



charles river

2019 Catalog

RESEARCH MODELS AND SERVICES

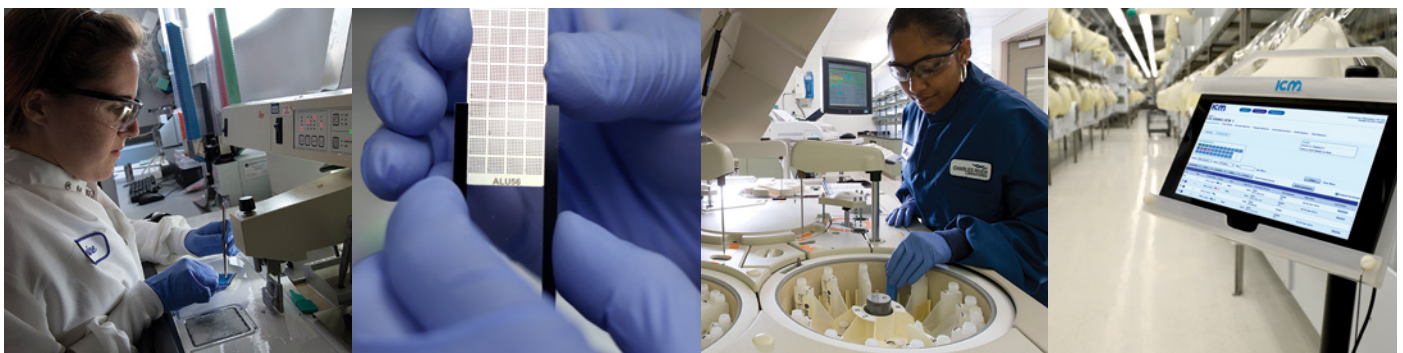
MORE THAN A MOUSE

Research Models and Services

What began as a thousand cages in a warehouse in Boston is now a global network of comprehensive research facilities that are strategically positioned to support your research in all major therapeutic areas. Through vital husbandry and study support, as well as supplementary staffing, consulting, training, and equipment, we fill the gaps so you can focus on your research. Our portfolio includes:

- Research Animal Models
- Biospecimens
- Animal Health Monitoring
- Surgical Services
- Animal Colony Management
- Embryology Services
- Preconditioned Models
- Model Creation Services
- Genetic Testing Services
- Clinical Pathology and Biomarkers

Further downstream, we help you maintain momentum on the way to market by shepherding your drug through discovery, safety assessment, clinical development, and manufacturing. Visit www.criver.com to explore how we can help streamline your operations throughout the course of research.



Contact us

If you are unsure about whom to contact at Charles River, we recommend that you start with Inbound Customer Support and Technical Assistance. Our representatives are available from 6 a.m.–6 p.m. ET Monday through Friday to field any questions you may have, or to direct inquiries to the correct contact or department. For all correspondence: Charles River, 251 Ballardvale Street, Wilmington, MA 01887

Inbound Customer Support and Technical Assistance

Phone: 1.877.CRIVER1 (1.877.274.8371)
Email: askcharlesriver@crl.com

Our expert technical group, including our highly qualified professional staff of veterinarians and doctorate-level scientists, can assist you in areas such as laboratory animal science, biology, husbandry, surgery, and health issues.

Specifically, we can assist you with:

- Information regarding the Charles River portfolio
- Performing literature searches
- Answering questions about specific animal models
- Coordinating custom orders, including surgical procedures and genetically modified or preconditioned research models

Research Models Client Relations Department

Phone: 1.800.LAB.RATS (1.800.522.7287)
Fax: 1.800.992.7329

Our customer service representatives strive to make the research model order and shipment process as easy as possible for you. When you call our Customer Service Department, our automated phone system directs your call (by area code) to your customer service team. This team concept lets you routinely speak with people who know you and your account. We offer five ways for you to order research models: phone, fax, mail, Electronic Data Interchange (EDI), and online ordering.

Specifically, we can assist you with:

- Animal orders
- Model availability
- Pricing and shipping details

Laboratory Services Client Relations/ Laboratory Testing Management® (LTM™) Support Team

Phone: 1.781.222.6701
Email: LabServices@crl.com

The Laboratory Services Client Relations team is your resource for health and genetic testing, including the use of LTM™, our online, interactive order entry and results management system that centralizes your health and genetic testing programs into one virtual location. For more information on LTM™, visit www.criver.com/lrm.

The Client Relations team can assist you with:

- Online ordering, scheduling sample submission, and sample shipping
- Coordinating delivery of your complimentary shipping materials
- Results retrieval and interpretation
- One-on-one or group demonstrations and training on LTM™
- Pricing, quotes, and invoice questions

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Research Models

Our Animal Models

Charles River is committed to providing you with high-quality genetically standardized models such as VAF/Plus® and VAF/Elite® animals which are free of select infectious agents and parasites. We understand that selecting the appropriate animal model for your studies is critical to your research success. To assist you, we offer an evaluation program that allows you to assess the quality and compatibility of our animal models before making a purchase. For more information, please go to www.criver.com/rmeval.

VAF* Health Profiles

The table below lists the infectious agents specifically excluded from our VAF/Plus®, VAF/Elite®, and Immunodeficient VAF/Elite® animal colonies. For further information regarding viral profiles, microbiological flora, or the comprehensive list of agents included in the Charles River health surveillance program, please go to the Health Reports section of our website at www.criver.com/info/rm or contact us at 1.877.274.8371 or askcharlesriver@crl.com.

Health Profile	Species	Agents Excluded†
VAF/Plus®	Mouse	SEND, PVM, MHV, MVM, MPV, TMEV (GDVII), REO, EDIM, MAV, POLY, K, MCMV, MTLV, LCMV, HANT, ECTRO, ECUN, CARB, LDV, MNV
		<i>M. pulmonis</i> , <i>Salmonella</i> spp., <i>S. moniliformis</i> , <i>C. kutscheri</i> , <i>H. hepaticus</i> , <i>C. rodentium</i>
	Rat	SEND, PVM, SDAV, KRV, H-1, RPV, RMV, REO, RTV, LCMV, HANT, MAV, ECUN, CARB
		<i>M. pulmonis</i> , <i>Salmonella</i> spp., <i>S. moniliformis</i> , <i>C. kutscheri</i> , <i>H. hepaticus</i>
	Guinea pig	SEND, PVM, LCMV, REO, GAV
		<i>M. pulmonis</i> , <i>Salmonella</i> spp., <i>S. moniliformis</i> , <i>S. zooepidemicus</i> , <i>B. bronchiseptica</i> , <i>H. hepaticus</i>
	Hamster	SEND, PVM, LCMV, REO, ECUN
		<i>Salmonella</i> spp., <i>H. hepaticus</i>
	Rabbit	ECUN, RHDV
		<i>P. multocida</i> , <i>Salmonella</i> spp., <i>Treponema</i> , Tyzzer's disease
VAF/Elite®	Mouse (immunocompetent)	These mice are free of all of the agents listed above in the VAF/Plus® mouse profile, plus Beta hemolytic <i>Streptococcus</i> spp., <i>K. oxytoca</i> , <i>K. pneumoniae</i> , <i>P. pneumotropica</i> , <i>P. aeruginosa</i> , <i>P. mirabilis</i> , <i>S. aureus</i> .
	Mouse (immunodeficient)	These mice are free of all of the agents listed above in the VAF/Plus® mouse profile, plus Beta hemolytic <i>Streptococcus</i> spp., <i>K. oxytoca</i> , <i>K. pneumoniae</i> , <i>P. pneumotropica</i> , <i>Pneumocystis</i> spp., <i>P. aeruginosa</i> , <i>P. mirabilis</i> , <i>S. aureus</i> , <i>C. bovis</i> .
	Rat (immunodeficient)	These rats are free of all of the agents listed above in the VAF/Plus® rat profile, plus <i>S. aureus</i> , <i>S. pneumoniae</i> , Beta hemolytic <i>Streptococcus</i> spp., <i>Klebsiella</i> spp., <i>K. oxytoca</i> , <i>K. pneumoniae</i> , <i>P. pneumotropica</i> , <i>Pneumocystis</i> spp., <i>P. aeruginosa</i> , <i>P. mirabilis</i> , <i>C. bovis</i> .

* Virus Antibody Free (VAF)

† All helminths, ectoparasites, and pathogenic GI protozoa are excluded as part of our VAF/Plus® and VAF/Elite® profiles. See Glossary of Terms for abbreviation key for agents.

The VAF/Elite® health profile is currently offered for the following stocks and strains of mice: 129-Elite, BALB/c-Elite, C57BL/6-Elite, CD1-Elite, SJL-Elite, and SKH1-Elite.

Birth Dates

Birth dates are furnished on shipping documents for orders placed by age and are calculated according to the ship date of the order. The date of birth is based upon the midpoint of the specified age range. Exact date of birth is provided when exact-age animals are ordered.

Age/Weight Correlation Information

Age/weight correlation information is presented throughout this product catalog for each sex of most stocks and strains. The information is specific to the conditions maintained in Charles River barrier production rooms. The shaded areas on each chart are the mean weight, plus or minus two standard deviations, at a given age, averaged across all production facilities. This represents the majority of the population. Overlaps in the full range of weights occur between age groups and will be more pronounced in outbred animals.

Ordering Information

To accommodate your need for prompt shipment, sales are made on the basis of telephone orders without written documentation. Fax or email confirmation of orders are available upon request. Our acceptance of your order is expressly made conditional on your consent to our General Terms and Conditions of Sale, and our prices have been set accordingly.

Any provision of a purchase order or confirmation that is additional to or conflicts with our General Terms and Conditions of Sale is expressly rejected and shall not be binding on us. Please consider this before placing your order.

Some animal models are produced only in small quantities. Upon your request, we will work to scale up our colony production to meet your needs.

The prices in this catalog are for customers located in the United States who are purchasing research models and services sourced from the United States. All other customers should contact Customer Service for pricing in your region.

For additional information, please contact the Customer Service Department at 1.800.LAB.RATS (1.800.522.7287) or by fax at 1.800.992.7329.

Cancellation Policies

Standard or Regular Animal Orders To avoid charges, cancellation of standard animal orders must be received at least one business day prior to the scheduled shipment date.

Rabbit Orders Cancellations of rabbit orders shipping at 3.1 kg or higher are subject to a cancellation fee.

Timed Pregnant Animals To avoid charges, cancellations for pregnant animals must be received prior to the scheduled mating day.

Value-Added Services To avoid charges, cancellations for value-added services, including, but not limited to, tattooing or ear tagging, must be received at least three business days prior to the ship date.

Surgical and Biospecimen Services Cancellations must be received at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to, 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

Shipments Outside North America Cancellations need to be received by 5:00 p.m. Eastern Time (ET) on the Friday prior to shipping. If canceled by then, the only cost incurred is for the USDA Health Certificate. If cancellation notice is received after the animals are packed and/or sent to the airport, the customer is responsible for animal and freight charges for transportation to/from the airport.

Miscellaneous Charges

Surcharges (where applicable)	
1 gram weight range for inbred mice	Add 5%
5 gram weight range for non-obese rats & hamsters	Add 25%
10 gram weight range for non-obese rats	Add 15%
Retired breeders with specified weight or approximate age	Add 50%

Applicable Container and Other Charges	
Filtered shipping container (Sew Easy™)	20.65 each
Gnoto-safe® shipping container	38.45 each
Weight list	0.70 per animal

Import/Export Preparation Charges	
Preparation of appropriate documentation for international shipment of Charles River products	590.00 per shipment*
Importation or exportation of non-Charles River products	890.00 per shipment*

* Plus fixed costs

Pregnant Animal Guarantee Policy

Charles River produces pregnant animals to your order specification. Most barrier-reared rats and mice can be safely and accurately palpated for pregnancy after 13 days of gestation. Prior to that, pregnancy is determined by observation of a vaginal plug. Following timed exposure to the male, the date the copulatory plug is found (plug date) is considered to be day one of gestation unless noted otherwise. For additional information and/or strain availability, contact the Customer Service Department at 1.800.LAB.RATS (1.800.522.7287).

Stock or Strain	PERCENT GUARANTEED PREGNANT		
	Timed Pregnant Up to 12 Days Gestation	Timed Pregnant 13 Days Gestation and Over	Untimed Pregnant 13-17 Days Gestation Only
Outbred rats	90%	100%	100%
Outbred mice	75%	100%	100%
Inbred and specialty rats, inbred and specialty mice	Plug guarantee only	75%	75%
NZW rabbits	50%	100%	N/A

Note: We do not guarantee the number of offspring per litter. Due to natural variation in the length of gestation, the exact day of parturition is not guaranteed. To avoid charges, cancellations for pregnant animals must be received prior to the scheduled mating day.

Filtered (Sew Easy™) Shipping Container Densities

It is our responsibility to maintain the strictest health and welfare standards when shipping our animals, not only because it's the right thing to do but because our animals are vital to your research. To help make the comfort and care of our animals a priority, we provide several crates that are tailored to established shipping density guidelines for a variety of species. Our shipping

crates have viewing windows that allow you to inspect the animals and assess their interior conditions during and after shipping. Prior to packing the animals, the interior of our filtered crates is UV light irradiated, and our individual Gnoto-safe® plastic containers are disinfected.

Rats

Gram Range Non-Obese	Days Range Non-Obese	Days Range Obese	Animals per Container*
Up to 50	Up to 21	Up to 21	20
51-75	22-26	22-24	17
76-100	27-30	25-26	13
101-125	31-35	27-28	10
126-150	36-42	29-36	9
151-200	43-50	37-42	8
201-250	51-60	43-48	6
251-300	61-70	49-56	5
301-400	71-94	57-63	4
401-450	95-plus	64-70	3
451-plus		71-plus	2

* Number of animals per container may be reduced as needed based on model requirements.

Mice

Gram Range Non-Obese	Days Range Non-Obese	Days Range Obese	Animals per Container
Up to 35	Up to 56	Up to 56	40
36-plus	57-plus	57-70	33
		71-plus	20

Rabbits

Kilogram Range	Animals per Container
Up to 2.5	2
2.6-plus	1

Special Services

	Rats per Container	Mice per Container	Guinea Pigs per Container	Hamsters per Container
Retired breeders	3	33	2	3
Proven breeders	3	33	2	3
Timed pregnants	7	17	3	3
Untimed pregnants	7	17	3	3
Littermates	7 (1 litter)	7 (1 litter)	3 (1 litter)	10 (1 litter)
Mothers with pups	2	3	2	2
Lactating females	7	33	3	15

Guinea Pigs

Gram Range	Days Range	Animals per Container
Up to 350	Up to 33	10
351-600	34-65	6
601-800	66-81	5
801-plus	82-plus	4

Gerbils

Gram Range	Days Range	Animals per Con- tainer
Up to 35	Up to 35	35
36-50	36-56	25
51-70	57-84	20
71-plus	85-plus	15

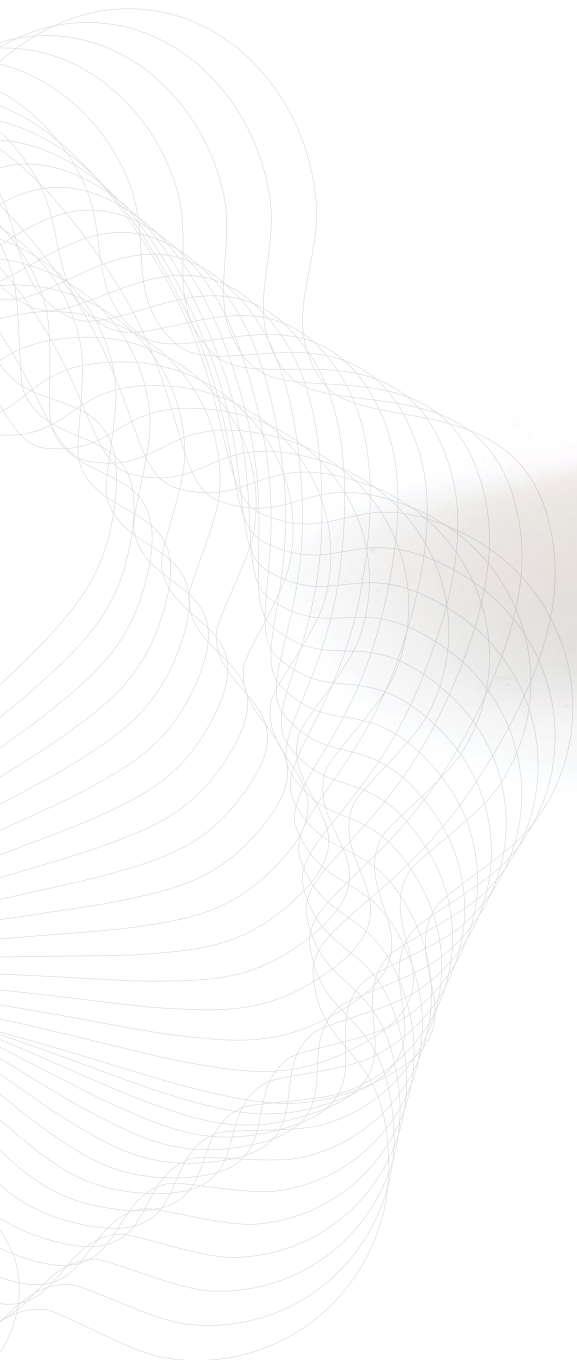
Hamsters

Gram Range	Days Range	Animals per Container
Up to 50	Up to 21	25
51-70	22-42	20
71-plus	43-plus	15

100% Recyclable Gnoto-safe® Shipping Container

	Mice	Rats
Animals per container*	30	2

* Two cages per container



Rat Models

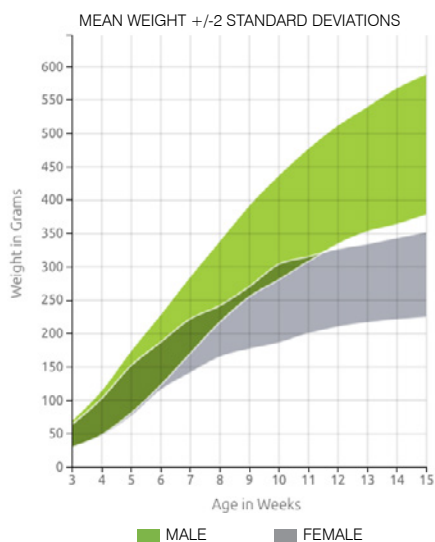
Charles River is dedicated to providing you with consistent availability of the highest quality research models globally. Our comprehensive portfolio of outbred, inbred, and disease/translational rat models enables you to select the appropriate animal model for your research.



RAT MODELS: OUTBRED

CD® IGS RATS

WHEN ORDERING, SPECIFY CD | STRAIN CODE: 001



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 50	18.70	18.75
51-75	23.70	24.85
76-100	29.15	30.35
101-125	33.05	34.35
126-150	38.20	42.15
151-175	40.60	46.15
176-200	47.35	49.70
201-225	50.50	52.60
226-250	54.95	57.10
251-275	59.10	64.40
276-300	61.65	—
301-325	65.15	—
326-350	71.50	—
351-plus	Price upon request	Price upon request
Retired breeders	47.45	46.15
Littermates 21 days old	36.00	36.00
Lactating rat with litter	—	169.20
Timed pregnant*	—	157.75
Untimed pregnant*	—	132.25

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

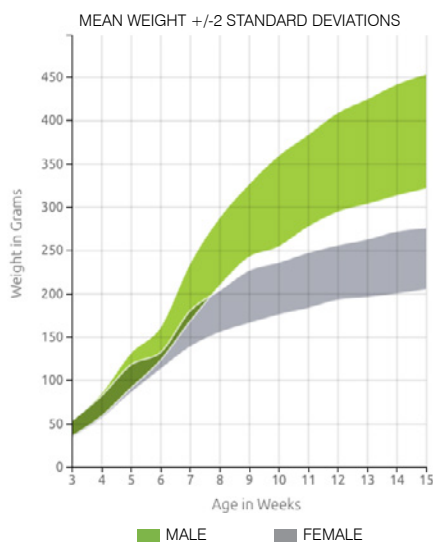
Nomenclature CrI:CD(SD) **Origin** Originated in 1925 by Robert W. Dawley from a hybrid hooded male and a female Wistar rat. To Charles River in 1950 from Sprague Dawley, Inc. In 1991, eight colonies were selected to form the IGS foundation colony. Rederived into an isolator foundation colony in 1997. IGS refers to animals bred using the Charles River International Genetic Standardization system. **Coat Color** White (albino) **Research Application** General multipurpose model, safety and efficacy testing, aging, nutrition, diet-induced obesity, oncology



RAT MODELS: OUTBRED

Sprague Dawley® RATS

WHEN ORDERING, SPECIFY SAS SD | STRAIN CODE: 400



	MALE	FEMALE
Weight in Grams	Price*	Price*
Up to 50	18.05	17.65
51-75	20.70	21.60
76-100	24.25	25.80
101-125	27.85	28.20
126-150	29.95	32.90
151-175	33.85	36.00
176-200	37.70	39.65
201-225	42.10	43.05
226-250	45.00	46.25
251-275	47.20	—
276-300	51.30	—
301-325	53.55	—
326-plus	Price upon request	Price upon request
Retired breeders	37.75	37.00
Littermates 21 days old	21.50	21.50
Lactating rat with litter	—	124.30
Timed pregnant†	—	119.70
Untimed pregnant†	—	95.75

* Specialty model. Discounts may not apply.

† For timed and untimed pregnant SAS SD rats, determination of pregnancy is by observation of vaginal plug. Plug date is considered to be day zero of gestation. Please see our pregnant animal guarantee policy.

Nomenclature Cr:SD **Origin** To SASCO from ARS/Sprague Dawley in 1979. To Charles River in 1996.

Coat Color White (albino) **Research Application** General multipurpose model, safety and efficacy testing, aging, nutrition, diet-induced obesity, oncology

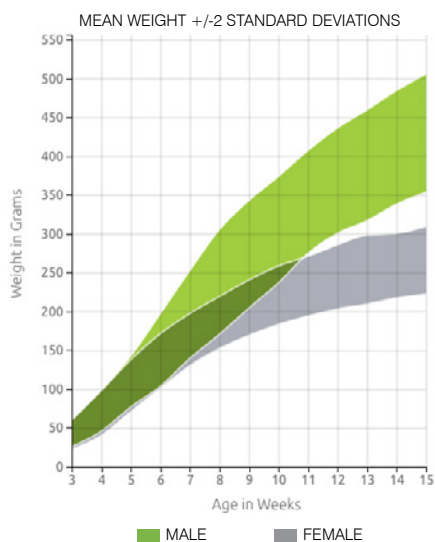
Sprague Dawley® is a registered trademark of Envigo Holding I, Inc.



RAT MODELS: OUTBRED

LONG-EVANS RATS

STRAIN CODE: 006



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 50	23.35	23.70
51-75	27.55	29.45
76-100	33.30	34.90
101-125	37.30	38.40
126-150	40.70	42.10
151-175	43.30	48.90
176-200	47.90	51.70
201-225	51.20	57.05
226-250	58.15	61.75
251-275	63.60	70.05
276-300	66.90	—
301-325	71.15	—
326-plus	Price upon request	Price upon request
Retired breeders	48.30	47.85
Littermates 21 days old	37.35	37.35
Lactating rat with litter	—	181.30
Timed pregnant*	—	168.30
Untimed pregnant*	—	137.95

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature CrI:LE **Origin** Originated by Drs. Long and Evans in 1915 by crossing several Wistar Institute white females with a wild gray male. To Charles River from Canadian Breeding Farm and Laboratories in 1978. **Coat Color** White with black hood; occasionally white with brown hood **Research Application** General multipurpose model, behavioral research, diet-induced obesity



RAT MODELS: OUTBRED

SENTINEL RATS (ISOLATOR-MAINTAINED)

STRAIN CODE: 118

Age in Days*	FEMALE
	Price
28-42	42.05

* Estimated age

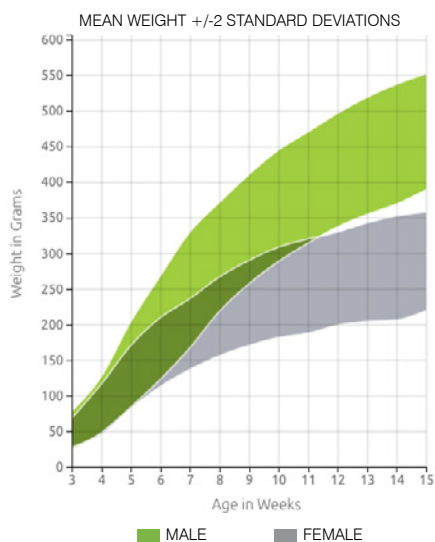
Nomenclature Crl:NIH-Foxn1^{nu} **Origin** This immunocompetent rat is the heterozygous offspring from the mating of a heterozygous female and a homozygous male. For the origin see the Nude Rat (RNU) in our Immunodeficient Models section. **Coat Color** White, black, black & white **Research Application** Multipurpose



RAT MODELS: OUTBRED

WISTAR IGS RATS

STRAIN CODE: 003



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 50	18.75	19.20
51-75	23.75	25.55
76-100	28.65	30.30
101-125	33.30	35.20
126-150	37.20	39.80
151-175	39.55	44.40
176-200	45.65	47.75
201-225	49.40	50.95
226-250	53.60	55.00
251-275	57.85	—
276-300	60.50	—
301-325	62.30	—
326-plus	Price upon request	Price upon request
Retired breeders	46.75	46.35
Littermates 21 days old	35.35	35.35
Lactating rat with litter	—	165.85
Timed pregnant*	—	154.70
Untimed pregnant*	—	129.40

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

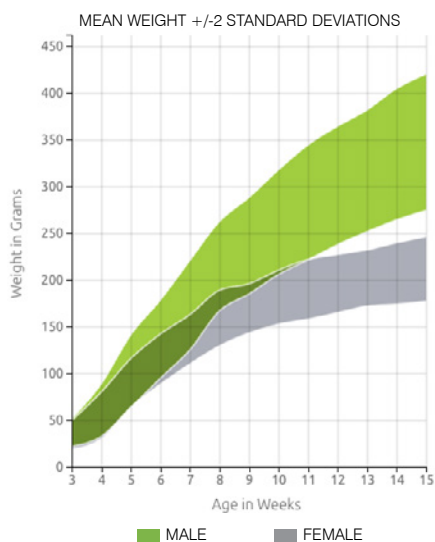
Nomenclature Crl:WI **Origin** To Scientific Products Farm, Ltd. [predecessor of Charles River United Kingdom] in 1947 from Wistar Institute. To Charles River in 1975 from Charles River UK. This particular colony was selected because of a low incidence of hydronephrosis. **Coat Color** White (albino) **Research Application** General multipurpose model, infectious disease research, safety and efficacy testing, aging



RAT MODELS: OUTBRED

WISTAR HAN IGS RATS

STRAIN CODE: 273



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 50	19.85	19.90
51-75	25.30	27.35
76-100	30.70	32.60
101-125	35.85	37.30
126-150	39.10	43.10
151-175	40.90	46.00
176-200	46.35	50.35
201-225	50.95	54.10
226-250	56.30	—
251-275	59.40	—
276-300	62.45	—
301-325	67.45	—
326-plus	Price upon request	Price upon request
Retired breeders	48.90	47.05
Littermates 21 days old	37.05	37.05
Lactating rat with litter	—	174.00
Timed pregnant*	—	162.25
Untimed pregnant*	—	135.80

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature Cri:WI(Han) **Origin** Rederived by GlaxoWellcome from Han Wistar stock supplied by BRL. Transferred to Charles River UK in 1996. Transferred to Charles River in 1997 and rederived into isolator-maintained foundation colony. IGS refers to animals bred using the Charles River International Genetic Standardization system. **Coat Color** White (albino) **Research Application** General multipurpose model, safety and efficacy testing, aging, oncology

RAT MODELS: OUTBRED

CRYOPRESERVED OUTBRED RAT MODELS

All strains listed below are currently maintained as cryopreserved models. **Please allow a minimum of 12-15 weeks for delivery.** A dedicated supply can be established for large orders, and breeding pairs may be available for select models. Contact our Customer Support Center at 1.877.274.8371 for pricing and availability.

