody. This is somewhat complicated by the identification of new species, but also highlights species that may not have been originally considered as etiological agents. (see website for current releases).

We are also finalizing a cross-absorption ELISA assay to serologically distinguish *Rickettsia typhi* (endemic typhus) from *Rickettsia prowazekii* (epidemic typhus) infection. Cross-absorption is a serum pre-treatment step, using fine latex covalently coated with rOmpB proteins. This is a confirmatory test for typhus group screening assays. As above, see our website for current releases.

**Anaplasma**



The IFA substrate for *Anaplasma phagocytophilum* appears as infected cytoplasmic vacuoles (morulae). A cell-free antigen is also available in MIF formats. Kits available for human, canine, equine and feline serum testing.

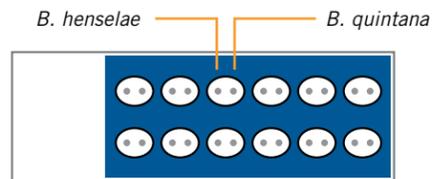


**Bartonella**

**MIF format:** 12-well substrate slides containing purified Bartonella henselae and Bartonella quintana in each well can be used for IgG and/or IgM antibody detection.

**IFA format:** 12-well substrate slides contain Bartonella-infected Vero cells propagated *in situ* within the slide wells and can be utilized for both IgG and IgM testing. Slides available for B. henselae, B. quintana, and other species of interest.

**ELISA format:** A human IgM ELISA format is due in late 2010 utilizing a 17-kDa antigen with excellent correlation to active or recent disease. This will be produced for several Bartonella species.



**Borrelia**

*Borrelia burgdorferi* 12-well IFA slides utilize an equal mix of biotypes represented by strains B31 and 297. Other species are available on a custom basis.

Cat No: BBDG-120			
BB-12	IFA Slides (10)	MM	Mounting Medium (1)
BBDP	Positive Control (1)	06-6001	PBS (1 L)
CN	Negative Control (1)	CG-25	Anti-canine IgG-conjugate

**Brucella**

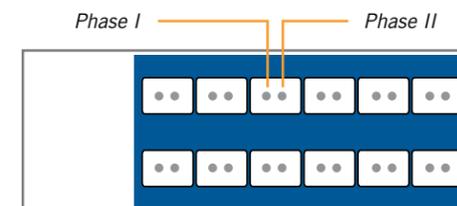
Substrate slides for canine brucellosis are produced using killed bacteria within a contrasting (red) background matrix. Specificity is based upon the IgG-specific response to rough biotype membrane antigens.

Cat No: BC-120			
BC-12	IFA Slides (10)	MM	Mounting Medium
BCP	Positive Control (1)	06-6001	PBS (1 L)
CN	Negative Control (1)	CG-25	Anti-canine IgG-conjugate

Smooth biotype antibody is detected on 2-spot slides (Cat. No. FT-12), containing B. abortus and Francisella tularensis (sometimes crossreacting).

**Coxiella burnetii**

*Coxiella burnetii* is a zoonotic pathogen found worldwide. Phase variation is utilized for diagnostic purposes, presented here as an MIF with phase I and II elementary bodies in each slide well. In general terms, phase II reactivity is an acute-phase response, while phase I reactivity is found in convalescent phase and in chronic disease states. Kits are available for human, canine, ovine and caprine serum testing.

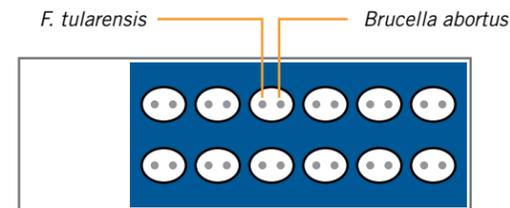


Cat No: QG-120			
Q-12	IFA Slides (10)	MM	Mounting Medium (1)
QGP	Positive Control (1)	06-6001	PBS (1 L)
QGN	Negative Control (1)	PGC-25	Anti-human IgG-conjugate
QD	IgG Serum Diluent		

Cat No: QM-120			
Q-12	IFA Slides (10)	MM	Mounting Medium (1)
QMP	Positive Control (1)	06-6001	PBS (1 L)
NHM	Negative Control (1)	PMC-25	Anti-human IgM-conjugate
MD-15	IgM Serum Diluent		

**Francisella tularensis**

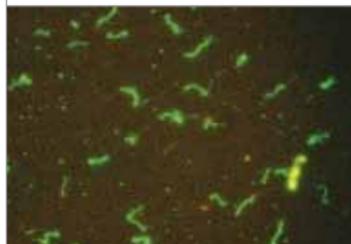
This MIF format combines *Francisella tularensis* with the most common source of cross-reactivity (smooth biotype Brucella). Kits are available for IgG and IgM class-specific antibody (human).



