

FINAL REPORT OF LABORATORY EXAMINATION

4011 Discovery Drive, Columbia, MO 65201

1-800-669-0825 1-573-499-5700

idx-radil@idexx.com

www.idexxbioresearch.com

IDEXX BioResearch Case # 25192-2013

Received: 12/9/2013

Completed: 12/23/2013

SEROLOGY DETAILS

	Baseline	1
CAR bacillus		
CAR bacillus purified bacteria	MFI > 3.750	-
Hantaan		
Hantaan purified virus	MFI > 1.250	-
LCMV		
LCMV purified virus	MFI > 0.300	-
Mycoplasma pulmonis		
<i>M. pulmonis</i> purified bacteria	MFI > 2.750	-
MAD1		
MAD1 purified virus	MFI > 2.550	-
RPV		
RPV purified virus	MFI > 1.450	-
NS1 ¹	MFI > 3.820	-
RMV		
RMV VP2 recombinant	MFI > 1.000	-
NS1 ¹	MFI > 3.820	-
KRV		
KRV purified virus	MFI > 2.250	-
NS1 ¹	MFI > 3.820	-
H1		
H1 purified virus	MFI > 1.200	-
NS1 ¹	MFI > 3.820	-
PVM		
PVM purified virus	MFI > 1.500	-
RCV/SDAV		
RCV/SDAV purified virus	MFI > 3.750	-
RCV/SDAV NC recombinant	MFI > 4.950	-
REO3		
REO3 purified virus	MFI > 4.500	-

If you have questions, please call our toll free number at 1-800-669-0825 or e-mail us at idx-radil@idexx.com.

	Baseline	1
RTV		
RTV purified virus	MFI > 1.100	-
TMEV purified virus	MFI > 1.400	-
Sendai		
Sendai purified virus	MFI > 2.800	-
<i>Clostridium piliforme</i>		
<i>Clostridium piliforme</i> purified bacteria	MFI > 4.950	-

NS1¹: NS1 protein is highly conserved among rodent parvoviruses and thus serves as a generic assay for parvovirus seroconversion.

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG Positive MFI results are reported as "+" followed by a number from 1 to 33 in thousands rounded off to the nearest thousand.

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**Received: 12/9/2013
Completed: 12/23/2013**

Submitted By

Sentinels
University of Missouri-RCA
Columbia, MO 65201

Phone: 573-884-7970
Email: franklinc@missouri.edu; bethunec@missouri.edu;
goerndta@missouri.edu; watermanjd@missouri.edu

Specimen Description

Species: rat
Number of Specimens/Animals: 1
Building/Facility: W114

Client ID	Investigator	Room #	Strain	Sex	Age	Rack
1	Bryda	W114	CD	F	Adult	1

Services/Tests Performed: Rederivation Necropsy Profile - rat

Serologic evaluation for antibodies to: *Clostridium piliforme*, *Mycoplasma pulmonis*, CAR bacillus, H1, Hantaan, KRV, LCMV, MAD1, PVM, RCV/SDAV, REO3, RMV, RPV, RTV, Sendai

PCR evaluation for: *Helicobacter bilis*, *Helicobacter ganmani*, *Helicobacter hepaticus*, *Helicobacter rodentium*, *Helicobacter spp.*, *Helicobacter typhlonius*, *Mycoplasma pulmonis*, *Pneumocystis carinii*, *Streptobacillus moniliformis*

Parasitologic evaluation for: fur mites, mesostigmatid mites, lice, Spironucleus muris, Giardia muris, large intestinal flagellates and amoeba, pinworms and tapeworms

Microbiologic evaluation for: *Corynebacterium kutscheri*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Pasteurella multocida*, *Pasteurella pneumotropica*, *Salmonella enterica*, *Streptococcus pneumoniae*

General Comments: CB: Sentinel Rats placed on 9/10/2013.

Summary: No conclusive evidence of serious, naturally occurring infectious disease was found.

NECROPSY

No gross lesions were detected in any of the body systems and organs examined.