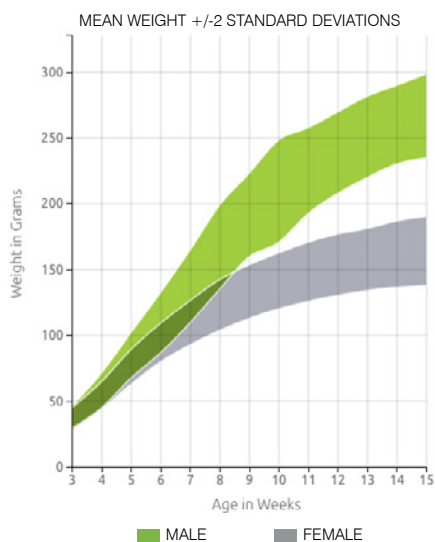
Common Name	Nomenclature	Coat Color	Therapeutic Area
CD® Hairless	CrI:CD-Prss8 ^{tr}	Hairless, albino background	Dermatology



RAT MODELS: INBRED

BROWN NORWAY RATS

WHEN ORDERING, SPECIFY BN | STRAIN CODE: 091



	MALE	FEMALE
Age in Days*	Price	Price
Up to 21	51.85	52.65
22-28	51.85	52.65
29-35	59.15	66.30
36-42	72.10	80.00
43-49	82.70	96.80
50-56	100.75	96.80
57-63	104.85	113.05
64-70	119.10	113.05
71-77	126.10	145.90
78-plus	Price upon request	Price upon request
Retired breeders	57.30	55.15
Littermates 21 days old	58.70	58.70
Lactating rat with litter	—	329.00
Timed pregnant†	—	274.20
Untimed pregnant†	—	251.60

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

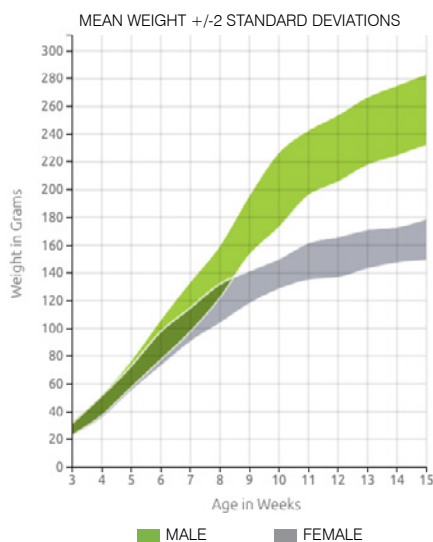
Nomenclature BN/Crl **Origin** Silvers and Billingham began brother x sister matings with selection for histocompatibility in 1958 from a brown mutation in a stock of wild rats maintained by King and Aptekman in a pen-bred colony of rats trapped from the wild in 1930 by King at the Wistar Institute. To Charles River from Radiobiology Institute, Netherlands in 1976. **Coat Color** Non-agouti brown **Research Application** Genetic mapping, respiratory inflammation, immunological dysfunction, aging, transplantation research **MHC Haplotype** RT1ⁿ



RAT MODELS: INBRED

FISCHER RATS

WHEN ORDERING, SPECIFY CDF™ | STRAIN CODE: 002



	MALE	FEMALE
Age in Days*	Price	Price
Up to 21	35.10	35.75
22-28	36.35	39.55
29-35	44.90	43.45
36-42	53.65	53.10
43-49	58.70	59.35
50-56	66.05	71.05
57-63	70.20	71.05
64-plus	Price upon request	Price upon request
Retired breeders	51.85	50.85
Littermates 21 days old only	54.85	54.85
Lactating rat with litter	—	290.60
Timed pregnant†	—	236.15
Untimed pregnant†	—	212.55

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature F344/DuCrI **Origin** From mating #344 of rats purchased from local breeder (Fischer). Colony originated by M.R. Curtis, Columbia University Institute for Cancer Research. Dunning at Columbia inbred to form the strain starting in 1920. Dunning to Charles River in 1960 at F68. **Coat Color** White (albino)

Research Application General multipurpose model, aging, safety and efficacy testing, surgical model, oncology, nutrition **MHC Haplotype** RT1^u



RAT MODELS: INBRED

F344 RATS

WHEN ORDERING, SPECIFY SAS FISCH | STRAIN CODE: 403

	MALE	FEMALE
Age in Days*	Price†	Price†
Up to 21	33.05	34.00
22-28	35.40	37.65
29-35	40.30	37.65
36-42	44.85	42.45
43-49	51.10	48.55
50-56	64.00	54.35
57-63	66.00	54.35
64-plus	Price upon request	Price upon request
Retired breeders	47.55	46.20
Littermates 21 days old	75.45	75.45
Lactating rat with litter	–	292.35
Timed pregnant‡	–	139.55
Untimed pregnant‡	–	113.10

* Estimated age

† Specialty model. Discounts may not apply.

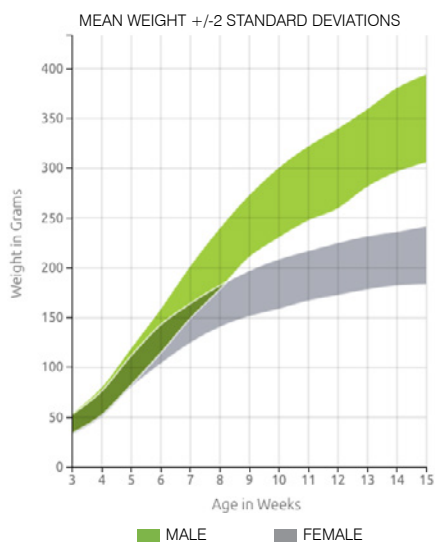
‡ For timed and untimed pregnant F344 rats, determination of pregnancy is by observation of vaginal plug. Plug date is considered to be day zero of gestation. Please see our pregnant animal guarantee policy.

Nomenclature F344/NCrl **Origin** Derived from NIH stock in 1992 by SASCO. To Charles River in 1996.

Coat Color White (albino) **Research Application** General multipurpose model, aging, safety and efficacy testing, surgical model, oncology, nutrition **MHC Haplotype** RT1^{lv}



RAT MODELS: INBRED
LEWIS RATS
 STRAIN CODE: 004



	MALE	FEMALE
Age in Days*	Price	Price
Up to 21	39.25	37.90
22-28	44.55	43.05
29-35	49.90	48.80
36-42	52.75	54.10
43-49	64.00	62.30
50-56	74.75	67.10
57-63	80.15	74.00
64-70	84.30	74.00
71-plus	Price upon request	Price upon request
Retired breeders	51.65	49.75
Littermates 21 days old	51.05	51.05
Lactating rat with litter	—	242.05
Timed pregnant†	—	208.30
Untimed pregnant†	—	162.25

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature LEW/Crl **Origin** Developed by Dr. Lewis from Wistar stock in the early 1950s. To Charles River from Tulane in 1970 at F34. **Coat Color** White (albino) **Research Application** Transplantation research, induced arthritis/inflammation, experimental allergic encephalitis, STZ-induced diabetes **MHC Haplotype** RT1ⁱ

CRYOPRESERVED INBRED RAT MODELS

All strains listed below are currently maintained as cryopreserved models. **Please allow a minimum of 12-15 weeks for delivery.** A dedicated supply can be established for large orders, and breeding pairs may be available for select models. Contact our Customer Support Center at 1.877.274.8371 for pricing and availability.

Common Name	Nomenclature	Coat Color	Therapeutic Area
Copenhagen	COP/CrCrI	White with a brown hood	Oncology



DAHL/SS



SHR



STROKE PRONE

RAT MODELS

DISEASE/TRANSLATIONAL MODELS

Characteristic	Dahl/SS	SHR	Stroke Prone
Insulin resistance	+	+	+
Hyperinsulinemia	+	+	+
Type 2 diabetes	–	–	–
Fasting hyperglycemia	–	–	+
Hypertension	+	+	+
Obesity	–	–	+
Cardiovascular disease	–	–	–
Hypertriglyceridemia	+	+	+
Hypercholesterolemia	+	+	–
Nephropathy	+	–	–
Leptin receptor defect	–	–	–
Special diet requirements	+	–	+
Genetics	I	I	O

+ Exhibits the characteristic

– Does not exhibit the characteristic

1 Hydronephrosis (interference)

2 Hydronephrosis (interference) is found infrequently

I Inbred

O Outbred

H Hybrid

NOTE: Please contact Customer Service at 1.800.LAB.RATS (1.800.522.7287) for information on preconditioning of animal models from Charles River. For more information, please refer to our Preconditioning Services section.



RAT MODELS

DISEASE/TRANSLATIONAL MODELS

Characteristic	ZDF	ZSF1	Zucker
Insulin resistance	+	+	+
Hyperinsulinemia	+	+	+
Type 2 diabetes	+	+	–
Fasting hyperglycemia	+	+	–
Hypertension	–	+	–
Obesity	+	+	+
Cardiovascular disease	–	–	–
Hypertriglyceridemia	+	+	+
Hypercholesterolemia	+	+	+
Nephropathy	+, 1	+, 2	+, 1
Leptin receptor defect	+	+	+
Special diet requirements	+	+	–
Genetics	I	H	O

+ Exhibits the characteristic

– Does not exhibit the characteristic

1 Hydronephrosis (interference)

2 Hydronephrosis (interference) is found infrequently

I Inbred

O Outbred

H Hybrid

NOTE: Please contact Customer Service at 1.800.LAB.RATS (1.800.522.7287) for information on preconditioning of animal models from Charles River. For more information, please refer to our Preconditioning Services section.



RAT MODELS: DISEASE/TRANSLATIONAL

DAHL/SALT SENSITIVE RATS (DAHL/SS)

STRAIN CODE: 320

	MALE	FEMALE
Age in Days*	Price	Price
Up to 28	132.20	129.70
29-35	141.60	138.85
36-42	148.95	146.10
43-49	158.05	155.10
50-56	165.10	161.90
57-plus	Price upon request	Price upon request
Timed pregnant†	–	318.50

* Estimated age

† For timed pregnant, please see our pregnant animal guarantee policy.

Nomenclature SS/JrHsdMcwiCrl **Origin** Inbred from a congenic control group of Dahl/SS rats (SS/JrHsd) obtained from Dr. Theodore Kurtz (UCSF, CA), which were originally derived from the Harlan SS/Jr colony. Maintained at the Medical College of Wisconsin since 1991, this strain has undergone considerable marker-selected breeding to eliminate residual heterozygosity and genetic contamination. To confirm homozygosity, the strain was tested with 200 microsatellite markers (genome-wide scan at 20cM), all of which were homozygous for all regions tested. (Cowley et al. 2000, *Physiol. Genomics* 2:107-115). To Charles River in 2001. **Coat Color** White (albino) **Research Application** Hypertension, diastolic heart failure, nephropathy

Note: Charles River's standard production diet is Purina 5L79. Weanlings are fed AIN-76A or may be fed Charles River's standard 5L79 diet. This model can be preconditioned on a diet at the customer's request.



RAT MODELS: DISEASE/TRANSLATIONAL

SHHF RATS

STRAIN CODE: 373 (OBESE), 374 (LEAN +/-)

Age in Days*	MALE		FEMALE	
	Obese Price	Lean +/- Price	Obese Price	Lean +/- Price
Up to 42	538.20	233.40	380.95	188.15
43-49	552.45	250.55	397.35	204.45
50-56	572.65	267.85	413.50	220.65
57-63	589.90	285.15	430.00	236.95
64-70	607.15	302.35	446.40	253.30
71-plus	Price upon request		Price upon request	

* Estimated age

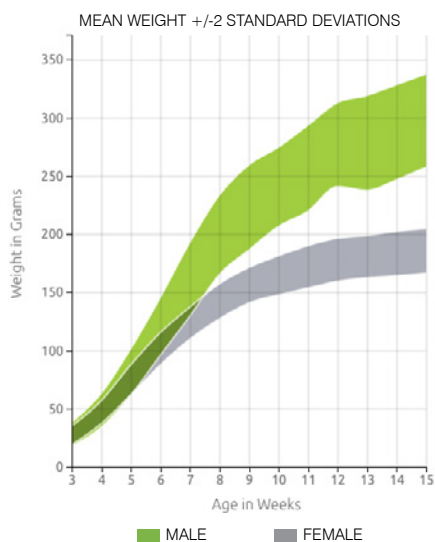
Nomenclature SHHF/MccGmiCr1-Lepr^{cp}/Cr1 **Origin** Breeding stock for this colony was transferred to Dr. Sylvia McCune at the University of Chicago Medical School in 1983 from the laboratory of J.E. Miller at G.D. Searle and Company. The animals were developed by backcrossing the SHROB rat to the SHR/N rat. Dr. McCune obtained the colony after the seventh backcross and continued to inbreed past 20 generations to fix the congestive heart failure trait. To Genetic Models, Inc. in 1994. To Charles River in 2001. **Coat Color** White (albino) **Research Application** Heart failure, hypertension, type 2 diabetes, nephropathy, insulin resistance



RAT MODELS: DISEASE/TRANSLATIONAL

SHR RATS

STRAIN CODE: 007



	MALE	FEMALE
Age in Days*	Price	Price
Up to 21	74.55	71.75
22-28	77.65	75.30
29-35	83.85	80.75
36-42	93.00	92.85
43-49	99.25	99.10
50-56	108.85	108.75
57-63	119.40	118.60
64-70	130.00	129.20
71-77	143.00	134.50
78-84	156.75	147.35
85-91	173.05	162.75
92-98	183.95	173.00
99-105	202.45	190.45
106-plus	Price upon request	Price upon request
Retired breeders	109.40	105.30
Littermates 21 days old only	115.35	115.35
Lactating rat with litter	—	483.05
Timed pregnant†	—	377.35
Untimed pregnant†	—	353.75

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

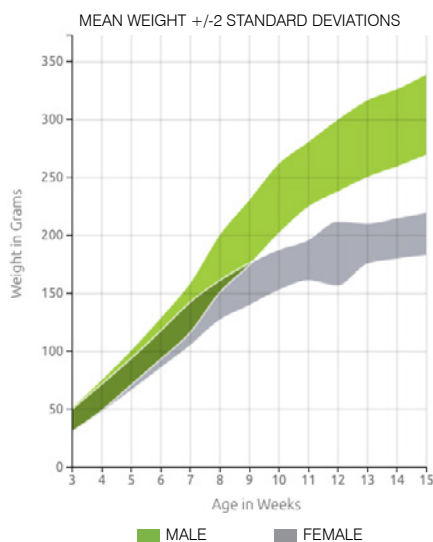
Nomenclature SHR/NCrl **Origin** Okamoto, Kyoto School of Medicine, 1963, from outbred Wistar Kyoto male with marked elevation of blood pressure mated to female with slightly elevated blood pressure. Brother x sister mating with continued selection for spontaneous hypertension was then started. To NIH in 1966 from Okamoto at F13. To Charles River from NIH in 1973 at F32. **Coat Color** White (albino) **Research Application** Genetic hypertension, hypertensive drug research, ADHD model, safety and efficacy testing **MHC Haplotype** RT1^k



RAT MODELS: DISEASE/TRANSLATIONAL

WKY RATS

(CONTROL FOR THE SHR) | STRAIN CODE: 008



	MALE	FEMALE
Age in Days*	Price	Price
Up to 21	59.70	58.55
22-28	66.00	64.85
29-35	71.95	70.65
36-42	76.20	74.75
43-49	83.45	85.70
50-56	100.70	98.80
57-63	108.25	106.20
64-70	120.05	117.75
71-77	128.20	123.50
78-84	143.85	138.55
85-91	157.50	151.70
92-98	171.35	165.10
99-105	187.20	180.30
106-plus	Price upon request	Price upon request
Retired breeders	107.40	105.30
Littermates 21 days old only	113.15	113.15
Lactating rat with litter	—	483.05
Timed pregnant†	—	377.35
Untimed pregnant†	—	353.75

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature WKY/NCrI **Origin** Developed from our outbred Wistar stock from Kyoto School of Medicine to NIH 1971. This is the same stock from which the SHR/N strain was developed. To Charles River in 1974 from NIH at F11.

Coat Color White (albino) **Research Application** Control for the SHR rat, ADHD model **MHC Haplotype** RT¹



RAT MODELS: DISEASE/TRANSLATIONAL

STROKE PRONE RATS

WHEN ORDERING, SPECIFY SHRSP | STRAIN CODE: 324

Age in Days*	MALE	FEMALE
	Price	Price
Up to 28	139.85	132.25
29-35	151.25	143.05
36-42	167.60	158.50
43-49	178.80	169.05
50-56	196.40	185.65
57-plus	Price upon request	Price upon request

* Estimated age

Nomenclature SHRSP/A3NCrI **Origin** The SHRSP was isolated from the SHR inbred rat. The SHR was originally isolated from Wistar-Kyoto rats by Okamoto and Aoki in 1963. The A3 subline was transferred to the NIH in 1975 from Yamori at generation F36. To Charles River in 2002. **Coat Color** White (albino) **Research Application** Stroke, ADHD model, nephropathy, hypertension, osteoporosis

Note: When fed Ziegler Brothers Stroke Prone Rodent Diet along with 1% salt in the water beginning at 7-8 weeks of age, stroke will occur at 16-18 weeks of age.



RAT MODELS: DISEASE/TRANSLATIONAL

ZDF RATS

STRAIN CODE: 370 (OBESE), 380 (LEAN fa/+), 371 (LEAN +/-)

Age in Days*	MALE			FEMALE		
	Obese Price	Lean fa/+ Price	Lean +/- Price	Obese Price	Lean fa/+ Price	Lean +/- Price
Up to 42	451.40	231.20	183.60	322.10	231.20	183.60
43-49	466.40	247.30	199.65	337.25	247.30	199.65
50-56	481.70	263.20	215.55	352.65	263.20	215.55
57-63	497.00	279.00	231.20	367.85	279.00	231.20
64-70	512.05	295.20	247.30	382.95	295.20	247.30
71-plus	Price upon request			Price upon request		

* Estimated age

Nomenclature ZDF-*Lepr^{fa}*/Crl **Origin** A mutation occurred in a colony of outbred Zucker rats in the laboratory of Dr. Walter Shaw at Eli Lilly Research Laboratories in Indianapolis, IN in 1974-75. Part of this colony containing the mutation was moved to Indiana University Medical School (IUMS), to the laboratory of Dr. Julia Clark in 1977. Several groups of animals with diabetic lineage were identified and rederived in 1981. Inbreeding of selected pairs from this rederivation was done in the laboratory of Dr. Richard Peterson at IUMS. An inbred line of ZDF rat was established in 1985. To Genetic Models, Inc. in 1991. To Charles River in 2001. **Coat Color** Black hooded with black stripe down the length of the back **Research Application** Type 2 diabetes, hyperlipidemia, glucose intolerance, obesity, hyperinsulinemia

Note: The Type 2 diabetes phenotype is triggered in the obese homozygous ZDF males and females by specific diets. Please contact our Customer Support Center at 1.877.274.8371 for additional information.



RAT MODELS: DISEASE/TRANSLATIONAL

ZSF1 RATS

STRAIN CODE: 378 (OBESE), 379 (LEAN +/-)

Age in Days*	MALE		FEMALE	
	Obese Price	Lean +/- Price	Obese Price	Lean +/- Price
Up to 42	467.45	183.40	338.25	180.80
43-49	484.65	200.35	354.95	197.50
50-56	501.30	217.25	371.90	214.25
57-63	518.00	233.95	388.85	231.45
64-70	535.05	250.90	405.80	248.00
71-plus	Price upon request		Price upon request	

* Estimated age

Nomenclature ZSF1-*Lepr^{fa}* *Lepr^{cp}*/Crl **Origin** This hybrid rat is a cross between a ZDF female and an SHHF male rat. This model was developed at Genetic Models, Inc. in Indianapolis, IN. To Charles River in 2001.
Coat Color Black hooded with black stripe down the length of the back **Research Application** Hypertension, type 2 diabetes, hyperlipidemia, nephropathy, metabolic syndrome



ZUCKER OBESE



ZUCKER LEAN

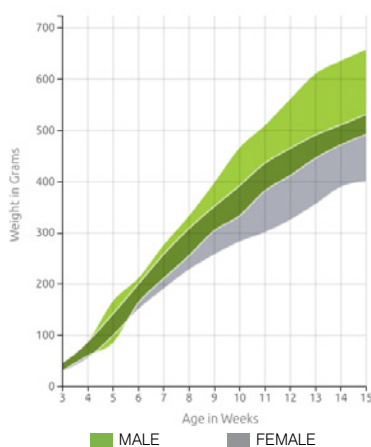
RAT MODELS: DISEASE/TRANSLATIONAL

ZUCKER RATS

STRAIN CODE: 185 (OBESE), 186 (LEAN)

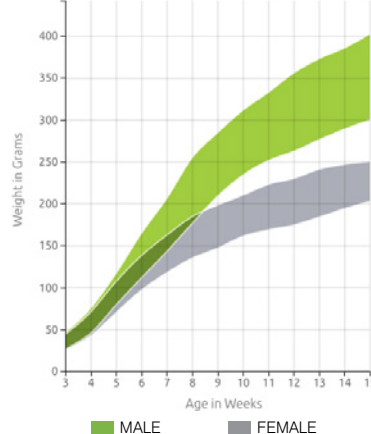
Zucker Obese

MEAN WEIGHT \pm 2 STANDARD DEVIATIONS



Zucker Lean

MEAN WEIGHT \pm 2 STANDARD DEVIATIONS



Age in Days*	MALE		FEMALE	
	Obese Price	Lean Price	Obese Price	Lean Price
Up to 28	307.30	78.35	295.90	75.45
29-35	321.25	81.50	309.35	78.45
36-42	336.45	84.75	323.95	81.65
43-49	353.80	95.95	340.65	92.35
50-56	379.90	105.60	365.75	101.65
57-63	401.15	115.40	386.20	111.10
64-70	421.45	120.35	405.90	115.90
71-77	440.95	125.20	424.65	120.50
78-84	452.70	130.50	435.95	125.60
85-91	466.20	138.05	448.95	133.00
Retired breeders	—	—	—	134.20

* Estimated age

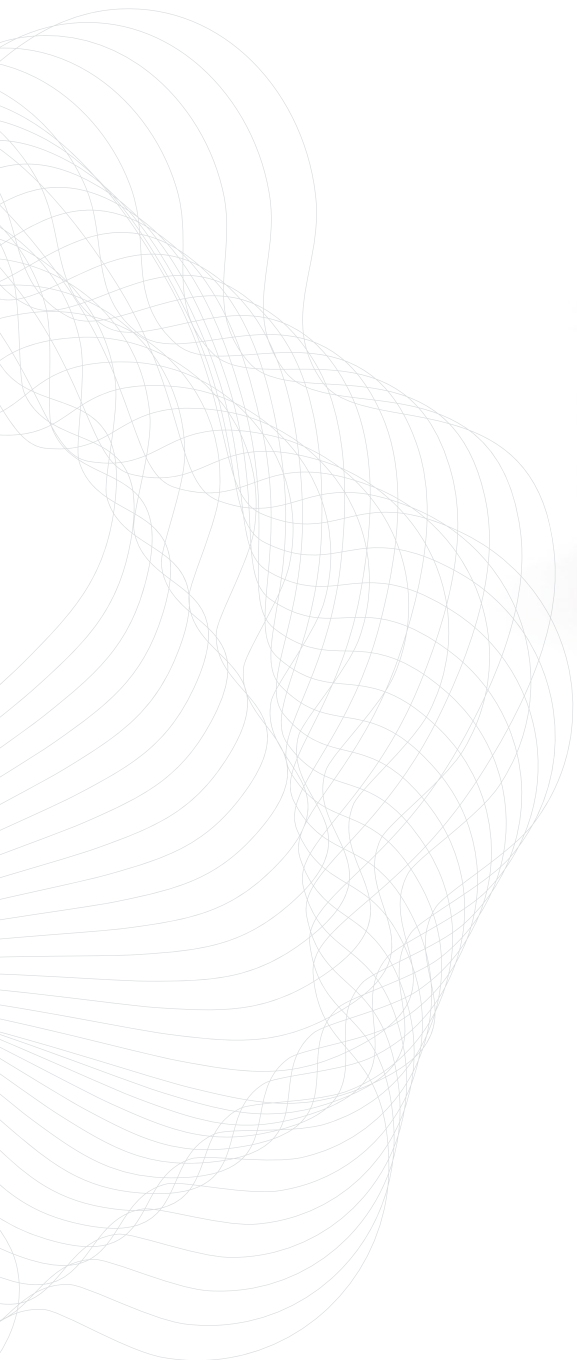
Nomenclature Crl:ZUC-*Lepr*^{fa} **Origin** The obese or fatty condition appeared spontaneously in the 13M strain maintained at the Laboratory of Comparative Pathology of Theodore and Lois Zucker in Stow, MA. Research colonies were established at many institutions from this nucleus colony. To Charles River in 1985 from a research colony maintained at a pharmaceutical company. **Coat Color** Four principal coat color variants: 1. predominantly brown; 2. brown and white; 3. predominantly black; 4. black and white **Research Application** Insulin resistance, glucose intolerance, metabolic syndrome, genetic obesity

RAT MODELS: DISEASE/TRANSLATIONAL

CRYOPRESERVED DISEASE/ TRANSLATIONAL MODELS

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Common Name	Nomenclature	Coat Color	Therapeutic Area
BDIX	BDIX/CrCrl	Agouti	Oncology
Buffalo	BUF/CrCrl	White (albino)	Oncology
FHH	FHH/EurMcwiCrl	White with fawn hood	Metabolic, renal, cardiovascular
GK	GK/TohiCskCrljCrl	White (albino)	Diabetes
Noble	NBL/CrCrl	White with black face/hood	Oncology
Obese Prone	Crl:OP(CD)	White (albino)	Metabolic
Obese Resistant	Crl:OR(CD)	White (albino)	Control for Obese Prone
PCK	PCK/CrljCrl- <i>Pkhd1</i> ^{Pck} /Crl	White (albino)	Renal
SHROB	SHROB/KolGmi-Crl- <i>Lepr</i> ^{cp} /Crl	White (albino)	Metabolic, renal
SS-13 ^{BN}	SS-Chr 13 ^{BN} /McwiCrl	White (albino)	Control for Dahl/SS
Wistar Furth	WF/CrCrl	White (albino)	Oncology



Mouse Models

With more than 100 strains of mouse models, Charles River is positioned to provide you with the mouse models you require to meet your program goals. Our global network of production facilities ensures that you have consistent access to these models, regardless of location.