Cat No: FTG-120			
FT-12	IFA Slides (10)	MM	Mounting Medium
FTP	Positive Control (1)	06-6001	PBS (1 L)
NHG50	Negative Control (1)	FTG-25	Anti-human IgG-conjugate

Cat No: FTM-120			
FT-12	IFA Slides (10)	MM	Mounting Medium
FTP	Positive Control (1)	06-6001	PBS (1 L)
NHM50	Negative Control (1)	FTM-25	Anti-human IgM-conjugate
MD-15	IgM Serum Diluent		

**Leptospira**

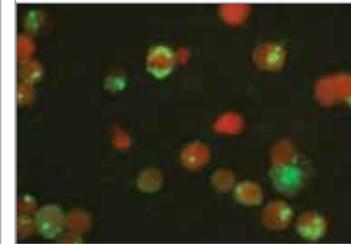


Genus-specific antigens are used in the production of this IFA substrate. These antigens are both sensitive and specific for the IgM-class antibody response, characteristic of recent or active infection. Kits are available for human and canine serum testing.

Cat No: LED-120			
LE-12	IFA Slides (10)	MM	Mounting Medium
LEDP	Positive Control (1)	06-6001	PBS (1 L)
CN	Negative Control (1)	LCG-25	Anti-canine IgG-conjugate

Cat No: LEM-120			
LE-12	IFA Slides (10)	MM	Mounting Medium
LEMP	Positive Control (1)	06-6001	PBS (1 L)
NHM50	Negative Control (1)	PMC-25	Anti-human IgM-conjugate
MD-2	IgM Serum Diluent		

**Neorickettsia risticii**



Formerly found within the genus Ehrlichia, this vector-borne organism causes Potomac Horse Fever and has also been described as a pathogen in dogs. Its appearance in culture and on stained slides is similar to Ehrlichia, with cytoplasmic morulae.

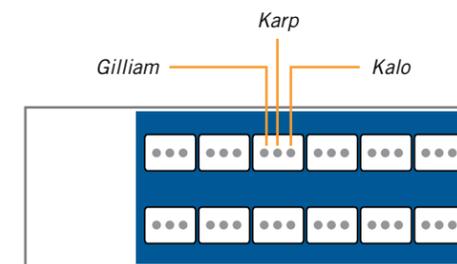
Cat No: ERE-120			
ER-12	IFA Slides (10)	MM	Mounting Medium (1)
EREP	Positive Control (1)	06-6001	PBS (1 L)
NE50	Negative Control (1)	EG+25	Anti-equine IgG-conjugate

**Orientia (scrub typhus)**

*Orientia tsutsugamushi* are obligate intracellular bacteria associated with trombiculid mite larvae (chiggers). Transmission to humans via chigger bites induces an antibody response, primarily directed against 56-kDa immunodominant outer-membrane protein.

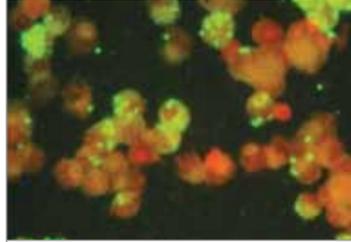
The standard MIF method, using prototype Karp, Kato and Gilliam strains, detects antibody against the whole organism and remains the most commonly used diagnostic method.

An ELISA will become available in 2010, based upon the 56-kDa protein.



