



## 2024 PRODUCTS & SERVICES CATALOG

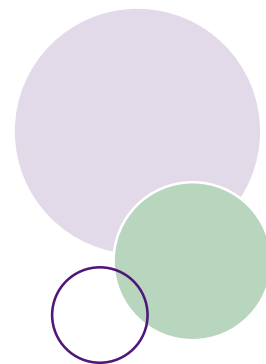
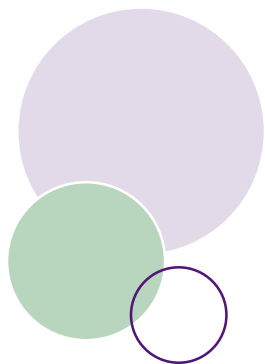


RELIABLE RESULTS

CUSTOMER-FOCUSED

KNOWLEDGEABLE STAFF

FAST TURNAROUND TIMES



*Knowledgeable Scientific Staff*

**Customer Focused**

Fast Turnaround Times

*Research and Development Emphasis*

*Relationship-Driven* **Reliable Results**





Timely Product Development

*Customized Solutions*

***For More Than 30 Years, VRL's Commitment to  
Our Clients Remains Our Core Focus.***

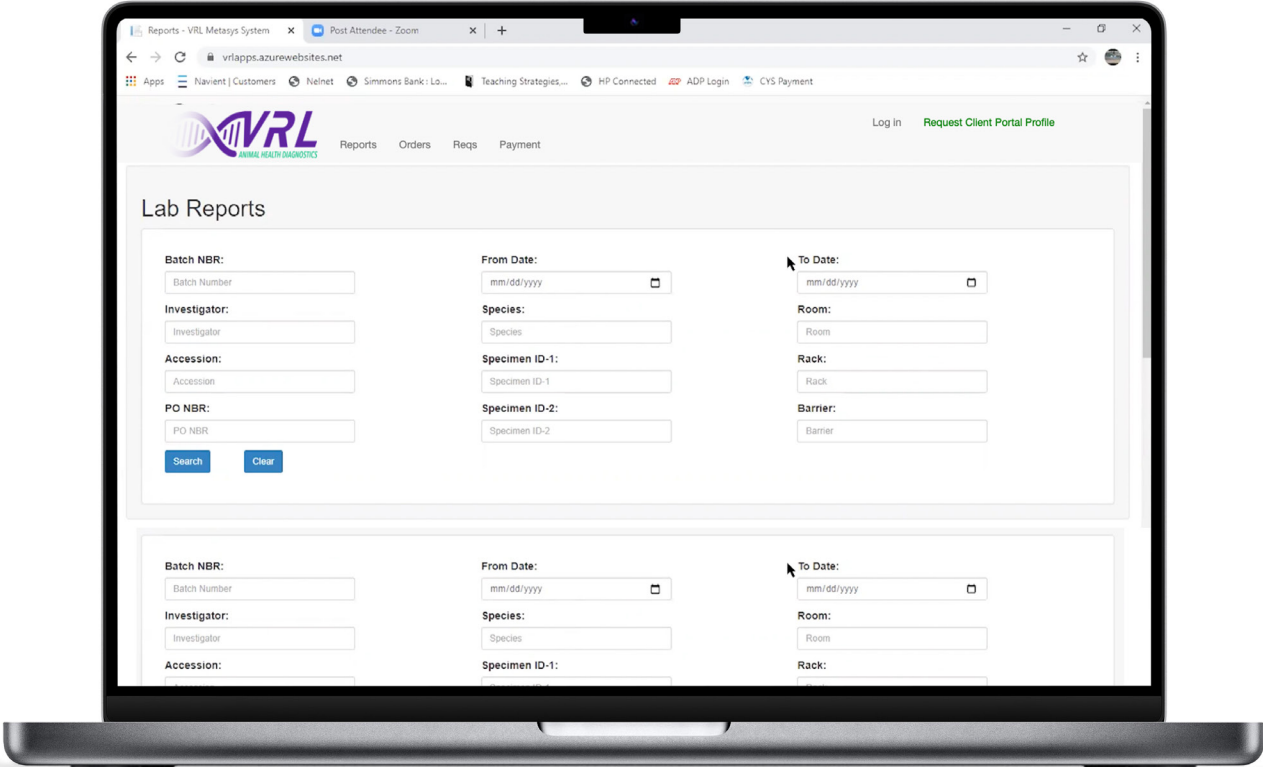


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# VRL Makes It Easy and Efficient to Order, Review, and Archive Your Test Results



If you haven't ordered from us in a while, we invite you to experience our popular online program for ordering tests, viewing and archiving results for on-demand future reference, and paying invoices.

**Welcome to the VRL Client Portal!**

**AQUATICS  
ZEBRAFISH  
PCR**

AGENT	SAMPLE TYPE	MYCOBACTERIUM	CORE	COMPLETE
		10Z08	10Z13	10Z18
<b>Mycobacterium abscessus</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium chelonae</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium fortuitum</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium gordonae</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium haemophilum</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium marinum</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium peregrinum</b>	Whole fish, environmental	•	•	•
<b>Mycobacterium saopaulense</b>	Whole fish, environmental	•	•	•
<b>Edwardsiella ictaluri</b>	Whole fish, environmental			•
<b>Pseudocapillaria tomentosa</b>	Whole fish, environmental		•	•
<b>Pseudoloma neurophilia</b>	Whole fish		•	•
<b>Myxidium streinsingeri</b>	Whole fish		•	•
<b>Flavobacterium columnare</b>	Whole fish, environmental			•
<b>Ichthyophthirius multifiliis</b>	Whole fish			•
<b>ISKNV (Infectious spleen and kidney necrosis virus)</b>	Whole fish			•
<b>Piscinoodinium pillulare</b>	Whole fish			•
<b>Pleistophora hyphessobryconis</b>	Whole fish			•
<b>Zebrafish Picornavirus</b>	Whole fish		•	•

**INDIVIDUAL AQUATICS PCR**

CODE	AGENT	SAMPLE TYPE
10825	<b>Batrachochytrium dendrobatidis</b>	Whole fish, environmental
10559	<b>Edwardsiella ictaluri</b>	Whole fish, environmental
10560	<b>Flavobacterium columnare</b>	Whole fish, environmental
10561	<b>Ichthyophthirius multifiliis</b>	Whole fish
10834	<b>IPNV (Infection Pancreatic Necrosis Virus)</b>	Whole fish, environmental
10562	<b>ISKNV (Infectious spleen and kidney necrosis virus)</b>	Whole fish, environmental
10551	<b>Mycobacterium abscessus</b>	Whole fish, environmental
10552	<b>Mycobacterium chelonae</b>	Whole fish, environmental
10553	<b>Mycobacterium fortuitum</b>	Whole fish, environmental
10554	<b>Mycobacterium gordonae</b>	Whole fish, environmental
10555	<b>Mycobacterium haemophilum</b>	Whole fish, environmental
10556	<b>Mycobacterium marinum</b>	Whole fish, environmental
10557	<b>Mycobacterium peregrinum</b>	Whole fish, environmental
10558	<b>Mycobacterium saopaulenses</b>	Whole fish, environmental
10577	<b>Mycobacterium genus spp.</b>	Whole fish, environmental
10563	<b>Myxidium streinsingeri</b>	Whole fish
10564	<b>Piscinoodinium pillulare</b>	Whole fish
10565	<b>Pleistophora hyphessobryconis</b>	Whole fish, environmental
10566	<b>Pseudocapillaria tomentosa</b>	Whole fish, environmental
10567	<b>Pseudoloma neurophilia</b>	Whole fish
10941	<b>Pseudocapillaroides xenopi</b>	Whole fish, environmental
10690	<b>Ranavirus</b>	Whole fish, environmental
10835	<b>Saprolegnia brachydanis</b>	Whole fish, environmental

**AQUATICS MICROBIOLOGY PANEL**

AGENTS (CODE 80Z01)	SAMPLE TYPE
<b>Aeromonas dhakensis</b>	Aseptic swab, environmental, tissue, whole fish
<b>Aeromonas hydrophila</b>	Aseptic swab, environmental, tissue, whole fish
<b>Edwardsiella ictaluri</b>	Aseptic swab, tissue, whole fish
<b>Flavobacterium columnare</b>	Skin swab, tissue, whole fish
<b>Other Bacteria</b>	Aseptic swab, environmental, tissue, whole fish
<b>Plesiomonas shigelloides</b>	Aseptic swab, environmental, tissue, whole fish
<b>Pseudomonas aeruginosa</b>	Aseptic swab, environmental, tissue, whole fish
<b>Pseudomonas fluorescens</b>	Aseptic swab, environmental, tissue, whole fish
<b>Saprolegnia spp.</b>	Skin swab, environmental, tissue, whole fish

**AQUATICS  
XENOPUS  
PCR**

CODE	AGENT	CORE	COMPLETE
		10Z20	10Z12
10825	<b>B. dendrobatidis</b>	•	•
10552	<b>Myco chelonae</b>	•	•
10556	<b>Myco marinum</b>	•	•
10941	<b>P. XENOPI</b>	•	•
10690	<b>RANAVIRUS PCR</b>	•	•
10554	<b>Myco gordonae</b>	•	•
10478	<b>Cryptosporidium spp</b>		•
10417	<b>P. aeruginosa</b>		•
10418	<b>Salmonella spp</b>		•

**ZEBRAFISH PATHOLOGY SERVICES**

SERVICE	SAMPLE PREPARATION	SHIPPING CONDITION
<b>NECROPSY</b>	Ship live fish in heavy duty bladders or doubled plastic bags Bags should be 1/3 water 2/3 air	Overnight in insulated containers at ambient temperature
<b>HISTOPATHOLOGY</b>	Open ventral cavity of euthanized fish. Place whole fish in 10% NBF, Davidsons, or Bouins fixative.	Overnight at ambient temperature
<b>HISTOPATHOLOGY &amp; PCR</b>	Flash freeze fish in liquid nitrogen. Flatten fish in foil wrap. Label foil.	Overnight on dry ice

**Zebrafish Necropsy** will include an external exam of the fish for malformities and lesions. The gills, heart, liver, kidney, intestines, swim bladder, gonads, and brain will be examined for lesions and parasites. Samples may be taken for bacterial cultures and/or PCR testing of infectious agents. Fish may be placed in 10% NBF, Davidson's fixative, or Bouin's if histopathology is required.

**Zebrafish Histopathology** routine services include whole fish processing, embedding, and slide production. Slides will be stained with H&E stain and include all major organs of the fish including the surrounding connective tissue. An acid-fast stain may be requested if a bacterial infection is suspected. A pathologist evaluation of each fish will be presented in a report format. Annotated microphotographs are available at an additional cost.

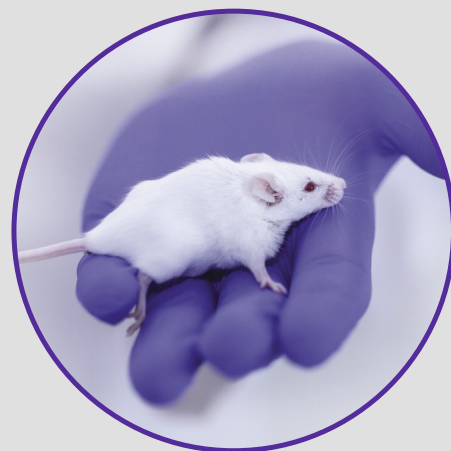




**VRL is proud to introduce SeraSorb.™ This small wonder is the next big solution for serological animal microsampling.**

- Requires minimal training to collect robust sampling
- Offers a quick, convenient turnkey process with low volumes of blood (only takes seconds to collect a consistent sample)

This new microsampling collection system that retains the quality of serological results, allows for the quantitative collection of samples and helps in the reduction of animals used as sentinels. **We have called the technology SeraSorb.™**



*The Animal Health field continues to evolve using technologies that are more compliant with the 3Rs philosophy. VRL's SeraSorb™ is a more humane, efficient way of collecting samples.*



## ANIMAL HEALTH MONITORING

### SEROLOGY

The panels outlined below are the most prevalent agents and or agents of the utmost concern. If customization is needed or required, VRL can provide you with a panel designed to meet your specific needs. If you need to build your own panel or need advice, let our Technical Staff know and we can design a testing panel focused on your concerns.



Sample Type: Serum, SeraSorb

### MOUSE SEROLOGY PANELS

ABBREVIATION	AGENT	CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		85018	85019	85020	85021
MHV	Mouse Hepatitis Virus	•	•	•	•
MVM (MMV)	Mouse Minute Virus	•	•	•	•
MPV (1-5)	Mouse Parvovirus	•	•	•	•
MNV	Murine Norovirus	•	•	•	•
EDIM	Rotavirus and Epizootic Diarrhea of Infant Mice	•	•	•	•
TMEV/GDVII	Theiler's Mouse Encephalomyelitis Virus	•	•	•	•
LCMV	Lymphocytic Choriomeningitis Virus		•	•	•
MAV-1 (FL)	Mouse Adenovirus-1 (MAV-FL)		•	•	•
MAV-2 (K87)	Mouse Adenovirus-2 (MAV-K87)		•	•	•
PVM	Pneumonia Virus of Mice		•	•	•
SEV	Sendai Virus		•	•	•
CARB	Cilia Associated Respiratory Bacillus			•	•
CPILI	Clostridium piliforme			•	•
ECTRO	Ectromelia Virus			•	•
MCMV	Murine Cytomegalovirus			•	•
MYCO	Mycoplasma pulmonis			•	•
POLY	Polyomavirus			•	•
REO	Respiratory Enteric Virus III			•	•
ECUN	Encephalitozoon cuniculi				•
HANT	Hantaan Virus				•
KV	K Virus (Mouse Pneumonitis Virus)				•
LDHV	Lactate Dehydrogenase Elevating Virus				•
MTV	Mouse Thymic Virus				•

### MOUSE PARVO PANEL

ABBREVIATION	AGENT	COMPLETE PLUS
		85022
MVM (MMV)	Mouse Minute Virus	•
MPV (1-5)	Mouse Parvovirus	•
NS-1	Generic Parvovirus NS-1	•

## ANIMAL HEALTH MONITORING

### RAT SEROLOGY PANELS

ABBREVIATION	AGENT	CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		85023	85024	85025	85026
KRV	Kilham's Rat Virus	•	•	•	•
PCAR	Pneumocystis carinii	•	•	•	•
SDA/RCV	Rat Coronavirus	•	•	•	•
RMV	Rat Minute Virus	•	•	•	•
RPV	Rat Parvovirus	•	•	•	•
RTV	Rat Theilovirus	•	•	•	•
H-1	Toolan's H-1	•	•	•	•
CARB	Cilia Associated Respiratory Bacillus		•	•	•
LCMV	Lymphocytic Choriomeningitis Virus		•	•	•
MAV-1 (FL)	Mouse Adenovirus - 1 (FL)		•	•	•
MPUL	Mycoplasma pulmonis		•	•	•
PVM	Pneumonia Virus of Mice			•	•
REO	Respiratory Enteric Virus III			•	•
SEV	Sendai Virus			•	•
CPILI	Clostridium pilforme				•
ECUN	Encephalitozoon cuniculi				•
HANT	Hantaan Virus				•
IDIR	Rat Rotavirus				•

### RAT PARVO PANEL

ABBREVIATION	AGENT	COMPLETE PLUS
		85027
RPV	Rat Parvovirus	•
RMV	Rat Minute Virus	•
KRV	Kilham's Rat Virus	•
H-1	Toolan's H-1	•
NS-1	Generic Parvovirus NS-1	•

**GUINEA PIG SEROLOGY PANELS**

ABBREVIATION	AGENT	ROUTINE	COMPLETE
		85030	85031
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>	•	•
PVM	<b>Pneumonia Virus of Mice</b>	•	•
REO	<b>Respiratory Enteric Virus III</b>	•	•
SEV	<b>Sendai Virus</b>	•	•
SV5	<b>Simian Virus 5</b>	•	•
GPADV	<b>Guinea Pig Adenovirus</b>	•	•
PIV-3	<b>Parainfluenza-3</b>	•	•
CPILI	<b>Clostridium piliforme</b>		•
ECUN	<b>Encephalitozoon cuniculi</b>		•

**RABBIT SEROLOGY PANELS**

ABBREVIATION	AGENT	ROUTINE	COMPLETE
		85028	85029
CARB	<b>Cilia Associated Respiratory Bacillus</b>	•	•
CPILI	<b>Clostridium piliforme</b>	•	•
ECUN	<b>Encephalitozoon cuniculi</b>	•	•
ROTA	<b>Rotavirus</b>	•	•
TREP	<b>Treponema cuniculi</b>	•	•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>		•
PIV-1	<b>Parainfluenza-1</b>		•
PIV-2	<b>Parainfluenza-2</b>		•
PMUL	<b>Mycoplasma pulmonis</b>		•
REO	<b>Respiratory Enteric Virus III</b>		•
TOXG	<b>Toxoplasma gondii</b>		•

**HAMSTER SEROLOGY PANELS**

ABBREVIATION	AGENT	ROUTINE	COMPLETE
		80213	80216
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>	•	•
PVM	<b>Pneumonia Virus of Mice</b>	•	•
REO	<b>Respiratory Enteric Virus III</b>	•	•
SEV	<b>Sendai Virus</b>	•	•
SV5	<b>Simian Virus 5</b>	•	•
ECUN	<b>Encephalitozoon cuniculi</b>		•
CPILI	<b>Clostridium piliforme</b>		•