MOUSE MODELS: OUTBRED

BLACK SWISS MICE

STRAIN CODE: 492

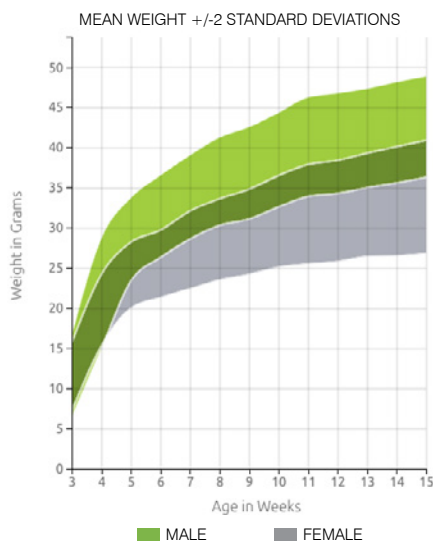
Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	12.60	13.60
22-28	12.75	13.90
29-35	13.65	14.65
36-42	14.10	15.20
43-49	15.55	15.85
50-56	16.20	16.75
57-plus	Price upon request	Price upon request

* Estimated age

Nomenclature Crl:NIHBL(S) **Origin** Developed at the NIH Genetic Resource by Dr. Carl Hansen. N:NIH Swiss outbred mice (albino) were crossed to C57BL/6N (black, non-agouti) mice to generate a hybrid black mouse that was heterozygous for the agouti locus. Through a series of test matings and backcrosses (N10) to the N:NIH(S) stock, the agouti gene was eliminated. Received by NCI in 2000. To Charles River in 2010 from NCI. **Coat Color** Black **Research Application** General purpose pigmented outbred mouse, foster mother, pseudopregnant recipients for albino lines



MOUSE MODELS: OUTBRED
CD-1® IGS MICE
 STRAIN CODE: 022



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 12	7.75	7.60
13-15	8.50	8.50
16-18	8.55	8.55
19-21	8.70	8.70
22-24	8.85	8.85
25-plus	Price upon request	Price upon request
Retired breeders	8.85	8.40
Littermates 21 days old only	10.30	10.30
Lactating mouse with litter	—	93.40
Timed pregnant*	—	63.50
Untimed pregnant*	—	41.90

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature Crl:CD1(ICR) **Origin** The original group of Swiss mice that served as progenitors of this stock consisted of two male and seven female albino mice derived from a non-inbred stock in the laboratory of Dr. de Coulon, Centre Anticancéreux Romand, Lausanne, Switzerland. These animals were imported into the United States by Dr. Clara Lynch of the Rockefeller Institute in 1926. The Hauschka Ha/ICR stock was initiated in 1948 at the Institute for Cancer Research (ICR) in Philadelphia from "Swiss" mice of Rockefeller origin. To Dr. Edward Mirand of Roswell Park Memorial Institute where they were designated as HaM/ICR. To Charles River in 1959. IGS refers to animals bred using the Charles River International Genetic Standardization system.

Coat Color White (albino) **Research Application** General multipurpose model, safety and efficacy testing, aging, surgical model, pseudopregnancy



MOUSE MODELS: OUTBRED

CD1-ELITE MICE^{*†}

STRAIN CODE: 482

Age in Days [‡]	MALE	FEMALE
	Price	Price
Up to 21	22.40	21.70
22-28	24.70	24.35
29-35	25.05	24.55
36-42	25.30	24.70
43-49	25.45	25.05
50-plus	Price upon request	Price upon request

* Isolator-maintained

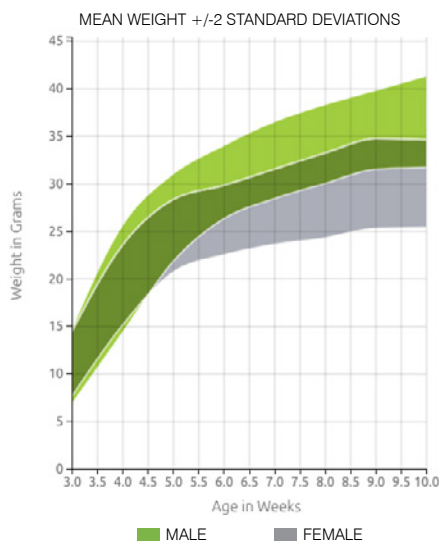
† Information regarding the VAF/Elite® health profile can be found in the research models overview section.

‡ Estimated age

Nomenclature Crl:CD1(ICR) **Origin** The original group of Swiss mice that served as progenitors of this stock consisted of two male and seven female albino mice derived from a non-inbred stock in the laboratory of Dr. de Coulon, Centre Anticancéreux Romand, Lausanne, Switzerland. These animals were imported into the United States by Dr. Clara Lynch of the Rockefeller Institute in 1926. The Hauschka Ha/ICR stock was initiated in 1948 at the Institute for Cancer Research (ICR) in Philadelphia from "Swiss" mice of Rockefeller origin. To Dr. Edward Mirand of Roswell Park Memorial Institute where they were designated as HaM/ICR. To Charles River in 1959. IGS refers to animals bred using the Charles River International Genetic Standardization system. **Coat Color** White (albino) **Research Application** General multipurpose model, safety and efficacy testing, aging, surgical model, pseudopregnancy



MOUSE MODELS: OUTBRED
CF-1™ MICE
 STRAIN CODE: 023



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 12	7.95	7.95
13-15	8.70	8.70
16-18	8.75	8.75
19-21	8.80	8.80
22-24	8.85	8.85
25-plus	Price upon request	Price upon request
Retired breeders	8.70	8.40
Littermates 21 days old only	10.65	10.65
Lactating mouse with litter	—	95.25
Timed pregnant*	—	64.75
Untimed pregnant*	—	42.70

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

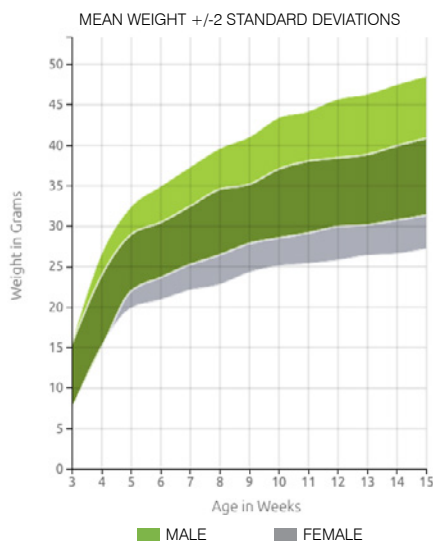
Nomenclature Crl:CF1 **Origin** Obtained by Carworth Farms from a Missouri laboratory. Not descended from “Swiss” mice from Rockefeller Institute (probably of wild albino origin). Intensively inbred by Carworth for over 20 generations. This line was then reduced to a single pair and progeny outbred from that point forward to form a new stock. To Charles River in 1974 from a representative cross-section of the Carworth CF-1 colony. **Coat Color** White (albino); carries brown behind its albino gene **Research Application** General multipurpose model, safety and efficacy testing, infectious disease model



MOUSE MODELS: OUTBRED

CFW[®] MICE (SWISS WEBSTER)

STRAIN CODE: 024



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 12	7.70	7.70
13-15	8.35	8.50
16-18	8.40	8.55
19-21	8.75	8.75
22-24	8.95	8.95
25-plus	Price upon request	Price upon request
Retired breeders	8.50	8.35
Littermates 21 days old only	10.45	10.45
Lactating mouse with litter	–	93.90
Timed pregnant*	–	63.85
Untimed pregnant*	–	42.10

* For timed and untimed pregnant, please see our pregnant animal guarantee policy.

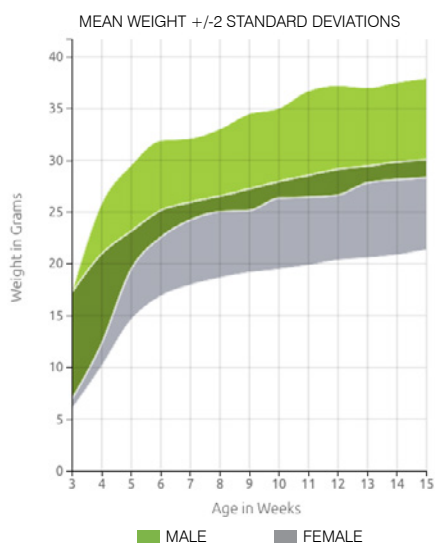
Nomenclature Crl:CFW(SW) **Origin** This stock resulted from the selective inbreeding by Dr. Leslie Webster using foundation animals from a large colony of Swiss mice maintained at Rockefeller Institute following importation from Switzerland in 1926. To Carworth Farms from Rockefeller Institute. Highly inbred at the time they were acquired by Carworth. This line was reduced to a single pair and progeny outbred from that point forward to form a new stock. To Charles River in 1974 from a representative cross-section of the Carworth CFW colony. **Coat Color** White (albino); carries black agouti behind its albino gene **Research Application** General multipurpose model, safety and efficacy testing



MOUSE MODELS: OUTBRED

SKH1-ELITE MICE^{*†}

STRAIN CODE: 477



Age in Days [‡]	MALE	FEMALE
	Price	Price
Up to 21	44.70	44.70
22-28	48.15	48.15
29-35	52.30	52.30
36-42	54.90	54.90
43-49	56.10	56.10
50-56	58.75	58.75
57-plus	Price upon request	Price upon request
Retired breeders	57.15	57.15
Littermates 21 days old only	160.60	160.60
Lactating mouse with litter	—	427.10
Untimed pregnant [§]	—	306.50

* Isolator-maintained

† Information regarding the VAF/Elite[®] health profile can be found in the research models overview section.

‡ Estimated age

§ For untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature Crl:SKH1-Hr^{hr} **Origin** An uncharacterized/non-pedigreed hairless strain of mice was acquired by Temple University from a small commercial supplier in New York City. To Charles River from the Skin and Cancer Hospital, Temple University in 1986. This mouse is euthymic and immunocompetent. **Coat Color** Hairless, albino background **Research Application** Wound healing model, dermatology, safety and efficacy testing



MOUSE MODELS: OUTBRED

SENTINEL MICE (ISOLATOR-MAINTAINED)

STRAIN CODE: 491, 089

Age in Days*	FEMALE
	Price
28-42	14.45

* Estimated age

Nomenclature CrI:NU(NCr)-Foxn1^{nu} and CrI:NU-Foxn1^{nu} **Origin** This immunocompetent mouse is the heterozygous offspring from the mating of a heterozygous female and a homozygous male. For the origin, see the Athymic and NU/NU Nude mouse models. **Coat Color** White (albino) **Research Application** Multipurpose

CRYOPRESERVED OUTBRED MICE

The strains listed below are currently maintained as cryopreserved models. **Please allow a minimum of 12-15 weeks for delivery.** A dedicated supply can be established for large orders, and breeding pairs may be available for select models. Contact our Customer Support Center at 1.877.274.8371 for pricing and availability.

Common Name	Nomenclature	Coat Color
NCI Sencar	CrI:ORL	White (albino)
SKH3	CrI:SKH3(SKH2)-Hr ^{hr}	Hairless, pigmented background with grey variations



MOUSE MODELS: INBRED

129-ELITE MICE^{*†}

STRAIN CODE: 476

Age in Days [‡]	MALE	FEMALE
	Price	Price
Up to 28	35.30	37.85
29-35	39.70	42.75
36-42	42.75	45.05
43-49	45.05	48.05
50-56	50.50	53.45
57-plus	Price upon request	Price upon request
Retired breeders	30.00	29.75
Littermates 21 days old only	43.05	43.05
Lactating mouse with litter	–	251.50
Untimed pregnant [§]	–	226.20

^{*} Isolator-maintained

[†] Information regarding the VAF/Elite[®] health profile can be found in the research models overview section.

[‡] Estimated age

[§] For untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature 129S2/SvPasCrl **Origin** Developed by Dr. L.C. Stevens from The Jackson Laboratory. During the 1970s, Dr. Stevens introduced this line to the Pasteur Institute of Paris in the laboratory of Dr. J.L. Guenet. To Iffa Credo in 1996. To Charles River in 1998. **Coat Color** Light-bellied agouti **Research Application** Transgenic/knockout model development, large number of unmyelinated axons in lumbar motor roots **MHC Haplotype** H2^b



MOUSE MODELS: INBRED

NCI A/JCr MICE

STRAIN CODE: 563

Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	55.35	55.35
22-28	56.90	56.90
29-35	59.75	59.75
36-42	65.35	65.35
43-49	67.05	67.05
50-56	76.70	76.70
57-plus	Price upon request	Price upon request
Retired breeders	91.65	90.75
Lactating mouse with litter	—	302.30
Untimed pregnant†	—	241.75

* Estimated age

† For untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature A/JCr **Origin** Developed by LC Strong in 1921 from a cross between a Cold Spring Harbor albino and a Bagg albino. Received by NCI from Jackson Laboratory in 1982. To Charles River in 2014. **Coat Color** White (albino) **Research Application** Oncology, immunology **MHC Haplotype** H2^a



MOUSE MODELS: INBRED

B6 ALBINO MICE*

STRAIN CODE: 493

Age in Days [†]	MALE	FEMALE
	Price	Price
Up to 28	40.15	40.80
29-35	41.90	42.65
36-42	43.60	44.40
43-49	51.05	48.05
50-56	54.95	51.70
57-plus	Price upon request	Price upon request

* Isolator-maintained

† Estimated age

Nomenclature B6N-Tyrc^{-Brd}/BrdCrCrI **Origin** Received by NCI from Dr. Allan Bradley at Baylor College of Medicine in 2000. The B6 albino strain is a spontaneous albino mutant coisogenic C57BL/6 strain. The mice contain a mutation in the tyrosinase gene and when homozygous for the mutation, the coat color of the mice is albino rather than black. To Charles River in 2009 from NCI. **Coat Color** White (albino) **Research Application** Creation of chimeras with B6N-derived embryonic stem cells **MHC Haplotype** H2^b



MOUSE MODELS: INBRED

NCI B6-Ly5.1/Cr MICE

STRAIN CODE: 564

Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	34.75	34.75
22-28	37.60	37.60
29-35	40.35	40.35
36-42	43.15	43.15
43-49	46.00	46.00
50-56	48.80	48.80
57-plus	Price upon request	Price upon request
Retired breeders	32.75	32.75

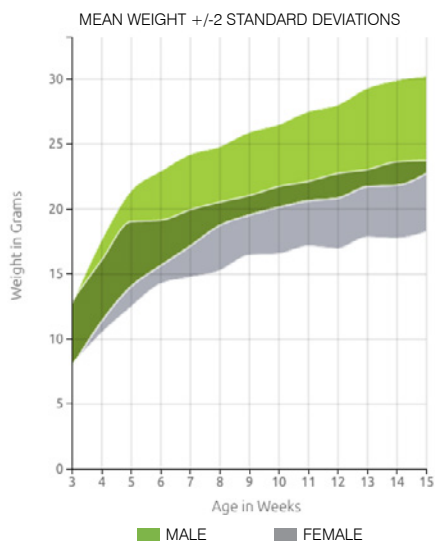
* Estimated age

Nomenclature B6.SJL-*Ptprca*^a*Pepc*^b/BoyCr **Origin** The strain was originally developed at the Sloan Kettering Institute where it was backcrossed onto a nonspecified C57BL/6 strain. The congenic strain "C57BL/6-Ly5.1" carries the allele of the SJL mouse in the *Ptprca* gene locus: "*Ptprca*" or "CD45.1" or "Ly5.1", which was renamed from "Ly-5.2" in 1987. To NCI via NIAID in 1983. To Charles River in 2014. Charles River breeds CD45.1 expressing B6.SJL-*Ptprca*^a *Pepc*^b/BoyCrCrl mice at our Frederick facility in the US. **Coat Color** Black

Research Application Inflammation **MHC Haplotype** H2^b



MOUSE MODELS: INBRED
BALB/c MICE
 STRAIN CODE: 028



	MALE	FEMALE
Age in Days*	Price	Price
Up to 21	24.50	25.90
22-28	28.40	30.15
29-35	30.30	31.05
36-42	33.80	33.00
43-49	34.45	33.60
50-56	38.25	35.80
57-63	38.95	36.55
64-70	39.75	37.25
71-plus	Price upon request	Price upon request
Retired breeders	24.25	24.25
Littermates 21 days old only	37.45	37.45
Lactating mouse with litter	—	220.75
Timed/untimed pregnant†	—	187.45

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature BALB/cAnNCrl **Origin** H.J. Bagg developed the "Bagg albino" in 1913 from stock from an Ohio pet dealer. Inbred in 1923 by McDowell. To Snell in 1932 at F26, then to Andervont in 1935. To NIH in 1951 from Andervont at F72. To Charles River in 1974 from NIH. **Coat Color** White (albino) **Research Application** General multipurpose model, hybridoma development, monoclonal antibody production, infectious disease **MHC Haplotype** H2^d



MOUSE MODELS: INBRED

BALB/c-ELITE MICE*†

STRAIN CODE: 547

Age in Days‡	MALE	FEMALE
	Price	Price
Up to 21	37.10	39.95
22-28	42.95	46.35
29-35	44.55	47.95
36-42	45.75	49.35
43-49	50.80	51.00
50-56	53.20	52.55
57-63	55.50	53.70
64-plus	Price upon request	Price upon request
Retired breeders	36.65	36.65

* Isolator-maintained

† Information regarding the VAF/Elite® health profile can be found in the research models overview section.

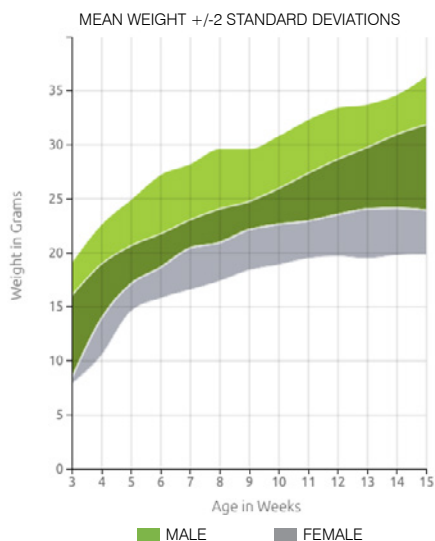
‡ Estimated age

Nomenclature BALB/cAnNCrI **Origin** H.J. Bagg developed the "Bagg albino" in 1913 from stock from an Ohio pet dealer. Inbred in 1923 by McDowell. To Snell in 1932 at F26, then to Andervont in 1935. To NIH in 1951 from Andervont at F72. To Charles River in 1974 from NIH. **Coat Color** White (albino) **Research Application** General multipurpose model, hybridoma development, monoclonal antibody production, infectious disease **MHC Haplotype** H2^d



MOUSE MODELS: INBRED C3H MICE

STRAIN CODE: 025



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	27.75	29.50
22-28	32.60	33.70
29-35	34.00	34.90
36-42	37.10	37.10
43-49	41.90	39.90
50-56	42.70	40.55
57-63	45.05	43.75
64-70	53.15	44.55
71-plus	Price upon request	Price upon request
Retired breeders	26.75	26.75
Littermates 21 days old only	41.50	41.50
Lactating mouse with litter	—	249.50
Timed/untimed pregnant†	—	213.55

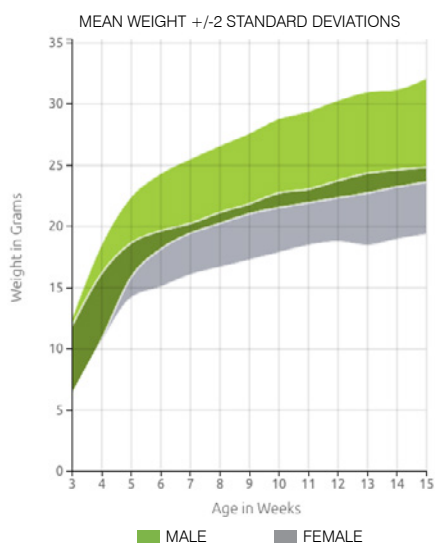
* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature C3H/HeNCrI **Origin** From a cross of a Bagg albino female and a DBA male by Strong in 1920. A litter of 4 females and 2 males sent to Andervont in 1930, then to Heston at F35. To NIH in 1951 from Heston at F57. To Charles River in 1974 from NIH. **Coat Color** Agouti (wild-type) **Research Application** Safety and efficacy testing, oncology, neurological disorders, retinal degeneration **MHC Haplotype** H2^k



MOUSE MODELS: INBRED
C57BL/6 MICE*
 STRAIN CODE: 027



Age in Days [†]	MALE	FEMALE
	Price	Price
Up to 21	24.15	26.00
22-28	27.95	30.05
29-35	30.30	31.50
36-42	32.75	33.25
43-49	37.65	33.90
50-56	38.35	35.50
57-63	38.75	36.20
64-70	39.70	36.90
71-plus	Price upon request	Price upon request
Retired breeders	25.00	24.25
Littermates 21 days old only	36.35	36.35
Lactating mouse with litter	—	280.60
Timed/untimed pregnant [‡]	—	233.35

* C57BL/6 mice are raised as age cohorts and shipped as such to minimize aggression, and divided or additional crates may be used to maintain original cohorts. Upon arrival at your facility, we recommend maintaining the housing group to preserve the established hierarchies whenever possible.

[†] Estimated age

[‡] For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature C57BL/6NCrl **Origin** Developed by C.C. Little in 1921, from a mating of Miss Abbie Lathrop's stock that also gave rise to strains C57BR and C57L. Strains 6 and 10 separated around 1937. To The Jackson Laboratory from Hall in 1948. To NIH in 1951 from The Jackson Laboratory at F32. To Charles River in 1974 from NIH. **Coat Color** Black **Research Application** General multipurpose model, diet-induced obesity, transgenic/knockout model development, safety and efficacy testing, immunology **MHC Haplotype** H2^b



MOUSE MODELS: INBRED

C57BL/6-ELITE MICE^{*†}

STRAIN CODE: 475

Age in Days [‡]	MALE	FEMALE
	Price	Price
Up to 21	37.00	40.75
22-28	42.90	47.10
29-35	46.25	50.75
36-42	49.00	51.65
43-49	57.25	52.65
50-56	58.40	53.80
57-63	59.50	54.90
64-plus	Price upon request	Price upon request
Retired breeders	37.35	37.35
Littermates 21 days old only	55.35	55.35
Lactating mouse with litter	–	428.25
Untimed pregnant [§]	–	285.05

* Isolator-maintained

† Information regarding the VAF/Elite[®] health profile can be found in the research models overview section.