Cat No: OTG-120 Kit	
OT3-12	12-well MIF slide (10)
OTGP	IgG Positive Control (1)
OTGN	IgG Negative Control (1)
PGC-25	Human IgG Conjugate
MSD-10	Serum Diluent
MM	Mounting Medium
06-6001	PBS (1 liter)

## Rickettsia



Rickettsia are obligate intracellular bacteria associated with arthropods, including fleas, body lice, mites and ticks. Transmission to humans via arthropod vectors induces an antibody response, primarily directed against the lipopolysaccharide (LPS) and 1-2 outer-membrane proteins (ompA and/or ompB).

The standard IFA and MIF methods detect antibody against the whole organism and remain the most commonly used of the recommended screening methods. ELISA methods, in contrast, offer several options.

Purified LPS antigen from spotted fever (SFG) or typhus group (TG) organisms often detects the earliest and most broadly reactive antibody response. This option is best used for IgG antibody screening. IgM testing is then performed against native ompB protein(s) isolated from species of interest.

Serological differentiation between *Rickettsia typhi* (endemic typhus) and *R. prowazekii* (epidemic typhus) currently requires cross-absorption and western immunoblot (or ELISA).

In contrast to the 2 TG species, the spotted fever group is expanding at an increasing rate, as molecular methods become available in previously under-evaluated regions of the world. Our collection of SFG species has also grown to keep pace with the needs of reference laboratories.

### Rickettsia Species (Antigens currently available for MIF, IFA, ELISA formats)

- *Rickettsia africae*
- *Rickettsia akari*
- *Rickettsia amblyommii*
- *Rickettsia asiatica*
- *Rickettsia australis*
- *Rickettsia canadensis*
- *Rickettsia conorii* (4 subspecies)
- *Rickettsia felis*
- *Rickettsia heilongjiangensis*
- *Rickettsia helvetica*
- *Rickettsia honei*
- *Rickettsia japonica*
- *Rickettsia massiliae*
- *Rickettsia monacensis*
- *Rickettsia montanensis*
- *Rickettsia parkeri*
- *Rickettsia prowazekii*
- *Rickettsia raoultii*
- *Rickettsia rhipicephali*
- *Rickettsia rickettsii*
- *Rickettsia siberica*
- *Rickettsia slovaca*
- *Rickettsia tamurae*
- *Rickettsia typhi*

## Rickettsia (continued)



**MIF format:** 2-antigen MIF with *Rickettsia rickettsii* and *Rickettsia typhi* in each well, for simultaneous detection of spotted fever and typhus group antibody. Antibody detection by IFA (or MIF) is considered group-specific, due to the presence of LPS antigens. Thus, in the 2-antigen format, both spotted fever and typhus groups are screened individually and simultaneously in each well. **(Catalog R2-12)**

3-antigen MIF with the addition of *Rickettsia felis* to the above 2-antigen format. Although *Rickettsia felis* is within the spotted fever group, it is not detected by cross-reactivity with other species. **(Catalog R3-12)**

Kit formats include (10) x 12-well Substrate Slides, IFA Conjugate, Controls for each antigen, Mounting Medium, Wash Buffer and Instructions for use. Kits for IgG antibody are available worldwide, but IgM kits are for export only. **(Catalog R2G-120, R2M-120, R3G-120 and R3M-120)**

MIF slides with 2-6 antigens per well can also be produced to your specifications. Custom combinations are prepared with a 100-slide minimum with choice of antigens.

## Rickettsia EIA

### ELISA Screen Kits Using LPS Antigens

Kits include 96-well plate (12 x 8-well strip modules) coated with either spotted fever group LPS (SFG-96K) or typhus group LPS (TFG-96K), working IgG Conjugate, Sample Diluent, Wash Buffer, TMB, Stop Reagent and Instructions for Use.

Cat: SFG-96K Spotted Fever Rickettsia IgG EIA Assay Kit 

Cat: TFG-96K Typhus Group Rickettsia IgG EIA Assay Kit 

### ELISA Kits Using rOmpB Protein Antigens

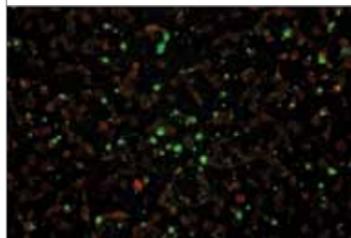
**Please note:** 96-well modules can be prepared for any listed antigen. Positive control sera, however, are often in short supply and we ask for 1-2 mL of positive serum for standardization.