SEROLOGY SUMMARY

	1
CAR bacillus	-
Hantaan	-
LCMV	-
<i>Mycoplasma pulmonis</i>	-
MAD1	-
RPV	-
RMV	-
KRV	-
H1	-
PVM	-
RCV/SDAV	-
REO3	-
RTV	-
Sendai	-
<i>Clostridium piliforme</i>	-
Rat IgG	N

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG

PCR EVALUATION

feces	1
<i>Helicobacter</i> spp.	-
<i>Helicobacter bilis</i>	-
<i>Helicobacter ganmani</i>	-
<i>Helicobacter hepaticus</i>	-
<i>Helicobacter rodentium</i>	-
<i>Helicobacter typhlonius</i>	-

lung	1
<i>Pneumocystis carinii</i>	-

nasopharyngeal swab	1
<i>Mycoplasma pulmonis</i>	-

oral swab	1
<i>Streptobacillus moniliformis</i>	-

Legend: + = positive - = negative id:id = pooled sample range id+id+id = non-range pooled sample NT or blank = no test performed wps = weak positive

Comments: All samples are first tested by the *Helicobacter* spp. PCR assay; a generic *Helicobacter* PCR assay that detects all bacteria in the *Helicobacter* genus. Samples testing negative on this assay are reported negative for *Helicobacter* spp. and all species-specific helicobacters. Samples testing positive on the *Helicobacter* spp. assay are subsequently retested on the *Helicobacter* spp. assay and tested with PCR assays specific for *H. bilis*, *H. ganmani*, *H. hepaticus*, *H. rodentium* and *H. typhlonius* and positive results are reported.

PARASITOLOGY

	1
parasites	-

MICROBIOLOGY

cecum	1
<i>Klebsiella oxytoca</i>	-
<i>Klebsiella pneumoniae</i>	-
<i>Salmonella enterica</i>	-

nasopharynx	1
<i>Corynebacterium kutscheri</i>	-
<i>Pasteurella multocida</i>	-
<i>Pasteurella pneumotropica</i>	-
<i>Streptococcus pneumoniae</i>	-

Legend: + = agent recovered - = agent not recovered blank = test not performed n = no growth p = Proteus overgrowth, which may interfere with the identification of other bacteria



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IDEXX BioResearch Case # 25190-2013

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SEROLOGY DETAILS

	Baseline	1
CAR bacillus		
CAR bacillus purified bacteria	MFI > 3.750	-
Hantaan		
Hantaan purified virus	MFI > 1.250	-
LCMV		
LCMV purified virus	MFI > 0.300	-
Mycoplasma pulmonis		
<i>M. pulmonis</i> purified bacteria	MFI > 2.750	-
MAD1		
MAD1 purified virus	MFI > 2.550	-
RPV		
RPV purified virus	MFI > 1.450	-
NS1 ¹	MFI > 3.820	-
RMV		
RMV VP2 recombinant	MFI > 1.000	-
NS1 ¹	MFI > 3.820	-
KRV		
KRV purified virus	MFI > 2.250	-
NS1 ¹	MFI > 3.820	-
H1		
H1 purified virus	MFI > 1.200	-
NS1 ¹	MFI > 3.820	-
PVM		
PVM purified virus	MFI > 1.500	-
RCV/SDAV		
RCV/SDAV purified virus	MFI > 3.750	-
RCV/SDAV NC recombinant	MFI > 4.950	-
REO3		
REO3 purified virus	MFI > 4.500	-

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	Baseline	1
RTV		
RTV purified virus	MFI > 1.100	-
TMEV purified virus	MFI > 1.400	-
Sendai		
Sendai purified virus	MFI > 2.800	-
<i>Clostridium piliforme</i>		
<i>Clostridium piliforme</i> purified bacteria	MFI > 4.950	-

NS1¹: NS1 protein is highly conserved among rodent parvoviruses and thus serves as a generic assay for parvovirus seroconversion.

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG Positive MFI results are reported as "+" followed by a number from 1 to 33 in thousands rounded off to the nearest thousand.