‡ Estimated age

§ For untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature C57BL/6NCrI **Origin** Developed by C.C. Little in 1921, from a mating of Miss Abbie Lathrop's stock that also gave rise to strains C57BR and C57L. Strains 6 and 10 separated around 1937. To The Jackson Laboratory from Hall in 1948. To NIH in 1951 from The Jackson Laboratory at F32. To Charles River in 1974 from NIH. **Coat Color** Black **Research Application** General multipurpose model, diet-induced obesity, transgenic/knockout model development, safety and efficacy testing, immunology **MHC Haplotype** H2^b



MOUSE MODELS: INBRED

C57BL/6-GERM-FREE*

STRAIN CODE: 574

Germ-free mice are an indispensable model for research into the host-microbiome interaction, which has been shown to play a crucial role in homeostasis of animal physiology, metabolism, immunity, and more. Imbalances of the microbiome, termed dysbiosis, have been linked to a wide and growing array of disease states, including type 1 diabetes, inflammatory bowel disease, obesity, and autism. To explore the influence of microbiota, germ-free mice can be compared to standard SPF mice or associated with a defined or complex microbiota, derived from humans as well as animals. In addition, germ-free mice can be used for a caesarean and embryo-transfer rederivation of mutant mouse models.

Age in Days [†]	MALE	FEMALE
	Price [‡]	Price [‡]
Up to 21	254.40	254.40
22-28	275.60	275.60
29-35	296.80	296.80
36-42	318.00	318.00
43-49	339.20	339.20
50-56	360.40	360.40
57-63	381.60	381.60
64-70	402.80	402.80
71-plus	Price upon request	Price upon request

* Isolator-maintained

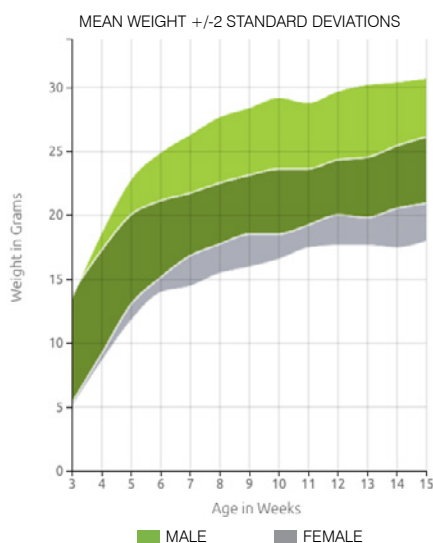
[†] Estimated age

[‡] Specialty model. Discounts may not apply.

Nomenclature C57BL/6NCrI **Origin** Developed by C.C. Little in 1921, from a mating of Miss Abbie Lathrop's stock that also gave rise to strains C57BR and C57L. Strains 6 and 10 separated around 1937. To The Jackson Laboratory from Hall in 1948. To NIH in 1951 from The Jackson Laboratory at F32. To Charles River in 1974 from NIH. **Coat Color** Black **Research Application** Host-microbiome interactions, effects of dysbiosis, influence of microbiota, a caesarean and embryo-transfer rederivation **MHC Haplotype** H2^b



MOUSE MODELS: INBRED
DBA/2 MICE
 STRAIN CODE: 026



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	36.45	38.40
22-28	41.30	39.05
29-35	43.60	45.70
36-42	47.00	46.60
43-49	47.90	47.40
50-56	52.55	48.25
57-63	53.50	50.55
64-70	54.45	50.95
71-plus	Price upon request	Price upon request
Retired breeders	32.35	32.35
Littermates 21 days old only	44.60	44.60
Lactating mouse with litter	—	261.65
Timed/untimed pregnant†	—	228.25

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature DBA/2NcrJ **Origin** Developed by C.C. Little in 1909 from stock segregating for coat color. Oldest of all the inbred strains of mice. In 1929-1930, crosses were made between sublines and several new sublines were established, including the widely used sublines 1 (previously called 12) and 2 (previously called 212). To Mider in 1938. To NIH in 1951 from Mider at F34. To Charles River in 1974 from NIH. **Coat Color** Non-agouti, dilute brown **Research Application** Safety and efficacy testing, immunology, audiogenic seizures **MHC Haplotype** H2^d



MOUSE MODELS: INBRED

Fox Chase CB17™ MICE*

STRAIN CODE: 251

Age in Days†	MALE	FEMALE
	Price	Price
Up to 28	77.40	77.40
29-35	82.95	82.95
36-42	91.60	91.60
43-49	97.75	97.75
50-56	103.65	103.65
57-plus	Price upon request	Price upon request

* Isolator-maintained

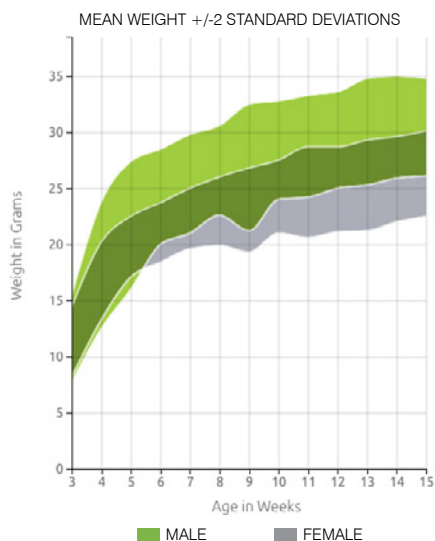
† Estimated age

Nomenclature C.BKa-*Igh*^b/IcrCrl **Origin** A congenic strain carrying the immunoglobulin heavy chain allele (*Igh-1b*) from a C57BL/Ka on a BALB/c background. To Charles River from Fox Chase in 1992. **Coat Color** White (albino) **Research Application** Control for CB17 SCID mouse **MHC Haplotype** H2^d

Fox Chase CB17™ is a trademark of the Fox Chase Cancer Center.



MOUSE MODELS: INBRED
FVB MICE
 STRAIN CODE: 207



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	27.45	30.40
22-35	30.55	33.40
36-49	35.40	38.40
50-63	42.05	44.30
64-77	49.90	51.95
78-91	57.50	58.60
92-plus	Price upon request	Price upon request
Retired breeders	24.85	24.85
Timed/untimed pregnant†	—	278.05

* Estimated age

† For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature FVB/NCrl **Origin** Derived in 1935 from an outbred Swiss colony [N:GP(S)] at NIH. In the early 1970s, while being established as an inbred strain, sensitivity to Friend leukemia virus B strain was discovered. At this time, inbreeding of this line for the Fv1b allele was undertaken and the strain was called FVB. To Charles River from NIH in 1994. **Coat Color** White (albino) **Research Application** Transgenic/knockout model development **MHC Haplotype** H2^q



MOUSE MODELS: INBRED

SJL-ELITE MICE^{*†}

STRAIN CODE: 478

Age in Days [‡]	MALE	FEMALE
	Price	Price
Up to 28	34.60	37.25
29-35	36.95	39.20
36-42	39.00	44.50
43-49	41.30	45.05
50-56	43.35	47.45
57-plus	Price upon request	Price upon request
Retired breeders	29.90	29.90
Littermates 21 days old only	39.65	39.65
Lactating mouse with litter	–	278.95
Untimed pregnant [§]	–	240.25

^{*} Isolator-maintained

[†] Information regarding the VAF/Elite[®] health profile can be found in the research models overview section.

[‡] Estimated age

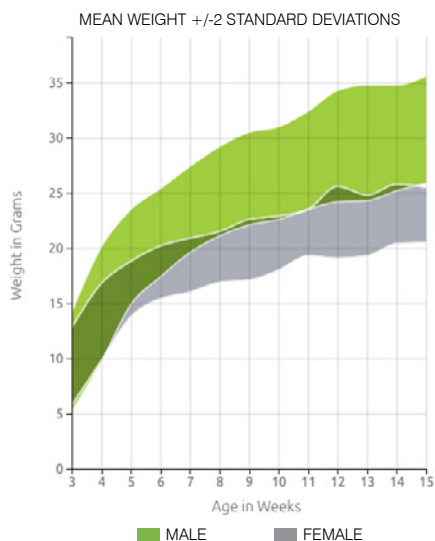
[§] For timed and untimed pregnant, please see our pregnant animal guarantee policy.

Nomenclature SJL/JOrlcoCrI **Origin** Selected by James Lambert in 1955 from three different strains of Swiss Webster brought to Jackson Laboratory between 1938 and 1943. This strain was introduced to CNRS-CSEAL, Orléans, France in 1978 and acquired by Iffa Credo in 1990 at F114. To Charles River from Iffa Credo in 1997.

Coat Color White (albino) **Research Application** Immunology, retinal degeneration, transgenic/knockout model development **MHC Haplotype** H2^s



MOUSE MODELS: HYBRID
B6C3F1 MICE
 STRAIN CODE: 031



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	26.50	28.65
22-28	30.65	33.50
29-35	32.95	34.55
36-42	39.50	38.15
43-49	43.45	38.15
50-56	51.65	38.15
57-plus	Price upon request	Price upon request
Littermates 21 days old only	41.65	41.65

* Estimated age

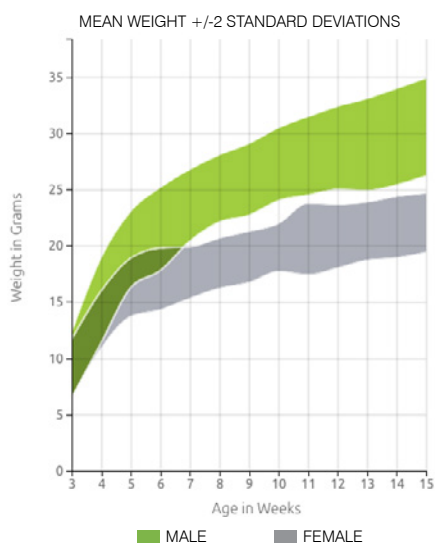
Nomenclature B6C3F1/Crl **Origin** A cross between female C57BL/6 and male C3H. **Coat Color** Agouti (wild-type) **Research Application** Safety and efficacy testing, transgenic/knockout model development, transplantation research



MOUSE MODELS: HYBRID

B6D2F1 MICE

WHEN ORDERING, SPECIFY BDF1 | STRAIN CODE: 099



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	24.95	27.90
22-28	28.80	31.35
29-35	32.25	32.80
36-42	38.65	34.30
43-49	42.80	36.80
50-56	50.25	36.80
57-plus	Price upon request	Price upon request
Littermates 21 days old only	41.35	41.35

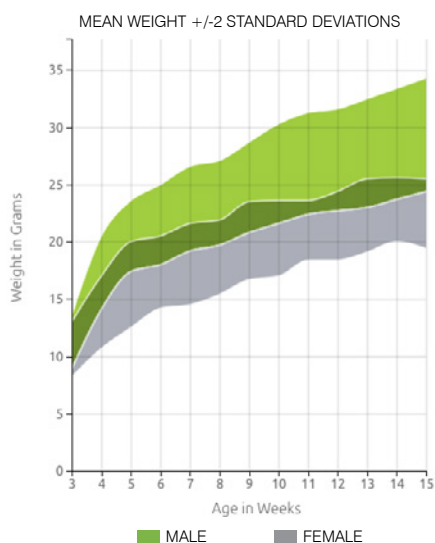
* Estimated age

Nomenclature B6D2F1/CrI **Origin** A cross between female C57BL/6 and male DBA/2. **Coat Color** Black

Research Application Safety and efficacy testing, transgenic/knockout model development, transplantation research, behavioral research



MOUSE MODELS: HYBRID
CB6F1 MICE
 STRAIN CODE: 176



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	27.35	29.80
22-28	31.55	35.15
29-35	32.45	36.05
36-42	33.75	38.80
43-49	35.70	38.80
50-56	35.70	38.80
57-plus	Price upon request	Price upon request
Littermates 21 days old only	41.40	41.40

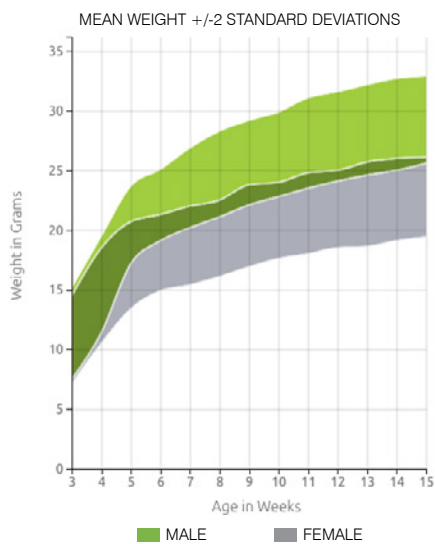
* Estimated age

Nomenclature CB6F1/CrI **Origin** A cross between female BALB/c and male C57BL/6. **Coat Color** Agouti
Research Application Transplantation research, monoclonal antibody production



MOUSE MODELS: HYBRID CD2F1 MICE

WHEN ORDERING, SPECIFY CDF1 | STRAIN CODE: 033



Age in Days*	MALE	FEMALE
	Price	Price
Up to 21	26.85	29.40
22-28	32.10	33.40
29-35	35.60	34.60
36-42	35.60	36.00
43-49	40.75	38.35
50-56	40.75	38.35
57-plus	Price upon request	Price upon request
Littermates 21 days old only	43.95	43.95

* Estimated age

Nomenclature CD2F1/CrI **Origin** A cross between female BALB/c and male DBA/2. **Coat Color** Brown agouti
Research Application Safety and efficacy testing, transplantation research, monoclonal antibody

MOUSE MODELS: DISEASE/TRANSLATIONAL CRYOPRESERVED DISEASE/ TRANSLATIONAL MODELS

All strains listed below are currently maintained as cryopreserved models. **Please allow a minimum of 12-15 weeks for delivery.** A dedicated supply can be established for large orders, and breeding pairs may be available for select models. Contact our Customer Support Center at 1.877.274.8371 for pricing and availability.

Common Name	Nomenclature	Coat Color	Therapeutic Area
AKR	AKR/NCrI	White (albino)	Oncology
APOA1	B6.CBA-Tg(APOA1)427Bres/CrI	Black	Metabolic, renal, cardiovascular
NCI B10.A/Cr	B10.A-H2 ^a H2-T18 ^a /SnSgCr	Black	Immunology, inflammation
PGP	CrI:CF1-Abcb1a ^{mds}	White (albino)	CNS
THE POUND MOUSE®	C57BL/6NCrI-Lepr ^{db-db} /CrI	Black	Diabetes



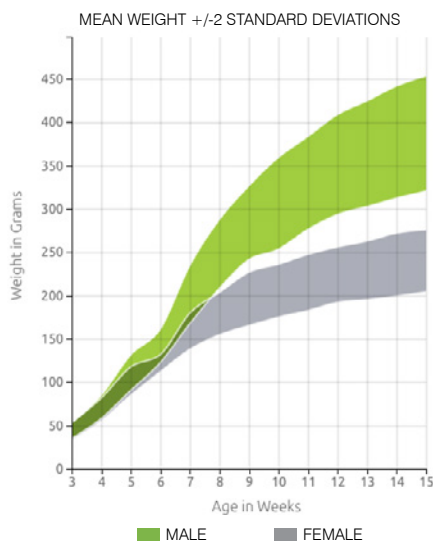
Specialty Models



RAT MODELS: OUTBRED

Sprague Dawley® RATS

WHEN ORDERING, SPECIFY SAS SD | STRAIN CODE: 400



	MALE	FEMALE
Weight in Grams	Price*	Price*
Up to 50	18.05	17.65
51-75	20.70	21.60
76-100	24.25	25.80
101-125	27.85	28.20
126-150	29.95	32.90
151-175	33.85	36.00
176-200	37.70	39.65
201-225	42.10	43.05
226-250	45.00	46.25
251-275	47.20	—
276-300	51.30	—
301-325	53.55	—
326-plus	Price upon request	Price upon request
Retired breeders	37.75	37.00
Littermates 21 days old	21.50	21.50
Lactating rat with litter	—	124.30
Timed pregnant†	—	119.70
Untimed pregnant†	—	95.75

* Specialty model. Discounts may not apply.

† For timed and untimed pregnant SAS SD rats, determination of pregnancy is by observation of vaginal plug. Plug date is considered to be day zero of gestation. Please see our pregnant animal guarantee policy.

Nomenclature CrI:SD **Origin** To SASCO from ARS/Sprague Dawley in 1979. To Charles River in 1996.

Coat Color White (albino) **Research Application** General multipurpose model, safety and efficacy testing, aging, nutrition, diet-induced obesity, oncology

Sprague Dawley® is a registered trademark of Envigo Holding I, Inc.



RAT MODELS: INBRED

F344 RATS

WHEN ORDERING, SPECIFY SAS FISCH | STRAIN CODE: 403

Age in Days*	MALE	FEMALE
	Price†	Price†
Up to 21	33.05	34.00
22-28	35.40	37.65
29-35	40.30	37.65
36-42	44.85	42.45
43-49	51.10	48.55
50-56	64.00	54.35
57-63	66.00	54.35
64-plus	Price upon request	Price upon request
Retired breeders	47.55	46.20
Littermates 21 days old	75.45	75.45
Lactating rat with litter	–	292.35
Timed pregnant‡	–	139.55
Untimed pregnant‡	–	113.10

* Estimated age

† Specialty model. Discounts may not apply.

‡ For timed and untimed pregnant F344 rats, determination of pregnancy is by observation of vaginal plug. Plug date is considered to be day zero of gestation. Please see our pregnant animal guarantee policy.

Nomenclature F344/NCrI **Origin** Derived from NIH stock in 1992 by SASCO. To Charles River in 1996.

Coat Color White (albino) **Research Application** General multipurpose model, aging, safety and efficacy testing, surgical model, oncology, nutrition **MHC Haplotype** RT1^w



MOUSE MODELS: INBRED

C57BL/6-GERM-FREE*

STRAIN CODE: 574

Germ-free mice are an indispensable model for research into the host-microbiome interaction, which has been shown to play a crucial role in homeostasis of animal physiology, metabolism, immunity, and more. Imbalances of the microbiome, termed dysbiosis, have been linked to a wide and growing array of disease states, including type 1 diabetes, inflammatory bowel disease, obesity, and autism. To explore the influence of microbiota, germ-free mice can be compared to standard SPF mice or associated with a defined or complex microbiota, derived from humans as well as animals. In addition, germ-free mice can be used for a caesarean and embryo-transfer rederivation of mutant mouse models.

Age in Days [†]	MALE	FEMALE
	Price [‡]	Price [‡]
Up to 21	254.40	254.40
22-28	275.60	275.60
29-35	296.80	296.80
36-42	318.00	318.00
43-49	339.20	339.20
50-56	360.40	360.40
57-63	381.60	381.60
64-70	402.80	402.80
71-plus	Price upon request	Price upon request

* Isolator-maintained

† Estimated age

‡ Specialty model. Discounts may not apply.

Nomenclature C57BL/6NCrI **Origin** Developed by C.C. Little in 1921, from a mating of Miss Abbie Lathrop's stock that also gave rise to strains C57BR and C57L. Strains 6 and 10 separated around 1937. To The Jackson Laboratory from Hall in 1948. To NIH in 1951 from The Jackson Laboratory at F32. To Charles River in 1974 from NIH. **Coat Color** Black **Research Application** Host-microbiome interactions, effects of dysbiosis, influence of microbiota, a caesarean and embryo-transfer rederivation **MHC Haplotype** H2^b



IMMUNODEFICIENT MODELS

NCG MICE*

STRAIN CODE: 572

COMMERCIAL PRICING

Age in Days†	MALE	FEMALE
	Price ‡	Price ‡
Up to 35	175.90	210.40
36-42	179.25	213.75
43-49	182.60	217.05
50-56	185.95	220.40
57-63	189.20	223.75
64-70	192.55	227.10
71-plus	Price upon request	Price upon request

* Coisogenic, isolator-maintained
 † Estimated age
 ‡ Specialty model. Discounts may not apply.

Nomenclature NOD-*Prkdc*^{em26Cd52}/*Il2rg*^{em26Cd22}/NjuCrl **Origin** Co-developed by Nanjing Biomedical Research Institute of Nanjing University and Nanjing Galaxy Biopharma in 2014 and transferred to Charles River in 2016. This model was created by sequential CRISPR/Cas9 editing of the *Prkdc* and *Il2rg* loci in the NOD/Nju mouse, generating a mouse coisogenic to the NOD/Nju. The NOD/Nju carries a mutation in the *Sirpa* (*SIRP α*) gene that allows for engrafting of foreign hematopoietic stem cells. The *Prkdc* knockout generates a SCID-like phenotype lacking proper T-cell and B-cell formation. The knockout of the *Il2rg* gene further exacerbates the SCID-like phenotype while additionally resulting in a decrease of NK cell production. **Coat Color** White (albino)
Research Application Oncology, immunology, infectious disease, graft vs. host disease, diabetes, regenerative medicine, human organ transplantation



Immunodeficient Models

Oncology is one of the leading areas of research into new therapeutics. Charles River's global portfolio of high-quality immunodeficient models gives you the benefit of partnering with an industry leader offering an infrastructure capable of advancing your research now and in the future.



IMMUNODEFICIENT MODELS

Model	Hair Coat	T-Cell Deficient	B-Cell Deficient	NK-Cell Deficient	Species	Genetics
Athymic Nude	No	Yes	No	No	Mouse	Outbred
Fox Chase SCID®	Yes	Yes	Yes	No	Mouse	Congenic
Fox Chase SCID® Beige	Yes	Yes	Yes	Impaired	Mouse	Congenic
NCG	Yes	Yes	Yes	Yes	Mouse	Coisogenic
NOD SCID	Yes	Yes	Yes	Impaired	Mouse	Congenic
BALB/c Nude	No	Yes	No	No	Mouse	Inbred
CD-1® Nude	No	Yes	No	No	Mouse	Outbred
NIH-III Nude	No	Yes	Yes	Impaired	Mouse	Outbred
NU/NU Nude	No	Yes	No	No	Mouse	Outbred
RNU Nude	No	Yes	No	No	Rat	Outbred
SHC™	No	Yes	Yes	No	Mouse	Congenic
SHO™	No	Yes	Yes	No	Mouse	Outbred
NCI SCID/NCr	Yes	Yes	Yes	No	Mouse	Congenic



IMMUNODEFICIENT MODELS

ATHYMIC NUDE MICE*

STRAIN CODE: 490 (HOMOZYGOUS), 491 (HETEROZYGOUS)†

Age in Days‡	MALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	83.50	62.85	52.50
43-56	92.55	72.20	61.60
57-63	105.20	84.70	75.20
64-plus	Price upon request		
Age in Days‡	FEMALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	97.05	73.00	61.15
43-56	107.65	85.05	73.10
57-63	121.90	98.05	86.65
64-plus	Price upon request		

* Outbred, isolator-maintained

† Heterozygous (haired) animals are not immunodeficient. Call 1.800.522.7287 for pricing and availability.

‡ Estimated age

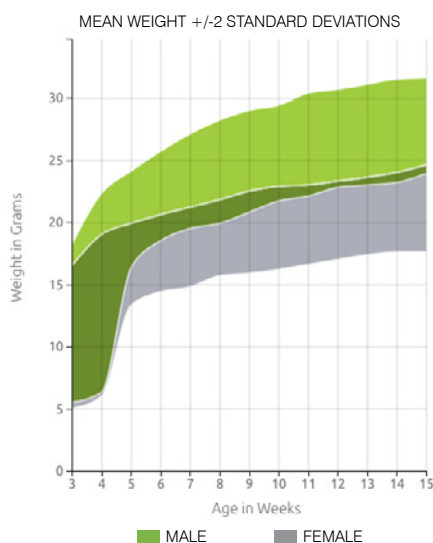
Nomenclature CrI:NU(NCr)-Foxn1^{nu} **Origin** This immunodeficient nude mouse originated from NIH and was originally thought to be a BALB/c congenic. It was later determined that it was not inbred and is therefore maintained as an outbred. It is not associated with any stock or strain. The animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. To Charles River from NCI in 2010. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

Fox Chase SCID® MICE*

WHEN ORDERING, SPECIFY CB17 SCID | STRAIN CODE: 236



	MALE	FEMALE
Age in Days†	Price	Price
Up to 28	92.45	92.45
29-35	98.80	98.80
36-42	105.75	105.75
43-49	111.30	111.30
50-56	117.70	117.70
57-plus	Price upon request	Price upon request

* Congenic, isolator-maintained

† Estimated age

Nomenclature CB17/lcr-Prkdc^{scid}/lcrIcoCrI **Origin** SCID mice possess a genetic autosomal recessive mutation (SCID). Discovered in 1980 by Bosma in C.B-17/lcr mice at Fox Chase Cancer Center. SCID mice show a severe combined immunodeficiency affecting both B and T lymphocytes. They have normal natural killer (NK) cells, macrophages and granulocytes. To Charles River in 1991 from an Iffa Credo foundation colony. **Coat Color** White (albino) **Research Application** Tumor biology and xenograft research

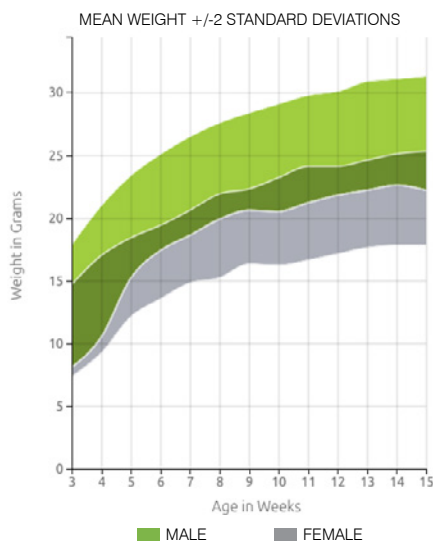
Fox Chase SCID® is a registered trademark of Fox Chase Cancer Center.