**MOUSE INDIVIDUAL SEROLOGY**

TEST CODE	ABBREVIATION	AGENT
80308	CARB	<b>Cilia Associated Respiratory Bacillus</b>
80102	CPILI	<b>Clostridium piliforme</b>
80145	CCV	<b>Convict Creek Virus, Hantavirus Pulmonary</b>
80305	ECTR	<b>Ectromelia Virus</b>
80101	ECUN	<b>Encephalitozoon cuniculi</b>
80339	NS-1	<b>Generic Parvovirus NS-1</b>
80324	HANT	<b>Hantaan Virus</b>
80119	KV	<b>K Virus (Mouse Pneumonitis Virus)</b>
80187	LDHV	<b>Lactate Dehydrogenase Elevating Virus</b>
80315	LCMV	<b>Lymphocytic Choriomeningitis Virus</b>
80310	MAV-1 (FL)	<b>Mouse Adenovirus-1 (MAV-FL)</b>
80317	MAV-2 (K87)	<b>Mouse Adenovirus-2 (MAV-K87)</b>
80303	MHV	<b>Mouse Hepatitis Virus</b>
80307	MMV	<b>Mouse Minute Virus</b>
80318	MPV	<b>Mouse Parvovirus</b>
80140	MTV	<b>Mouse Thymic Virus</b>
80126	MCMV	<b>Murine Cytomegalovirus</b>
80335	MNV	<b>Murine Norovirus</b>
80312	MARTH	<b>Mycoplasma arthritidis</b>
80311	MPUL	<b>Mycoplasma pulmonis</b>
80197	PMUR	<b>Pneumocystis murina</b>
80301	PVM	<b>Pneumonia Virus of Mice</b>
80332	POLY	<b>Polyoma Virus</b>
80152	PUUM	<b>Puumala (European Hantavirus)</b>
80309	REO	<b>Respiratory Enteric Virus III</b>
80320	EDIM	<b>Rotavirus and Epizootic Diarrhea of Infant Mice</b>
80302	SEV	<b>Sendai Virus</b>
80306	TMEV/GDVII	<b>Theiler's Mouse Encephalomyelitis Virus</b>

**RAT INDIVIDUAL SEROLOGY**

TEST CODE	ABBREVIATION	AGENT
80308	CARB	<b>Cilia-Associated Respiratory Bacillus</b>
80103	CPILI	<b>Clostridium piliforme</b>
80101	ECUN	<b>Encephalitozoon cuniculi</b>
80339	NS-1	<b>Generic Parvovirus NS-1</b>
80324	HANT	<b>Hantaan Virus</b>
80196	KRV	<b>Kilham Rat Virus</b>
80118	LCMV	<b>Lymphocytic Choriomeningitis Virus</b>
80310	MAV-1 (FL)	<b>Mouse Adenovirus-1 (MAV-FL)</b>
80123	MAV-2 (K87)	<b>Mouse Adenovirus-2 (MAV-K87)</b>
80312	MARTH	<b>Mycoplasma arthritidis</b>
80311	MPUL	<b>Mycoplasma pulmonis</b>
80127	PARV	<b>Parvovirus Generic (detects RPV, RMV, KRV, H-1)</b>
80384	PCAR	<b>Pneumocystis carinii</b>
80301	PVM	<b>Pneumonia Virus of Mice</b>
80304	SDA/RCV	<b>Rat Coronavirus</b>
80125	RCMV	<b>Rat Cytomegalovirus</b>
80309	REO	<b>Respiratory Enteric Virus III</b>
80161	RMV	<b>Rat Minute Virus</b>
80160	RPV	<b>Rat Parvovirus</b>
80393	PPyV2	<b>Rat Polyomavirus 2</b>
80340	IDIR	<b>Rat Rotavirus</b>
80108	RTV	<b>Rat Theilovirus</b>
80302	SEV	<b>Sendai Virus</b>
80146	SEO	<b>Seoul Virus (Hantavirus of wild rats)</b>
80195	H-1	<b>Toolan's H-1 Virus</b>

## ANIMAL HEALTH MONITORING

### RABBIT INDIVIDUAL SEROLOGY

TEST CODE	ABBREVIATION	AGENT
80109	BBRON	<b>Bordetella bronchiseptica</b>
80308	CARB	<b>Cilia Associated Respiratory Bacillus</b>
80107	CPILI	<b>Clostridium piliforme</b>
80101	ECUN	<b>Encephalitozoon cuniculi</b>
80118	LCMV	<b>Lymphocytic Choriomeningitis Virus</b>
80186	PIV-1	<b>Parainfluenza-1</b>
80188	PIV-2	<b>Parainfluenza-2</b>
80181	PMUL	<b>Pasteurella multocida</b>
80189	RHDF	<b>Rabbit Hemorrhagic Fever</b>
80323	ROTA	<b>Rotavirus</b>
80309	REO	<b>Respiratory Enteric Virus III</b>
80182	TOXG	<b>Toxoplasma gondii</b>
80180	TREP	<b>Treponema cuniculi</b>

### GUINEA PIG INDIVIDUAL SEROLOGY

TEST CODE	ABBREVIATION	AGENT
80308	CARB	<b>Cilia Associated Respiratory Bacillus</b>
80107	CPILI	<b>Clostridium piliforme</b>
80101	ECUN	<b>Encephalitozoon cuniculi</b>
80123	GPADV	<b>Guinea Pig Adenovirus</b>
80385	GPCMV	<b>Guinea pig Cytomegalovirus</b>
80315	LCMV	<b>Lymphocytic Choriomeningitis Virus</b>
80457	PIV-3	<b>Parainfluenza-3</b>
80301	PVM	<b>Pneumonia Virus of Mice</b>
80309	REO	<b>Respiratory Enteric Virus III</b>
80302	SEV	<b>Sendai Virus</b>
80138	SV5	<b>Simian Virus 5</b>

### HAMSTER INDIVIDUAL SEROLOGY

TEST CODE	ABBREVIATION	AGENT
80117	CARB	<b>Cilia Associated Respiratory Bacillus</b>
80102	CPILI	<b>Clostridium piliforme</b>
80101	ECUN	<b>Encephalitozoon cuniculi</b>
80118	LCMV	<b>Lymphocytic Choriomeningitis Virus</b>
80301	PVM	<b>Pneumonia Virus of Mice</b>
80309	REO	<b>Respiratory Enteric Virus III</b>
80302	SEV	<b>Sendai Virus</b>
80138	SV5	<b>Simian Virus 5</b>

### FERRET INDIVIDUAL SEROLOGY

TEST CODE	ABBREVIATION	AGENT
80457	PIV-3	<b>Parainfluenza-3</b>
80472	RSV	<b>Respiratory Syncytial Virus</b>





**Do you need quick answers?** The VRL Fast Track Health Assessment provides a comprehensive look at the health status of your colony or incoming animals in quarantine. Fast Track can provide answers in as little as 24 hours and meets the 3R's of Replacement, Reduction and Refinement.

**Sample Types:** Serum, SeraSorb  
Fecal Pellet  
Oral Swab  
Fur Swab

**MOUSE FAST TRACK**

ABBREVIATION	AGENT	CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		70017	70018	70019	70020
<b>INDIVIDUAL SEROLOGY</b>					
MHV	Mouse Hepatitis Virus	•	•	•	•
MVM (MMV)	Mouse Minute Virus	•	•	•	•
MPV (1-5)	Mouse Parvovirus	•	•	•	•
MNV	Murine Norovirus	•	•	•	•
EDIM	Rotavirus/Epizootic Diarrhea of Infant Mice	•	•	•	•
TMEV/GDVII	Theiler's Mouse Encephalomyelitis Virus	•	•	•	•
LCMV	Lymphocytic Choriomeningitis Virus		•	•	•
MAV-1 (FL)	Mouse Adenovirus-1 (MAV-FL)		•	•	•
MAV-2 (K87)	Mouse Adenovirus-2 (MAV-K87)		•	•	•
PVM	Pneumonia Virus of Mice		•	•	•
SEV	Sendai Virus		•	•	•
CARB	Cilia Associated Respiratory Bacillus			•	•
CPILI	Clostridium piliforme			•	•
ECTRO	Ectromelia Virus			•	•
MCMV	Murine Cytomegalovirus			•	•
MYCO	Mycoplasma pulmonis			•	•
POLY	Polyomavirus			•	•
REO	Respiratory Enteric Virus III			•	•
ECUN	Encephalitozoon cuniculi				•
HANT	Hantaan Virus				•
KV	K Virus (Mouse Pneumonitis Virus)				•
LDHV	Lactate Dehydrogenase Elevating Virus				•
MTV	Mouse Thymic Virus				•
<b>FECAL PCR</b>					
HELICO	Helicobacter generic	•	•	•	•
PIN	Pinworms (Syphacia spp., Aspicularis tetraptera)	•	•	•	•
KOXY	Klebsiella oxytoca		•	•	•
KPNE	Klebsiella pneumoniae		•	•	•
CROD	Citrobacter rodentium			•	•
PAER	Pseudomonas aeruginosa			•	•
SALM	Salmonella spp.			•	•
SMUR	Spironucleus muris			•	•
CRYP	Cryptosporidium spp.			•	•
GIAR	Giardia spp.			•	•
EMUR	Entamoeba muris			•	•
CAMPY	Campylobacter spp.				•
PMIR	Proteus mirabilis				•
RNAN	Rodentolepis nana				•
TMUR	Tritrichomonas muris				•


**MOUSE FAST TRACK (CONT'D)**

ABBREVIATION	AGENT	CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		70017	70018	70019	70020
<b>ORAL PCR</b>					
RPNEU	<b>Rodentibacter pneumotropica</b>		•	•	•
RHEYL	<b>Rodentibacter heylii</b>		•	•	•
BBRO	<b>Bordetella bronchiseptica</b>			•	•
CKUT	<b>Corynebacterium kutscheri</b>			•	•
SBETA	<b>Streptococcus spp. beta-hemolytic</b>			•	•
SMONI	<b>Streptobacillus moniliformis</b>			•	•
BHIN	<b>Bordetella hinzii</b>				•
PMUL	<b>Pasteurella multocida</b>				•
SAUR	<b>Staphylococcus aureus</b>				•
<b>SKIN PCR</b>					
FUR	<b>Fur Mites (Myobia musculi &amp; Myocoptes musculinus, Radfordia affinis, Ornithonyssus bacoti)</b>	•	•	•	•

**RAT FAST TRACK**

ABBREVIATION	AGENT	CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		70005	70006	70007	70008
<b>SEROLOGY</b>					
KRV	Kilham's Rat Virus	•	•	•	•
H-1	Toolan's H-1 Virus	•	•	•	•
PCAR	Pneumocystis carinii	•	•	•	•
SDA/RCV	Rat Coronavirus	•	•	•	•
RMV	Rat Minute Virus	•	•	•	•
RPV	Rat Parvovirus	•	•	•	•
RTV	Rat Theilovirus	•	•	•	•
CARB	Cilia Associated Respiratory Bacillus		•	•	•
LCMV	Lymphocytic Choriomeningitis Virus		•	•	•
MAV-1 (FL)	Mouse Adenovirus		•	•	•
MPUL	Mycoplasma pulmonis		•	•	•
PVM	Pneumonia Virus of Mice			•	•
REO	Respiratory Enteric Virus III			•	•
SEV	Sendai Virus			•	•
CPILI	Clostridium piliforme				•
ECUN	Encephalitozoon cuniculi				•
HANT	Hantaan Virus				•
IDIR	Rat Rotavirus				•
<b>FECAL PCR</b>					
HELICO	Helicobacter	•	•	•	•
PIN	Pinworms (Syphacia & Aspicularis)	•	•	•	•
KOXY	Klebsiella oxytoca		•	•	•
KPNE	Klebsiella pneumoniae		•	•	•
PAER	Pseudomonas aeruginosa			•	•
SALM	Salmonella spp.			•	•
SMUR	Spironucleus muris			•	•
CRYP	Cryptosporidium spp.			•	•
GIAR	Giardia spp.			•	•
EMUR	Entamoeba muris			•	•
CAMPY	Campylobacter spp.				•
PMIR	Proteus mirabilis				•
TMUR	Tritrichomonas muris				•
<b>ORAL PCR</b>					
RPNEU	Rodentibacter pneumotropica		•	•	•
RHEYL	Rodentibacter heylii		•	•	•
BBRO	Bordetella bronchiseptica			•	•
CKUT	Corynebacterium kutscheri			•	•
SBETA	Streptococcus spp. beta-hemolytic			•	•
SMONI	Streptobacillus moniliformis			•	•
BHIN	Bordetella hinzii				•
PMUL	Pasteurella multocida				•
SAUR	Staphylococcus aureus				•
SPNE	Streptococcus pneumoniae				•
<b>SKIN PCR</b>					
FUR	Fur Mites (Myobia musculi & Myocoptes musculinus, Radfordia affinis, Ornithonyssus bacoti)	•	•	•	•



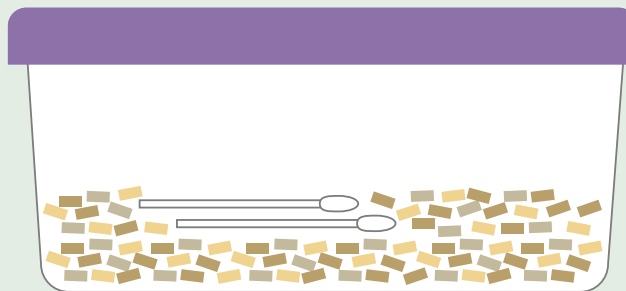
## A better alternative for plenum filter testing

**PCR has become one of the most useful tools in pathogen detection over the last 20 years.** The advent of PCR has allowed for a more sensitive detection of pathogens in animal colonies, while decreasing the number of sentinel animals used in health surveillance.

In this document we explain how to use swabs as a replacement for sentinel animals. This alternative does not require special systems and it can be used with any type of rack and cage. **The process is similar to the traditional sentinel program using live animals, but instead of using animals, our solution uses swabs.**

### Materials Used:

- Gloves
- Sterile Swabs
- Measuring Tablespoon
- Sentinel Cage
- 50 ml Conical Tube
- Permanent Markers
- Shipping Box or Envelope



## PROCEDURE

*(Hang this in your lab for quick reference)*

### 1. Put gloves on

*Note: Change gloves when collecting dirty bedding from different racks.*

### 2. Remove lid from the designated sentinel cage

### 3. Place two sentinel swabs in a designated sentinel cage

*Note: Two swabs are used in the event a retest is necessary due to unexpected results.*

### 4. When changing cage bedding, collect approximately 1 Tbsp of dirty bedding and place in designated sentinel cage

*Note: The dirty bedding should be collected from the area where the animal defecated and urinated.*

### 5. Replace lid on the designated sentinel cage

### 6. Shake the cage, swabs should remain in the dirty bedding until the next cage change

### 7. In a week or two, remove the dirty bedding from the cage (keep the swabs in the cage)

*Note: The timing of dirty bedding changes is dependent on your husbandry program.*

### 8. Repeat steps 4-7 through the end of your monitoring cycle

### 9. At the end of the cycle, collect the swabs and place in a collection tube

### 10. Label the collection tubes and submit swabs to VRL for PCR testing

*Note: Two swabs are used in the event a retest is necessary due to unexpected results.*

*REFERENCE: Evaluating Sentinel Swab Media for Improved Detection in Rodent Environmental Health Monitoring. Moll, JR; Lankasky, J; Pitts, D; Berger, R. AALAS 2023*



# EnviroRAX

EnviroRax is the alternative to traditional live animal sampling monitoring programs. If you have a ventilated rack system, or an alternative testing method, VRL can provide a surveillance program of viruses, bacteria, fungi and parasites all by PCR.

Sentinel Swab or Plenum testing offers the following advantages:

- Ease of sample collection and submission
- Fast results, 48-72 hours
- Commitment to the 3 Rs; Replacement, Reduction, and Refinement

**MOUSE**

	FECAL	CORE	COMPLETE	BACTERIA	PARASITES
ABBREVIATION	10606	10607	10608	10609	10610
<b>VIRUS</b>					
MHV	•	•	•		
MMV	•	•	•		
MPV (1-5)	•	•	•		
MNV	•	•	•		
GDVII	•	•	•		
EDIM	•	•	•		
MAV1	•		•		
MAV2	•		•		
REO	•		•		
ECTR	•		•		
LCMV	•		•		
PVM			•		
SEV			•		

<b>BACTERIA</b>					
HELICO	•	•	•	•	
MPUL			•	•	
CAMPY	•		•	•	
CROD	•		•	•	
CARB			•	•	
CPIL	•		•	•	
SALM	•		•	•	
SMONI	•		•	•	
PMIR	•		•	•	
BBRO			•	•	
BHIN	•		•	•	
CKUT	•		•	•	
KOXY	•		•	•	
KPNE	•		•	•	
RPNEU	•	•	•	•	
RHEYL	•	•	•	•	
PAER			•	•	
SAUR	•		•	•	
SPNE	•		•	•	
SAGA	•		•	•	
SCAN	•		•	•	
SEQU	•		•	•	
SPYO	•		•	•	
CBOV	•				

**RAT/VIRUS**

	FECAL	CORE	COMPLETE	BACTERIA	PARASITES
ABBREVIATION	10618	10619	10620	10629	10630
<b>VIRUS</b>					
RCV/SDA	•	•	•		
RMV	•	•	•		
RPV	•	•	•		
H-1	•	•	•		
KRV	•	•	•		
RTV	•	•	•		
MAV	•		•		
REO	•		•		
PVM	•		•		
HAN	•		•		
SEV			•		

<b>BACTERIA</b>					
HELICO	•	•	•	•	
SMONI	•		•	•	
MPUL			•	•	
CAMPY	•		•	•	
CARB			•	•	
CPIL	•		•	•	
SALM	•		•	•	
PMIR	•		•	•	
BBRO			•	•	
CKUT	•		•	•	
KOXY	•		•	•	
KPNE	•		•	•	
RPNEU	•	•	•	•	
RHEYL	•	•	•	•	
PAER			•	•	
SAUR	•		•	•	
SPNE	•		•	•	
SCAN	•		•	•	
SEQU	•		•	•	
SPYO	•		•	•	

# Enviro@RAX

## MOUSE

	FECAL	CORE	COMPLETE	BACTERIA	PARASITES
ABBREVIATION	10606	10607	10608	10609	10610
<b>FUNGI</b>					
PCAR			•		
<b>PARASITES</b>					
FUR		•	•		•
PIN	•	•	•		•
GIAR	•		•		•
SMUR	•		•		•
CRYP	•		•		•
EMUR	•		•		•
TMUR	•		•		•

## ANIMAL HEALTH MONITORING

## RAT/FUNGI

	FECAL	CORE	COMPLETE	BACTERIA	PARASITES
ABBREVIATION	10618	10619	10620	10629	10630
<b>FUNGI</b>					
PCAR			•		
<b>PARASITES</b>					
FUR		•	•		•
PIN	•	•	•		•
GIAR	•		•		•
SMUR	•		•		•
CRYP	•		•		•
EMUR	•		•		•
TMUR	•		•		•