### Babesia microti

*Babesia* are obligate intra-erythrocytic protozoa transmitted by tick vectors. *Babesia microti* can be transmitted to humans, causing flu-like symptoms as well as a malaria-like illness. Substrate slides are prepared with infected mouse erythrocytes, where the merozoites are visible as compact inclusions.

BM-12	Babesia microti 12-well slides
BMG-120	Babesia microti IFA IgG Kit
BMM-120	Babesia microti IFA IgM Kit

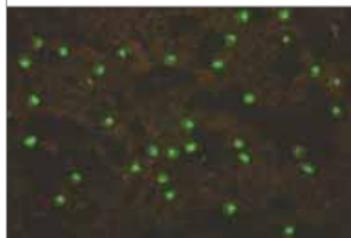
### Equine piroplasmosis



*Babesia caballi* and *Theileria equi* (USDA strains) are propagated in horse erythrocytes in vitro for preparation of IFA substrate slides. Currently, the indirect fluorescent antibody (IFA) test and enzyme-linked immunosorbent assays (ELISA) are the prescribed tests for international trade.

BK-12	Babesia caballi 12-well slides
BKG-120	Babesia caballi IFA Kit
BE-12	Theileria equi 12-well slides
BEG-120	Theileria equi IFA Kit

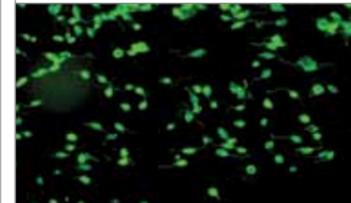
### Bovine piroplasmosis



*Babesia bigemina* and *Babesia bovis* (USDA strains) are propagated in bovine erythrocytes in vitro for preparation of IFA substrate slides. Currently, the indirect fluorescent antibody (IFA) test and enzyme-linked immunosorbent assays (ELISA) are the prescribed tests for international trade.

BI-12	Babesia bigemina 12-well slides
BIG-120	Babesia bigemina IFA Kit
BV-12	Babesia bovis 12-well slides
BVG-120	Babesia bovis IFA Kit

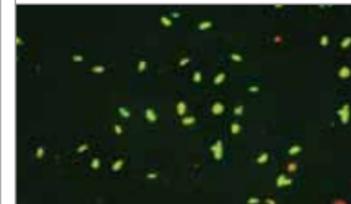
### Leishmania



*Leishmania infantum* promastigotes are broadly cross-reactive with other *Leishmania* species and have been used in the U.S. and the Mediterranean region for diagnosis of canine infection.

Cat No: LPD-120			
LP-12	IFA Slides (10)	MM	Mounting Medium (1)
LPP	Positive Control (1)	06-6001	PBS (1 L)
LPN	Negative Control (1)	CG-25	Anti-canine IgG-conjugate

### Neospora caninum



*Neospora* is propagated in Vero cells and purified for use as an IFA substrate. Kits are available for canine and equine serum IgG testing.

Cat No: NCD-120			
NC-12	IFA Slides (10)	MM	Mounting Medium (1)
NCDP	Positive Control (1)	06-6001	PBS (1 L)
CN	Negative Control (1)	NCC-25	Anti-canine IgG-conjugate

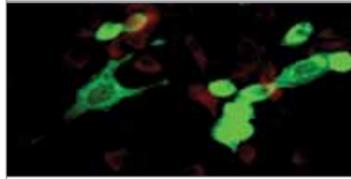
Cat No: NCE-120			
NC-12	IFA Slides (10)	MM	Mounting Medium (1)
NCEP	Positive Control (1)	06-6001	PBS (1 L)
NE50	Negative Control (1)	EG+25	Anti-equine IgG-conjugate

### Toxoplasma gondii

*Toxoplasma gondii* is propagated in HS27 fibroblasts and purified for use as an IFA substrate. The appearance of these tachyzoites is very similar to that of *Neospora* (picture above).