IMMUNODEFICIENT MODELS

Fox Chase SCID® BEIGE MICE*

STRAIN CODE: 250



	MALE	FEMALE
Age in Days†	Price	Price
Up to 28	97.05	98.00
29-35	102.70	103.75
36-42	109.40	109.40
43-49	115.50	115.50
50-56	121.25	121.25
57-plus	Price upon request	Price upon request

* Congenic, isolator-maintained

† Estimated age

Nomenclature CB17.Cg-Prkdc^{scid} Lys^{tg-tg}/Cr1 **Origin** A congenic mouse that possesses both autosomal recessive mutations SCID (*Prkdc*^{scid}) and beige (*Lys*^{tg-tg}). The SCID mutation results in severe combined immunodeficiency affecting both the B and T lymphocytes. The beige mutation results in defective natural killer (NK) cells. This mouse was developed by Croy et al. at the University of Guelph by an intercross of C.B-17 SCID/SCID to C57BL/6 bg/bg mice. To Charles River in 1993. **Coat Color** White (albino) **Research Application** Tumor biology and xenograft research

Fox Chase SCID® is a registered trademark of Fox Chase Cancer Center.



IMMUNODEFICIENT MODELS

NCG MICE*

STRAIN CODE: 572

COMMERCIAL PRICING

Age in Days†	MALE	FEMALE
	Price ‡	Price ‡
Up to 35	175.90	210.40
36-42	179.25	213.75
43-49	182.60	217.05
50-56	185.95	220.40
57-63	189.20	223.75
64-70	192.55	227.10
71-plus	Price upon request	Price upon request

* Coisogenic, isolator-maintained

† Estimated age

‡ Specialty model. Discounts may not apply.

Nomenclature NOD-*Prkdc*^{em26Cd52}/*Il2rg*^{em26Cd22}/NjuCrl **Origin** Co-developed by Nanjing Biomedical Research Institute of Nanjing University and Nanjing Galaxy Biopharma in 2014 and transferred to Charles River in 2016. This model was created by sequential CRISPR/Cas9 editing of the *Prkdc* and *Il2rg* loci in the NOD/Nju mouse, generating a mouse coisogenic to the NOD/Nju. The NOD/Nju carries a mutation in the *Sirpa* (*SIRP α*) gene that allows for engrafting of foreign hematopoietic stem cells. The *Prkdc* knockout generates a SCID-like phenotype lacking proper T-cell and B-cell formation. The knockout of the *Il2rg* gene further exacerbates the SCID-like phenotype while additionally resulting in a decrease of NK cell production. **Coat Color** White (albino)

Research Application Oncology, immunology, infectious disease, graft vs. host disease, diabetes, regenerative medicine, human organ transplantation



IMMUNODEFICIENT MODELS

NCG/PBMC SELECT HUMANIZATION KIT*

Charles River has partnered with HemaCare, a leading global provider of biological blood products and services, to offer our new NCG/PBMC Select Humanization Kit. Now you have the ability to create your own humanized model on your own timeline.

Note: Ordering cells requires a corresponding order for NCG mice.

Kit Advantages

- **Study ready** – Peripheral blood mononuclear cells (PBMCs) have already been pretested for engraftment in the NCG mouse model.
- **Efficient** – Cells have been prescreened, thus eliminating the time and labor associated with donor qualification, which can accelerate results and also increase probability of successful engraftment.
- **Flexible** – The NCG mouse model can be humanized according to your study timelines.
- **Trusted source** – This kit is the product of a partnership between industry leaders with over 100 years of combined experience in providing high-quality research animal models and human biologics to the research industry.

COMMERCIAL PRICING

Age in Days†	NCG MALE KIT	NCG FEMALE KIT
	Price	Price
Up to 35 days	2,694.00	3,039.00
36-42	2,727.50	3,072.50
43-49	2,761.00	3,105.50
50-56	2,794.50	3,139.00
57-63	2,827.00	3,172.50
64-70	2,860.50	3,206.00
71-plus	Price upon request	Price upon request

* The kit is made up of 10 mice and one vial of 100 million PBMCs.

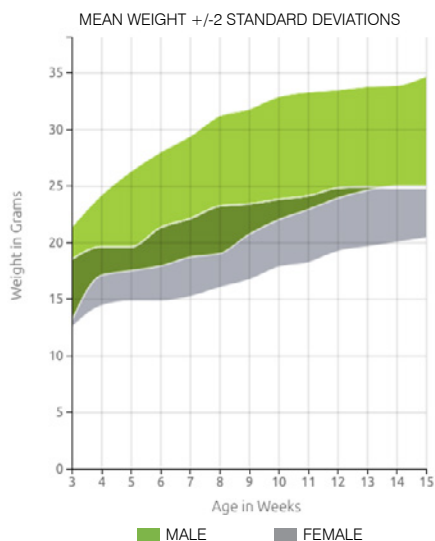
† Estimated age



IMMUNODEFICIENT MODELS

NOD SCID MICE*

STRAIN CODE: 394



Age in Days†	MALE	FEMALE
	Price	Price
Up to 42	136.60	144.85
43-56	147.75	159.85
57-plus	Price upon request	Price upon request

* Congenic, isolator-maintained

† Estimated age

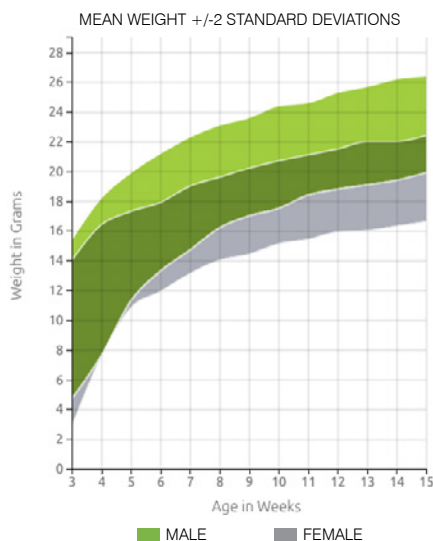
Nomenclature NOD.CB17-*Prkdc*^{scid}/NCrCrI **Origin** The SCID mutation has been transferred onto a non-obese diabetic background. Animals homozygous for the SCID mutation have impaired T and B cell lymphocyte development. The NOD background additionally results in deficient natural killer (NK) cell function. To Charles River in 2003 from NIH. **Coat Color** White (albino) **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

NUDE MICE*–BALB/c

WHEN ORDERING, SPECIFY BALB/c NUDE | STRAIN CODE: 194 (HOMOZYGOUS), 195 (HETEROZYGOUS)†



MALE/FEMALE

Homozygous, either sex nu/nu, 28-42 days†

Heterozygous, either sex nu/+ , 28-42 days††

43-plus

Price

192.35

70.75

Price upon request

* Inbred, isolator-maintained

† Heterozygous (haired) animals are not immunodeficient.

‡ Estimated age

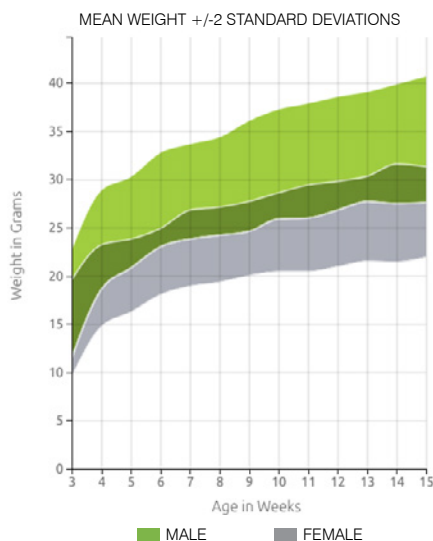
Nomenclature CAnN.Cg-Foxn1^{nu}/CrJ **Origin** Developed through crosses and backcrosses between BALB/cABom-nu and BALB/cAnNCrj-nu at Charles River Japan. Pedigreed pregnant females of CAnN.Cg-Foxn1^{nu}/CrJ were received from Charles River Japan in 1985. This mouse is inbred, and genetic monitoring results confirm it to be a BALB/c nude. The homozygous animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. **Coat Color** Hairless, albino background
Research Application Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

NUDE MICE[®]-CD-1[®]

WHEN ORDERING, SPECIFY CD-1[®] NUDE | STRAIN CODE: 086 (HOMOZYGOUS), 087 (HETEROZYGOUS)[†]



Age in Days [‡]	MALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	83.50	62.85	52.50
43-56	92.55	72.20	61.60
57-63	104.20	83.85	74.50
64-plus	Price upon request		
Age in Days [‡]	FEMALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	97.05	73.00	61.15
43-56	107.65	85.05	73.10
57-63	121.90	98.05	86.65
64-plus	Price upon request		

* Outbred, isolator-maintained

[†] Heterozygous (haired) animals are not immunodeficient. Call 1.800.522.7287 for pricing and availability.

[‡] Estimated age.

Nomenclature Crl:CD1-Foxn1^{nu} **Origin** Developed from the transfer of the nude gene from Crl:NU-Foxn1^{nu} to a CD-1[®] mouse through a series of crosses and backcrosses beginning in 1979 at Charles River Wilmington, MA. The animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

NUDE MICE*–NIH-III

STRAIN CODE: 201 (HOMOZYGOUS), 202 (HETEROZYGOUS)†

MALE/FEMALE	Price
Homozygous, either sex nu/nu, 28-42 days‡	110.85
Heterozygous, either sex nu/+, 28-42 days†‡	57.10
43-plus	Price upon request

* Outbred, isolator-maintained

† Heterozygous (haired) animals are not immunodeficient.

‡ Estimated age

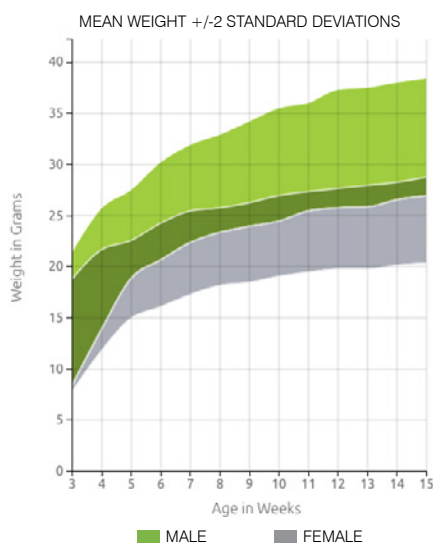
Nomenclature Crl:NIH-LySt^{bg-J} Foxn1^{nu} Btk^{ed} **Origin** Most commonly called the NIH-III, it was developed at NIH. In addition to the nude gene, which results in the absence of thymus and T cell function, this mouse has two other mutations important in regulating the function of the immune system. These are designated as x-linked immune defect Btk^{ed} and beige LySt^{bg-J}. The xid mutation affects the maturation of T-independent B lymphocytes. It has been demonstrated that bg homozygotes have defective natural killer (NK) cells that are cytotoxic *in vitro* to tumor cells. However, the extent of the T-independent B lymphocyte and NK cell deficiencies in the NIH-III have not been established. **Coat Color** Hairless, light to dark gray pigmented skin **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

NUDE MICE*–NU/NU

STRAIN CODE: 088 (HOMOZYGOUS), 089 (HETEROZYGOUS)†



Age in Days [‡]	MALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	83.50	62.85	52.50
43-56	92.55	72.20	61.60
57-63	104.20	83.85	74.50
64-plus	Price upon request		
Age in Days [‡]	FEMALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	97.05	73.00	61.15
43-56	107.65	85.05	73.10
57-63	120.65	97.10	85.85
64-plus	Price upon request		

* Outbred, isolator-maintained

† Heterozygous (haired) animals are not immunodeficient. Call 1.800.522.7287 for pricing and availability.

‡ Estimated age

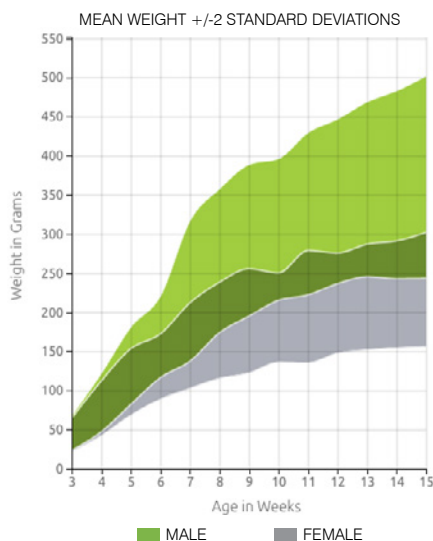
Nomenclature CrI:NU-Foxn1^{nu} **Origin** This immunodeficient nude mouse originated from NIH and was originally thought to be a BALB/c congenic. It was later determined that it was not inbred and is, therefore, maintained as an outbred, and is not associated with any stock or strain. The animal lacks a thymus, is unable to produce T cells and is therefore immunodeficient. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

NUDE RATS*

WHEN ORDERING, SPECIFY RNU | STRAIN CODE: 316 (HOMOZYGOUS), 118 (HETEROZYGOUS)†



Age in Days‡	MALE	FEMALE
	Price	Price
Up to 28	167.90	171.05
29-35	210.15	210.15
36-42	252.50	252.50
43-49	291.50	291.50
50-56	334.10	334.10
57-63	372.55	372.55
64-70	412.30	416.05
71-plus	Price upon request	Price upon request

* Outbred, isolator-maintained

† Heterozygous (haired) animals are not immunodeficient. Call 1.800.522.7287 for pricing and availability.

‡ Estimated age

Nomenclature CrI:NIH-Foxn1^{nu} **Origin** The NIH nude rat was developed in 1979-1980 through a series of matings involving eight inbred rat strains. To Charles River from the NIH in 2001. This athymic nude rat is T-cell deficient and shows depleted cell populations in thymus-dependent areas of peripheral lymphoid organs. **Coat Color** White, black, black & white **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

SCID HAIRLESS CONGENIC MICE*

WHEN ORDERING, SPECIFY SHC™ | STRAIN CODE: 488

Age in Days†	MALE	FEMALE
	Price	Price
Up to 28	115.45	115.45
29-35	123.20	123.20
36-42	130.60	130.60
43-49	137.55	137.55
50-56	145.40	145.40
57-plus	Price upon request	Price upon request

* Congenic, isolator-maintained

† Estimated age

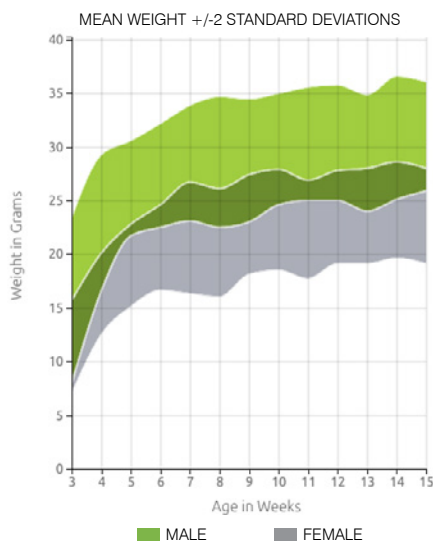
Nomenclature CB17.Cg-Prkdc^{scid} Hl^{hr}/lcrCr1 **Origin** The hairless SCID congenic was created in 2009 by Charles River Research Models by using marker-assisted accelerated backcrossing to place the hairless gene (*Hl^{hr}*) present in the CrI:SKH1-*Hl^{hr}* stock onto a CB17/lcr-Prkdc^{scid}/lcr1coCr genetic background. These mice are homozygous for both *Hl^{hr}* and *Prkdc^{scid}* mutations, so they exhibit the severe combined immunodeficiency phenotype characteristic of SCID mice and are also hairless. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

SCID HAIRLESS OUTBRED MICE*

WHEN ORDERING, SPECIFY SHO® | STRAIN CODE: 474



Age in Days†	MALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	100.40	75.55	63.15
43-56	111.30	86.70	74.05
57-63	126.50	102.00	90.35
64-plus	Price upon request		
Age in Days†	FEMALE QUANTITY AND PRICING		
	1-100	101-250	251+
Up to 42	116.80	87.85	73.45
43-56	129.50	102.40	87.90
57-63	143.95	115.85	102.45
64-plus	Price upon request		

* Outbred, isolator-maintained

† Estimated age

Nomenclature Crl:SHO-Prkdc^{scid} Hr^{hr} **Origin** The hairless SCID mouse was produced by Charles River Research Models in 2007 by intercrossing the Crl:HA-Prkdc^{scid} and Crl:SKH1-Hr^{hr} stocks. The resulting animals are homozygous for the Prkdc^{scid} and the Hr^{hr} mutations and thus exhibit the severe combined immunodeficiency phenotype characteristic of SCID mice and are also hairless.

Coat Color Hairless, albino background **Research Application** Tumor biology and xenograft research



IMMUNODEFICIENT MODELS

NCI SCID/NCr MICE*

STRAIN CODE: 561

Age in Days†	MALE	FEMALE
	Price	Price
Up to 21	106.65	106.65
22-28	109.10	109.10
29-35	111.55	111.55
36-42	113.90	113.90
43-49	116.30	116.30
50-56	118.75	118.75
57-plus	Price upon request	Price upon request

* Congenic, isolator-maintained

† Estimated age

Nomenclature CB17/lcr-Prkdc^{scid}/lcrCr **Origin** SCID mice possess a genetic autosomal recessive mutation *Prkdc*^{scid}. Discovered in 1980 by Bosma in C.B-17/lcr mice at Fox Chase Cancer Center. SCID mice show a severe combined immunodeficiency affecting both B and T lymphocytes. They have normal natural killer (NK) cells, macrophages, and granulocytes. NCI received this mouse in 1991. To Charles River in 2014. **Coat Color** White (albino) **Research Application** Tumor biology and xenograft research



Rabbit, Guinea Pig, Gerbil, and Hamster

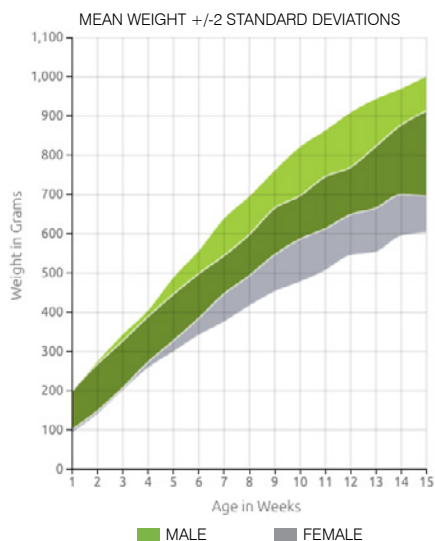
Because most diseases cause a wide range of complications, their study is complex and often requires research programs to take a multidisciplinary approach. Therefore, aside from mouse and rat models, we also provide other species of research models in order to support your program requirements.



OUTBRED GUINEA PIGS

HARTLEY GUINEA PIGS

STRAIN CODE: 051



	SPECIFIED SEX	EITHER SEX
Weight in Grams	Price	Price
Up to 200	123.40	89.10
201-250	137.75	97.15
251-300	145.90	104.95
301-350	154.35	111.60
351-400	162.70	118.10
401-450	171.25	123.40
451-500	179.05	129.60
501-550	193.15	141.50
551-plus	Price upon request	Price upon request
Retired breeders	41.30	41.30

Pregnant animal pricing available upon request.

Nomenclature Crl:HA **Origin** To Charles River in 1968 from Medical Research Council, Millhill, England.
Coat Color White (acromelanic albino)



OUTBRED GUINEA PIGS

IAF HAIRLESS GUINEA PIGS

STRAIN CODE: 161

Weight in Grams	MALE	FEMALE
	Price	Price
Up to 200	251.50	251.50
201-250	270.95	270.95
251-300	302.85	302.85
301-350	329.90	329.90
351-400	356.70	356.70
401-450	377.15	377.15
451-500	390.55	390.55
501-550	422.90	422.90
551-plus	Price upon request	Price upon request

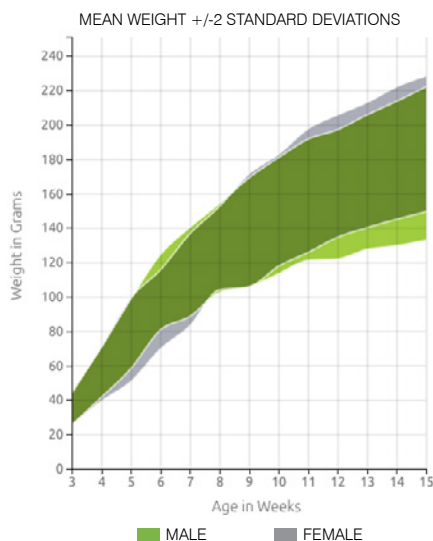
Nomenclature Cri:HA-*Hr^{hr}* **Origin** Mutation first identified in 1978, among the offspring of three females caged with one male in a colony of albino Hartley guinea pigs at Montreal's Institute Armand Frappier (IAF). To Charles River in 1982. This guinea pig is euthymic and immunocompetent. **Coat Color** Hairless, albino background **Research Application** Dermatology



OUTBRED HAMSTERS

LVG GOLDEN SYRIAN HAMSTERS

STRAIN CODE: 049



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 50	38.20	38.20
51-60	42.20	42.20
61-70	45.95	45.95
71-80	51.85	51.85
81-90	58.30	58.30
91-100	65.25	65.25
101-110	70.35	70.35
111-120	73.30	73.30
121-plus	Price upon request	Price upon request
Retired breeders	59.40	59.40
Timed pregnant	—	136.30

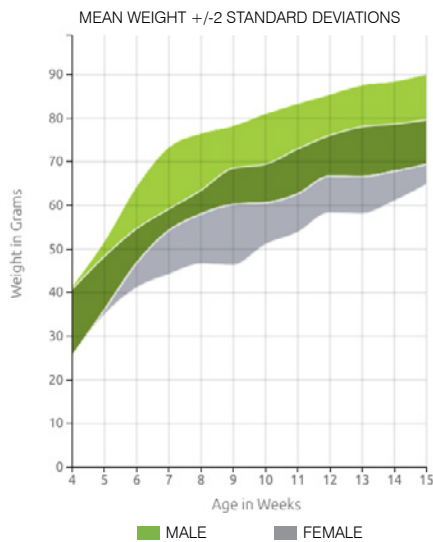
Nomenclature CrI:LVG(SYR) **Origin** Three members of a litter captured in Syria in 1930 were retained in captivity. It is the progeny of these animals that were first imported to the United States in 1938. Descended from two original colonies acquired by Lakeview in 1949 and 1951. Closed outbred colony since 1951. To Charles River in 1969. **Coat Color** Medium tan



OUTBRED GERBILS

MONGOLIAN GERBILS

STRAIN CODE: 243



	MALE	FEMALE
Weight in Grams	Price	Price
Up to 40	89.75	85.45
41-50	92.40	89.75
51-60	99.45	92.40
61-70	102.45	96.05
71-80	105.95	102.45
81-90	111.80	—
91-plus	Price upon request	Price upon request
Retired breeders	89.75	89.75
Proven breeder pair	—	255.30
Untimed pregnant	—	268.05
Lactating mother with pups	—	281.15

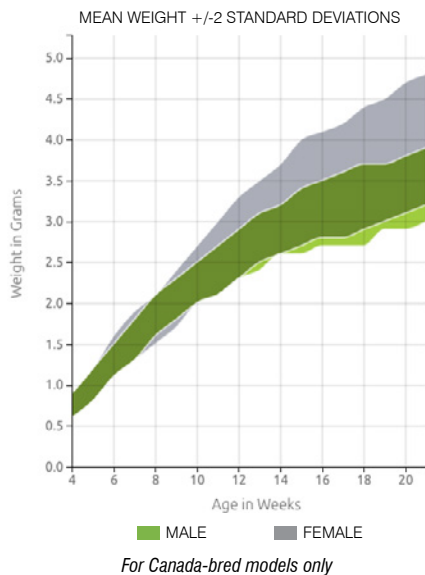
Nomenclature Crl:MON(Tum) **Origin** The stock was obtained from Tumblebrook Farms in 1995. Rederived in 1996. **Coat Color** Predominantly agouti with some black



OUTBRED RABBITS

NEW ZEALAND WHITE RABBITS*

STRAIN CODE: 052 (CR)



WEIGHT		SPECIFIED SEX	EITHER SEX
Kgs	Lbs	Price	Price
1.4-1.8	3-4	175.00	146.60
1.9-2.3	4-5	207.55	178.25
2.4-2.7	5-6	241.00	211.50
2.8-3.0	6-7	270.50	241.00
3.1-3.3	7	311.75	280.55
3.4-3.6	8	338.55	307.20
3.7-3.9	8-9	351.20	331.35

Pregnant animal pricing and additional services available upon request. Please see our pregnant animal guarantee policy.
 * See our research models overview section for rabbit cancellation policy.