**FECAL PCR PROFILES/MOUSE**

ABBREVIATION	AGENT	ROUTINE COMPLETE	
		10667	10668
MHV	<b>Mouse Hepatitis Virus</b>	•	•
MMV	<b>Mouse Minute Virus</b>	•	•
MPV	<b>Mouse Parvovirus</b>	•	•
MNV	<b>Murine Norovirus</b>	•	•
GDVII	<b>Theiler's Mouse Encephalomyelitis Virus</b>	•	•
EDIM	<b>Rotavirus/Epizootic Diarrhea of Infant Mice</b>	•	•
MAV 1&2	<b>Mouse Adenovirus FL &amp; K87</b>		•
REO	<b>Respiratory Enteric Virus III</b>		•
ECTRO	<b>Ectromelia Virus</b>		•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>		•
HELICO	<b>Helicobacter generic</b>	•	•
CROD	<b>Citrobacter rodentium</b>		•
BHIN	<b>Bordetella hinzii</b>		•
CAMPY	<b>Campylobacter spp.</b>		•
CBOV	<b>Corynebacterium bovis</b>		•
CKUT	<b>Corynebacterium kutscheri</b>		•
CPILI	<b>Clostridium piliforme</b>		•
KOXY	<b>Klebsiella oxytoca</b>		•
KPNE	<b>Klebsiella pneumoniae</b>		•
RPNEU	<b>Rodentibacter pneumotropica</b>	•	•
RHEYL	<b>Rodentibacter heylii</b>	•	•
SALM	<b>Salmonella spp.</b>		•
SAUR	<b>Staphylococcus aureus</b>		•
SMONI	<b>Streptobacillus moniliformis</b>		•
SPNE	<b>Streptococcus pneumoniae</b>		•
SAGA	<b>Streptococcus agalactiae</b>		•
SCAN	<b>Streptococcus canis</b>		•
SEQU	<b>Streptococcus equi subs. zooepidemicus</b>		•
SPYO	<b>Streptococcus pyogenes</b>		•
PMIR	<b>Proteus mirabilis</b>	•	•
PIN	<b>Pinworms (Syphacia &amp; Aspicularis)</b>		•
GIAR	<b>Giardia spp.</b>		•
SMUR	<b>Spironucleus muris</b>		•
CRYP	<b>Cryptosporidium spp.</b>		•
EMUR	<b>Entamoeba muris</b>		•

**FECAL PCR PROFILES/RAT**

ABBREVIATION	AGENT	ROUTINE	COMPLETE
		10669	10670
RCV/SDA	<b>Rat Coronavirus</b>	•	•
RMV	<b>Rat Minute Virus</b>	•	•
RPV	<b>Rat Parvovirus</b>	•	•
H-1	<b>Toolan's H-1</b>	•	•
KRV	<b>Kilham's Rat Virus</b>	•	•
RTV	<b>Rat Theilovirus</b>	•	•
MAV	<b>Mouse Adenovirus FL, K87</b>		•
REO	<b>Respiratory Enteric Virus</b>		•
HAN	<b>Hantavirus</b>		•
HELICO	<b>Helicobacter generic</b>	•	•
SMONI	<b>Streptobacillus moniliformis</b>		•
CAMPY	<b>Campylobacter spp.</b>		•
CKUT	<b>Corynebacterium kutscheri</b>		•
CPIL	<b>Clostridium piliforme</b>		•
KOXY	<b>Klebsiella oxytoca</b>		•
KPNE	<b>Klebsiella pneumoniae</b>		•
RPNEU	<b>Rodentibacter pneumotropica</b>	•	•
RHEYL	<b>Rodentibacter heylii</b>		
SALM	<b>Salmonella spp.</b>		•
SAUR	<b>Staphylococcus aureus</b>		•
SPNE	<b>Streptococcus pneumoniae</b>		•
SCAN	<b>Streptococcus canis</b>		•
SEQU	<b>Streptococcus equi subs. zooepidemicus</b>		•
SPYO	<b>Streptococcus pyogenes</b>		•
PMIR	<b>Proteus mirabilis</b>		•
PIN	<b>Pinworms (Syphacia &amp; Aspicularis)</b>	•	•
GIAR	<b>Giardia spp.</b>		•
SMUR	<b>Spironucleus muris</b>		•
CRYP	<b>Cryptosporidium spp.</b>		•
EMUR	<b>Entamoeba muris</b>		•

## RODENT VIRUS/INDIVIDUAL PCR

## ANIMAL HEALTH MONITORING

TEST CODE	ABBREVIATION	AGENT	SAMPLE TYPE	SPECIES
10569	BC	<b>Boone Cardiovirus</b>	Feces, environmental	Rat
10423	ECTRO	<b>Ectromelia Virus</b>	Feces, environmental, skin lesion	Mouse
10526	GPADV	<b>Guinea pig Adenovirus</b>	Feces, environmental, oral swab, lung	Guinea pig
10425	GPCMV	<b>Guinea pig Cytomegalovirus</b>	Feces, spleen, salivary gland	Guinea pig
10426	HANT	<b>Hantaan Virus</b>	Feces, environmental, kidney	Mouse, Rat, Guinea pig, Hamster
10446	KRV	<b>Killham's Rat Virus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Rat
10449	KRV/H-1	<b>Killham's Rat Virus/Toolan's H-1 Virus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Rat
10433	KV	<b>K Virus (Mouse Pneumonitis Virus)</b>	Feces, environmental, mesenteric lymph nodes	Mouse
10434	LDHV	<b>Lactate Dehydrogenase Elevating Virus</b>	Serum, spleen	Mouse
10435	LCMV	<b>Lymphocytic Choriomeningitis Virus</b>	Feces, environmental, kidney	Mouse
10436	MAV-1	<b>Mouse Adenovirus 1 (FL)</b>	Feces, environmental, mesenteric lymph nodes	Mouse
10529	MAV-2	<b>Mouse Adenovirus 2 (K87)</b>	Feces, environmental, intestine	Mouse
10438	MHV	<b>Mouse Hepatitis Virus</b>	Feces, environmental, mesenteric lymph nodes	Mouse
10447	MVM (MMV)	<b>Mouse Minute Virus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Mouse
10448	MPV	<b>Mouse Parvovirus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Mouse
10450	MMV/MPV	<b>Mouse Minute Virus/Mouse Parvovirus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Mouse
10460	MTV	<b>Mouse Thymic Virus</b>	Feces, environmental, oral swab, salivary gland	Mouse
10437	MCMV	<b>Murine Cytomegalovirus</b>	Feces, environmental, spleen, salivary gland	Mouse
10440	MNV	<b>Murine Norovirus</b>	Feces, environmental	Mouse
10444	PARVO	<b>Parvovirus generic</b>	Feces, environmental, mesenteric lymph nodes, spleen	Mouse, Rat
10452	PVM	<b>Pneumonia Virus of Mice</b>	Feces, environmental, oral swab, lung	Mouse
10453	POLY	<b>Polyomavirus</b>	Feces, kidney, environmental	Mouse
10454	POLY/K	<b>Polyomavirus / K Virus</b>	Feces, kidney, environmental	Mouse
10401	PUUV	<b>Puumala Virus</b>	Feces, environmental, kidney	Mouse, Rat
10455	RCV	<b>Rat Coronavirus</b>	Feces, environmental, oral swab, Harderian gland	Rat
10587	RCMV	<b>Rat Cytomegalovirus</b>	Feces, environmental, oral swab, salivary gland	Rat
10473	RMV	<b>Rat Minute Virus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Rat
10474	RPV	<b>Rat Parvovirus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Rat
10456	REO	<b>Respiratory Enteric Virus III</b>	Feces, liver, lung, environmental	Mouse, Rat, Guinea pig, Hamster
10439	EDIM	<b>Rotavirus/Epizootic Diarrhea of Infant Mice</b>	Feces, environmental	Mouse
10457	SEV	<b>Sendai Virus</b>	Feces, environmental, oral swab, lung	Mouse, Rat, Guinea pig, Hamster
10403	SEOV	<b>Seoul Virus</b>	Feces, environmental, kidney	Mouse, Rat
10402	SINV	<b>Sin Nombre Virus</b>	Feces, environmental, kidney	Mouse
10459	TMEV/GDVII	<b>Theiler's Mouse Encephalomyelitis Virus</b>	Feces, environmental	Mouse
10445	H-1	<b>Toolan's H-1 Virus</b>	Feces, environmental, mesenteric lymph nodes, spleen	Rat

## RODENT PARASITES/INDIVIDUAL PCR

TEST CODE	ABBREVIATION	AGENT	SAMPLE TYPE	SPECIES
10478	CRYP	<b>Cryptosporidium spp.</b>	Feces, environmental	Mouse, Rat
10524	DEMO	<b>Demodex</b>	Fur swab, environmental, feces	Mouse, Rat
10494	EIME	<b>Eimeria spp.</b>	Feces, environmental	Rabbit
10493	EMUR	<b>Entamoeba muris</b>	Feces, environmental	Mouse, Rat
10479	FUR	<b>Fur Mites (Myobia musculi &amp; Myocoptes musculinus, Radfordia affinis, Ornithonyssus bacoti)</b>	Fur swab, skin swab	Mouse, Rat
10498	GMUR	<b>Giardia muris</b>	Feces, environmental	Mouse, Rat
10487	GIAR	<b>Giardia spp.</b>	Feces, environmental	Mouse, Rat
10521	HDIM	<b>Hymenolepis diminuta (rat tapeworm)</b>	Feces, environmental	Mouse, Rat
10589	HNAN	<b>Hymenolepis nana</b>	Feces, environmental	Mouse, Rat
10585	ORNI	<b>Ornithonyssus spp</b>	Fur swab, environmental	Mouse, Rat
10893	PAMB	<b>Passalurus ambiguus</b>	Feces, environmental	Mouse, Rat
10461	PIN	<b>Pinworms (Syphacia &amp; Aspicularis)</b>	Feces, environmental	Mouse, Rat
10520	RNAN	<b>Rodentolepis nana</b>	Feces, environmental	Mouse, Rat
10486	SMUR	<b>Spironucleus muris</b>	Feces, environmental	Mouse, Rat
10492	TMUR	<b>Tritrichomonas muris</b>	Feces, environmental	Mouse, Rat



**RODENT BACTERIA/INDIVIDUAL PCR**
**ANIMAL HEALTH MONITORING**

TEST CODE	ABBREVIATION	AGENT	SAMPLE TYPE	SPECIES
10480	BBRO	<b>Bordetella bronchiseptica</b>	Feces, environmental, oral swab, trachea	Mouse, Guinea pig, Rat, Rabbit
10404	BHIN	<b>Bordetella hinzii</b>	Feces, environmental, oral swab, trachea	Mouse
10405	CAMPY	<b>Campylobacter spp.</b>	Feces, environmental	Mouse, Rat, Hamster, Guinea pig
10406	CCOL	<b>Campylobacter coli</b>	Feces, environmental	Mouse, Rat, Hamster, Guinea pig
10407	CJEJ	<b>Campylobacter jejuni</b>	Feces, environmental	Mouse, Rat, Hamster, Guinea pig
10424	CARB	<b>Cilia Associated Respiratory Bacillus</b>	Feces, environmental, oral swab, trachea	Mouse, Rat, Rabbit
10408	CROD	<b>Citrobacter rodentium</b>	Feces, environmental	Mouse, Rat
10590	CPER	<b>Clostridium perfringens</b>	Feces, environmental	Mouse, Rat
10491		<b>Clostridium difficile</b>		
10421	CPILI	<b>Clostridium piliforme</b>	Feces, environmental	Mouse, Rat, Rabbit, Ferret
10422	CBOV	<b>Corynebacterium bovis</b>	Feces, environmental, fur swab	Mouse, Rat
10409	CKUT	<b>Corynebacterium kutscheri</b>	Feces, environment, oral swab	Mouse, Hamster, Rat
10420	ECUN	<b>Encephalitozoon cuniculi</b>	Feces, kidney, brain, environmental	Mouse, Rat, Gamster, Guinea pig, Rabbit
10427	HELICO	<b>Helicobacter generic</b>	Feces, environmental	Mouse, Guinea pig, Rabbit, Rat
10428	HBIL	<b>Helicobacter bilis</b>	Feces, environmental	Mouse, Rabbit, Rat
10429	HHEP	<b>Helicobacter hepaticus</b>	Feces, environmental	Mouse, Rabbit, Rat
10462	HGAN	<b>Helicobacter ganmani</b>	Feces, environmental	Mouse, Rabbit, Rat
10525	HMASTO	<b>Helicobacter mastomyrinus</b>	Feces, environmental	Mouse, Rabbit, Rat
10430	HROD	<b>Helicobacter rodentium</b>	Feces, environmental	Mouse, Rabbit, Rat
10431	HTYP	<b>Helicobacter typhlonius</b>	Feces, environmental	Mouse, Rabbit, Rat
10432	HMUL	<b>Helicobacter Multiplex</b>	Feces, environmental	Mouse, Rabbit, Rat
10411	KOXY	<b>Klebsiella oxytoca</b>	Feces, environmental	Mouse, Rat
10412	KPNE	<b>Klebsiella pneumoniae</b>	Feces, environmental	Mouse, Rat
10410	LINT	<b>Lawsonia intracellularis</b>	Feces, intestine, mesenteric lymph node	Guinea pig, Hamster, Rat, Rabbit
10573	LEPTO	<b>Leptospira spp.</b>	Feces, kidney	Mouse, Rat
10441	MYCO	<b>Mycoplasma spp.</b>	Feces, environmental, oral, swab	Mouse, Rat
10442	MART	<b>Mycoplasma arthritis</b>	Feces, environmental, oral, swab	Mouse, Rat
10443	MPUL	<b>Mycoplasma pulmonis</b>	Feces, environmental, oral, swab	Mouse, Rat
10413	PMUL	<b>Pasteurella multocida</b>	Feces, environmental, oral, swab	Mouse, Rat, Gamster, Guinea pig, Rabbit
10531	PAST	<b>Pasteurella spp.</b>	Feces, environmental, oral, swab	Mouse, Rat, Gamster, Guinea pig, Rabbit
10451	PCAR	<b>Pneumocystis carinii</b>	Oral swab, lung, environmental	Rat
10414	PMUR	<b>Pneumocystis murina</b>	Oral swab, lung, environmental	Mouse
10415	PNEU	<b>Pneumocystis spp.</b>	Oral swab, lung, environmental	Rat, Mouse
10416	PMIR	<b>Proteus mirabilis</b>	Feces, environmental	Mouse, Rat, Gamster, Guinea pig, Rabbit
10417	PAER	<b>Pseudomonas aeruginosa</b>	Feces, environmental	Mouse, Rat
10463	RPNEU	<b>Rodentibacter pneumotropica</b>	Feces, environmental, oral swab, trachea	Mouse, Rat
10579	RHEYL	<b>Rodentibacter heylii</b>	Feces, environmental, oral swab, trachea	Mouse, Rat
10418	SALM	<b>Salmonella spp.</b>	Feces, environmental	Mouse, Rat, Gamster, Guinea pig, Rabbit
10588	SFB	<b>Segmented Filamentous Bacteria</b>	Feces, environmental	Mouse
10458	SAUR	<b>Staphylococcus aureus</b>	Feces, environmental, oral swabs, fur swab/skin swab	Mouse, Rat
10522	STAX	<b>Staphylococcus xylosus</b>	Feces, environmental, oral swab, fur swab/skin swab	Mouse, Rat
10464	SMONI	<b>Streptobacillus moniliformis</b>	Feces, environmental, oral swab	Mouse, Rat
10523	SBETA	<b>B-hemolytic Streptococcus (Groups A, B, C, G)</b>	Feces, environmental, oral swab	Mouse, Rat
10419	SAGA	<b>Streptococcus agalactiae</b>	Feces, environmental, oral swab	Mouse, Rat
10495	SCAN	<b>Streptococcus canis</b>	Feces, environmental, oral swab	Mouse, Rat
10496	SEQU	<b>Streptococcus equi subs. Zoepidemicus</b>	Feces, environmental, oral swab	Mouse, Rat
10465	SPNE	<b>Streptococcus pneumoniae</b>	Feces, environmental, oral swab	Mouse, Rat
10497	SPYO	<b>Streptococcus pyogenes</b>	Feces, environmental, oral swab	Mouse, Rat
10482	TREP	<b>Treponema cuniculi</b>	Genital swab	Rabbit
11165		<b>Yersinia spp.</b>		

**BACTERIOLOGY SERVICES**

CODE	TESTS	SAMPLE TYPE
80613	<b>Aerobic bacteria Isolation from swab of selected sites/organs</b>	Swabs, feces
80616	<b>Aerobic Blood Culture</b>	Blood media bottle
80617	<b>Anaerobic bacteria Isolation</b>	Swab of the selected site/organ
80615	<b>Antibiotic Sensitivity Testing</b>	Swabs, feces
80623	<b>Culture for <i>Corynebacterium bovis</i></b>	Swabs, feces
80612	<b>Gastrointestinal Bacterial Culture</b>	Swabs, feces
80610	<b>Oropharyngeal/Nasal Bacterial Culture</b>	Swabs, feces

**ENVIRONMENTAL MONITORING**

CODE	TESTS	SAMPLE TYPE
80738	<b>Environmental Swab</b>	Swabs
80734	<b>Identification of Bacterial Isolates</b>	Agar Plate
80736	<b>RODAC Plate (Colony Count, Gram staining)</b>	Rodac Plate
80737	<b>Water Analysis (Colony Count, Gram staining)</b>	Water
80624	<b>Water testing for <i>Pseudomonas aeruginosa</i></b>	Water

**GNOTOBIOTIC TEST**

CODE	TESTS	SAMPLE TYPE
80647	<b>Gnotobiotic Micro</b>	Feces
80648	<b>Gnotobiotic Micro + 16S PCR</b>	Feces

**MYCOLOGY**

CODE	TESTS	SAMPLE TYPE
80626	<b>Dermatophyte</b>	Fur pluck, skin scraping
80607	<b>Fungi Isolation</b>	Feces, swab, environmental

**PARASITOLOGY SERVICES**

<b>CODE</b>	<b>TESTS</b>
80618	<b>Fecal sedimentation for ova and protozoal cysts</b>
80619	<b>PVA-trichrome stain for protozoal trophozoites and cysts</b>
80626	<b>Dermatophyte testing</b>
80720	<b>Direct feces examination for helminths</b>
80721	<b>Wet mounts of ileal and cecal content examined for protozoa (live animal submission required)</b>
80722	<b>Pelt exam for ectoparasites</b>
80723	<b>Bladder examined microscopically for <i>Trichosomoides crassicauda</i> (live animal submission required)</b>
80724	<b>Cellophane tape test for <i>Syphacia</i> spp.</b>
80755	<b>Parasite examination of blood smear (Giemsa stain)</b>

## NECROPSY PANELS

### Comprehensive Animal Health Assessment Profiles

Live animal submissions (required for mouse, rat, hamster): Includes an initial clinical exam of the animal, gross necropsy, oropharyngeal and fecal bacterial culture for pathogens, pelt exam for ectoparasites, examination of the feces for helminths and microscopic examination of the duodenum, ileum, cecum and colon contents for protozoa.