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goerndta@missouri.edu; watermanjd@missouri.edu

Specimen Description

Species: rat
Number of Specimens/Animals: 1

Client ID	Investigator	Room #	Strain	Sex	Age
1	Bryda	W113	CD	F	Adult

Services/Tests Performed: Rederivation Necropsy Profile - rat

Serologic evaluation for antibodies to: *Clostridium piliforme*, *Mycoplasma pulmonis*, CAR bacillus, H1, Hantaan, KRV, LCMV, MAD1, PVM, RCV/SDAV, REO3, RMV, RPV, RTV, Sendai

PCR evaluation for: *Helicobacter bilis*, *Helicobacter ganmani*, *Helicobacter hepaticus*, *Helicobacter rodentium*, *Helicobacter spp.*, *Helicobacter typhlonius*, *Mycoplasma pulmonis*, *Pneumocystis carinii*, *Streptobacillus moniliformis*

Parasitologic evaluation for: fur mites, mesostigmatid mites, lice, *Spironucleus muris*, *Giardia muris*, large intestinal flagellates and amoeba, pinworms and tapeworms

Microbiologic evaluation for: *Corynebacterium kutscheri*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Pasteurella multocida*, *Pasteurella pneumotropica*, *Salmonella enterica*, *Streptococcus pneumoniae*

General Comments: CB: Sentinel Rats placed on 9/10/2013.

Summary: No conclusive evidence of serious, naturally occurring infectious disease was found.

NECROPSY

No gross lesions were detected in any of the body systems and organs examined.

SEROLOGY SUMMARY

	1
CAR bacillus	-
Hantaan	-
LCMV	-
<i>Mycoplasma pulmonis</i>	-
MAD1	-
RPV	-
RMV	-
KRV	-
H1	-
PVM	-
RCV/SDAV	-
REO3	-
RTV	-
Sendai	-
<i>Clostridium piliforme</i>	-
Rat IgG	N

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG

PCR EVALUATION

feces	1
<i>Helicobacter</i> spp.	-
<i>Helicobacter bilis</i>	-
<i>Helicobacter ganmani</i>	-
<i>Helicobacter hepaticus</i>	-
<i>Helicobacter rodentium</i>	-
<i>Helicobacter typhlonius</i>	-

lung	1
<i>Pneumocystis carinii</i>	-

nasopharyngeal swab	1
<i>Mycoplasma pulmonis</i>	-

oral swab	1
<i>Streptobacillus moniliformis</i>	-

Legend: + = positive - = negative id:id = pooled sample range id+id+id = non-range pooled sample NT or blank = no test performed wps = weak positive

Comments: All samples are first tested by the *Helicobacter* spp. PCR assay; a generic *Helicobacter* PCR assay that detects all bacteria in the *Helicobacter* genus. Samples testing negative on this assay are reported negative for *Helicobacter* spp. and all species-specific helicobacters. Samples testing positive on the *Helicobacter* spp. assay are subsequently retested on the *Helicobacter* spp. assay and tested with PCR assays specific for *H. bilis*, *H. ganmani*, *H. hepaticus*, *H. rodentium* and *H. typhlonius* and positive results are reported.

PARASITOLOGY

	1
parasites	-

MICROBIOLOGY

cecum	1
<i>Klebsiella oxytoca</i>	-
<i>Klebsiella pneumoniae</i>	-
<i>Salmonella enterica</i>	-

nasopharynx	1
<i>Corynebacterium kutscheri</i>	-
<i>Pasteurella multocida</i>	-
<i>Pasteurella pneumotropica</i>	-
<i>Streptococcus pneumoniae</i>	-

Legend: + = agent recovered - = agent not recovered blank = test not performed n = no growth p = Proteus overgrowth, which may interfere with the identification of other bacteria