Nomenclature CrI:KBL(NZW) **Origin** The NZW rabbit was obtained in 1991 by Charles River (Canada) from Kitayama Labs K.K. of Nagano Prefecture, Japan. **Coat Color** White (albino)



OUTBRED RABBITS

NEW ZEALAND WHITE RABBITS*

STRAIN CODE: 571 (OAKWOOD)

WEIGHT		SPECIFIED SEX Price	EITHER SEX Price
Kgs	Lbs		
1.4-1.8	3-4	175.00	146.60
1.9-2.3	4-5	207.55	178.25
2.4-2.7	5-6	241.00	211.50
2.8-3.0	6-7	270.50	241.00
3.1-3.3	7	311.75	280.55
3.4-3.6	8	338.55	307.20
3.7-3.9	8-9	351.20	331.35

*Pregnant animal pricing and additional services available upon request. Please see our pregnant animal guarantee policy.
* See our research models overview section for rabbit cancellation policy.*

Nomenclature Ora:NZW **Origin** This NZW rabbit colony was rederived by caesarean section by Oakwood Research, Oxford, Michigan in 1996. **Coat Color** White (albino)



Preconditioning Services

Preconditioning services can help alleviate the space, time, and labor costs involved with refining a model to meet your unique research requirements. Whether you are looking for animals fed a special diet, altered through surgery, or reared to a certain age, Charles River has the state-of-the-art animal facilities, professional animal care, and robust model selection to deliver study-ready animals right to your door.

VASCULAR CATHETERIZATIONS

In addition to the rat, mouse, and guinea pig surgery models available, we are able to provide a limited number of procedures in the hamster and gerbil. Also, many of our surgical procedures can be combined into one order. For more information regarding combination procedures or other available species, please contact Customer Service at 1.800.522.7287. For a quote on any of our surgical procedures, visit www.criver.com/surgeryquote.

Vascular Catheterizations¹

	Code	Rat Price ^{††}	Mouse Price ^{††}	Guinea Pig Price ^{††}
Carotid artery, common	CARART	115.35	177.15	155.75
Carotid artery – cranial dosing ²	CARART-CD	115.35	185.70	–
Femoral artery	FEMART	133.40	–	–
Femoral vein	FEMVEIN	113.75	–	–
Jugular vein	JUGVEIN	93.10	132.70	114.75
Double jugular vein ³	JUGJUGVEIN	187.20	–	228.85
Portal vein	PORTVEIN	187.05	–	–
Vena cava (femoral vein)	VENACAVA-FV	113.75	–	–

Any two vascular catheter procedures may be combined.

1. Charles River partners with multiple catheter manufacturers to provide standard and customized catheters. Our standard vascular catheter is made of polyurethane with a blunt-cut tip; however, round-tip catheters are available at an additional cost. Silicone, polyethylene, and blended catheters are available upon request. Specific catheters that are able to accommodate automated samplers are also available at an additional cost.

2. For infusion only; no sample collection

3. Infusion using only one of these two catheters (indicated on shipping documentation)

** Surgical procedures do not include the price of the animal, shipping, or container charges.*

† Add \$13.05 surcharge per animal for gas anesthesia. Add \$16.50 surcharge per animal for immunodeficient and isolator-maintained models.

Cancellations must be received by 5:00 p.m. Eastern Time (ET) at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to: 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

NON-VASCULAR CATHETERIZATIONS

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Non-Vascular Catheterizations

	Code	Rat Price [†]	Mouse Price [†]	Guinea Pig Price [†]
Bile duct [‡]	BILECANN	205.45	323.15	–
Cecum ¹	CECUM	163.55	186.70	–
Colon ¹	COLON	189.90	224.90	–
Duodenum ¹	DUODCANN	169.65	262.55	–
Ileum ¹	ILEUM	206.80	–	–
Intraperitoneal catheterization ¹	IP-CATH	126.55	145.50	151.80
Intrathecal cannulation ¹	THECALCAN	226.05	–	–
Jejunum ¹	JEJUNUM	208.80	221.55	–
Stomach (gastric) ¹	STOMCANN	144.35	157.35	–
Subcutaneous catheter ¹	SQCATH	64.90	98.00	86.50
Urinary bladder ¹	URIBLADCAN	136.35	158.80	–

Any non-vascular catheter procedure may be combined with a vascular catheter procedure.

1. For infusion only; no sample collection

** Surgical procedures do not include the price of the animal, shipping, or container charges.*

† Add \$13.05 surcharge per animal for gas anesthesia. Add \$16.50 surcharge per animal for immunodeficient and isolator-maintained models.

‡ The IACUC surgery protocol requires an extended postoperative holding period for animal recovery before shipping.

Cancellations must be received by 5:00 p.m. Eastern Time (ET) at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to: 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

SOFT TISSUE PROCEDURES

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Soft Tissue Procedures

	Code	Rat Price [†]	Mouse Price [†]	Guinea Pig Price [†]
Adrenalectomy	ADREX	26.80	28.20	–
Adrenal demedullation	ADREXDEMED	44.20	48.00	–
Bile duct ligation	BILEDUCLIG	74.40	93.15	–
Castration	CASTRATE	26.10	27.30	–
Hypophysectomy (pharyngeal) – std. weights [‡]	HYPOX	77.80	–	–
Hypophysectomy < 75 g or > 200 g [‡]	HYPOX1	116.20	–	–
Hysterectomy	HYSTERX	81.55	87.25	–
Nephrectomy – unilateral	NEPHREX	42.75	48.70	–
3/4 nephrectomy	34NEPHREX	147.90	162.55	–
5/6 nephrectomy – multiple survival [‡]	56NEPHREX	147.90	162.55	–
Osteoarthritis model (MIA) [‡]	MIA14	34.25	–	–
Ovariectomy	OVARIEX	27.40	28.05	54.30
Parathyroidectomy [‡]	PARATHYROX	60.75	–	–
Splenectomy	SPLEENX	31.95	38.30	–
Splenic denervation	SPLENDNERV	152.65	–	–
Thymectomy	THYMEX	57.90	73.10	–
Thyroidectomy w/ parathyroid reimplant	THYROX	58.55	–	–
Thyroidectomy + parathyroidectomy	THYRO+PARA	62.60	63.50	–
Tubal ligation – bilateral	BITUBALLIG	41.30	43.50	–
Tubal ligation – unilateral	UNTUBALLIG	34.55	35.60	–
Ureter ligation	URETERLIG	94.35	108.80	–
Vagotomy (hepatic – standard procedure for mice) [‡]	VAGOX	84.00	86.25	–
Vagotomy – stomach [‡]	VAGOX-STM	84.00	–	–
Vagotomy (sub-diaphragmatic – standard procedure for rats) [‡]	VAGOX-SD	84.00	–	–
Vasectomy	VASEX	34.80	37.35	–

A soft tissue procedure may be combined with a vascular catheter procedure.

Sham procedures are available upon request.

** Surgical procedures do not include the price of the animal, shipping, or container charges.*

† Add \$13.05 surcharge per animal for gas anesthesia. Add \$16.50 surcharge per animal for immunodeficient and isolator-maintained models.

‡ The IACUC surgery protocol requires an extended postoperative holding period for animal recovery before shipping.

Cancellations must be received by 5:00 p.m. Eastern Time (ET) at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to: 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

NEUROLOGICAL PROCEDURES

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Neurological Procedures

	Code	Rat Price ^{††}	Mouse Price ^{††}	Guinea Pig Price ^{††}
Angiotensin II testing for IVC	ANG II	107.60	—	—
Bilateral brain cannulation ^{1,2,‡}	BIL-BRAIN	268.55	332.55	—
Bilateral superior cervical ganglion denervation	GANGLIONBI	102.25	140.15	—
Chronic constriction injury (CCI) of sciatic nerve	BENNET	202.85	—	—
Intracisternal cannulation	INTRCIST	207.64	—	—
Intralateral ventricular cannulation ^{1†}	IVC	149.55	172.85	—
Intralateral ventricular cannulation – MRI compatible ^{1†}	IVC-MRI	180.55	—	—
Intralateral ventricular cannulation for pump connection ^{1†}	IVCTUBING	174.40	208.80	—
Intralateral ventricular cannulation for pump connection – MRI compatible ^{1†}	IVCTUBINGMRI	208.75	—	—
Intrathecal cannulation ^{1†}	THECALCAN	226.05	—	—
Microdialysis probe implantation ^{2†}	UNI-BMICRO	198.40	—	—
Olfactory bulbectomy	OLFACTOREX	146.50	—	—
Parkinson's model (chemical-6-OHDA) [‡]	PARKINSON	245.30	—	—
Schizophrenia/epilepsy model	MAM	\$	—	—
Spinal nerve ligation (SNL)	CHUNG	219.15	—	—
Superior cervical ganglion denervation	GANGLION	71.50	109.95	—
Third ventricular cannulation ^{1†}	3RDVENTCAN	170.70	242.10	—
Unilateral brain cannulation ^{1,2,‡}	UNI-BRAIN	162.50	184.20	—

Any of these procedures may be combined with a vascular catheter procedure.

1. For infusion only; no sample collection

2. Customer provides coordinates.

** Surgical procedures do not include the price of the animal, shipping, or container charges.*

† Add \$13.05 surcharge per animal for gas anesthesia. Add \$16.50 surcharge per animal for immunodeficient and isolator-maintained models.

‡ The IACUC surgery protocol requires an extended postoperative holding period for animal recovery before shipping.

\$ Priced upon request.

Cancellations must be received by 5:00 p.m. Eastern Time (ET) at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to: 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

CARDIOVASCULAR PROCEDURES

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Cardiovascular Procedures

	Code	Rat Price [†]	Mouse Price [†]	Guinea Pig Price [†]
Abdominal banding – hypertension model [‡]	ABDBAND	97.70	–	–
Atherosclerosis – carotid artery embolectomy	ATHERO-EMB	248.35	–	–
Left coronary artery ligation [‡]	MYOINFARC	304.50	–	–
Portal circulation redirected to the vena cava, bypassing the liver	PORTCAVSHT	337.00	–	–
Thoracic aortic banding – ascending aorta [‡]	AATABAND	215.05	–	–
Thoracic aortic banding – transverse aorta [‡]	TABAND	166.40	–	–

* Surgical procedures do not include the price of the animal, shipping, or container charges.

† Add \$13.05 surcharge per animal for gas anesthesia. Add \$16.50 surcharge per animal for immunodeficient and isolator-maintained models.

‡ The IACUC surgery protocol requires an extended postoperative holding period for animal recovery before shipping.

Cancellations must be received by 5:00 p.m. Eastern Time (ET) at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to: 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

DEVICE IMPLANTS

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Device Implants¹

	Code	Rat Price**†	Mouse Price**†	Guinea Pig Price**†
Blood pressure telemetry‡	TELEMBP	203.70	228.75	212.70
Blood pressure + electrocardiograph telemetry‡	TELEMBPECG	249.25	297.75	251.65
Blood pressure + electroencephalograph telemetry‡	TELEMBPEEG	249.25	–	–
Electrocardiograph telemetry‡	TELEMECG	171.30	177.60	177.15
Electroencephalograph + electrocardiograph telemetry‡	EEG/ECG	202.25	217.65	–
Electroencephalograph + electromyograph telemetry‡	EEG/EMG	211.00	–	–
Electroencephalograph + electroencephalograph + electromyograph‡	EEG/EEG/EMG	360.95	–	–
Electromyograph telemetry‡	EMG	171.30	–	–
Left ventricle pressure telemetry	TELEMLVP	470.75	–	–
Osmotic/infusion pump or VAP	IMPLANT2	73.80	73.80	73.80
Pleural pressure telemetry‡	TELEMPPP	288.50	–	–
Pleural pressure + electrocardiograph telemetry‡	TELEMPPECG	350.45	–	–
Portal vein pressure telemetry	TELEMPVP	239.65	–	–
Simple injectable implant	IMPLANT	30.05	30.05	30.05
Temperature + activity telemetry‡	TELEMTA	146.25	–	–

1. Charles River does not stock any of these items, but will implant them when supplied by the customer in factory-direct packaging. Price does not include the cost of these devices. The items must be drop-shipped directly from the vendor to Charles River. Shipping address will be provided after order confirmation. Contact Charles River for other combinations of telemetry procedures.

* Surgical procedures do not include the price of the animal, shipping, or container charges.

† Add \$13.05 surcharge per animal for gas anesthesia. Add \$16.50 surcharge per animal for immunodeficient and isolator-maintained models.

‡ The IACUC surgery protocol requires an extended postoperative holding period for animal recovery before shipping.

Cancellations must be received by 5:00 p.m. Eastern Time (ET) at least five business days prior to the scheduled ship date for most orders. Notice of cancellation is extended prior to the scheduled ship date for procedures with prolonged holding times, including, but not limited to: 5/6 nephrectomy, Parkinson's, and telemetry procedures. Animals requested to be held longer than seven days postoperatively will incur a holding fee.

PRECONDITIONING SERVICES: SURGICAL PROCEDURES

OPTIONAL ACCESSORIES FOR CATHETERIZED RODENTS

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Optional Accessories for Catheterized Rodents

	Code	Rat Price*	Mouse Price*	Guinea Pig Price*
Button application only (1 or 2 channel) ¹	BUTTON	36.25	36.25	–
Button surgery (most buttons) ¹	BUTTONSURG	58.60	–	58.60
Instech brand one-channel magnetic button (VABR1B/22 for rats or guinea pig and VABM1B/25 for mice) ²	BUTTON-1CH	90.30	90.30	90.30
Instech brand two-channel magnetic button (VABR2B/22 for rats or guinea pigs and VAM2B/25R25 for mice) ²	BUTTON-2CH	111.70	111.70	111.70
Instech brand three-channel magnetic button (VABR3B/22 for rats) ²	BUTTON-3CH	124.05	–	–
Instech brand one-channel non-magnetic button (VAB95BS) ²	BUTONVAB95BS	90.30	–	90.30
Instech brand one-channel magnetic mouse button (VAB62BS/22) ²	BUTONVAB62BS	–	90.30	–
Instech brand button cap (VABRC for rats or guinea pigs and VABM1C for mice)	BUTTON-CAP	25.00	25.00	25.00
Instech brand harness (application only) ¹	INSTJACKET	10.95	–	10.95
Instech brand harness (single-channel VAH95AB) ²	INSTJACKET+S	62.90	–	–
Instech brand harness (two-channel VAHD115AB) ²	INSTJACKET+D	86.75	–	–
Instech brand harness for bile (VAHD115AB +VAHD115L) ²	INSTJACKET+B	130.40	–	–
Instech brand harness (three-channel VAHD115AB-1P) ²	INSTJCKT-3CH	103.70	–	–
SAI harness (application only) ¹	SAIJACKET	10.95	–	10.95
SAI harness (single-channel QCH-22)	SAIJACKET+S	49.55	–	–
SAI harness (two-channel QCDH-22) ²	SAIJACKET+D	68.45	–	–
Instech PinPort™ ²	PINPORT	6.50	6.50	6.50
Instech PinPort™ supplied by customer ¹	PINPORT-CS	2.35	2.35	2.35

1. Items provided by customer. The items must be drop-shipped directly from the vendor to Charles River. Shipping address will be provided after order confirmation. 10% extra accessories are required to mitigate short shipping due to unforeseen complications related to surgery.

2. Provided by Charles River. Limited stock kept in-house.

* Surgical procedures do not include the price of the animal, shipping, or container charges.

MISCELLANEOUS OPTIONS

In addition to the rat, mouse, and guinea pig surgery models available, we are able to provide a limited number of procedures in the hamster and gerbil. Also, many of our surgical procedures can be combined into one order. For more information regarding combination procedures or other available species, please contact Customer Service at 1.800.522.7287. For a quote on any of our surgical procedures, visit www.criver.com/surgeryquote.

Miscellaneous Options

	Code	Price
Isoflurane anesthesia	GAS	13.05
Antibiotic – ampicillin	ANTIBIO-AMP	13.00
Antibiotic – enrofloxacin (Baytril)	ANTIBIO-BAY	18.90

PRECONDITIONING SERVICES:

SURGICAL SUPPORT*

	Price†
Rent-A-Surgeon	3,836.15
Rent-A-Trainer	5,545.00

** For more information on our Surgical Support Services, please visit www.criver.com.*

† Pricing is per day per surgeon/trainer. Additional travel expenses will apply.

Many of our more specialized surgical offerings were developed based on customer requests. If you are interested in a surgical procedure that is not listed here, please contact us at 1.877.274.8371 or askcharlesriver@crl.com to discuss the development of a customized procedure.

PRE-ID™ SERVICES

Charles River can provide preconditioned models that meet your exact study needs, saving you space, time, and labor costs. Our husbandry procedures utilize strict biosecurity guidelines developed under the direction of the professional staff at our AAALAC-accredited facilities. We offer services that include pre-identification, pre-screening, pre-dosing/pre-injection, feeding, aging, and phenotypic evaluations. Any of these services can be used, alone or in combination, based on your needs. For further information, please contact Customer Service at 1.800.522.7287, or to request a quote, visit www.criver.com/preconditionedquote.

Pre-ID™ Services*

Description	Code	Price
NEW UID chip - subcutaneous implant	UIDCHIP	17.20
Avid brand identification chip – subcutaneous implant	AVIDTRANS	14.50
Biomed brand identification chip – subcutaneous implant	BIOMEDTRNS	14.50
Ear punch	EARPUNCH	4.30
Ear tag	EARTAGS	4.60
RapID TAGS® (customer-supplied tag)†	RAPID	6.00
Somark Labstamp® (mice only)	LABSTAMP ID	6.30
Tail marking	TAILMARK	4.35
Tattoo	TATTOO	7.95
Trovan® brand identification chip - subcutaneous implant	TROVAN-ID	14.10

* Pre-ID™ services do not include the price of the animal, shipping, or container charges.

† Charles River can supply the tag and service for \$12.60 per animal.

Pre-ID™ Species

Method*	Mouse	Rat	Guinea Pig	Gerbil	Hamster
Ear punch	•	•	•	•	•
Ear tag	•	•	•	•	•
Microchip (AVIDTRANS, BIOMEDTRNS, TROVAN-ID and UID)	•	•	•	•	•
RapID TAGS®	•	•	•	•	•
Somark Labstamp®	•				
Tail marking	•	•			
Tattoo	•	•	•		

* Not all options are available for every species/strain.

PRECONDITIONING SERVICES: PRECONDITIONED MODELS

PRE-SCREENING SERVICES

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Pre-Screening Services*

Description	Code	Price
Glucose monitoring	GLUCOSE	7.55

** Pre-screening services do not include the price of the animal, shipping, or container charges.*

PRE-DOSING/PRE-INJECTION SERVICES

Charles River can provide preconditioned models that meet your exact study needs, saving you space, time, and labor costs. Our husbandry procedures utilize strict biosecurity guidelines developed under the direction of the professional staff at our AAALAC-accredited facilities. We offer services that include pre-identification, pre-screening, pre-dosing/pre-injection, feeding, aging, and phenotypic evaluations. Any of these services can be used, alone or in combination, based on your needs. For further information, please contact Customer Service at 1.800.522.7287, or to request a quote, visit www.criver.com/preconditionedquote.

Pre-Dosing/Pre-Injection Services*

Description	Code	Price
Injection†	INJECT	6.45
IP (intraperitoneal) injection†	INJ-IP	6.45
IP (intraperitoneal) injection of pristane (mice only)	PRISTANE	5.50
Subcutaneous injection†	INJ-SUB-Q	6.45

* Pre-dosing/pre-injection services do not include the price of the animal, shipping, or container charges.

† Customer-supplied injectable

CUSTOM DIETS

Charles River can provide preconditioned models that meet your exact study needs, saving you space, time, and labor costs. Our husbandry procedures utilize strict biosecurity guidelines developed under the direction of the professional staff at our AAALAC-accredited facilities. We offer services that include pre-identification, pre-screening, pre-dosing/pre-injection, feeding, aging, and phenotypic evaluations. Any of these services can be used, alone or in combination, based on your needs. For further information, please contact Customer Service at 1.800.522.7287, or to request a quote, visit www.criver.com/preconditionedquote.

Custom Diets*

Animals available from Charles River barrier rooms can be pre-fed specialized diets to induce obesity, hypertension, or stroke. Additionally, customers have the option to receive biospecimens (e.g., tissue, organs, serum) from animals that have been preconditioned and/or had a surgical procedure.

** Pricing is based on the strain of animal, length, and complexity of the program.*

AGING SERVICES

Charles River can provide preconditioned models that meet your exact study needs, saving you space, time, and labor costs. Our husbandry procedures utilize strict biosecurity guidelines developed under the direction of the professional staff at our AAALAC-accredited facilities. We offer services that include pre-identification, pre-screening, pre-dosing/pre-injection, feeding, aging, and phenotypic evaluations. Any of these services can be used, alone or in combination, based on your needs. For further information, please contact Customer Service at 1.800.522.7287, or to request a quote, visit www.criver.com/preconditionedquote.

Aging Services*

In some models, the disease conditions develop as the animal ages. Any of our barrier-reared animals can be aged upon request. Some strains will exhibit the following as they age:

- Hypertension
- Heart failure

** Pricing is based on the strain of animal, length, and complexity of the program.*

PHENOTYPIC EVALUATIONS

Charles River can provide preconditioned models that meet your exact study needs, saving you space, time, and labor costs. Our husbandry procedures utilize strict biosecurity guidelines developed under the direction of the professional staff at our AAALAC-accredited facilities. We offer services that include pre-identification, pre-screening, pre-dosing/pre-injection, feeding, aging, and phenotypic evaluations. Any of these services can be used, alone or in combination, based on your needs. For further information, please contact Customer Service at 1.800.522.7287, or to request a quote, visit www.criver.com/preconditionedquote.

Phenotypic Evaluations*

As animals are held, various phenotypic parameters can be measured, recorded, and analyzed. Available parameters include:

- Body weights
- Monitoring of food and water intake
- Blood glucose and insulin levels
- Clinical chemistries
- Blood pressure monitoring

** Pricing is based on the strain of animal, length, and complexity of the program.*

PRECONDITIONING SERVICES:

BIOSPECIMENS

Biospecimens are used to gain a better understanding of a compound's pharmacokinetic properties. Charles River can provide blood products, tissues, and organs collected from VAF/Plus® rats, mice, guinea pigs, hamsters, or gerbils. Examples of our more common biospecimen order requests are below.

Benefits

- Whole blood is collected fresh on shipment day.
- Samples are collected from VAF/Plus® or SPF animals.
- Biospecimen collection can be customized upon request.
- Samples for multiple species are available.
- All collections may be performed aseptically upon request.
- Organs can be perfused with saline upon request.

Blood Products

- Whole blood
- Serum/plasma
- Anticoagulants commonly used: K2 EDTA, K3 EDTA, sodium heparin, lithium heparin, sodium citrate

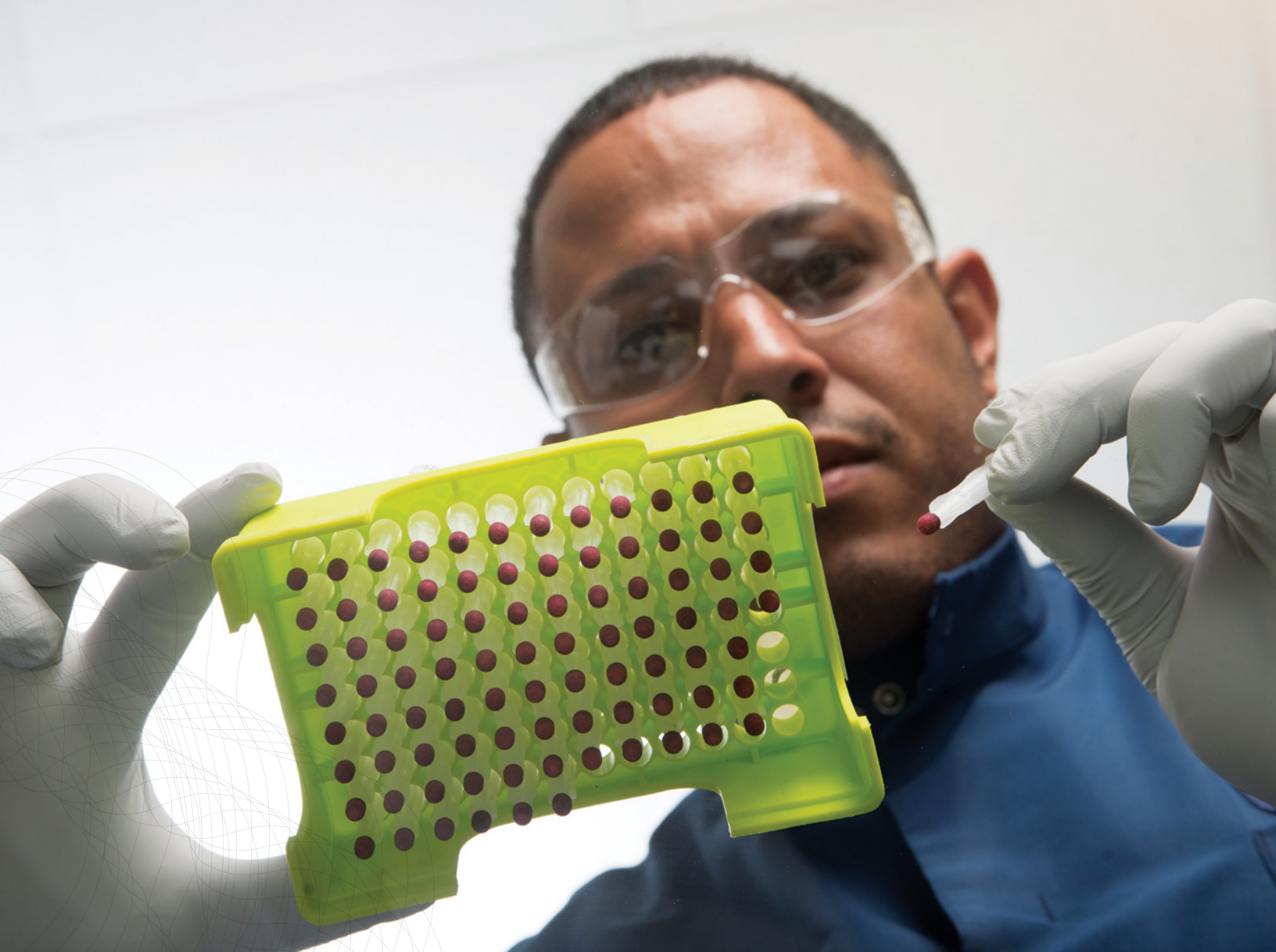
Tissues* and Organs

Adipose tissue	White
	Brown
Bladder	
Bone	
Brain	
Connective tissue	
Ears	
Eyes	
Gall bladder	
Gastrointestinal tract	Buccal cavity
	Caecum
	Esophagus
	Large intestine
	Rectum
	Small intestine
Glandular tissue	Stomach
	Salivary
	Thymus
Heart	Thyroid
Kidneys	
Liver	
Lungs	

Tissues* and Organs

Lymph nodes	
Muscle tissue	
Nervous tissue	
Pancreas	
Reproductive tract — male	Epididymus
	Penis
	Preputial gland
	Prostate
	Testes
	Vesicular gland
Reproductive tract — female	Vas deferens
	Cervix
	Fallopian tubes
	Ovaries
	Uterus
Skin	Vaginal fornix
Spleen	
Tail	
Trachea	
Vascular Tissue	Aorta
	Major arteries and veins

* Tissues can be shipped fresh in PBS, PBS with 25% sucrose, or customized if requested. Tissues may be flash frozen by immersion in liquid nitrogen, or fresh frozen, then stored in -80° C until shipped on dry ice.