**Rabbits:** VRL cannot euthanize rabbits. To prepare rabbit samples for necropsy panels, [follow instructions on page 63](#).

Please contact your representative if customization is needed.

## ANIMAL HEALTH MONITORING

### MOUSE

ABBREVIATION	AGENT	With Histopathology	CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		Without Histopathology	80001	80002	80003	80004
		80005	80006	80007	80008	
<b>SEROLOGY</b>						
MHV	Mouse Hepatitis Virus	•	•	•	•	•
MVM (MMV)	Mouse Minute Virus	•	•	•	•	•
MPV (1-5)	Mouse Parvovirus	•	•	•	•	•
MNV	Murine Norovirus	•	•	•	•	•
EDIM	Rotavirus/Epizootic Diarrhea of Infant Mice	•	•	•	•	•
TMEV/GDVII	Theiler's Mouse Encephalomyelitis Virus	•	•	•	•	•
LCMV	Lymphocytic Choriomeningitis Virus		•	•	•	•
MAV-1 (FL)	Mouse Adenovirus-1 (MAV-FL)		•	•	•	•
MAV-2 (K87)	Mouse Adenovirus-2 (MAV-K87)		•	•	•	•
PVM	Pneumonia Virus of Mice		•	•	•	•
SEV	Sendai Virus		•	•	•	•
CARB	Cilia Associated Respiratory Bacillus				•	•
CPILI	Clostridium piliforme				•	•
ECTRO	Ectromelia Virus				•	•
MCMV	Murine Cytomegalovirus				•	•
MYCO	Mycoplasma pulmonis				•	•
POLY	Polyomavirus				•	•
REO	Respiratory Enteric Virus III				•	•
ECUN	Encephalitozoon cuniculi					•
HANT	Hantaan Virus					•
KV	K Virus (Mouse Pneumonitis Virus)					•
LDHV	Lactate Dehydrogenase Elevating Virus					•
MTV	Mouse Thymic Virus					•
<b>PCR</b>						
HELICO	Helicobacter spp.		•	•	•	•
<b>HISTOPATHOLOGY</b>						
	Lung		•	•	•	•
	Liver		•	•	•	•
	Colon		•	•	•	•
	Cecum		•	•	•	•
	Lesioned Organs		•	•	•	•

**NECROPSY PANELS  
MOUSE (CONT'D)**

ABBREVIATION	AGENT		CORE	ROUTINE	COMPLETE	COMPLETE PLUS
			80001	80002	80003	80004
		With Histopathology	80001	80002	80003	80004
		Without Histopathology	80005	80006	80007	80008
<b>PARASITOLOGY</b>						
	<b>Ectoparasite Exam</b>		•	•	•	•
	<b>Endoparasite Exam</b>		•	•	•	•
<b>MICROBIOLOGY</b>						
BBRO	<b>Bordetella bronchiseptica</b>		•	•	•	•
CKUT	<b>Corynebacterium kutscheri</b>		•	•	•	•
KOXY	<b>Klebsiella oxytoca</b>		•	•	•	•
KPNE	<b>Klebsiella pneumoniae</b>		•	•	•	•
PMUL	<b>Pasteurella multocida</b>		•	•	•	•
RPNEU	<b>Rodentibacter pneumotropica</b>		•	•	•	•
RHEYL	<b>Rodentibacter heylii</b>		•	•	•	•
PAER	<b>Pseudomonas aeruginosa</b>		•	•	•	•
SAUR	<b>Staphylococcus aureus</b>		•	•	•	•
SBETA	<b>Streptococcus spp. beta-hemolytic</b>		•	•	•	•
SPNE	<b>Streptococcus pneumoniae</b>		•	•	•	•
CROD	<b>Citrobacter rodentium</b>		•	•	•	•
SALM	<b>Salmonella spp.</b>		•	•	•	•
PMIR	<b>Proteus mirabilis</b>		•	•	•	•
CBOV	<b>Corynebacterium bovis</b>		•	•	•	•
	<b>Other Bacteria</b>		•	•	•	•

**NECROPSY PANELS**
**RAT**

ABBREVIATION	AGENT		CORE	ROUTINE	COMPLETE	COMPLETE PLUS
			80009	80016	80010	80025
		With Histopathology	80012	80015	80013	80026
<b>SEROLOGY</b>						
KRV	<b>Kilham's Rat Virus</b>		•	•	•	•
H-1	<b>Toolan's H-1 Virus</b>		•	•	•	•
RCAR	<b>Pneumocystis carinii</b>		•	•	•	•
SDA/RCV	<b>Rat Coronavirus</b>		•	•	•	•
RMV	<b>Rat Minute Virus</b>		•	•	•	•
RPV	<b>Rat Parvovirus</b>		•	•	•	•
RTV	<b>Rat Theilovirus</b>		•	•	•	•
CARB	<b>Cilia Associated Respiratory Bacillus</b>			•	•	•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>			•	•	•
MAV-1 (FL)	<b>Mouse Adenovirus</b>			•	•	•
MPUL	<b>Mycoplasma pulmonis</b>			•	•	•
PVM	<b>Pneumonia Virus of Mice</b>				•	•
REO	<b>Respiratory Enteric Virus III</b>				•	•
SEV	<b>Sendai Virus</b>				•	•
CPILI	<b>Clostridium piliforme</b>					•
ECUN	<b>Encephalitozoon cuniculi</b>					•
HANT	<b>Hantaan Virus</b>					•
IDIR	<b>Rat Rotavirus</b>					•
<b>PCR</b>						
HELICO	<b>Helicobacter spp.</b>		•	•	•	•
<b>MICROBIOLOGY</b>						
BBRO	<b>Bordetella bronchiseptica</b>		•	•	•	•
CKUT	<b>Corynebacterium kutscheri</b>		•	•	•	•
KOXY	<b>Klebsiella oxytoca</b>		•	•	•	•
KPNE	<b>Klebsiella pneumoniae</b>		•	•	•	•
PMUL	<b>Pasteurella multocida</b>		•	•	•	•
RPNEU	<b>Rodentibacter pneumotropica</b>		•	•	•	•
RHEYL	<b>Rodentibacter heylii</b>		•	•	•	•
PAER	<b>Pseudomonas aeruginosa</b>		•	•	•	•
SAUR	<b>Staphylococcus aureus</b>		•	•	•	•
SBETA	<b>Streptococcus spp. beta-hemolytic</b>		•	•	•	•
SPNE	<b>Streptococcus pneumoniae</b>		•	•	•	•
CROD	<b>Citrobacter rodentium</b>		•	•	•	•
SALM	<b>Salmonella spp.</b>		•	•	•	•
PMIR	<b>Proteus mirabilis</b>		•	•	•	•
CBOV	<b>Corynebacterium bovis</b>		•	•	•	•
	<b>Other Bacteria</b>		•	•	•	•

**NECROPSY PANELS  
RAT (CONT'D)**

ABBREVIATION	AGENT		CORE	ROUTINE	COMPLETE	COMPLETE PLUS
		With Histopathology	80009	80016	80010	80025
		Without Histopathology	80012	80015	80013	80026
<b>PARASITOLOGY</b>						
	<b>Ectoparasite Exam</b>		•	•	•	•
	<b>Endoparasite Exam</b>		•	•	•	•
<b>HISTOPATHOLOGY</b>						
	<b>Lung</b>		•	•	•	•
	<b>Liver</b>		•	•	•	•
	<b>Colon</b>		•	•	•	•
	<b>Cecum</b>		•	•	•	•
	<b>Harderian Gland</b>		•	•	•	•
	<b>Salivary Glands</b>		•	•	•	•
	<b>Kidney</b>		•	•	•	•
	<b>Lesioned Organs</b>		•	•	•	•



**NECROPSY PANELS**
**RABBIT**

ABBREVIATION	AGENT	ROUTINE COMPLETE	
		With Histopathology 80020	80022
		Without Histopathology 80021	80023
<b>SEROLOGY</b>			
CARB	<b>Cilia Associated Respiratory Bacillus</b>	•	•
CPILI	<b>Clostridium piliforme</b>	•	•
ECUN	<b>Encephalitozoon cuniculi</b>	•	•
PMUL	<b>Pasteurella multocida</b>	•	•
TREP	<b>Treponema cuniculi</b>	•	•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>		•
PIV-1	<b>Parainfluenza Virus-1</b>		•
PIV-2	<b>Parainfluenza Virus-2</b>		•
RHDV	<b>Rabbit Hemorrhagic Disease Virus</b>		•
ROTA	<b>Rabbit Rotavirus</b>		•
REO	<b>Respiratory Enteric Virus III</b>		•
TOXG	<b>Toxoplasma gondii</b>		•
<b>MICROBIOLOGY</b>			
BBRO	<b>Bordetella bronchiseptica</b>	•	•
CKUT	<b>Corynebacterium kutscheri</b>	•	•
KOXY	<b>Klebsiella oxytoca</b>	•	•
KPNE	<b>Klebsiella pneumoniae</b>	•	•
PMUL	<b>Pasteurella multocida</b>	•	•
RPNEU	<b>Rodentibacter pneumotropica</b>	•	•
RHEYL	<b>Rodentibacter heylii</b>	•	•
PAER	<b>Pseudomonas aeruginosa</b>	•	•
SAUR	<b>Staphylococcus aureus</b>	•	•
SBETA	<b>Streptococcus spp. beta-hemolytic</b>	•	•
SPNE	<b>Streptococcus pneumoniae</b>	•	•
CROD	<b>Citrobacter rodentium</b>	•	•
SALM	<b>Salmonella spp.</b>	•	•
PMIR	<b>Proteus mirabilis</b>	•	•
CBOV	<b>Corynebacterium bovis</b>	•	•
	<b>Other Bacteria</b>	•	•
<b>PARASITOLOGY</b>			
	<b>Ectoparasite Exam</b>	•	•
	<b>Endoparasite Exam</b>	•	•
<b>HISTOPATHOLOGY</b>			
	<b>Lung</b>	•	•
	<b>Liver</b>	•	•
	<b>Cecum</b>	•	•
	<b>Colon</b>	•	•
	<b>Kidney</b>	•	•
	<b>Lesioned Organs</b>	•	•

**NECROPSY PANELS**
**HAMSTER**

ABBREVIATION	AGENT	ROUTINE COMPLETE	
		With Histopathology 80030	80033
		Without Histopathology 80027	80034
<b>SEROLOGY</b>			
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>	•	•
PVM	<b>Pneumonia Virus of Mice</b>	•	•
REO	<b>Respiratory Enteric Virus III</b>	•	•
SEV	<b>Sendai Virus</b>	•	•
SV5	<b>Simian Virus 5</b>	•	•
CPILI	<b>Clostridium piliforme</b>		•
ECUM	<b>Encephalitozoon cuniculi</b>		•
<b>MICROBIOLOGY</b>			
BBRO	<b>Bordetella bronchiseptica</b>	•	•
CKUT	<b>Corynebacterium kutscheri</b>	•	•
KOXY	<b>Klebsiella oxytoca</b>	•	•
KPNE	<b>Klebsiella pneumoniae</b>	•	•
PMUL	<b>Pasteurella multocida</b>	•	•
RPNEU	<b>Rodentibacter pneumotropica</b>	•	•
RHEYL	<b>Rodentibacter heylii</b>	•	•
PAER	<b>Pseudomonas aeruginosa</b>	•	•
SAUR	<b>Staphylococcus aureus</b>	•	•
SBETA	<b>Streptococcus spp. beta-hemolytic</b>	•	•
SPNE	<b>Streptococcus pneumoniae</b>	•	•
CROD	<b>Citrobacter rodentium</b>	•	•
SALM	<b>Salmonella spp.</b>	•	•
PMIR	<b>Proteus mirabilis</b>	•	•
CBOV	<b>Corynebacterium bovis</b>	•	•
	<b>Other Bacteria</b>	•	•
<b>PARASITOLOGY</b>			
	<b>Ectoparasite Exam</b>	•	•
	<b>Endoparasite Exam</b>	•	•
<b>HISTOPATHOLOGY</b>			
	<b>Lung</b>	•	•
	<b>Liver</b>	•	•
	<b>Colon</b>	•	•
	<b>Cecum</b>	•	•
	<b>Kidney</b>	•	•
	<b>Lesioned Organs</b>	•	•

**CANINE SEROLOGY**

CODE	TESTS
D156	<b>Trypanosoma cruzi (Chagas disease) IgG</b>
D8583	<b>Trypanosoma cruzi (Chagas disease) kDNA</b>
D8540	<b>Trypanosoma cruzi (Chagas disease) nDNA</b>

**CANINE PCR**

CODE	TESTS
D8590	<b>Bordetella bronchiseptica</b>
D8591	<b>Campylobacter coli</b>
D8556	<b>Campylobacter jejuni</b>
D8585	<b>Cryptosporidium spp.</b>
D8592	<b>Clostridium difficile toxins A &amp; B</b>
D8588	<b>Dirofilaria immitis (heartworm)</b>
D8586	<b>Giardia spp.</b>
D8550	<b>Salmonella</b>
D8593	<b>Streptococcus equi subs. Zooepidemicus</b>
D8583	<b>Trypanosoma cruzi (Chagas disease) kDNA</b>
D8540	<b>Trypanosoma cruzi (Chagas disease) nDNA</b>

**CANINE MICROBIOLOGY**

CODE	TESTS
D400	<b>Aerobic Culture</b>
D397	<b>Aerobic Sensitivity (Can only be done with culture)</b>
D401	<b>Anaerobic Culture</b>
D396	<b>Anaerobic Sensitivity (Can only be done with culture)</b>
D5002	<b>Campylobacter Culture</b>
D2406	<b>Concentrated Fecal Float (cysts, eggs, larvae)</b>
D3406	<b>Concentrated Fecal Float (helminths Only)</b>
D515	<b>Methicillin-resistant Staphylococcus aureus (MRSA) culture</b>
D406	<b>Ova &amp; Parasites</b>
D500	<b>Salmonella Culture</b>





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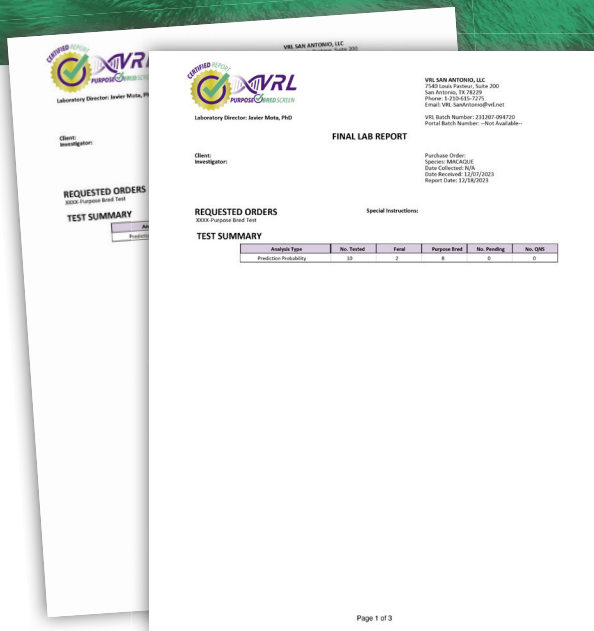
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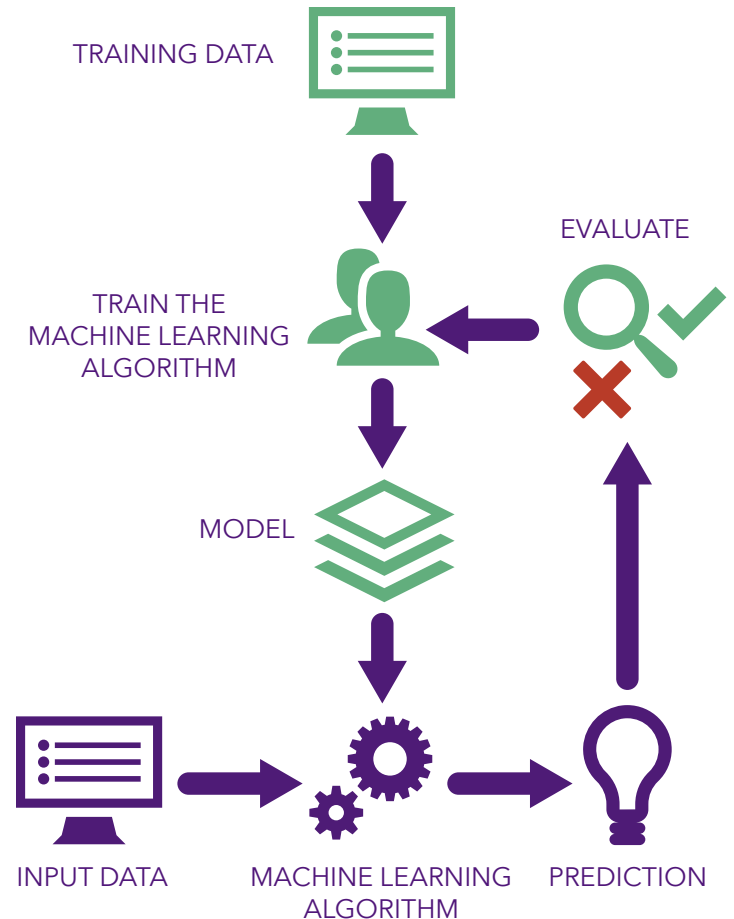
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**MACAQUE SEROLOGY PANELS**