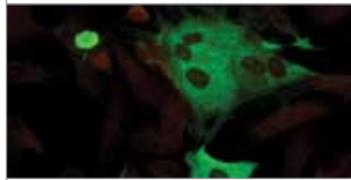
Cat No: TGF-120			
TG-12	IFA Slides (10)	MM	Mounting Medium (1)
TXP	Positive Control (1)	06-6001	PBS (1 L)
TXN	Negative Control (1)	FG+25	Anti-feline IgG-conjugate

**Feline Calicivirus**



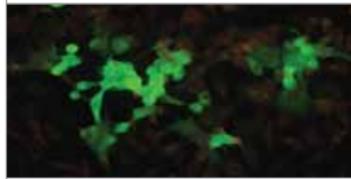
FCV-12	12-well IFA Substrate Slides (10)	MM	Mounting Medium
FCVP	Positive Control (1)	06-6001	PBS powder (1 liter)
FCVN	Negative Control (1)	FG+25	Anti-feline igG conjugate

**Feline Coronavirus**



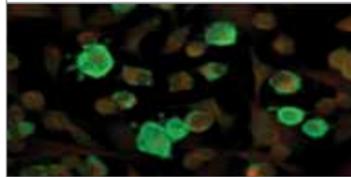
FIP-12	12-well IFA Substrate Slides (10)	MM	Mounting Medium
FIPP	Positive Control (1)	06-6001	PBS powder (1 liter)
FIPN	Negative Control (1)	FG+25	Anti-feline igG conjugate

**Feline Herpesvirus**



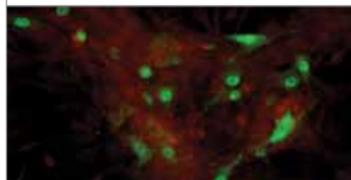
FCV-12	12-well IFA Substrate Slides (10)	MM	Mounting Medium
FCVP	Positive Control (1)	06-6001	PBS powder (1 liter)
FCVN	Negative Control (1)	FG+25	Anti-feline igG conjugate

**Canine Distemper**



CDV-12	12-well IFA Substrate Slides (10)	MM	Mounting Medium
CDVP	Positive Control (1)	06-6001	PBS powder (1 liter)
CDVN	Negative Control (1)	CG+25	Anti-canine igG conjugate

**Canine Parvovirus**



CPV-12	12-well IFA Substrate Slides (10)	MM	Mounting Medium
CPDP	Positive Control (1)	06-6001	PBS powder (1 liter)
CPDN	Negative Control (1)	CG+25	Anti-canine igG conjugate

**IFA/MIF Conjugates**



DyLight 488 conjugates are prepared from affinity-purified antibody in a stabilizing buffer containing Evans' blue counterstain, ready to use. They are packaged in dropper bottles of 2.5 mL and 10 mL quantities.

2.5 mL	10 mL	Description
BG-25	BG-100	Anti-bovine IgG (Fc-specific) (goat)
CG-25	CG-100	Anti-canine IgG (Fc-specific) (rabbit)
CG+25	CG+100	Anti-canine IgG (H+L specific) (rabbit)
CM-25	CM-100	Anti-canine IgM (Fc-specific) (goat)
EG-25	EG-100	Anti-equine IgG (Fc-specific) (rabbit)
EG+25	EG+100	Anti-equine IgG (H+L specific) (rabbit)
FG-25	FG-100	Anti-feline IgG (Fc-specific) (goat)
FG+25	FG+100	Anti-feline IgG (H+L specific) (goat)
FM-25	FM-100	Anti-feline IgM (Fc-specific) (goat)
PGC-25	PGC-100	Anti-human IgG (Fc-specific) (goat)
PAC-25	PAC-100	Anti-human IgA (Fc-specific) (goat)
PMC-25	PMC-100	Anti-human IgM (Fc-specific) (goat)
PCG-25	PCG-100	Anti-caprine IgG (Fc-specific) (rabbit)
OG-25	OG-100	Anti-ovine IgG (Fc-specific) (rabbit)
GAM-25	GAM-100	Anti-murine IgG (Fc-specific) (goat)

**IFA/MIF Control Sets**



Sets consist of a Positive and Negative Control, each 0.5 mL, in color-coded dropper bottles. All controls are pre-diluted to the recommended screening dilution, with the Positive Control calibrated to reach endpoint when further diluted 1:8 (acceptable range 1:4 to 1:16). Control sets are available for every IFA and MIF slide format.