360[™] Diagnostics

Charles River 360 Diagnostics[™] is the only comprehensive partner that offers solutions from prevention to resolution. Through innovations like the HemaTIP[™] Microsampler, Laboratory Testing Management[®] (LTM[™]), MALDI-TOF for microbial identification, and Exhaust Air Dust (EAD[®]) testing with our PCR Rodent Infectious Agent (PRIA[®]) panels, we can manage your animal health surveillance program effectively and efficiently. To learn more, visit www.criver.com/dx.

1.877.criver1

| www.criver.com

| askcharlesriver@crl.com

ANIMAL HEALTH SURVEILLANCE

Our diagnostic laboratory is a full-service rodent and rabbit necropsy laboratory with a complete spectrum of specialized services, including infectious disease PCR, serology, microbiology, pathology, and parasitology. We offer testing services on multiple laboratory animal species for both routine surveillance and diagnosis of diseases.

Dedicated to Saving You Time and Money

When it comes to your research, you can't put a price on value — so we don't. Below are just a few of the value-added services we provide on a daily basis absolutely free of charge.

LTM™ online free and secure system to store and access testing records and results	Complimentary sample collection and shipping supplies
	Free retesting
Consultations with Charles River professional scientific staff	Outbreak assistance
Single point of contact: Laboratory Services client support team	Rush results for emergency situations
	Budget-friendly pricing
Hands-on training and ongoing support for reagents customers	Continuing education and training

Health Monitoring Programs

Charles River offers several testing options that can either reduce or completely remove the use of sentinels from your health surveillance programs. Below we outline alternative, hybrid, and traditional health monitoring programs.

Alternative (Sentinel-Free) Programs

Charles River offers Exhaust Air Dust (EAD®) PCR testing as an alternative approach to screening the health of your animal colonies. The increased sensitivity and specificity of this sampling method enables us to detect viruses, bacteria, and parasites by screening ventilated caging systems and other environmental surfaces. This approach not only reduces or eliminates the need for sentinels, but it also increases the probability of detecting those infectious agents that are not readily detected by sentinels exposed to soiled bedding. Any of our standard PRIA® panels can be used or customized to more specifically meet your needs.

Rack Type	Sampling Level	Sample Types Options
Individually ventilated cages (IVC)	Rack-level	EAD® swab* Pre-filter media Rack collection device† Direct‡
Individually ventilated cages (IVC) with cage-level filtration	Cage-level	Cage filter media Direct‡
Static-top filter cages	Rack-level	Direct‡
Conventional open-top cages	Rack-level	Environmental swab§ Direct‡

* E.g., plenum swab, pre-filter swab, and/or exhaust hose swab

† Caging manufacturer sample collection device

‡ E.g., fecal pellets, body swab, oral swab

§ Swab various surfaces that are in contact with resident animals.

ANIMAL HEALTH SURVEILLANCE

Hybrid Programs

Hybrid programs allow for a combination of alternative (environmentally based) samples to be submitted in combination with direct animal (antemortem) samples such as fecal pellets, body swabs, and oral swabs, as well as sentinel serology.

Rack Type	Sampling Level	Sample Types Options
Individually ventilated cages (IVC)	Mixed	Blood/serum Direct† EAD® swab* Rack or cage filter media Cage swab
Static-top filter cages	Mixed	Blood/serum Direct† Cage swab
Conventional open-top cages	Mixed	Blood/serum Direct† Environmental swab‡

* E.g., plenum swab, pre-filter swab, and/or exhaust hose swab

† E.g., fecal pellets, body swab, oral swab

‡ Swab various surfaces that are in contact with resident animals.

Traditional Whole-Animal Sentinel Program

Whole animals can be submitted for a health monitoring (HM) protocol – samples will be collected in our necropsy laboratory and screened for the presence of infectious agents. Also, services offered as part of an HM protocol are available individually – samples can be collected at your facility and submitted directly to our laboratory for testing. Customized and FELASA-compliant testing is available upon request.

Protocol	Species	Serology*	PCR†	Microbiology‡	Parasitology	Pathology
HM Basic	Mouse, rat, hamster, g. pig, rabbit, and gerbil	(None)	<i>Lawsonia</i> (hamster only)	Upper respiratory and gastrointestinal tracts	Endoparasite and ectoparasite exams	Gross necropsy with histology of lesions
HM Basic (Immunodeficient)	Mouse and rat	(None)	<i>C.bovis</i> , <i>Pneumocystis</i> & <i>Mycoplasma pulmonis</i> (mouse only)			
HM Prevalent	Mouse and rat	Prevalent	(None)			
HM Standard	Mouse, rat, g. pig, and rabbit	Tracking	(None)			
HM Assessment	Mouse, rat, hamster, g. pig, rabbit, and gerbil	Assessment	<i>Lawsonia</i> (hamster only)			
HM Plus	Mouse and rat	Assessment Plus	(None)	(None)		
HM Plus without Microbiology	Mouse and rat	Assessment Plus	(None)			
HM Quarterly FELASA	Mouse and rat	FELASA Quarterly	<i>Helicobacter</i>			
HM Annual FELASA	Mouse and rat	FELASA Annual	<i>Helicobacter</i>	Upper respiratory and gastrointestinal tracts		
Build your own custom protocol	Mouse, rat, hamster, g. pig, rabbit, and gerbil					

* For a full list of serology agents, please see serology profiles section.

† In addition to the included PCR tests, samples can be collected and screened for the agent(s) of your choice (e.g., *Helicobacter*) for an added fee.

‡ For more information on microbiology services, please see microbiology culture section.

ANIMAL HEALTH SURVEILLANCE

PRIA® PCR Infectious Agent Panels

Detect viruses, bacteria and parasites in principal animals by screening non-invasive samples with a PRIA® panel.

Up to 10 samples (e.g., one fecal pellet each from 10 animals) can be combined and submitted as one pool for PCR testing at no additional charge. View the agents in our standard panels to request a custom panel as needed.

Mouse and Rat PRIA® Panels	Sample Type				EAD® Swab or Environmental Sample*
	Fecal Pellets	Body Swab	Oral Swab	Lung	
Prevalent PRIA®	•	•	•	••	•
Prevalent (Immunodeficient) PRIA®	•	•	•	••	•
Fecal PRIA®	•				
Surveillance Plus PRIA®†	•	•	•	••	•
FELASA Basic PRIA® (3-month)	•	•	••		•
FELASA Complete PRIA® (Annual)	•	•	•		•
Bacteria PRIA®	•	•	•		•
Environmental Prevalent PRIA®	••	••	••		•
Environmental Surveillance Plus PRIA®	••	••	••		•
Environmental Complete Mouse/Rat PRIA®	••	••	••		•

• Required sample type

•• Add for increased sensitivity

* See animal health surveillance section for more information pertaining to your cage/rack system.

† Lung is required for Rat Surveillance Plus PRIA® and may be added for increased sensitivity for Mouse Surveillance Plus PRIA®.

ANIMAL HEALTH SURVEILLANCE

Mouse PRIA® Panels — Direct Animal, Exhaust Air Dust (EAD®), and Environmental Sampling

	Prevalent	Prevalent (Immunodeficient)	Fecal*	Surveillance Plus	FELASA Basic (3-Month)	FELASA Complete (Annual)	Bacteria- Only
Viruses							
Mouse parvoviruses (MVM/MPV)	•	•	•	•	•	•	
Murine norovirus (MNV)	•	•	•	•	•	•	
Mouse coronavirus (MHV)	•	•	•	•	•	•	
Murine rotavirus (MRV/EDIM)	•	•	•	•	•	•	
Mouse theilovirus (TMEV, GDVII)	•	•	•	•	•	•	
Adenovirus type 1 & 2 (MAV-1 & MAV-2)			•	•		•	
Reovirus type 1, 2, 3, 4			•	•		•	
Pneumonia virus of mice				•		•	
Sendai virus				•		•	
Ectromelia (mousepox)			•	•		•	
Lymphocytic choriomeningitis virus			•	•		•	
New World hantavirus†							
Bacteria							
<i>Helicobacter</i>	•	•	•	•	•	•	•
<i>Citrobacter rodentium</i>			•	•		•	•
<i>Mycoplasma pulmonis</i>				•		•	•
<i>Streptobacillus moniliformis</i>			•	•		•	•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)	•	•	•	•	•	•	•
<i>Clostridium piliforme</i>			•	•		•	•
CAR <i>Bacillus</i>				•			•
<i>Pseudomonas aeruginosa</i>				•			•
<i>Salmonella</i>			•	•		•	•
<i>Campylobacter</i>			•	•			•
<i>Bordetella bronchiseptica</i>				•			•
<i>Bordetella hinzii</i>			•	•			•
<i>Corynebacterium kutscheri</i>			•	•		•	•
<i>Corynebacterium bovis</i>		•	•	•			•
<i>Staphylococcus aureus</i>		•	•	•			•
<i>Streptococcus pneumoniae</i>		•	•	•	•	•	•
<i>Klebsiella pneumoniae</i>		•	•	•			•
<i>Klebsiella oxytoca</i>		•	•	•			•
Beta hemolytic <i>Streptococcus</i> group A				•	•	•	•
Beta hemolytic <i>Streptococcus</i> group B		•	•	•	•	•	•
Beta hemolytic <i>Streptococcus</i> group C			•	•	•	•	•
Beta hemolytic <i>Streptococcus</i> group G			•	•	•	•	•
<i>Proteus mirabilis</i>		•	•	•			•
<i>Leptospira</i> †							
<i>Francisella tularensis</i> †							
Parasites/Protozoa/Fungi							
Fur mites (<i>Myobia</i> , <i>Myocoptes</i> , <i>Radfordia</i>)	•	•		•	•	•	
Pinworms (<i>Aspicularis</i> , <i>Syphacia</i>)	•	•		•	•	•	
<i>Giardia</i>			•	•	•	•	
<i>Spironucleus muris</i>	•	•	•	•	•	•	
<i>Cryptosporidium</i>			•	•	•	•	
<i>Entamoeba</i>	•	•	•	•	•	•	
<i>Pneumocystis</i>	•	•		•			
<i>Demodex</i>		•		•			
<i>Tritrichomonas</i>	•	•		•			

* Direct animal sampling only

† Available as a wild rodent add-on

ANIMAL HEALTH SURVEILLANCE

Rat PRIA® Panels — Direct Animal, Exhaust Air Dust (EAD®), and Environmental Sampling

	Prevalent	Fecal	Surveillance Plus	FELASA Basic (3-Month)	FELASA Complete (Annual)	Bacteria-Only
Viruses						
NEW Rat polyoma virus 2 (RatPyV2)			•			
Rat parvoviruses (H-1, KRV, RPV, RMV)	•	•	•	•	•	
Rat coronavirus (RCV, SDAV)	•	•	•	•	•	
Rat theilovirus (RTV)	•	•	•	•	•	
Adenovirus type 1 & 2 (MAV-1 & MAV-2)		•	•		•	
Reovirus type 1, 2, 3, 4		•	•		•	
Pneumonia virus of mice			•	•	•	
Sendai virus			•		•	
Seoul (hantavirus)		•	•		•	
New World hantavirus*						
Bacteria						
<i>Helicobacter</i>	•	•	•	•	•	•
<i>Mycoplasma pulmonis</i>			•	•	•	•
<i>Streptobacillus moniliformis</i>		•	•		•	•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)	•	•	•	•	•	•
<i>Clostridium piliforme</i>		•	•	•	•	•
CAR <i>Bacillus</i>			•		•	•
<i>Pseudomonas aeruginosa</i>			•			•
<i>Salmonella</i>		•	•		•	•
<i>Campylobacter</i>		•	•			•
<i>Bordetella bronchiseptica</i>			•			•
<i>Corynebacterium kutscheri</i>		•	•			•
<i>Staphylococcus aureus</i>		•	•			•
<i>Streptococcus pneumoniae</i>		•	•	•	•	•
<i>Klebsiella pneumoniae</i>		•	•			•
<i>Klebsiella oxytoca</i>		•	•			•
Beta hemolytic <i>Streptococcus</i> group A			•	•	•	•
Beta hemolytic <i>Streptococcus</i> group B		•	•	•	•	•
Beta hemolytic <i>Streptococcus</i> group C		•	•	•	•	•
Beta hemolytic <i>Streptococcus</i> group G		•	•	•	•	•
<i>Proteus mirabilis</i>		•	•			•
<i>Leptospira</i> *						
<i>Francisella tularensis</i> *						
Parasites/Protozoa/Fungi						
Fur mites (<i>Myobia</i> , <i>Myocoptes</i> , <i>Radfordia</i>)	•		•	•	•	
Pinworms (<i>Aspicularis</i> , <i>Syphacia</i>)	•		•	•	•	
<i>Giardia</i>		•	•	•	•	
<i>Spiroplasma muris</i>	•	•	•	•	•	
<i>Cryptosporidium</i>		•	•	•	•	
<i>Entamoeba</i>	•	•	•	•	•	
<i>Pneumocystis</i>	•		•		•	

* Available as a wild rodent add-on

ANIMAL HEALTH SURVEILLANCE

Rabbit PRIA® Panels — Direct Animal Sampling*

	FELASA Basic (3-Month)	FELASA Complete (Annual)	Surveillance Plus
Viruses			
Murine rotavirus (MRV/EDIM)	•	•	•
Lymphocytic choriomeningitis virus			•
Rabbit picobirnavirus			•
Rabbit hepatitis E virus			•
Bacteria			
<i>Helicobacter</i>			•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)			•
<i>Clostridium piliforme</i>	•	•	•
CAR <i>Bacillus</i>		•	•
<i>Pseudomonas aeruginosa</i>			•
<i>Salmonella</i>		•	•
<i>Bordetella bronchiseptica</i>	•	•	•
<i>Staphylococcus aureus</i>			•
<i>Lawsonia</i>			•
<i>Pasteurella multocida</i>	•	•	•
<i>Treponema paraluis-cuniculi</i>			•
Parasites/Protozoa/Fungi			
Pinworms (<i>Passalurus ambiguus</i>)	•	•	•
<i>Francisella tularensis</i> †			
<i>Cryptosporidium</i>	•	•	•
<i>Entamoeba</i>			•
<i>Encephalitozoon cuniculi</i>	•	•	•
<i>Eimeria coccidia</i>			•

* Fecal pellets, body swab, and oral swab required for all rabbit and gerbil PRIA® panels

† Available as an add-on assay

ANIMAL HEALTH SURVEILLANCE

Gerbil PRIA® Panels — Direct Animal Sampling*

	Surveillance Plus
Viruses	
Murine rotavirus (MRV/EDIM)	•
Sendai virus	•
Lymphocytic choriomeningitis virus	•
Bacteria	
<i>Helicobacter</i>	•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)	•
<i>Pseudomonas aeruginosa</i>	•
<i>Salmonella</i>	•
<i>Bordetella bronchiseptica</i>	•
<i>Staphylococcus aureus</i>	•
<i>Streptococcus pneumoniae</i>	•
<i>Klebsiella pneumoniae</i>	•
<i>Klebsiella oxytoca</i>	•
Beta hemolytic <i>Streptococcus</i> group B	•
Beta hemolytic <i>Streptococcus</i> group C	•
Beta hemolytic <i>Streptococcus</i> group G	•
<i>Pasteurella multocida</i>	•
Parasites/Protozoa/Fungi	
Fur mites	•
Pinworms	•
<i>Giardia</i>	•
<i>Spironucleus muris</i>	•
<i>Cryptosporidium</i>	•
<i>Entamoeba</i>	•

* Fecal pellets, body swab, and oral swab required for all rabbit and gerbil PRIA® panels

ANIMAL HEALTH SURVEILLANCE

Hamster* PRIA® Panels — Direct Animal Sampling*

	FELASA Basic (3-Month)	FELASA Complete (Annual)	Surveillance Plus
Viruses			
Parvovirus (HPV/MVM/MPV)			•
Murine rotavirus (MRV/EDIM)			•
Reovirus type 1, 2, 3, 4			•
Pneumonia virus of mice			•
Sendai virus	•	•	•
Lymphocytic choriomeningitis virus	•	•	•
Polyoma virus			•
Bacteria			
<i>Helicobacter</i>		•	•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)	•	•	•
<i>Clostridium piliforme</i>		•	•
<i>Pseudomonas aeruginosa</i>			•
<i>Salmonella</i>		•	•
<i>Campylobacter</i>			•
<i>Bordetella bronchiseptica</i>			•
<i>Corynebacterium kutscheri</i>		•	•
<i>Corynebacterium bovis</i>			•
<i>Staphylococcus aureus</i>			•
<i>Streptococcus pneumoniae</i>			•
<i>Klebsiella pneumoniae</i>			•
<i>Klebsiella oxytoca</i>			•
Beta hemolytic <i>Streptococcus</i> group A			•
Beta hemolytic <i>Streptococcus</i> group B			•
Beta hemolytic <i>Streptococcus</i> group C			•
Beta hemolytic <i>Streptococcus</i> group G			•
<i>Proteus mirabilis</i>			•
<i>Pasteurellaceae</i>			•
<i>Lawsonia</i>			•
<i>Pasteurella multocida</i>			•
Parasites/Protozoa/Fungi			
Fur mites	•	•	•
Pinworms	•	•	•
<i>Giardia</i>	•	•	•
<i>Spironucleus muris</i>	•	•	•
<i>Cryptosporidium</i>	•	•	•
<i>Entamoeba</i>	•	•	•
<i>Encephalitozoon cuniculi</i>			•
<i>Demodex</i>	•	•	•

* Fecal pellets, body swabs, and oral swabs required for all hamster PRIA® panels

ANIMAL HEALTH SURVEILLANCE

Guinea Pig PRIA® Panels — Direct Animal Sampling*

	FELASA Basic (3-Month)	FELASA Complete (Annual)	Surveillance Plus
Viruses			
Murine rotavirus (MRV/EDIM)			•
Reovirus type 1, 2, 3, 4			•
Sendai virus	•	•	•
Lymphocytic choriomeningitis virus			•
Guinea pig adenovirus	•	•	•
Guinea pig cytomegalovirus		•	•
Guinea pig PIV 3	•	•	•
Bacteria			
<i>Helicobacter</i>			•
<i>Mycoplasma pulmonis</i>			•
<i>Streptobacillus moniliformis</i>		•	•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)			•
<i>Clostridium piliforme</i>		•	•
<i>Pseudomonas aeruginosa</i>			•
<i>Salmonella</i>		•	•
<i>Campylobacter</i>			•
<i>Bordetella bronchiseptica</i>	•	•	•
<i>Corynebacterium kutscheri</i>	•	•	•
<i>Staphylococcus aureus</i>			•
<i>Streptococcus pneumoniae</i>	•	•	•
<i>Klebsiella pneumoniae</i>			•
<i>Klebsiella oxytoca</i>			•
Beta hemolytic <i>Streptococcus</i> group A	•	•	•
Beta hemolytic <i>Streptococcus</i> group B	•	•	•
Beta hemolytic <i>Streptococcus</i> group C	•	•	•
Beta hemolytic <i>Streptococcus</i> group G	•	•	•
<i>Pasteurella multocida</i>			•
Parasites/Protozoa/Fungi			
<i>Giardia</i>	•	•	•
<i>Spironucleus muris</i>	•	•	•
<i>Cryptosporidium</i>	•	•	•
<i>Entamoeba</i>	•	•	•
<i>Encephalitozoon cuniculi</i>		•	•

* Fecal pellets and oral swabs required for all guinea pig PRIA® panels

MOUSE

Our primary serology testing method is the Multiplexed Fluorometric ImmunoAssay® or MFIA®. Additionally, we utilize other methods such as the Indirect Fluorescent Antibody (IFA) test, Enzyme-Linked Immunosorbent Assay (ELISA), and Western Blot to confirm questionable or positive results, as well as to screen select rare agents. Blood or diluted serum samples collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Mouse Serology Profiles

Agent*	Parvovirus	Prevalent	Tracking	Assessment	Assessment Plus	FELASA Quarterly	FELASA Annual
MPV†	•	•	•	•	•	•	•
MVM	•	•	•	•	•	•	•
Generic parvovirus NS-1	•	•	•	•	•	•	•
MHV†		•	•	•	•	•	•
MNV		•	•	•	•	•	•
TMEV (GDVII)		•	•	•	•	•	•
EDIM (ROTA-A)		•	•	•	•	•	•
SEND			•	•	•		•
PVM			•	•	•		•
REO			•	•	•		•
MPUL			•	•	•		•
LCMV				•	•		•
MAV-1 & MAV-2†				•	•		•
ECTRO				•	•		•
K				•	•		
POLY				•	•		
MCMV					•		
HTNV (HANT)					•		
ECUN					•		
CARB					•		
MTLV					•		
PHV					•		
LDV					•		
CPIL							•
Sample suitability control: tissue	•	•	•	•	•	•	•
Sample suitability control: anti-mouse IgG	•	•	•	•	•	•	•
System suitability control: mouse IgG	•	•	•	•	•	•	•

* Agent abbreviations are defined in the Glossary of Terms.

† Multiple assays are included. MPV: several recombinant viral coat proteins (VP2) to detect seroconversion to MPV-1, MPV-2, and MPV-5. MHV: a recombinant MHV nucleocapsid (N) protein and two highly purified whole-viral lysate antigens. MAV: highly purified recombinant antigens to both FL and K87.

The HemaTIP™ blood micro-sampler simplifies the blood collection process by placing the media on the tip of an easy-to-hold stylus. The tip only needs to touch the blood, and its super-absorptive matrix media wicks the sample in 3-6 seconds. To learn more, go to www.criver.com/hematip.



RAT

Our primary serology testing method is the Multiplexed Fluorometric ImmunoAssay® or MFI®. Additionally, we utilize other methods such as the Indirect Fluorescent Antibody Test (IFA), Enzyme-Linked Immunosorbent Assay (ELISA) and Western Blot to confirm questionable or positive results, as well as to screen select rare agents. Blood or diluted serum samples collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Rat Serology Profiles

Agent*	Parvovirus	Prevalent	Tracking	Assessment	Assessment Plus	FELASA Quarterly	FELASA Annual
RatPyV2 (Rat polyomavirus 2)					•		
RPV	•	•	•	•	•	•	•
H-1	•	•	•	•	•	•	•
KRV	•	•	•	•	•	•	•
RMV	•	•	•	•	•	•	•
Generic parvovirus NS-1	•	•	•	•	•	•	•
SDAV		•	•	•	•	•	•
RTV		•	•	•	•	•	•
PCAR		•	•	•	•		•
SEND			•	•	•		•
PVM			•	•	•	•	•
REO			•	•	•		•
MPUL			•	•	•	•	•
LCMV				•	•		
MAV-1 & MAV-2				•	•		•
HTNV (HANT)					•		•
ECUN					•		
CARB					•		•
IDIR (ROTA-B)					•		
CPIL						•	•
Sample suitability control: tissue	•	•	•	•	•	•	•
Sample suitability control: anti-rat IgG	•	•	•	•	•	•	•
System suitability control: rat IgG	•	•	•	•	•	•	•

* Agent abbreviations are defined in the Glossary of Terms.

The HemaTIP™ blood micro-sampler simplifies the blood collection process by placing the media on the tip of an easy-to-hold stylus. The tip only needs to touch the blood, and its super-absorptive matrix media wicks the sample in 3-6 seconds. To learn more, go to www.criver.com/hematip.