AGENT	Panel A1 <b>L14</b>	Panel A2 <b>21</b>	Panel A3 <b>L12</b>	Panel A4 <b>L13</b>	Panel A5 <b>L123</b>	Panel A6 <b>L17</b>	Panel A7 <b>L19</b>	Panel G <b>3005</b>	Panel G1 <b>3003</b>	Panel H <b>6</b>
<b>Herpes B-Virus</b>	•	•	•	•	•	•	•	•	•	
<b>Measles (Rubeola)</b>	•	•		•		•	•			
<b>SIV</b>	•	•	•	•	•		•			•
<b>STLV-1</b>	•		•							•
<b>SRV 1,2,3,4,5,6,8</b>	•	•	•	•	•	•	•			•
<b>Cytomegalovirus (CMV) Rhesus</b>		•				•	•	•	•	
<b>HSV-1</b>								•		
<b>HSV-2</b>								•		
<b>Simian Varicella</b>								•	•	
<b>Epstein-Barr virus (EBV)</b>								•	•	
<b>Foamy Virus</b>										•

**OLD WORLD SEROLOGY PANELS**

AGENT	Panel B <b>2</b>	Panel B1 <b>12</b>	Panel B2 <b>13</b>	Panel B3 <b>14</b>	Panel F <b>2005</b>
<b>HSV1</b>	•				•
<b>HSV2</b>		•		•	•
<b>HVP2</b>			•		
<b>Measles</b>	•	•	•	•	
<b>SA6 (AgmCMV)</b>	•	•	•	•	•
<b>SA8</b>	•	•		•	•
<b>SIV</b>	•	•	•		
<b>STLV-1</b>		•	•		
<b>EBV</b>					•
<b>Simian Varicella</b>					•

**BABOON SEROLOGY PANELS**

AGENT	Panel B2 <b>13</b>	Panel B4 <b>15</b>	Panel F1 <b>2006</b>
<b>HVP-2</b>	•	•	•
<b>Measles</b>	•	•	
<b>SA6 (AgmCMV)</b>	•	•	•
<b>SIV</b>	•	•	
<b>STLV-1</b>	•		
<b>EBV</b>			•
<b>SVV</b>			•

**NEW WORLD SEROLOGY PANELS**

AGENT	Panel C <b>3</b>
<b>H.tamarinus</b>	•
<b>H.saimiri</b>	•
<b>Measles</b>	•
<b>Sq. Monkey CMV</b>	•



**NHP INDIVIDUAL SEROLOGY**

TEST CODE	ABBREVIATION	AGENT
L158	COVID	2019-nCoV (SARS-CoV-2) -RT
120	ADENO	Adenovirus
107	SA6	African green monkey cytomegalovirus
103	SA8	African green monkey herpesvirus
L115	BPSU	Burkholderia pseudomallei
L161	CAS9	CAS9 ELISA Test
108	CMV	Cytomegalovirus Chimpanzee
106	CMV	Cytomegalovirus RhCMV (Macaca spp.)
109	CMV	Cytomegalovirus Squirrel Monkey
131	EMCV	Encephalomyocarditis Virus
110	EBV	Epstein-Barr Virus
1135	EBOLAR	Filovirus-Ebola (Reston Strain)
80487	EBOLAZ	Filovirus-Ebola (Zaire)
80488	EBOLAS	Filovirus-Ebola (Sudan)
80491		Filovirus-Ebola (Zaire/Sudan/Reston)
80492	MARB	Filovirus-Marburg (Musoke)
80496	FILO	Filovirus-Ebola (Zaire/Sudan/Reston) & Marburg (Musoke)
201	HEPA	Hepatitis A (IgM)
200	HBV	Hepatitis A (Total)
2202	HBV	Hepatitis B Core IgG and IgM Antibody
7024	HBV	Hepatitis B Core IgM Antibody
1202	HBV	Hepatitis B Surface Antigen
202	HBV	Hepatitis B Surface Antigen Antibody
3202	HEPC	Hepatitis C Antibody
L100	HBV	Herpes B-Virus
W100	HBV	Herpes B-Virus Western Blot
104	HTAM	Herpes tamarinus
114	HVP-2	Herpesvirus Papio 2
101	HSV-1	Herpesvirus type 1
102	HSV-2	Herpesvirus type 2
105	HSAIM	Herpesvirus saimiri
140	CPOX	Human Varicella-Zoster Herpesvirus (Chicken pox Virus)
123	FLU-A	Influenza A (Flu A)

TEST CODE	ABBREVIATION	AGENT
124	FLU-B	Influenza B (Flu B)
151	LEPTO	Leptospirosis
132	LCMV	Lymphocytic Choriomeningitis (LCMV)
L112	MEAS	Measles (Rubeola)
133	CMC	Monkeypox (Copenhagen Strain)
L162	M.tb IgG	M. tuberculosis IgG ELISA
125	PIV-1	Parainfluenza type 1 (Paraflu 1)
126	PIV-2	Parainfluenza type 2 (Paraflu 2)
127	PIV-3	Parainfluenza type 3 (Paraflu 3)
249	POLIO	Polio
137	RABIES	Rabies Virus
128	RSV	Respiratory Syncytial Virus
139	SA11	Rotavirus
W107	SA6	SA6
134	SHF	Simian Hemorrhagic fever
136	FOAMY	Simian Foamy Virus, Group Specific
L111	VSV	Simian Varicella Virus
L121	SIV	Simian Immunodeficiency Virus
W121	SIV	Simian Immunodeficiency Virus
L1110	SRV	(Simian Retrovirus) Group Specific Antibody
W1110	SRV	Simian Retrovirus Type D
L118	STLV-1	Simian T-cell Leukemia Virus
W118	STLV	Simian T-cell Leukemia Virus
L2118	STLV-2	Simian T-Cell Leukemia Virus
W2118	STLV-2	Simian T-cell Leukemia Virus
130	SV40	Simian Papovavirus-macaques
129	SV5	Simian Parainfluenza Virus
9002		Titers per Antigen
9005		Titers per Panel
6028	TOX IgG	Toxoplasma IgG
6029	TOX IgM	Toxoplasma IgM
L154	TCRUZ	Trypanosoma cruzi (Chagas disease) IgG
L155	TCRUZ	Trypanosoma cruzi (Chagas disease) IgM

**NHP INDIVIDUAL PCR**

TEST CODE	ABBREVIATION	AGENT
8597	COVID	2019-nCoV (SARS-CoV-2) -RT
8574	ABO	ABO phenotyping
8508	SIV	African green monkey
8541	SA6	African green monkey Cytomegalovirus
8573	BPSEU	Burkholderia pseudomallei
8554	CAMP	Campylobacter screen spp.
8556	CJEJ	Campylobacter jejuni
8590	CCOL	Campylobacter coli
8579	CHIK	Chikungunya
8510	SIV	Chimpanzee
8585	CRYP	Cryptosporidium spp.
8607	DENG	Dengue
8539	EMCV	Encephalomyocarditis Virus (EMCV) RT
8567	FILO	Filovirus
8586	GIAR	Giardia spp.
8561	HELICO	Heliobacter spp.
8520	HBVA-H	Hepatitis B genotype A-H
8548	HBVD	Hepatitis B genotype D
8500	HERB	Herpes B-virus
8538	KLEB	Klebsiella pneumoniae rmpA/magA genotyping
8620	LEISH	Leishmaniasis disease
8532	LEPTO	Leptospira
8509	SIV	Macaque
8534	MALA	Malaria
8566		Male Gender y-chromosome
8535	MAMU	Mamu-A*01 screen
8582	PLAS	Measles
8587	MRSA	Methicillin-resistant Staphylococcus aureus

TEST CODE	ABBREVIATION	AGENT
8527	MYCO	Mycobacterium spp.
8584	MTURB	Mycobacterium tuberculosis
8529	MTURBX	Mycobacterium tuberculosis complex
8530		Mycobacterium tuberculosis and Mycobacterium bovis
8611	PIV-3	Parainfluenza-3
8555	RSV	Respiratory Syncytial Virus
8578	RV-2	Rhadinovirus lineage 2
8501	CMV	Rhesus Cytomegalovirus
8550	SALM	Salmonella
8531		Salmonella / Shigella
8551	SHIG	Shigella
8504	FOAMY	Simian Foamy Virus, African green monkey
8505	FOAMY	Simian Foamy Virus, Baboon
8506	FOAMY	Simian Foamy Virus, Chimpanzee
8507	FOAMY	Simian Foamy Virus, Macaque
8092	SPV	Simian Parvovirus
8552	VSV	Simian Varicella Virus
8559	SIV	Screen spp.
8511	SRV	Simian Retrovirus; 1,2,3,4,5,6, 8
8516	STLV	STLV-1 (Simian T-cell Leukemia Virus)
8517	SV40	SV40
8583	TCRUZ	Trypanosoma cruzi kDNA
8540	TCRUZ	Trypanosoma cruzi nDNA
8558	YERS	Yersinia
8543	YENT	Yersinia enterocolitica
8542	YPSEU	Yersinia pseudotuberculosis
8581	ZIKA	Zika Virus

**NHP BACTERIOLOGY CULTURE PANELS**

AGENT	Panel #1 402	Panel #2 409	Panel #3 502	Panel #4 503	Panel #5 505	Panel #6 508	Panel #7 509	Panel #8 513	Panel #9 514	Panel #10 517	Panel #11 518
Salmonella	•	•	•	•	•	•	•	•	•	•	•
Shigella	•	•	•	•	•	•	•	•		•	•
Campylobacter	•	•		•		•		•	•	•	
Vibrio	•										•
Yersinia	•				•	•		•			•
Klebsiella		•					•	•	•		
Klebsiella HMV										•	

**NHP INDIVIDUAL BACTERIOLOGY**

CODE	ABBREVIATION
400	<b>Aerobic Culture</b>
397	<b>Aerobic Sensitivity</b>
401	<b>Anaerobic Culture</b>
396	<b>Anaerobic Sensitivity</b>
395	<b>Antibiotic Sensitivity Testing</b>
502	<b>Campylobacter Culture</b>
2065	<b>E.coli 0157: H7 Culture</b>
504	<b>Klebsiella Culture</b>
516	<b>Klebsiella HMV Phenotype (String test)</b>
500	<b>Salmonella Culture</b>
501	<b>Shigella Culture</b>
5004	<b>Vibrio Culture</b>
5003	<b>Yersinia Culture</b>

**NHP G.I. PCR PANELS**

PANEL	8596	8598	8592
Campylobacter screen spp.	•	•	
Salmonella	•	•	
Shigella	•	•	
Yersinia enterocolitica	•		
Yersinia pseudotuberculosis	•		
Cryptosporidium spp.	•		
Giardia spp.	•		
Campylobacter jejuni	•		
Yersinia		•	
Simian Immunodeficiency Virus			•
Simian Retrovirus			•
Simian T-cell Leukemia Virus			•

**NHP SPECIALTY TESTS**
**NHP INDIVIDUAL PARASITOLOGY**

CODE	ABBREVIATION
2406	Fecal Concentration
3406	Fecal Concentrated (Helminths Only)
406	Ova & Parasites

**SPECIALTY TESTS**

CODE	ABBREVIATION
8597	2019-nCoV (SARS-CoV-2)-RT-PCR
302	Herpes B-virus Isolation
8536	Mamu-A*01 sequence confirmation
515	MRSA
301	SRV (Simian Retrovirus) isolation
8625	HPV 16 & 18
8623	Influenza A & B

**NHP G.I. PCR PANELS**

PANEL	8601	8602
ASSAY	Profile 1	Profile 2
Campylobacter coli	•	•
Campylobacter jejuni	•	•
Clostridium Difficile (toxin A&B)	•	•
Cryptosporidium spp.	•	•
Giardia spp.	•	•
Helicobacter screen spp.	•	•
Salmonella	•	•
Shigella	•	•
Yersinia enterocolitica	•	•
Yersinia pseudotuberculosis	•	•
Balantidium coli		•
Entamoeba histolytica		•
Giardia lamblia		•

**FELASA PANELS  
MOUSE**

ABBREVIATION		FELASA Q		FELASA A	
		Serology Panels		PCR Panels	
		818MF	828MF	838MF	848MF
<b>VIRUSES</b>					
MHV	<b>Mouse Hepatitis Virus</b>	•	•	•	•
MMV	<b>Mouse Minute Virus</b>	•	•	•	•
MPV	<b>Mouse Parvovirus</b>	•	•	•	•
MNV	<b>Murine Norovirus</b>	•	•	•	•
EDIM	<b>Rotavirus/Epizootic Diarrhea of Infant Mice</b>	•	•	•	•
TMEV/GDVII	<b>Theiler's Mouse Encephalomyelitis Virus</b>	•	•	•	•
ECTR	<b>Ectromelia Virus</b>		•		•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>		•		•
MAV-1 (FL)	<b>Mouse Adenovirus-1 (MAV-FL)</b>		•		•
MAV-2 (K87)	<b>Mouse Adenovirus-2 (MAV-K87)</b>		•		•
PVM	<b>Pneumonia Virus of Mice</b>		•		•
REO	<b>Respiratory Enteric Virus III</b>		•		•
SEV	<b>Sendai Virus</b>		•		•
<b>BACTERIA AND FUNGI</b>					
CPILI	<b>Clostridium piliforme</b>		•		•
MPUL	<b>Mycoplasma pulmonis</b>		•		•
HELICO	<b>Helicobacter spp.</b>			•	•
RPNEU	<b>Rodentibacter pneumotropica</b>			•	•
STRGA	<b>Streptococcus B Hemolytic Group A</b>			•	•
STRGB	<b>Streptococcus B Hemolytic Group B</b>			•	•
STRGC	<b>Streptococcus B Hemolytic Group C</b>			•	•
STRGG	<b>Streptococcus B Hemolytic Group G</b>			•	•
SPNE	<b>Streptococcus pneumoniae</b>			•	•
CROD	<b>Citrobacter rodentium</b>				•
CKUT	<b>Corynebacterium kutscheri</b>				•
SALM	<b>Salmonella spp.</b>				•
SMONI	<b>Streptobacillus moniliformis</b>				•
<b>PARASITES</b>					
FUR	<b>Fur Mites (Myobia musculi &amp; Myocptes musculinus, Radfordia affinis, Ornithonyssus bacoti)</b>			•	•
GMUR	<b>Giardia muris</b>			•	•
SMUR	<b>Spironucleus muris</b>			•	•
CRYP	<b>Cryptosporidium spp.</b>			•	•
PIN	<b>Pinworms (Aspicularis, Syphacia)</b>			•	•
EMUR	<b>Entamoeba muris</b>			•	•

**FELASA PANELS**
**RAT**

ABBREVIATION	VIRUSES	FELASA Q		FELASA A	
		Serology Panels		PCR Panels	
		828RF	838RF	848RF	858RF
<b>VIRUSES</b>					
H-1	<b>Toolan's H-1</b>	•	•	•	•
KRV	<b>Kilham Rat Virus</b>	•	•	•	•
RMV	<b>Rat Minute Virus</b>	•	•	•	•
RPV	<b>Rat parvovirus</b>	•	•	•	•
RCV/SDA	<b>Rat Coronavirus</b>	•	•	•	•
RTV	<b>Rat Theilovirus</b>	•	•	•	•
PVM	<b>Pneumonia Virus of Mice</b>	•	•	•	•
MAV-1 (FL)	<b>Mouse Adenovirus - 1 (FL)</b>		•		•
MAD-2 (K87)	<b>Mouse Adenovirus - 2 (K87)</b>		•		•
REO	<b>Respiratory Enteric Virus III</b>		•		•
SEV	<b>Sendai Virus</b>		•		•
HANT	<b>Hantaan Virus</b>		•		•
<b>BACTERIA AND FUNGI</b>					
PCAR	<b>Pneumocystis carinii</b>		•		•
CARB	<b>CAR Bacillus</b>		•		•
CPILI	<b>Clostridium piliforme</b>	•	•	•	•
MPUL	<b>Mycoplasma pulmonis</b>	•	•	•	•
HELICO	<b>Helicobacter spp.</b>			•	•
PASTP	<b>Pasteurella pneumotropica</b>			•	•
STREPA	<b>Streptococci B Hemolytic Group A</b>			•	•
STREPB	<b>Streptococci B Hemolytic Group B</b>			•	•
STREPC	<b>Streptococci B Hemolytic Group C</b>			•	•
STREPG	<b>Streptococci B Hemolytic Group G</b>			•	•
SPNE	<b>Streptococcus pneumoniae</b>			•	•
SALM	<b>Salmonella spp.</b>				•
SMONI	<b>Streptobacillus moniliforme</b>				•
<b>PARASITES</b>					
FUR	<b>Fur Mites (Myobia musculi &amp; Myocoptes musculinus, Radfordia affinis, Ornithonyssus bacoti)</b>			•	•
GIAR	<b>Giardia spp.</b>			•	•
SPIR	<b>Spironucleus spp.</b>			•	•
CRYP	<b>Cryptosporidium spp.</b>			•	•
PIN	<b>Pinworms (Aspiculuris, Syphacia)</b>			•	•
ENT	<b>Entamoeba spp</b>			•	•

**FELASA PANELS  
GUINEA PIG**

ABBREVIATION		FELASA Q FELASA A FELASA Q FELASA A			
		Serology Panels		PCR Panels	
		81GPF	82GPF	11GPF	12GPF
<b>VIRUSES</b>					
GPADV	Guinea pig adenovirus	•	•	•	•
PIV-3	Parainfluenza Virus 3	•	•	•	•
SEV	Sendai Virus	•	•	•	•
GPCMV	Guinea pig CMV		•		•
<b>BACTERIA AND FUNGI</b>					
BBRO	Bordetella bronchiseptica	•	•	•	•
CKUT	Corynebacterium kutscheri			•	•
SBETA	Streptococci b-hemolytic (not group D)			•	•
SPNE	Streptococcus pneumoniae			•	•
CPILI	Clostridium piliforme		•		•
ECUN	Encephalitozoon cuniculi		•		•
SALM	Salmonella spp.				•
SMONI	Streptobacillus moniliformis				•
<b>PARASITES</b>					
	Endoparasites			•	•
	Ectoparasites			•	•

**HAMSTER**

ABBREVIATION		FELASA Q FELASA A FELASA Q FELASA A			
		Serology Panels		PCR Panels	
		81HMF	82HMF	11HMF	12HMF
<b>VIRUSES</b>					
LCMV	Lymphocytic Choriomeningitis virus	•	•	•	•
SEV	Sendai Virus	•	•	•	•
<b>BACTERIA AND FUNGI</b>					
RPNEU	Rodentibacter pneumotropica			•	•
CKUT	Corynebacterium kutscheri				•
CPILI	Clostridium piliforme		•		•
HELICO	Helicobacter spp.		•		•
SALM	Salmonella spp.				•
<b>PARASITES</b>					
	Endoparasites			•	•
	Ectoparasites			•	•