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SEROLOGY DETAILS

	Baseline	1	2	3	4	5	6
CAR bacillus							
CAR bacillus purified bacteria	MFI > 3.750	-	-	-	-	-	-
Hantaan							
Hantaan purified virus	MFI > 1.250	-	-	-	-	-	-
LCMV							
LCMV purified virus	MFI > 0.300	-	-	-	-	-	-
Mycoplasma pulmonis							
<i>M. pulmonis</i> purified bacteria	MFI > 2.750	-	-	-	-	-	-
MAD1							
MAD1 purified virus	MFI > 2.550	-	-	-	-	-	-
RPV							
RPV purified virus	MFI > 1.450	-	-	-	-	-	-
NS1 ¹	MFI > 3.820	-	-	-	-	-	-
RMV							
RMV VP2 recombinant	MFI > 1.000	-	-	-	-	-	-
NS1 ¹	MFI > 3.820	-	-	-	-	-	-
KRV							
KRV purified virus	MFI > 2.250	-	-	-	-	-	-
NS1 ¹	MFI > 3.820	-	-	-	-	-	-
H1							
H1 purified virus	MFI > 1.200	-	-	-	-	-	-
NS1 ¹	MFI > 3.820	-	-	-	-	-	-
PVM							
PVM purified virus	MFI > 1.500	-	-	-	-	-	-
RCV/SDAV							
RCV/SDAV purified virus	MFI > 3.750	-	-	-	-	-	-
RCV/SDAV NC recombinant	MFI > 4.950	-	-	-	-	-	-
REO3							
REO3 purified virus	MFI > 4.500	-	-	-	-	-	-

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	Baseline	1	2	3	4	5	6
RTV							
RTV purified virus	MFI > 1.100	-	-	-	-	-	-
TMEV purified virus	MFI > 1.400	-	-	-	-	-	-
Sendai							
Sendai purified virus	MFI > 2.800	-	-	-	-	-	-
<i>Clostridium piliforme</i>							
<i>Clostridium piliforme</i> purified bacteria	MFI > 4.950	-	-	-	-	-	-

NS1¹: NS1 protein is highly conserved among rodent parvoviruses and thus serves as a generic assay for parvovirus seroconversion.

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG

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Phone: 573-884-7970
Email: franklinc@missouri.edu; bethunec@missouri.edu;
goerndta@missouri.edu; watermanjd@missouri.edu

Specimen Description

Species: rat
Number of Specimens/Animals: 6
Building/Facility: W112

Client ID	Investigator	Room #	Strain	Sex	Rack
1	Bryda	W112	CD	F	1
2		W112	CD	F	2
3		W112	CD	F	3
4		W112	CD	F	4
5		W112	CD	F	5
6		W112	CD	F	6

Services/Tests Performed: Rederivation Necropsy Profile - rat

Serologic evaluation for antibodies to: *Clostridium piliforme*, *Mycoplasma pulmonis*, CAR bacillus, H1, Hantaan, KRV, LCMV, MAD1, MAD2, PVM, RCMV, RCV/SDAV, REO3, RMV, RPV, RTV, Sendai

PCR evaluation for: *Helicobacter bilis*, *Helicobacter ganmani*, *Helicobacter hepaticus*, *Helicobacter rodentium*, *Helicobacter* spp., *Helicobacter typhlonius*, *Mycoplasma pulmonis*, *Pneumocystis carinii*, *Streptobacillus moniliformis*

Parasitologic evaluation for: fur mites, mesostigmatid mites, lice, *Spironucleus muris*, *Giardia muris*, large intestinal flagellates and amoeba, pinworms and tapeworms

Microbiologic evaluation for: *Corynebacterium kutscheri*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Pasteurella multocida*, *Pasteurella pneumotropica*, *Salmonella enterica*, *Streptococcus pneumoniae*

General Comments: CB: Sentinel Rats placed on 9/10/2013.

Additional tests on samples collected from rat 1 were requested by the client on Dec 18. These tests included RCMV and MAD2 serology, and culture for *Staphylococcus aureus* and beta-hemolytic *Streptococcus*.

Summary: *Staphylococcus aureus* was cultured from the oropharynx of rat 1. No conclusive evidence of serious, naturally occurring infectious disease was found. All other test results were negative. Please see the report for details.

NECROPSY

No gross lesions were detected in any of the body systems and organs examined.