**FELASA PANELS  
RABBIT**

ABBREVIATION		FELASA Q FELASA A FELASA Q FELASA A			
		Serology Panels		PCR Panels	
		81RBF	82RBF	11RBF	12RBF
<b>VIRUSES</b>					
RHDV	<b>Rabbit hemorrhagic disease Virus</b>	•	•	•	•
RROTA	<b>Rabbit Rotavirus</b>	•	•	•	•
<b>BACTERIA AND FUNGI</b>					
BBRO	<b>Bordetella bronchiseptica</b>	•	•	•	•
ECUN	<b>Encephalitozoon cuniculi</b>	•	•	•	•
CPILI	<b>Clostridium piliforme</b>	•	•	•	•
PMUL	<b>Pasteurella multocida</b>		•	•	•
CARB	<b>Cilia Associated Respiratory Bacillus</b>		•		•
SALM	<b>Salmonella spp.</b>		•		•
<b>PARASITES</b>					
	<b>Endoparasites</b>			•	•
	<b>Ectoparasites</b>			•	•

**ELISA KITS / COMPLETE SETS**
**VRL ELISA Kits include:**

(2) 48-well test plates, valid for conducting up to 96 tests  
 Positive Control  
 Negative Control

Wash solution                      ABST Substrate  
 Milk diluent                        Species-specific Conjugate  
 Milk powder                        Stop Buffer

MOUSE / ELISA KITS	ORDER #
Ectromelia (ECTR)	60163
Lymphocytic Choriomeningitis Virus (LCMV)	60165
Mouse Minute Virus (MMV)	60160
Epizootic Diarrhea of Infant Mice (EDIM)	60159
Mouse Hepatitis Virus (MHV)	60164
Mouse Parvovirus (MPV)	60171
Mycoplasma pulmonis (MPUL)	60172
Pneumonia Virus of Mice (PVM)	60169
Reovirus type 3 (REO3)	60167
Sendai Virus (SEV)	60157
Theiler's Mouse Encephalomyelitis Virus (TMEV/GDVII)	60168
Clostridium piliforme (CPILI)	60158
Adenovirus, Strain K-87 (MAV-2)	60162
Murine Norovirus (MNV)	60166

RAT / ELISA KITS	ORDER #
CAR Bacillus (CARB)	60203
Clostridium piliforme (CPILI)	60174
Hantaan Virus (HANT)	60178
Mycoplasma pulmonis (MPUL)	60176
Pneumonia Virus (PVM)	60181
Rat Coronavirus/ Sialodacryoadenitis (RCV)	60186
Sendai Virus (SEV)	60185
Rat Theilovirus (RTV)	60207
Adenovirus, Strain K-87 (MAV-2)	60194
Rat Minute Virus (RMV)	60179
Kilham's Rat Virus (KRV)	60204
Rat Parvovirus (RPV)	60180

SIMIAN / ELISA KITS	ORDER #
Simian B Virus	60100
Simian Immunodeficiency Virus (SIV)	60196
Simian Retrovirus (SRV)	60197
Simian-T-lymphotropic Virus (STLV)	60315
Simian Foamy virus	60316
Measles	60333
Filovirus (FILO)	60346
Plasmodium (Malaria)	60347
Monkeypox	60331

GUINEA PIG / ELISA KITS	ORDER #
Sendai Virus (SEV)	60310
Adenovirus, Strain K-87 (MAV-2)	60305
Clostridium piliforme (CPILI)	60306
Guinea Pig Cytomegalovirus (CMV)	60307
Encephalitozoon cuniculi (ECUN)	60308

**Contact your sales representative to inquire about the development of additional ELISA Kits & Reagents.**

**INDIVIDUAL COMPONENTS / MOUSE REAGENTS**

ELISA KIT/REAGENTS	INDIVIDUAL COMPONENTS		
	Conjugates	ELISA Plates	Positive Control
Ectromelia (ECTR)	60353	60139	60391
Lymphocytic Choriomeningitis Virus (LCMV)	60354	60142	60392
Mouse Minute Virus (MMV)	60355	60130	60393
Epizootic Diarrhea of Infant Mice (EDIM)	60356	60151	60394
Mouse Hepatitis Virus (MHV)	60357	60124	60395
Mouse Parvovirus (MPV)	60358	60211	60396
Mycoplasma pulmonis (MPUL)	60359	60148	60397
Pneumonia Virus of Mice (PVM)	60360	60229	60398
Reovirus type 3 (REO3)	60361	60145	60399
Theiler's Mouse Encephalomyelitis Virus (TMEV/GDVII)	60362	60127	60400
Clostridium piliforme (CPILI)	60363	60208	60401
Murine Norovirus (MNV)	60364	60220	60402

*Common individual components for all kits*

COMMON COMPONENTS
Substrate
<b>60348</b>
Diluent
<b>60349</b>
Negative Control
<b>60350</b>
Stop Solution
<b>60351</b>
Washer Buffer
<b>60352</b>

**INDIVIDUAL COMPONENTS / RAT REAGENTS**

ELISA KIT/REAGENTS	INDIVIDUAL COMPONENTS		
	Conjugates	ELISA Plates	Positive Control
CAR Bacillus (CARB)	60365	60136	60403
Clostridium piliforme (CPILI)	60366	60208	60404
Hantaan Virus (HANT)	60367	60239	60405
Mycoplasma pulmonis (MPUL)	60368	60148	60406
Pneumonia Virus (PVM)	60369	60229	60407
Rat Coronavirus/ Sialodacryoadenitis (RCV)	60370	60251	60408
Sendai Virus (SEV)	60371	60133	60409
Rat Theilovirus (RTV)	60372	60246	60410
Adenovirus, Strain K-87 (MAV-2)	60373	60217	60411
Rat Minute Virus (RMV)	60374	60260	60412
Kilham's Rat Virus (KRV)	60375	60254	60413
Rat Parvovirus (RPV)	60376	60263	60414

**INDIVIDUAL COMPONENTS / SIMIAN REAGENTS**

ELISA KIT/REAGENTS	INDIVIDUAL COMPONENTS		
	Conjugates	ELISA Plates	Positive Control
Simian B Virus	60377	60112	60415
Simian Immunodeficiency Virus (SIV)	60378	60115	60416
Simian Retrovirus (SRV)	60379	60118	60417
Simian-T-lymphotropic Virus (STLV)	60380	60121	60418
Simian Foamy virus	60381	60424	60419
Measles	60382	60425	60420
Filovirus (FILO)	60383	60426	60421
Plasmodium (Malaria)	60384	60427	60422
Monkeypox	60385	60428	60423

**INDIVIDUAL COMPONENTS / GUINEA PIG REAGENTS**

ELISA KIT/REAGENTS	INDIVIDUAL COMPONENTS		
	Conjugates	ELISA Plates	Positive Control
Sendai Virus (SEV)	60386	60133	60324
Adenovirus, Strain K-87 (MAV-2)	60387	60217	60320
Clostridium piliforme (CPILI)	60388	60208	60321
GP Cytomegalovirus (CMV)	60389	60429	60325
Encephalitozoon cuniculi (ECUN)	60390	60430	60322

# CytoClear CELL LINE PATHOGEN SCREENING

## MOUSE

ABBREVIATION	AGENTS	PREMIUM	REGULAR
		10000	10019
ECTRO	<b>Ectromelia Virus</b>	•	•
HANT	<b>Hantaan Virus</b>	•	
KV	<b>K Virus (Mouse Pneumonitis Virus)</b>	•	
LDHV	<b>Lactate Dehydrogenase Elevating Virus</b>	•	•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>	•	•
MMV	<b>Mouse Minute Virus</b>	•	•
MAV-1 (FL)	<b>Mouse Adenovirus-1</b>	•	•
MAV-2 (K87)	<b>Mouse Adenovirus-2</b>	•	•
MPV (1-5)	<b>Mouse Parvovirus</b>	•	•
EDIM	<b>Rotavirus/Epizootic Diarrhea of Infant Mice</b>	•	•
MHV	<b>Mouse Hepatitis Virus</b>	•	•
MYCO	<b>Mycoplasma spp.</b>	•	•
MCMV	<b>Murine Cytomegalovirus</b>	•	
MTV	<b>Mouse Thymic Virus</b>	•	
PVM	<b>Pneumonia Virus of Mice</b>	•	•
POLY	<b>Polyomavirus</b>	•	
REO	<b>Respiratory Enteric Virus III</b>	•	•
SEV	<b>Sendai Virus</b>	•	•
TMEV/GDVII	<b>Theiler's Mouse Encephalomyelitis Virus</b>	•	•

## RAT

ABBREVIATION	AGENTS	10020
HANT	<b>Hantaan Virus</b>	•
KRV	<b>Killham's Rat Virus</b>	•
MYCO	<b>Mycoplasma spp.</b>	•
PVM	<b>Pneumonia Virus of Mice</b>	•
RCV	<b>Rat Coronavirus</b>	•
REO	<b>Respiratory Enteric Virus III</b>	•
SEV	<b>Sendai Virus</b>	•
TMEV/GDVII	<b>Theiler's Mouse Encephalomyelitis Virus</b>	•

# CytoClear

**CELL LINE PATHOGEN SCREENING**
**HAMSTER**
**PREMIUM**

ABBREVIATION	AGENTS	10003
PVM	<b>Pneumonia Virus of Mice</b>	•
REO	<b>Respiratory Enteric Virus III</b>	•
SEV	<b>Sendai Virus</b>	•
LCMV	<b>Lymphocytic Choriomeningitis Virus</b>	•
MYCO	<b>Mycoplasma spp.</b>	•

**HUMAN**
**PREMIUM**
**REGULAR**

ABBREVIATION	AGENTS	10012	10007
MYCO	<b>Mycoplasma spp.</b>	•	•
HIV1	<b>Human immunodeficiency Virus 1</b>	•	•
HIV2	<b>Human immunodeficiency Virus 2</b>	•	•
HTLV1	<b>Human T-lymphotropic Virus 1</b>	•	•
HTLV2	<b>Human T-lymphotropic Virus 2</b>	•	•
HEPA	<b>Hepatitis Virus A</b>	•	•
HEPB	<b>Hepatitis Virus B</b>	•	•
HEPC	<b>Hepatitis C</b>	•	•
HAN	<b>Hantaviruses (Hantaan, Seoul, Sin Nombre Virus)</b>	•	
HSV1	<b>Herpes Simplex 1</b>	•	
HSV2	<b>Herpes Simplex 2</b>	•	
HCMV	<b>Human Cytomegalovirus</b>	•	
HHV6	<b>Human Herpes Virus 6</b>	•	
HHV8	<b>Human Herpes Virus 8</b>	•	
HAdV	<b>Human Adenovirus</b>	•	
HPV	<b>Human Papillomavirus 16 &amp; 18</b>	•	
LCMV	<b>Lymphocytic choriomeningitis Virus</b>	•	
VZZ	<b>Varicella Virus</b>	•	
EBV	<b>Epstein-Barr Virus</b>	•	
CBOV	<b>Corynebacterium bovis</b>	•	

**STERILITY**

TEST CODE	AGENTS
<b>80625</b>	Detection of bacteria, including mycoplasma, and fungi contamination via aerobic and anaerobic culture. This test is performed using different solid and liquid culture media to ensure the growth of slow and fastidious contaminants

## **CytoID** CELL LINE AUTHENTICATION (STR)

<b>SAMPLE TYPE</b>	<b>TEST CODE</b>	<b>INCLUDES MYCOPLASMA SPP.</b>
Human 9 STR marker profile: Interspecies contamination check for human, mouse, rat, African green monkey, and Chinese hamster	HSTR9	HSTM9
Human 16 STR marker profile: Interspecies contamination check for human, mouse, rat, African green monkey, and Chinese hamster	HST16	STM16
Mouse genetic profile using NIST published 9 species-specific STR markers: Interspecies contamination check for human, mouse, rat, African green monkey, and Chinese hamster	MSTR9	MSTM9
Rat genetic profile using NIST published 31 species-specific STR markers: Interspecies contamination check for human, mouse, rat, African green monkey, and Chinese hamster	STR31	STM31



## VRL is one of the FIRST Commercial Laboratories Offering AAV Neutralizing Antibody Testing

*What does that mean for you? It means that you can take advantage of the expertise, knowledge and efficiencies of a commercial laboratory.*

### Technical Expertise

The VRL Technical Staff can help you navigate the complexity to better understand AAV testing with:

- Consistent testing methodology and techniques
- One stop shop; Screening, Titer and GLP testing
- Data Interpretation

### Fast Turnaround Times

Know the status of your animals to start them on your Gene Therapy Study!

- Large capacity with dedicated and experienced staff
- Ability to receive samples from quarantine
- *Results in days, not weeks*

### Ready & Available

*We value our partnerships, and that means being available when you need us most.*

## Experience the VRL Advantage!

Learn more about AAV testing →



# AAV Neutralizing Antibody Testing



Adeno-associated virus (AAV) is a small single-stranded DNA virus that belongs to the genus Dependovirus and the family Parvoviridae. When this replication-defective virus infects host cells, latency is established by integration of the virus genome into the host genome. The viral infection becomes lytic in the presence of helper viruses (such as adenoviruses or herpesviruses). There were more than 100 AAV variants isolated from adenovirus stocks, human and nonhuman primate tissues, but no associated diseases were documented.

AAV has been used as a gene delivery vehicle to deliver transgenes in vivo for gene therapies of several diseases, such as retinal dystrophy and spinal muscular atrophy. However, prior exposure of AAV may lead to the development of neutralization antibodies against AAV that can compromise the transduction efficiency of AAV vector-mediate gene therapy in vivo. Thus, detection of pre-existing AAV neutralization antibodies helps the consideration to screen candidates for AAV gene therapy clinical trials.

## Our VRL Scientific Staff is also available to assist you with:

- *Animal Health Monitoring*
- *Preclinical Services*
- *Biological Testing*

See how we can strengthen your program by enhancing the quality of research at your institution! Call us now at

**800.804.3586**

SERVING CLIENTS INTERNATIONALLY WITH LABORATORIES IN TEXAS AND MARYLAND

## VRL offers a cell-based in vitro assay in two formats for the detection of anti-AAV neutralizing antibodies:

1. The screening assay (qualitative neutralization assay): the result is reported as positive or negative for the 3 dilutions (1:10, 1:20, 1:40) of each serum sample.
2. The neutralizing antibody titer (or 50% inhibitory dose [ID50]) assay: (quantitative neutralization assay): each serum sample is 2-fold serial diluted from 1:10-1:5120, the result is reported as a titer value at which 50% inhibition of virus transduction is calculated.

## Plus, GLP Compliance for the above tests!

### Specimen Requirements

For each AAV serotype neutralizing antibody assay, minimal 0.2 ml serum is required. Serum samples are stable at 4 °C up to a week, or keep at -20 °C for longer storage before shipping.

Ship serum samples overnight with ice packs.



7540 Louis Pasteur Drive, Ste. 200  
San Antonio, TX 78229

401 Professional Drive, Ste. 210  
Gaithersburg, MD 20879



## AAV Neutralizing Antibody Testing

VRL is one of the FIRST Commercial Laboratories Offering AAV Neutralizing Antibody Testing. What does that mean for you? It means that you can take advantage of the expertise, knowledge and efficiencies of a commercial laboratory.

*And Available for GLP Studies!*

### NAb Assay

CODE	ABBREVIATION
2066	<b>AAV1 neutralizing antibody screening assay</b>
2070	<b>AAV1 neutralizing antibody titer assay</b>
2091	<b>AAV2 neutralizing antibody screening assay</b>
2074	<b>AAV2 neutralizing antibody titer assay</b>
2189	<b>AAV2-QuadYF neutralizing antibody screening assay</b>
2193	<b>AAV2-QuadYF neutralizing antibody titer assay</b>
2138	<b>AAV2-retro neutralizing antibody screening assay</b>
2139	<b>AAV2-retro neutralizing antibody titer assay</b>
2178	<b>AAV2.7m8 neutralizing antibody screening assay</b>
2177	<b>AAV2.7m8 neutralizing antibody titer assay</b>
2121	<b>AAV3 neutralizing antibody screening assay</b>
2134	<b>AAV3 neutralizing antibody titer assay</b>
2126	<b>AAV3b neutralizing antibody screening assay</b>
2132	<b>AAV3b neutralizing antibody titer assay</b>
2182	<b>AAV4 neutralizing antibody screening assay</b>
2188	<b>AAV4 neutralizing antibody titer assay</b>
2092	<b>AAV5 neutralizing antibody screening assay</b>
2078	<b>AAV5 neutralizing antibody titer assay</b>
2093	<b>AAV6 neutralizing antibody screening assay</b>
2082	<b>AAV6 neutralizing antibody titer assay</b>
2156	<b>AAV6.2 neutralizing antibody screening assay</b>
2160	<b>AAV6.2 neutralizing antibody titer assay</b>

CODE	ABBREVIATION
2107	<b>AAV-6TM neutralizing antibody screening assay</b>
2197	<b>AAV-6TM neutralizing antibody titer assay</b>
2110	<b>AAV7 neutralizing antibody screening assay</b>
2135	<b>AAV7 neutralizing antibody titer assay</b>
2094	<b>AAV8 neutralizing antibody screening assay</b>
2086	<b>AAV8 neutralizing antibody titer assay</b>
2190	<b>AAVDJ-8 neutralizing antibody screening assay</b>
2194	<b>AAVDJ-8 neutralizing antibody titer assay</b>
2106	<b>AAVDJ neutralizing antibody screening assay</b>
2172	<b>AAVDJ neutralizing antibody titer assay</b>
2095	<b>AAV9 neutralizing antibody screening assay</b>
2090	<b>AAV9 neutralizing antibody titer assay</b>
2096	<b>AAVrh10 neutralizing antibody screening assay</b>
2101	<b>AAVrh10 neutralizing antibody titer assay</b>
2164	<b>AAVhu37 neutralizing antibody screening assay</b>
2186	<b>AAVhu37 neutralizing antibody titer assay</b>
2136	<b>AAVrh74 neutralizing antibody screening assay</b>
2137	<b>AAVrh74 neutralizing antibody titer assay</b>
2192	<b>AAVPHP.S neutralizing antibody screening assay</b>
2196	<b>AAVPHP.S neutralizing antibody titer assay</b>
2191	<b>AAVPHP.eB neutralizing antibody screening assay</b>
2195	<b>AAVPHP.eB neutralizing antibody titer assay</b>

### TAb Assay

CODE		ABBREVIATION
IgG	IgM	
L2222	L2231	<b>AAV1 qualitative assay</b>
L2187	L2232	<b>AAV2 qualitative assay</b>
L2221	L2228	<b>AAV5 qualitative assay</b>
L2223	L2233	<b>AAV8 qualitative assay</b>
L2218	L2234	<b>AAV9 qualitative assay</b>

CODE		ABBREVIATION
IgG	IgM	
L2235	L2236	<b>AAV1 quantitative assay</b>
L2237	L2238	<b>AAV2 quantitative assay</b>
L2229	L2230	<b>AAV5 quantitative assay</b>
L2225	L2239	<b>AAV8 quantitative assay</b>
L2224	L2250	<b>AAV9 quantitative assay</b>

**RODENT CLINICAL CHEMISTRY PANELS**

STANDARD PANELS					
ASSAY	PANEL	Comprehensive Plus 80824	Comprehensive 808CM	Hepatic 808HF	Renal 808RF
Alanine Aminotransferase (ALT/SGPT)		•	•	•	
Albumin		•	•	•	•
Alkaline phosphatase (ALP)		•	•	•	
Aspartate Aminotransferase (AST/SGOT)		•	•	•	
Bicarbonate (CO <sub>2</sub> )		•	•		•
Bilirubin, Direct		•		•	
Bilirubin, Total		•	•	•	
Blood Urea Nitrogen		•			•
Calcium		•	•		•
Chloride		•	•		•
Cholesterol		•	•		
Creatine Kinase (CK)		•			
Creatinine		•	•		•
Glucose		•	•		•
Phosphorus, Inorganic		•			•
Potassium		•	•		•
Sodium		•	•		•
Protein, Total		•	•	•	•
GGT		•		•	
Triglycerides		•			
Albumin/Globulin Ratio (A/G Ratio)		•	•	•	•
Globulin		•	•	•	•
Bilirubin, Indirect		•		•	
BUN/Creatinine Ratio (B/C Ratio)		•			•
Na/K Ratio		•	•		•
<b>VOLUME</b>		<b>200µl</b>	<b>170µl</b>	<b>90µl</b>	<b>125µl</b>

CUSTOM PANELS (Select from above assays list)	
Clinical Chemistry Panel (2-7 assays)	<b>80821</b>
Clinical Chemistry Panel (8-14 assays)	<b>80822</b>
Clinical Chemistry Panel (15-19 assays)	<b>80823</b>

ASSAY	PANEL	LIPID 808LP	ASSAY	PANEL	IRON 808IP
Cholesterol		•	Ferritin		•
TRIG		•	Iron		•
HDL		•	TIBC		•
LDL		•			
<b>VOLUME</b>		<b>40µl</b>	<b>VOLUME</b>		<b>125µl</b>

**RODENT CLINICAL CHEMISTRY PARAMETERS**

<b>PARAMETER</b>	
<b>1020</b>	<b>a-Amylase, Pancreatic</b>
<b>1008</b>	<b>Alanine Aminotransferase</b>
<b>1001</b>	<b>Albumin</b>
<b>1016</b>	<b>Alkaline phosphatase</b>
<b>1007</b>	<b>Aspartate Aminotransferase</b>
<b>1010</b>	<b>Bilirubin, Direct</b>
<b>1009</b>	<b>Bilirubin, Direct &amp; Total</b>
<b>1011</b>	<b>Bilirubin, Total</b>
<b>1002</b>	<b>Calcium</b>
<b>1012</b>	<b>Carbon Dioxide</b>
<b>1003</b>	<b>Chloride</b>
<b>1056</b>	<b>Cholesterol</b>
<b>1030</b>	<b>Creatine Kinase (CPK)</b>
<b>1013</b>	<b>Creatinine</b>
<b>1004</b>	<b>Glucose</b>
<b>1036</b>	<b>HDL-Cholesterol</b>
<b>1040</b>	<b>Iron</b>
<b>1041</b>	<b>LDL-Cholesterol</b>
<b>1000</b>	<b>Lactate Dehydrogenase</b>
<b>1042</b>	<b>Lipase</b>
<b>1043</b>	<b>Magnesium</b>
<b>1018</b>	<b>Phosphorus, Inorganic</b>
<b>1005</b>	<b>Potassium</b>
<b>1017</b>	<b>Protein, Total</b>
<b>1006</b>	<b>Sodium</b>
<b>1049</b>	<b>Triglycerides</b>
<b>1019</b>	<b>Urea Nitrogen</b>
<b>1051</b>	<b>Uric Acid</b>

**CANINE CLINICAL CHEMISTRY PANELS**

ASSAY	D5501
Albumin/Globulin Ratio (A/G Ratio)	•
Albumin	•
Alkaline Phosphatase	•
Alanine Aminotransferase (ALT, SGPT)	•
Amylase	•
Aspartate Aminotransferase (AST, SGOT)	•
Blood Urea Nitrogen (BUN)	•
Calcium	•
Chloride	•
Cholesterol	•
Creatine phosphokinase (CPK)	•
Creatinine	•
Gamma Glutamyl Transferase (GGT)	•
Globulin	•
Glucose	•
Lipase	•
Magnesium	•
Phosphorus	•
Potassium	•
Sodium	•
Total Bilirubin	•
Total Protein	•
Triglycerides	•

**CANINE COMPLETE BLOOD COUNT (CBC)**

ASSAY	D6111
White Blood Cell (WBC)	•
Neutrophil count and %	•
Lymphocyte count and %	•
Monocyte count and %	•
Eosinophil count and %	•
Basophil count and %	•
Red Blood Cell (RBC)	•
Hemoglobin (HGB)	•
Hematocrit (HCT)	•
Mean Corpuscular Volume (MCV)	•
Mean Corpuscular Hemoglobin (MCH)	•
Mean Corpuscular Hemoglobin Concentra-	•
Red Cell Distribution Width (RDW)	•
Platelet count	•
Mean Platelet Volume (MPV)	•

**CANINE CHEMISTRY & CBC PANEL**

ASSAY	D5506
Chem Profile & CBC	•

**NHP CLINICAL CHEMISTRY PANELS**

PANEL	5500	5501	5502	5503	5504
ASSAY	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
Albumin	•	•	•		
Albumin/Globulin Ratio (A/G Ratio)		•			
Alkaline Phosphatase	•	•	•		
Alanine Aminotransferase (ALT, SGPT)	•	•	•		
Amylase	•	•			
Aspartate Aminotransferase (AST,SGOT)		•	•		
Blood Urea Nitrogen (BUN)	•	•			•
Blood Urea Nitrogen (BUN) Creatinine Ratio (B/C Ratio)		•			
Calcium	•	•			•
Chloride		•		•	•
Cholesterol	•	•			
Creatinine	•	•			•
Creatinine Phosphokinase (CPK)		•			
Direct Bilirubin			•		
Gamma Glutamyl Transferase (GGT)		•	•		
Globulin	•	•			
Glucose	•	•			•
Lipase		•			
Magnesium		•			
Na/K Ratio		•			
Phosphorus	•	•			
Potassium		•		•	•
Sodium		•		•	•
Total Bilirubin	•	•	•		
Total Protein	•	•	•		
Triglycerides		•			

CHEMISTRY PROFILE & CBC COMBINATION					
	PRODUCT CODES				
Chemistry Profile 1 & CBC	5505				
Chemistry Profile 2 & CBC		5506			
Chemistry Profile 3 & CBC			5507		
Chemistry Profile 4 & CBC				5508	
Chemistry Profile 5 & CBC					5509

COMPLETE BLOOD COUNT (CBC)
TEST CODE 6111
White Blood Cell (WBC)
Neutrophils count and %
Lymphocyte count and %
Monocytes count and %
Eosinophils count and %
Basophils count %
Red blood Cell (RBC)
Hemoglobin (HGB)
Hematocrit (HCT)
Mean Corpuscular Volume (MCV)
Mean Corpuscular Hemoglobin (MCH)
Mean Corpuscular Hemoglobin Concentration (MCHC)
Mean Platelet Volume (MPV)
Red Cell Distribution Width (RDW)
Platelet Counts

**HEMATOLOGY**

**Sample Type:** 175µl Whole Blood in EDTA Tube

DESCRIPTION	TEST CODE 80802	TEST CODE 80801	TEST CODE 80804	TEST CODE 80805	TEST CODE 80803
<b>WBC</b>	•	•	•	•	
<b>RBC</b>	•	•	•	•	
<b>HGB</b>	•	•	•	•	
<b>HCT%</b>	•	•	•	•	
<b>MCV</b>	•	•	•	•	
<b>MCH</b>	•	•	•	•	
<b>MCHC</b>	•	•	•	•	
<b>CHCM*</b>	•	•	•	•	
<b>CH*</b>	•	•	•	•	
<b>RDW%</b>	•	•	•	•	
<b>HDW*</b>	•	•	•	•	
<b>MPV</b>	•	•	•	•	
<b>WBC Differentials</b>	•	•	•	•	
<b>Platelets</b>		•		•	
<b>Reticulocytes%</b>			•	•	•

*\*Specialty Hemoglobin parameters available at no extra cost*

**Other parameters and morphology flags available upon request. Please inquire.**

**COAGULATION FACTORS**

TEST CODE	DESCRIPTION
<b>COAG</b>	PT, aPTT, Fibrinogen (Specimen type: 270µl plasma)
<b>1101</b>	Prothrombin Time (PT) (Specimen type: 150µl plasma)
<b>1102</b>	Partial Thromboplastin Time (aPPT) (Specimen type: 150µl plasma)
<b>1103</b>	Fibrinogen (Specimen type: 200µl plasma)

**URINALYSIS**

TEST CODE	DESCRIPTION
<b>80810</b>	Complete urinalysis (gross examination, specific gravity and protein by refractometry, dipstick, and microscope exam) (Specimen type: Urine)

**HISTOLOGY**

TISSUE	RAT	MOUSE	RABBIT	GUINEA PIG	HAMSTER	COMMON SHORT LIST	RAT SHORT LIST	RABBIT SHORT LIST
	8050R	8050M	8050B	8050G	8050H	80504	80505	80503
Brain	•	•	•	•	•			
Heart	•	•	•	•	•			
Lung	•	•	•	•	•	•	•	•
Liver	•	•	•	•	•	•	•	•
Kidney	•	•	•	•	•		•	•
Spleen	•	•	•	•	•			
Trachea	•	•	•	•	•			
Eyes	•	•	•	•	•			
Ileum	•	•	•	•	•			
Cecum	•	•	•	•	•	•	•	•
Colon	•	•	•	•	•	•	•	•
Nasal Turbinate	•	•	•	•	•			
Ear, Inner	•	•	•	•	•			
Salivary Glands	•						•	
Urinary Bladder	•							
Mesenteric Lymph Node	•							
Harderian Gland	•						•	

**À LA CARTE HISTOLOGY SERVICES**

AGENTS	TEST CODE
Unstained Slide (from untrimmed tissue)	80517
Unstained Slide (from trimmed tissue)	80521
H&E Stain (from untrimmed tissue)	805H1
H&E Stain (from trimmed tissue)	80522
Gram Stain (from untrimmed tissue)	805GR
Gram Stain (from trimmed tissue)	80523
Special Stain, non-Silver Stain (from untrimmed tissue)	80520
Special Stain, non-Silver Stain (from trimmed tissue)	80524
Special Stain, Silver Stain (from untrimmed tissue)	80525
Special Stain, Silver Stain (from trimmed tissue)	80526
Bone Decalcification	80527
Annotated Microphotograph	80513
Pathology Interpretation (Individual tissue slide read)	805PI
Pathology services - Pathologist consultation	80512
1 to 3 Tissues includes Pathology summary	H-1
Up to 4 Tissues includes Pathology summary	H-4
Up to 5 Tissues includes Pathology summary	H-5
Up to 6 Tissues includes Pathology summary	H-6
Up to 7 Tissues includes Pathology summary	H-7
Up to 8 Tissues includes Pathology summary	H-8
Gross Necropsy	8074M

**BIOMARKERS**

BIOMARKERS	MOUSE	RAT	NHP
	MCY1	RCY1	NCY1
IL-1a	•	•	
IL-1b	•	•	•
IL-Ra			•
IL-2	•	•	•
IL-3	•		
IL-4	•	•	•
IL-5	•	•	•
IL-6	•	•	•
IL-7	•		
IL-8			•
IL-9	•		
IL-10	•	•	•
IL-12 (p70)	•	•	
IL-12 (p40)	•		•
IL-13	•	•	•
IL-15	•		•
IL-17	•		•
IL-17A		•	
IL-18		•	•
EGF		•	
Eotaxin/CCL11	•	•	
Fractalkine		•	
G-CSF	•	•	•
GM-CSF	•	•	•
GRO/KC		•	
IFN-γ	•	•	•
IP-10	•	•	
KC	•		
Leptin		•	
LIF	•		
LIX	•	•	
M-CSF	•		
MCP-1	•	•	•
MIG	•		
MIP-1a	•	•	•
MIP-1b	•		•
MIP-2	•	•	
RANTES	•	•	
TGF-α			•
TNFα	•	•	•
VEGF	•	•	•
sCD40L			•

Contact your sales rep about custom panels and other available biomarkers.



## GENERAL SUBMISSION INSTRUCTIONS

Please be sure to include all necessary paperwork with each submission to ensure our staff can easily account for each sample submitted and that the testing expectations are clearly communicated.

1. Manual submission forms can be found here:  
Submit Samples | VRL Diagnostics ([www.vrlsat.com/submit-samples](http://www.vrlsat.com/submit-samples))
2. Online submission can be made here: Log in - VRL Metasys System ([vrlapps.azurewebsites.net](http://vrlapps.azurewebsites.net))

Vials must be clearly labeled with specimen IDs and must match the IDs listed on the order form.

Bags containing vials must be leak proof and placed into a sturdy box or insulated shipper to ensure the integrity of the samples. Use padding to help secure samples in place within the box.

Be sure to ship samples at their appropriate shipping conditions according to the information provided in the following pages.

Ship overnight using your favorite courier.

Samples are received Monday through Saturday (be sure to select "Saturday delivery" for this option).

### **Non-Human Primate (NHP) samples are shipped to:**

**VRL-San Antonio, USA**  
7540 Louis Pasteur, Suite 200  
San Antonio, Texas 78229  
Phone: 877-615-7275

### **Rodent, Rabbit, Dog, Swine, Aquatic Animals (and other small animals) samples are shipped to:**

**VRL-Maryland, USA**  
401 Professional Drive, Suite 210  
Gaithersburg, MD 20879  
Phone: 800-804-3586

## SEROLOGY SAMPLE PREPARATION AND SHIPPING INSTRUCTIONS

Heat inactivated serum samples may be shipped at ambient temperature.

Non-heat inactivated serum samples must be shipped chilled or frozen.

Collect blood in serum separator tubes and centrifuge at 2000 rpm for 10 minutes.

Draw off serum and transfer to a clean microcentrifuge tube.

Sample Type	Collection Volume	Sample Requirements
<b>Mouse Serum</b>	<b>Undiluted:</b> 0.05 ml needed per test  <b>Diluted:</b> 0.25 ml needed per test	Dilute 1-part serum/plasma in 4-parts sterile Phosphate Buffer Saline (PBS)  Heat Inactivate @ 56°C
<b>Rodent Serum</b>	<b>Undiluted:</b> 0.025 ml needed per test 0.20 ml needed per panel  <b>Diluted:</b> 0.05 ml needed per test 1.0 ml needed per panel	Dilute 1-part serum/plasma in 4-parts sterile Phosphate Buffer Saline (PBS)  Heat Inactivate @ 56°C
<b>Rabbit Serum</b>	<b>Undiluted:</b> 0.025 ml needed per test 0.20 ml needed per panel	Do not Heat Inactivate @ 56°C
<b>Non-Human Primate Serum</b>	<b>Undiluted:</b> 0.50 ml needed for basic testing 1.0 ml needed for extensive testing	Do not Heat Inactivate @ 56°C  Ship on cold/ice packs  For frozen samples, overnight with dry ice
<b>SeraSorb™</b>	The SeraSorb™ will absorb up 30µl of blood	SeraSorbs™ can be shipped at ambient temperature

## PCR SAMPLE PREPARATION AND SHIPPING INSTRUCTIONS

Health monitoring sample types for PCR include feces, fur swabs/plucks, tissue, environmental swabs, rack exhaust filters, and whole blood.

Biological material PCR types include cultured cells, pelleted cells, or culture media.

Sample Type	Amount Needed	Shipping Requirements
<b>Fecal Pellets (Rodent)</b>	2 - 10 fecal pellets per sample	Ambient temperature
<b>Fecal Scoop (NHP)</b>	Any amount in a sterile tube	Ambient temperature
<b>Fur Swab/Pluck (Rodent)</b>	1 fur swab or pluck per animal (up to 5 swabs/plucks per vial if pooling)	Ambient temperature
<b>Tissue</b>	100-500 mg of tissue per sample (about the size of a pea)	Overnight in insulated container with dry ice
<b>Environmental Swabs</b>	1 swab per environmental source (up to 5 swabs per vial if pooling)	Ambient temperature
<b>Rack Exhaust Filters</b>	1 filter per vial - pooling is not recommended	Ambient temperature
<b>Blood (NHP Only)</b>	1-3 ml whole blood (EDTA tube)	Chilled on cold packs
<b>Cultured Cells or Cell Pellet</b>	2 vials of 1 ml each of $1 \times 10^6$ cells/ml in culture media or equivalent amount of pelleted cells	Overnight in insulated container with dry ice
<b>Culture Fluid</b>	2 vials of culture fluid - 1 ml per vial	Overnight in insulated container with dry ice

## MICROBIOLOGY SAMPLE PREPARATION AND SHIPPING INSTRUCTIONS

Samples for microbiology testing should be collected as close to the time of shipping as possible. Never freeze samples for microbiology, ship chilled (separated from the cold source) or at ambient temperature.