SEROLOGY SUMMARY

	1	2	3	4	5	6
CAR bacillus	-	-	-	-	-	-
Hantaan	-	-	-	-	-	-
LCMV	-	-	-	-	-	-
<i>Mycoplasma pulmonis</i>	-	-	-	-	-	-
MAD1	-	-	-	-	-	-
RPV	-	-	-	-	-	-
RMV	-	-	-	-	-	-
KRV	-	-	-	-	-	-
H1	-	-	-	-	-	-
PVM	-	-	-	-	-	-
RCV/SDAV	-	-	-	-	-	-
REO3	-	-	-	-	-	-
RTV	-	-	-	-	-	-
Sendai	-	-	-	-	-	-
<i>Clostridium piliforme</i>	-	-	-	-	-	-
Rat IgG	N	N	N	N	N	N

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG

PCR EVALUATION

feces	1	2	3	4	5	6
<i>Helicobacter</i> spp.	-	-	-	-	-	-
<i>Helicobacter bilis</i>	-	-	-	-	-	-
<i>Helicobacter ganmani</i>	-	-	-	-	-	-
<i>Helicobacter hepaticus</i>	-	-	-	-	-	-
<i>Helicobacter rodentium</i>	-	-	-	-	-	-
<i>Helicobacter typhlonius</i>	-	-	-	-	-	-

lung	1	2	3	4	5	6
<i>Pneumocystis carinii</i>	-	-	-	-	-	-

nasopharyngeal swab	1	2	3	4	5	6
<i>Mycoplasma pulmonis</i>	-	-	-	-	-	-

oral swab	1	2	3	4	5	6
<i>Streptobacillus moniliformis</i>	-	-	-	-	-	-

Legend: + = positive - = negative id:id = pooled sample range id+id+id = non-range pooled sample NT or blank = no test performed wps = weak positive

Comments: All samples are first tested by the *Helicobacter* spp. PCR assay; a generic *Helicobacter* PCR assay that detects all bacteria in the *Helicobacter* genus. Samples testing negative on this assay are reported negative for *Helicobacter* spp. and all species-specific helicobacters. Samples testing positive on the *Helicobacter* spp. assay are subsequently retested on the *Helicobacter* spp. assay and tested with PCR assays specific for *H. bilis*, *H. ganmani*, *H. hepaticus*, *H. rodentium* and *H. typhlonius* and positive results are reported.

PARASITOLOGY

	1	2	3	4	5	6
parasites	-	-	-	-	-	-

MICROBIOLOGY

cecum	1	2	3	4	5	6
<i>Klebsiella oxytoca</i>	-	-	-	-	-	-
<i>Klebsiella pneumoniae</i>	-	-	-	-	-	-
<i>Salmonella enterica</i>	-	-	-	-	-	-

nasopharynx	1	2	3	4	5	6
<i>Corynebacterium kutscheri</i>	-	-	-	-	-	-
<i>Pasteurella multocida</i>	-	-	-	-	-	-
<i>Pasteurella pneumotropica</i>	-	-	-	-	-	-
<i>Streptococcus pneumoniae</i>	-	-	-	-	-	-

Legend: + = agent recovered - = agent not recovered blank = test not performed n = no growth p = Proteus overgrowth, which may interfere with the identification of other bacteria

Comments: The culture for *Salmonella enterica* screens for all subspecies of *Salmonella* known to infect man and animals.

nasopharynx	1
<i>Staphylococcus aureus</i>	+
<i>Streptococcus</i> sp. beta hemolytic	-

Legend: + = agent recovered - = agent not recovered blank = test not performed n = no growth p = Proteus overgrowth, which may interfere with the identification of other bacteria

ADDENDUM TO FINAL REPORT OF LABORATORY EXAMINATION
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 Addendum Dated: 12/19/2013

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 goerndta@missouri.edu; watermanjd@missouri.edu

SEROLOGY DETAILS

12/19/2013	Baseline	1
MAD2		
MAD2 purified virus	MFI > 3.500	-
RCMV		
RCMV	IFA	-

Legend: + = positive - = negative blank = test not performed EQ = equivocal HE = hemolysis precluded testing I = insufficient W = weak positive WB = Western Blot confirmatory analysis pending NS = non-specific reactivity N = normal IgG L = less than normal IgG
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