Sample Type	Collection Material	Shipping Requirements
<b>Aerobic Swab</b>	<ul style="list-style-type: none"> <li>• Bacti-Swab w/ Stuart's Transport Media</li> <li>• Cary Blair Transport Media</li> <li>• Aimes Transport Media</li> </ul>	Submerge swab into media and/or break media capsule so that the swab is wet.
<b>Anaerobic Swab</b>	<ul style="list-style-type: none"> <li>• Cary Blair Transport Media</li> </ul>	Submerge swab into media so that the swab is wet.
<b>Fecal Pellets (Rodent)</b>	Sterile vial	May add PBS to keep moist
<b>Fecal Scoop (NHP)</b>	Sterile vial	May add PBS to keep moist
<b>Tissue</b>	Sterile vial	May add PBS to keep moist
<b>Feed/Bedding</b>	Sterile vial	May add PBS to keep moist
<b>Blood Bottles</b>	BD BACTEC Peds Plus/F Culture Vials	Sterilize plunger before injecting 1.0ml whole blood into bottle. Ship upright at ambient temperature
<b>Environmental</b>	RODAC Plate, Water, Swab	<ul style="list-style-type: none"> <li>• Tape RODAC plates closed</li> <li>• Water samples should be three 50 ml conical tubes per source</li> <li>• See Aerobic Swab details above</li> </ul>

## NHP VIRUS ISOLATION COLLECTION

<b>B-Virus</b>		
Sample Type	Collection Instructions	Special Instructions
<b>Swab</b>	Buccal cavity, cornea, genital area	Send with cold packs in viral transport medium (e.g. Eagle's)
<b>Biopsy</b>	One cubic centimeter of tissue	Collect with sterile instruments. Send with cold packs in viral transport medium (e.g. Eagle's)
<b>SRV</b>		
Sample Type	Collection Tubes	Special Instructions
<b>Whole Blood</b>	<ul style="list-style-type: none"> <li>• Lithium heparin (green top Vacutainer)</li> <li>• Sodium heparin (blue top Vacutainer)</li> <li>• ACD (yellow top Vacutainer)</li> </ul>	Do not freeze! Ship on cold packs to keep refrigerated

## PARASITOLOGY SAMPLE PREPARATION AND SHIPPING INSTRUCTIONS

Parasitology samples can be shipped at ambient temperature. Ensure all liquids are in a sealable, leak-proof container with a secondary bag or container to contain potential leaks.

Testing Service	Sample Type	Collection
<b>Wet mount or fecal sedimentation for Helminth ova, Protozoal cysts &amp; oocysts</b>	Feces	Fecal samples may be sent fresh in a sterile vial or cup. Ideally, 1-part feces to 3-parts 10% Neutral buffered Formalin
<b>Perianal tape test for <i>Syphacia</i> spp ova (Rodents)</b>	Clear Cellophane Tape & Microscope Slides	Firmly press tape to anus. Stick tape to microscope slide. Ship slides in slide box or slide flat.
<b>Tape test for fur mites (Rodents)</b>	Clear Cellophane Tape & Microscope Slides	Firmly press three separate pieces of tape to neck, rump, and abdomen. Stick tape to microscope slide. Ship slides in slide box or slide flat.

**CLINICAL PATHOLOGY SAMPLE COLLECTION AND SHIPPING INSTRUCTIONS**

Hematology			
Collection Material	Sample Volume	Sample Preparation	Shipping Conditions
<b>EDTA Tubes - Lavender top 3.5 ml (large animals) or 0.5 ml (rodents)</b>	Minimum of 175µL Whole Blood	Whole blood collection - invert tubes with blood about 7 times to mix EDTA with blood.	Never freeze! Ship with cold packs but don't let tubes come in contact with ice packs.
Chemistry			
Collection Material	Sample Volume	Sample Preparation	Shipping Conditions
<b>Serum Separator Tubes - Red top 3.5 ml (large animals) or 0.5 ml (rodents)</b>	Large Panels = 200µL Renal Panel = 125µL Hepatic Panel = 90µL Single Tests = 40µL	Allow blood to clot at room temp for 20-30 min. Centrifuge 15 min at 2500 rpm. Draw off serum into transport tube.	If shipping same day of collection, ship on cold packs. If longer than 24 hours, ship frozen on dry ice.
Coagulation			
Collection Material	Sample Volume	Sample Preparation	Shipping Conditions
<b>Sodium Citrate Tubes - Light blue top 3.5 ml (large animals) or 0.5 ml (rodents)</b>	Add 1 part of 3.2% sodium citrate solution to 9 parts of whole blood. Mix thoroughly.	Centrifuge 15 min at 3000 rpm. Draw off plasma into transport tube. Freeze plasma within 4 hours of collection.	Ship frozen on dry ice.
Urinalysis			
Collection Material	Sample Volume	Sample Preparation	Shipping Conditions
<b>Sterile Vial</b>	250µL - 1,000µL	Collect urine as sterile as possible avoiding contact with the coat.	Ship on cold packs. Don't freeze.

**HISTOPATHOLOGY SAMPLE COLLECTION AND SHIPPING INSTRUCTIONS**

How to Collect	Fixation	Shipping
Place excised tissues in 10% Neutral Buffered Formalin (NBF) at a ratio of 30% tissue to 70% NBF. Large tissues should be scored to allow proper fixation.	Tissues should remain in fixative a minimum of 48 hours prior to processing. Keep at room temperature.	Make sure the formalin jar lids are tight and will not pop off during shipping. Place jars in sealable plastic bags with absorbent material to contain any potential leaks. Pad the jars for protection.

**ZEBRAFISH/AQUATIC ANIMAL SAMPLE COLLECTION AND SHIPPING INFORMATION**

Samples for Microbiology (bacteria and/or fungal culture)		
Sample Type	Sample Preparation	Shipping Conditions
<b>Culture Swabs w/ Transport Medium (Modified Stuart's, Aimes, etc.)</b>	Swab affected area from animal such as gills, skin, orifices. Protect from UV light.	Overnight at ambient temperature
<b>Water Samples</b>	Three 50ml conical tubes. Protect from UV light.	Overnight at ambient temperature
<b>Agar Plates for Culture Identification</b>	Wrap agar plates in Parafilm. Protect from UV light.	Overnight at ambient temperature
Samples for PCR Analysis (Environmental & Feeds)		
Sample Type	Sample Preparation	Shipping Conditions
<b>Environmental Swabs</b>	1 swab per environmental source	Ambient temperature
<b>Water + Detritus</b>	1 Liter of tank water + 25 mL detritus (collected from bottom of tank) passed through a 0.2 µm filter (Corning Part No. 430186 or equivalent).	Send excised filter at Ambient Temperature
<b>Live Feed</b>	1.0ml of live feed	Ambient temperature
<b>Whole Fish</b>	Freeze fish & place into sterile vial	Frozen on ice pack (dry ice not required)
Zebrafish Pathology Services		
Sample Type	Sample Preparation	Shipping Conditions
<b>Necropsy</b>	Ship live fish in heavy duty bladders or doubled plastic bags. Bags should be 1/3 water 2/3 air	Overnight in insulated containers at ambient temperature
<b>Histopathology</b>	Open ventral cavity of euthanized fish. Place whole fish in 10%NBF, Davidsons, or Bouins fixative.	Overnight at ambient temperature
<b>Histopathology &amp; PCR</b>	Flash freeze fish in liquid nitrogen. Flatten fish in foil wrap. Label foil.	Overnight on dry ice

**Zebrafish Necropsy** will include an external exam of the fish for malformities and lesions. The gills, heart, liver, kidney, intestines, swim bladder, gonads, and brain will be examined for lesions and parasites. Samples may be taken for bacterial cultures and/or PCR testing of infectious agents. Fish may be placed in 10% formalin, Davidson's fixative, or Bouins if histopathology is required.

**Zebrafish Histopathology** routine services include whole fish processing, embedding, and slide production. Slides will be stained with H&E stain and include all major organs of the fish including the surrounding connective tissue. An acid-fast stain may be requested if a bacterial infection is suspected. A pathologist evaluation of each fish will be presented in a report format. Annotated microphotographs are available at an additional cost.

**INSTRUCTIONS FOR SUBMISSION OF SAMPLES FOR NECROPSY PANEL TESTING (IF ANIMAL NOT SENT LIVE)**

1. Euthanize the animal(s) according to your facility's IACUC guidelines.
2. Draw whole blood and spin down in a centrifuge tube to separate and then collect the serum. Alternatively, a SeraSorb™ micro-sampling device can be used as a dried whole blood collection method for serological testing. The blood draw can be taken prior to euthanasia, or immediately afterward.  
NOTE: If serology work is being requested, the blood draw MUST be taken either prior to euthanasia, or immediately afterward. If the euthanized animal is sent without blood being drawn immediately, the blood will be coagulated and therefore useless for serology by the time it arrives at VRL.
3. Additional samples can be taken prior to necropsy, depending on services required:
  - a. Bacteriological services: Take several fecal pellets and an oral swab.
  - b. Parasitology services: Take several fecal pellets and use tape to perform a fur pluck.
  - c. PCR services: Take fecal pellets and use tape to perform a fur pluck.
4. If histopathology services are required, perform an immediate necropsy. Open the abdominal cavity and the chest cavity, make observations and notes. Collect the organs in a methodical manner, usually starting with lungs, heart, liver, intestines, kidney, pancreas, lymph nodes, etc. These organs are often large, so you can trim them at necropsy with a sharp bladed instrument down to a size that will fit into a normal cassette. If using cassettes, label the cassettes with a permanent marker. Place organs/tissues (either in cassettes or not) in a jar of 10% neutral buffered formalin at 10 to 20 times the amount of tissue. Use the formalin liberally.
5. Allow the tissues to incubate in formalin for 48 - 72 hours, if being sent without trimming. If samples are trimmed thin enough to fit into a cassette, incubation for 24 - 48 hours is sufficient.
6. To ship:
  - a. For either untrimmed organs/tissues or samples in cassettes, place the jar(s) in moisture-proof containers, such as a ziploc bag, and ship to VRL.
  - b. If sending cassettes, as an alternative method to save on shipping costs, the cassettes can be placed in formalin-soaked gauze that will remain moist during shipment. Pour off excess formalin, until the gauze is wet and can keep the tissues wet. Place them in a moisture proof container and ship to VRL.



## VRL TERMS AND CONDITIONS

Unless otherwise agreed in an agreement signed by VRL Laboratories (collectively, “VRL,” “we,” “us” or “our”), laboratory testing and consulting services (data collection, analysis and interpretation, and reference laboratory services) that we provide to you, the client, are subject solely to the terms and conditions stated herein and in any terms appearing on the back of our invoices and billing statements to you. The terms and conditions stated herein control in the event of any conflict.

3. **Confidentiality.** We agree to maintain in confidence all of your proprietary and nonpublic materials, data, reports, plans, records, technical and other information and to use such confidential information only for the purpose of performing analyses of specimens and providing reports on our findings to you. We shall protect your confidential information by using the same degree of care, but not less than a reasonable degree of care, to prevent the unauthorized use, dissemination or publication of the confidential information as we use to protect our own confidential information of a like nature. In any instance where information is subpoenaed by, and must be released to, a governmental agency, or is otherwise required to be disclosed pursuant to law or regulation, we will promptly notify you. You authorize us to reference, use and disclose de-identified and aggregated data included in our analyses, reports or other services provided that such de-identified and aggregated data is combined with other de-identified data from other clients. You agree not to use the VRL name and/or data in any manner that might cause harm to our reputation and/or business. Under no circumstances is the name of VRL to be published—either alone or in association with that of any other party—without our approval in writing.
4. **Payment Terms.** All fees are charged or billed directly to you. Payment in advance is required for all clients except those whose credit has been established with our company. For clients with approved credit, our standard terms are net the 30th day of the month following the date of invoice. Overdue payments are subject to finance charges of the lower of 1½% per month or the maximum interest rate allowed by law. We may change payment terms at any time or revoke any credit previously extended. We must agree in writing to any extension of payment beyond our standard terms. If at any time you have not paid all amounts due, other than amounts disputed in good faith, then without prejudice to any other rights we may suspend all work for you, including warranty service. If you default in payment for services rendered, you are responsible for reasonable collection and/or legal fees.
5. **Delivery of Results.** Upon timely delivery of specimens, we will use commercially reasonable efforts to meet standard turnaround times. We will advise you if we receive specimens in damaged, contaminated or improperly preserved condition, or which do not meet specimen volume requirements. We reserve the right to refuse to accept or to rescind acceptance of any specimen, which in our judgment is likely to pose any unreasonable risk in handling and/or analysis. You represent and warrant that any specimen containing any hazardous substance, which is to be delivered to us, will be packaged, labeled, transported and delivered in accordance with applicable laws.
6. **Quality Assurance.** We will perform services consistent with our quality assurance standard operating procedures. It is your exclusive responsibility to confirm that our standard practices will meet your needs before placing any order for work.
7. **Retention of Specimens.** After we report analytical results, we routinely retain whole blood specimens in our storage facilities for forty-eight (48) hours, and serum specimens for sixty (60) days, after which we may destroy the specimens, unless a different arrangement has been previously agreed upon in writing with the client.
8. **Hazardous Materials and Human Specimens.** We may return to you unused portions of specimens found or suspected to be hazardous, or to contain hazardous materials according to state or federal guidelines upon completion of the analytical work. We will not accept or analyze human specimens. We may invoice you for the cost of returning the specimen.
9. **Specimen Containers.** If available we may provide specimen containers upon request. We reserve the right to charge a fee for specimen containers. All specimens become the property of VRL upon delivery to a VRL facility.
10. **Retention of Reports.** Unless otherwise agreed in writing, we shall retain copies of reports for a period of one (1) year, after which we may destroy the reports. Reports and data for GLP studies will be retained for 5 years in accordance with FDA 21CFR, part 58 regulations.
11. **Force Majeure.** VRL will not be responsible if its performance of this quotation/agreement is interrupted or delayed by reason of Acts of God; wars; blockades; riots; explosion; strike, lockouts or other industrial disturbance involving employees of VRL or its suppliers or subcontractors; fires accidents to equipment; or any other causes not within its control. VRL's obligations under this quotation/agreement will be deemed timely performed hereunder when performed promptly upon removal of the effects of cause.
12. **Limited Warranty and Limits of Liability.** In accepting work, we warrant that we shall provide services in a professional manner using qualified personnel, and we warrant the accuracy of test results for the specimen as submitted. EXCEPT AS STATED IN THIS LIMITED WARRANTY, WE MAKE NO OTHER WARRANTY, REPRESENTATION OR CONDITION, EXPRESS OR IMPLIED, WRITTEN OR ORAL, AND THERE IS NO WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE OR NONINFRINGEMENT. We do not assume, nor do we authorize any employee, agent or other person to assume for us, any other liability in connection with our services. If you qualify as a “consumer” under applicable law, then you may be entitled to implied warranties allowed by law, limited to the period of the express warranties and the remedies set forth in this limited warranty. Some jurisdictions do not allow limitations

## VRL TERMS AND CONDITIONS CONT.

on how long an implied warranty lasts, so the above limitations may not apply to you.

We are not liable for failure to perform due to circumstances beyond our reasonable control. UNDER NO CIRCUMSTANCES WILL WE BE LIABLE TO YOU OR ANY OTHER PERSON FOR LOSS OF PROFIT OR USE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, INDIRECT, EXEMPLARY, PUNITIVE OR MULTIPLE DAMAGES, INCLUDING WITHOUT LIMITATION FOR LOSS OF GOODWILL, DATA OR EQUIPMENT OR FOR BUSINESS INTERRUPTION, ARISING OUT OF THE SALE OR PROVISION OF OUR SERVICES OR FAILURE OR DELAY IN DELIVERING SUCH SERVICES, WHETHER BASED ON WARRANTY, CONTRACT, TORT OR OTHERWISE, EVEN IF WE WERE ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSSES. OUR ENTIRE LIABILITY TO YOU IN CONNECTION WITH THE PROVISION OF LABORATORY TESTING OR CONSULTING SERVICES, WHETHER BASED ON WARRANTY, CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED THE AMOUNT YOU PAID FOR SUCH LABORATORY TEST OR CONSULTATION SERVICE. We accept no legal responsibility for the purposes for which you use our analyses, reports or other services.

Some jurisdictions do not allow the exclusion or limitation of special, incidental, consequential, indirect, exemplary, and punitive or multiple damages or the limitation of liability to the actual price paid for the product or service, so the above limitations may not apply to you. Our limited warranty gives you specific legal rights, and you may also have other rights that vary from jurisdiction to jurisdiction. We shall not accept any purchase order or other order for work that includes any conditions that vary from these Standard Terms and Conditions, and we hereby object to any conflicting terms contained in any acceptance or order submitted by you.

13. **Collection and Use of Personal Information.** VRL collects your personal information to respond to your request for products, services, or information, to fulfill our obligations to you under orders or contracts, to arrange for and process payments owed by you in connection with orders or contracts, or for other limited purposes. VRL does not share your personal information with third parties unless required to do so by law, or as reasonably necessary to fulfill or administer orders or contracts made with VRL. VRL may also use your personal information to send you educational information, information about upcoming seminars, information about new tests that become available, and information about products and services offered by VRL and its partners that we think may be of interest to you. Please note that your information may be stored and processed in the United States, countries of the European Union, and elsewhere. Full information about VRL's privacy policies can be viewed at [VRL.NET](http://VRL.NET).
14. **Governing Law; Waiver of Jury Trial.** These Standard Terms and Conditions and the transactions contemplated hereby, and all related disputes between the parties under or relating to these Standard Terms and Conditions, whether in contract, tort or otherwise, shall be governed by the laws of the States of Maryland and Texas without reference to conflict of laws principles, and any related legal actions must be brought in the court of appropriate jurisdiction in the States of Maryland and Texas which shall have exclusive jurisdiction (except that either of us may bring an action for an injunction or similar equitable relief against the other in any proper jurisdiction). You hereby waive any claim of lack of jurisdiction or inconvenient forum. YOU AND WE WAIVE TRIAL BY JURY IN ANY LEGAL ACTION BY OR AGAINST US IN SUCH LEGAL ACTIONS. We each further waive any claims against the other for multiple, punitive, or exemplary damages in any legal actions relating to these Standard Terms and Conditions. The prevailing party in any such legal actions shall be entitled to an award of its reasonable legal fees and costs.

**Equal Opportunity/Affirmative Action Notice.** We are an equal opportunity/affirmative action employer and comply with all the regulations of executive order 11246 and the regulations promulgated thereunder.









**VRL LABORATORIES**

[www.vrl.net](http://www.vrl.net)

7540 Louis Pasteur Dr., Suite 200  
San Antonio, TX 78229

401 Professional Dr., Suite 210  
Gaithersburg, MD 20879

4365 Beaudry Av  
Saint-Hyacinthe QC J2S 8W2