Our primary serology testing method is the Multiplexed Fluorometric ImmunoAssay® or MFIA®. Additionally, we utilize other methods such as the Indirect Fluorescent Antibody Test (IFA), Enzyme-Linked Immunosorbent Assay (ELISA) and Western Blot to confirm questionable or positive results, as well as to screen select rare agents. Blood or diluted serum samples collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Hamster* Serology Profiles

Agent†	Assessment	FELASA Quarterly	FELASA Annual
SEND	•	•	•
PIV-5	•		
PVM	•		
REO	•		
LCMV	•	•	•
ECUN	•		
CPIL			•
Sample suitability control: tissue	•	•	•
Sample suitability control: anti-hamster IgG	•	•	•
System suitability control: hamster IgG	•	•	•

* Applicable for golden Syrian hamsters only. Other strains should be screened using the serology profile for Miscellaneous Rodent Species.
† Agent abbreviations are defined in the Glossary of Terms.

The HemaTIP™ blood microasampler simplifies the blood collection process by placing the media on the tip of an easy-to-hold stylus. The tip only needs to touch the blood, and its super-absorptive matrix media wicks the sample in 3-6 seconds. To learn more, go to www.criver.com/hematip.



GUINEA PIG

Our primary serology testing method is the Multiplexed Fluorometric ImmunoAssay® or MFIA®. Additionally, we utilize other methods such as the Indirect Fluorescent Antibody Test (IFA), Enzyme-Linked Immunosorbent Assay (ELISA) and Western Blot to confirm questionable or positive results, as well as to screen select rare agents. Blood or diluted serum samples collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Guinea Pig Serology Profiles

Agent*	Assessment	FELASA Quarterly	FELASA Annual
SEND	•	•	•
PIV-5	•		
PVM	•		
REO	•		
LCMV	•		
ECUN	•		•
PIV-3	•	•	•
MPUL	•		
CPIL			•
GAV	•		
GpCMV			•
Sample suitability control: tissue	•	•	•
Sample suitability control: anti-guinea pig IgG	•	•	•
System suitability control: guinea pig IgG	•	•	•

* Agent abbreviations are defined in the Glossary of Terms.

The HemaTIP™ blood microasampler simplifies the blood collection process by placing the media on the tip of an easy-to-hold stylus. The tip only needs to touch the blood, and its super-absorptive matrix media wicks the sample in 3-6 seconds. To learn more, go to www.criver.com/hematip.



RABBIT

Our primary serology testing method is the Multiplexed Fluorometric ImmunoAssay® or MFIA®. Additionally, we utilize other methods such as the Indirect Fluorescent Antibody Test (IFA), Enzyme-Linked Immunosorbent Assay (ELISA) and Western Blot to confirm questionable or positive results, as well as to screen select rare agents. Blood or diluted serum samples collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Rabbit Serology Profiles

Agent*	Tracking	Assessment	FELASA Quarterly	FELASA Annual
ECUN	•	•	•	•
CARB	•	•		•
TREP	•	•		
CPIL		•	•	•
PIV-1		•		
PIV-5 (PIV-2)		•		
REO		•		
ROTA		•	•	•
LCMV		•		
TOXO		•		
RHDV			•	•
MYXO†				
Sample suitability control: tissue	•	•	•	•
Sample suitability control: anti-rabbit IgG	•	•	•	•
System suitability control: rabbit IgG	•	•	•	•

* Agent abbreviations are defined in the Glossary of Terms.

† Available as an add-on

The HemaTIP™ blood micro-sampler simplifies the blood collection process by placing the media on the tip of an easy-to-hold stylus. The tip only needs to touch the blood, and its super-absorptive matrix media wicks the sample in 3-6 seconds. To learn more, go to www.criver.com/hematip.



GERBIL AND MISCELLANEOUS RODENT

Our primary serology testing method is the Multiplexed Fluorometric ImmunoAssay® or MFIA®. Additionally, we utilize other methods such as the Indirect Fluorescent Antibody Test (IFA), Enzyme-Linked Immunosorbent Assay (ELISA) and Western Blot to confirm questionable or positive results, as well as to screen select rare agents. Blood or diluted serum samples collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Gerbil and Miscellaneous Rodent* Serology Profiles

Agent†	Gerbil Tracking	Gerbil Assessment	Rodent Assessment
LCMV	•	•	•
CPIL	•	•	
MHV		•	•
REO		•	•
SEND		•	•
PVM		•	•
MVM		•	•
ROTA		•	•
PIV-2		•	•
PIV-3		•	•
HTNV (HANT)		•	•
PHV		•	•
ECUN			•
Sample suitability control: tissue	•	•	•

* For applicable species (e.g., Armenian hamster, cotton rat, Peromyscus, ground squirrel), contact Charles River.

† Agent abbreviations are defined in the Glossary of Terms.

The HemaTIP™ blood micro-sampler simplifies the blood collection process by placing the media on the tip of an easy-to-hold stylus. The tip only needs to touch the blood, and its super-absorptive matrix media wicks the sample in 3-6 seconds. To learn more, go to www.criver.com/hematip.



MICROBIOLOGY CULTURE

This service can be used in conjunction with an environmental monitoring (e.g., feed, bedding, water) or animal health surveillance program, and diagnostic evaluation. Live animals, samples (e.g., swabs, transport media), and organisms for identification can be collected at your facility and submitted directly to our laboratory for testing. Matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry analysis is used for efficient and accurate identification of pure single colonies from culture. See below for a list of agents. Once you are ready to submit samples, visit LTM™ to create your order online.

Upper Respiratory Culture	Mouse	Rat	Rabbit	Gerbil	Hamster	Guinea Pig
<i>Bordetella bronchiseptica</i>	•	•	•	•	•	•
<i>Corynebacterium kutscheri</i>	•	•	•	•	•	•
<i>Klebsiella oxytoca</i>	•	•	•	•	•	•
<i>Klebsiella pneumoniae</i>	•	•	•	•	•	•
<i>Pasteurella multocida</i>	•	•	•	•	•	•
<i>Pasteurella pneumotropica</i> (Heyl & Jawetz)	•	•	•	•	•	•
<i>Pseudomonas aeruginosa</i>	•	•	•	•	•	•
<i>Staphylococcus aureus</i>	•	•	•	•	•	•
<i>Streptococcus beta hemolytic</i>	•	•	•	•	•	•
<i>Streptococcus pneumoniae</i>	•	•	•	•	•	•
<i>Streptococcus zooepidemicus</i>						•
<i>Proteus mirabilis</i>	•	•	•	•	•	•
Other bacteria	•	•	•	•	•	•

Gastrointestinal Tract Culture	Mouse	Rat	Rabbit	Gerbil	Hamster	Guinea Pig
<i>Citrobacter rodentium</i>	•					
<i>Klebsiella oxytoca</i>	•	•	•	•	•	•
<i>Klebsiella pneumoniae</i>	•	•	•	•	•	•
<i>Pseudomonas aeruginosa</i>	•	•	•	•	•	•
<i>Salmonella</i>	•	•	•	•	•	•
<i>Campylobacter</i> spp.					•	
<i>Campylobacter coli</i>					•	
<i>Campylobacter jejuni</i>					•	
Other bacteria	•	•	•	•	•	•

Additional Microbiology Services*

Abscess/lesion culture

Aerobic culture

Anaerobic culture

Fungal culture

MALDI-TOF identification

* Euthanasia and collection fees may apply with live animal submissions.

Surface Testing

Environmental swab (culture) for rodent pathogens

Surface swab (culture) for relative count
(genus identification)

RODAC® plate count

RODAC® plate count with identification

NOTE: For comprehensive screening of germ-free colonies, please see microbiome services.
RODAC® is a registered trademark of Becton, Dickinson and Company.

Environmental Monitoring

Microbial/bioburden (count)*

Sterility (+/- determination)*

Water pH

Limulus amebocyte lysate (LAL) assay, non-GXP

* Sample types include water, rodent feed, and rodent bedding.
Subculture identification per colony upon request.

RODENT AND RABBIT PARASITOLOGY

Samples (e.g., feces, swabs, or tapes) collected at your facility can be submitted directly to our laboratory for testing. Once you are ready to submit samples, visit LTM™ to create your order online.

Sample Type	Test
Feces*	Fecal concentration centrifugation (FCC)
	<i>Cryptosporidium</i> PCR
	<i>Entamoeba</i> PCR
	<i>Giardia</i> (<i>G. lamblia</i> , <i>G. muris</i>) PCR
	<i>Spironucleus muris</i> PCR
	<i>Tritrichomonas</i> PCR
Fur swab*	Fur mite PCR
	<i>Demodex</i> PCR
Feces, anal, and/or fur swab*	Custom parasitology PCR panel
	Pinworm PCR
Tape	Tape test for ectoparasites
	Tape test for endoparasites
Live animal	Direct exam for ectoparasites
	Direct exam for endoparasites
	Wet mount for protozoa

* Up to 8 samples for FCC or 10 samples for PCR can be pooled and tested as a single group with one result reported.

360 DIAGNOSTICS™

NECROPSY AND
HISTOPATHOLOGY SERVICES

Services range from routine diagnostic assessment to pathology support or custom protocol design with report.
We also offer necropsy training for your staff.

Sample Types	Service
Live animal	Full diagnostic histopathology
	Gross necropsy exam
	Whole body perfusion
	Blood collection
	Organ survey (basic, extended)
	Organ culture
	Organ weight
	Body weight
	Snap freezing tissues
Fixed tissue and/or paraffin block	Extensive customized tissue collection protocols
	Routine H&E and specialized staining techniques
	Trim/cassette/embed
	Slide preparation and evaluation
	Decal: large and small tissues
	Cassette to paraffin block
Slide	Interpretation
	Digital images

SIMIAN (NONHUMAN PRIMATE) HEALTH SURVEILLANCE

Services available for samples only; whole animals are not accepted.

Service	Item	Included
Serology	Macaque Tracking Profile without MV	SIV*, SRV*, STLV, HBV
	Macaque Tracking Profile	SIV*, SRV*, STLV, HBV, MV
	Macaque Assessment Profile	Macaque tracking profile and SFV, SCMV, MRV, SVV, SV-40
	Flavivirus Profile	Dengue virus, West Nile virus, Zika virus
	TB Plex	Tuberculosis multiplex assay
	Custom MFIA Serology Profile	Panel of two (2) or more infectious agents
	Single Agent	Single/individual infectious agent
PCR	Blood PCR Panel	<i>Plasmodium</i> (Malaria), Lymphocryptovirus (Old World), MRV (Macaca papio rhadinovirus-2), SRV, SIV, SFV, STLV
	Fecal PCR Panel	<i>Campylobacter</i> , <i>Helicobacter</i> , <i>Salmonella</i> , <i>Shigella</i> , <i>Yersinia</i> (<i>Y. enterocolitica</i> , <i>Y. pseudotuberculosis</i>)†
	Flavivirus PCR Panel	Dengue virus, West Nile virus, Zika virus
	Custom PCR Panel	Panel of two (2) or more infectious agents
	Single agent	Single/individual infectious agent
Microbiology	Simian culture for <i>Salmonella</i>	
	Simian culture for <i>Shigella</i>	
	Simian culture <i>Campylobacter</i>	
	Simian culture for Sal/Shig	
	Simian culture Sal/Shig/Campy	
	Simian culture Sal/Shig/Yers	
	Simian culture for Campy/Sal/Shig/Yers	
Parasitology	Fecal concentration centrifugation (FCC)	Detects ova and cysts
Blood Typing	NHP blood typing	NHP blood typing by PCR

* Multiple assays are included, both whole-viral lysate and highly purified recombinant antigens.

† Available for Old and New World.

Available Agents for Add-On	Old World	New World	Serology	PCR	PCR Sample type
<i>Mycoplasma</i> genus	•	•		•	Fecal swab, saliva/oral swab
Parainfluenza virus 5 [PIV-5 (SV-5)]	•		•		n/a
<i>Trypanosoma cruzi</i> (Chagas)	•		•	•	Blood, serum, plasma
Hepatitis A virus (HEP-A)	•		•	•	Blood, serum, plasma
Epstein-Barr virus (EBV)	•		•	•	Saliva/oral swab, blood
<i>Giardia</i>	•	•		•	Fecal swab
Simian <i>Cryptosporidium</i>	•	•		•	Fecal swab
Simian cytomegalovirus (SCMV)	•		•	•	Blood, serum, plasma
Simian varicella virus (SVV)	•			•	Blood, skin swab
Herpes B virus (HBV)	•		•	•	Blood, serum, plasma
Lymphocryptovirus	•	•	*	•	Saliva/oral swab, blood
Yellow fever	•		•	•	Blood, serum, plasma
Saimiriine herpesvirus 1 (SaHV-1)		•	*	*	Blood
Saimiriine herpesvirus 2 (SaHV-2)		•	*	*	Blood
Squirrel monkey CMV (SqCMV)		•	*	*	Blood
Measles	•	•	*	*	Blood
Tuberculosis (TB)	•	•	*	•	Lung, saliva/oral swab
NEW Filovirus	•		•		n/a
Hepatitis B - surface antigen	•		•		n/a
Hepatitis B - surface antigen antibody	•		•		n/a
Hepatitis B - core antibody	•		•		n/a

* Please inquire

ZEBRAFISH HEALTH SURVEILLANCE

Charles River offers zebrafish health surveillance for the research community.

Service	Test Name	Includes	Sampling Unit
Multiple Services	HM Plus	Necropsy, histopathology workup, aerobic culture, PCR for common infectious agents	Per 65 fish in a single submission
Bacteriology	Renal Culture	Culture from zebrafish kidney; includes isolation and identification	Per fish
Histopathology	Processing (with H&E Stain)	Trim, embed, create slides, and H&E staining	Per fish
	Special Staining	Multiple special stains available upon request	Per fish
	Pathologist Interpretation	Pathologist interpretation of stained slides	Per fish
Infectious Disease PCR	<i>Mycobacterium</i> Panel	<i>Mycobacterium abscessus</i> , <i>M. chelonae</i> , <i>M. fortuitum</i> , <i>M. haemophilum</i> , <i>M. marinum</i> , <i>M. peregrinum</i>	Per pool of up to 5 fish
	Modified Basic Panel	<i>Mycobacterium</i> Panel, <i>Aeromonas hydrophila</i> , <i>Pseudocapillaria tomentosa</i> , <i>Pseudoloma neurophilia</i>	Per pool of up to 5 fish
	Modified Surveillance Plus Panel	Modified Basic Panel, <i>Edwardsiella ictaluri</i> , <i>Flavobacterium columnare</i> , <i>Ichthyophthirius multifiliis</i> , <i>Piscinoodinium pillulare</i> , <i>Pleistophora hyphessobryconis</i> , <i>Saprolegnia brachydanis</i>	Per pool of up to 5 fish
	Custom Panel	Visit LTM™ to select from list of zebrafish pathogen assays	Per pool of up to 5 fish
	Single Agent Test	Visit LTM™ to select from list of zebrafish pathogen assays	Per pool of up to 5 fish

FERRET HEALTH SURVEILLANCE

Services available for samples only; whole animals are not accepted. Once you are ready to submit samples, visit LTM™ to create your order online. Custom profiles and single agent testing are available upon request.

Service	Item
Infectious Disease PCR	Custom panel (2 or more agents)
	Single agent test
Histology	Custom histology
Parasitology	Custom parasitology
Microbiology	Custom culture and identification

Ferret Assays

Agent	PCR	Microbiology
Aleutian disease virus (parvovirus)	•	
Canine distemper virus (paramyxovirus)	•	
Ferret coronaviruses (enteric and systemic)	•	
Group A rotavirus	•	
Influenza A (INFA)	•	
Beta hemolytic <i>Streptococcus</i> (group B)	•	•
Beta hemolytic <i>Streptococcus</i> (group C)	•	•
Beta hemolytic <i>Streptococcus</i> (group G)	•	•
<i>Bordetella bronchiseptica</i>	•	•
<i>Campylobacter</i> genus (<i>C. coli</i> , <i>C. jejuni</i>)	•	•
<i>Clostridium piliforme</i>	•	
<i>Helicobacter</i> genus (<i>H. mustelae</i>)	•	
<i>Klebsiella oxytoca</i>	•	•
<i>Klebsiella pneumoniae</i>	•	•
<i>Lawsonia intracellularis</i>	•	
<i>Mycoplasma</i> genus	•	
<i>Mycoplasma mustelae</i>	•	
<i>Pasteurella multocida</i>	•	•
<i>Salmonella</i> genus	•	•
<i>Staphylococcus aureus</i>	•	•
<i>Staphylococcus xylosum</i>	•	
<i>Streptococcus pneumoniae</i>	•	•
<i>Cryptosporidium</i>	•	
<i>Giardia</i> genus (<i>G. lamblia</i> , <i>G. muris</i>)	•	
<i>Toxoplasma gondii</i>	•	

MFIA® REAGENTS

HemaTIP™ microsampler collection method is available to MFIA® reagent customers for in-house use only.

Commercial use of Charles River reagents requires specific licensing. Please inquire for further details.

MFIA® Bead Mixture

Each unit is sufficient for one plate of 96 tests. Sample and system suitability controls included in profile mixture. Custom bead mixtures are available upon request. Visit www.criver.com/serologyreagents to review the testing procedures in the Methods Manual and to place an order.

Item	Tests Included**
Mouse Parvovirus	MPV-1, MPV-2, MPV-5, MVM, NS-1
Mouse Prevalent	Mouse parvovirus profile and MHV, MNV, TMEV (GDVII), EDIM (ROTA-A)
Mouse Tracking	Mouse prevalent profile and SEND, PVM, REO, MPUL
Mouse Assessment	Mouse tracking profile and LCMV, MAV, ECTRO, K, POLY
Mouse Assessment Plus	Mouse assessment profile and MCMV, HTNV (HANT), ECUN, CARB, CPIL, MTLV, PHV, LDV
Rat Prevalent	RPV, H-1, KRV, RMV, NS-1, SDAV, RTV, PCAR
Rat Tracking	Rat prevalent profile and SEND, PVM, REO, MPUL
Rat Assessment Plus	Rat tracking profile and LCMV, MAV, HTNV (HANT), ECUN, CARB, CPIL, IDIR (ROTA-B), RatPyV2
Macaque Tracking	SIV†, SRV†, STLV, HBV, MV
Macaque Assessment	Macaque tracking profile and SFV, SCMV, MRV, SV-40, SVV
Macaque TB Plex	Tuberculosis multiplex assay
Baboon Tracking	HPV-2, STLV, SIV, SA-11, MV
African Green Tracking	SA-8, STLV, SIV, SA-11, MV
Rabbit Assessment	ECUN, CARB, CPIL, PIV-1, PIV-5 (PIV-2), REO, ROTA, LCMV, TOXO
Guinea Pig Assessment	SEND, PIV-5, PVM, REO, LCMV, ECUN, PIV-3, MPUL
Hamster Assessment	SEND, PIV-5, PVM, REO, LCMV, ECUN
Poultry Tracking	HEV, AE, ANV, PMV-2, REO, F. pox, IBV, IBDV, ALV-A, ALV-B, ALV-J, NDV, AI, ILT
Poultry Assessment Plus	Poultry tracking profile and Adeno GRP I, Adeno GRP III, ROTA, MD, REV, MG, MS, <i>Salmonella pullorum-gallinarum</i>

* Mouse profiles: multiple assays are included. MPV: several recombinant viral coat proteins (VP2) to detect seroconversion to MPV-1, MPV-2, and MPV-5. MHV: a recombinant nucleocapsid (N) protein and two highly purified recombinant antigens. MAV: highly purified whole-viral lysate antigens to both FL and K87.

† Macaque profiles: multiple assays included, both whole-viral lysate and highly purified recombinant antigens.

MFIA® Control Sera Package

Each unit is sufficient for five plates and includes high and low range, negative, and diluent controls. Contact Charles River to place your order.

Item
"Mouse A" for Parvovirus, Prevalent, Tracking
"Mouse B" for Assessment, Assessment Plus
"Rat A" for Prevalent, Tracking
"Rat B" for Assessment Plus
Macaque Tracking
Macaque Assessment
Macaque TB Plex Multiplex Assay
Baboon Tracking
African Green Tracking
Rabbit Assessment
Guinea Pig Assessment
Hamster Assessment
Poultry Tracking
Poultry Assessment Plus

MFIA® Supplemental Reagents

Each unit is sufficient for five plates. Contact Charles River to place your order.

Item
Conjugate for mouse/rat samples
Conjugate for simian samples
Conjugate for rabbit samples
Conjugate for guinea pig samples
Conjugate for hamster samples
Conjugate for poultry samples
Primary diluent (rodent, rabbit, and poultry)
Primary diluent (simian)
Elution buffer
Streptavidin-R-Phycoerythrin (SPE)

ELISA REAGENTS

Commercial use of Charles River reagents requires specific licensing. Please inquire for further details.

The table below is for **mouse, rat, guinea pig**, and **hamster** ELISA reagents. Contact Charles River to place your order.

Item	Approximately
96-well coated plate	48 tests
Conjugate	10,000 tests
Control sera – positive (high or low score)	10 plates
Control sera – negative	10 plates

The table below is for **simian (nonhuman primate)** ELISA reagents. View our online catalog for the list of available ELISA plates. Contact Charles River to place your order.

Item	Approximately
96-well coated plate*	48 tests
Conjugate	10,000 tests
Control sera† – positive	10 plates
Control sera – negative	10 plates

* Available agents include: SRV, STLV, MV, HBV

† Outside the United States, customers must obtain a CITES permit to import control sera for MV.

IFA REAGENTS

Commercial use of Charles River reagents requires specific licensing. Please inquire for further details.

The table below is for **mouse, rat, guinea pig, hamster, rabbit, and gerbil** IFA reagents.

View our online catalog for the list of available IFA slides for each species. Contact Charles River to place your order.

Item	Approximately
18-well coated slide	18 tests
Conjugate	180 tests
Control sera – positive or negative	10 slides

The table below is for **simian (nonhuman primate)** IFA reagents. View our online catalog for the list of available IFA slides. Contact Charles River to place your order.

Item	Approximately
18-well coated slide*	18 tests
Conjugate	180 tests
Control sera† – positive and negative	10 slides

* Available agents include: *SIV, STLV, HVP-2, SFV, SCMV, SVV, SV-40, MV, SRV-2, SRV-5, HEP-A, MRV*

† Outside the United States, customers must obtain a CITES permit to import control sera for the following agents: *SFV, SCMV, SV-40, MV*.

AVAILABLE RODENT ELISA AND RODENT/RABBIT IFA REAGENT ASSAYS

Commercial use of Charles River reagents requires specific licensing. Please inquire for further details.

Agent	Platform		Agent	Platform		Agent	Platform	
	ELISA	IFA		ELISA	IFA		ELISA	IFA
CARB	•	•	MAV	•	•	PIV-5	•	•
CPIL	•	•	MCMV	•	•	POLY	•	•
ECTRO	•	•	MHV	•	•	PVM	•	•
ECUN	•	•	MNV	•	•	REO	•	•
EDIM	•	•	MPUL	•	•	RMV	•	
GDVII	•	•	MPV	•	•	RPV	•	•
H-1	•	•	MTLV		•	RTV	•	•
HTNV (HANT)	•	•	MVM	•	•	SDAV	•	•
K	•	•	NS-1	•		SEND	•	•
KRV	•	•	PCAR	•	•	TOXO		•
LCMV	•	•	PHV	•	•			
MARTH		•	PIV-3	•	•			

PCR PANELS TO SCREEN CELL LINES AND RESEARCH BIOLOGICS FOR RODENT INFECTIOUS AGENTS

Our CLEAR (cell line examination and report) PCR Panels are performed non-GXP; this service is available for research purposes only. Once you are ready to submit samples, visit LTM™ to create your order online.

Agent	Mouse Essential Panel	Rat Essential Panel	Mouse/Rat Comprehensive Panel
Murine norovirus (MNV)	•		•
Mouse parvoviruses* (MPV 1-5, MVM)	•		•
Mouse hepatitis virus (MHV)	•		•
Reovirus (type 1 & 3) (REO)	•	•	•
Lymphocytic choriomeningitis virus (LCMV)	•	•	•
Lactate dehydrogenase-elevating virus (LDV)	•	•	•
Murine rotavirus [EDIM (ROTA-A)]	•		•
Theiler's murine encephalomyelitis virus (TMEV [GDVII])	•	•	•
Mousepox (ectromelia) (ECTRO)	•		•
Hantavirus hantaan [HTNV (HANT)]	•		•
Hantavirus seoul (SEO)		•	•
Polyoma virus (POLY)	•	•	•
K virus (K)			•
Adenovirus type 1 & 2 (MAV-1 & MAV-2)	•	•	•
Mouse cytomegalovirus (MCMV)			•
Mouse thymic virus (MTLV)			•
Pneumonia virus of mice (PVM)			•
Sendai (SEND)	•	•	•
Rat cytomegalovirus (RCMV)		•	•
Rat theilovirus [Theiler's-like virus of rats (RTV)]		•	•
Rat parvoviruses* (RPV, KRV, RMV, H-1)		•	•
Rat rotavirus [IDIR (ROTA-B)]		•	•
Rat coronavirus (RCV, SDAV)		•	•
<i>Mycoplasma</i> (genus) (including <i>Acholeplasma laidlawii</i>)	•	•	•
<i>Mycoplasma pulmonis</i>	•	•	•
Vesivirus	•		•
Positive template control	•	•	•
Negative template control	•	•	•
Spike inhibition control	•	•	•
Nucleic acid recovery control (NARC)	•	•	•

* Strain determination assays are performed on all positive results.

PCR PANELS TO SCREEN CELL LINES AND RESEARCH BIOLOGICS FOR HUMAN INFECTIOUS AGENTS

Our CLEAR (cell line examination and report) PCR Panels are performed non-GXP; this service is available for research purposes only. Once you are ready to submit samples, visit LTM™ to create your order online.

Agent	Human HEP/HIV	Human Essential	Human Comprehensive
Polyomavirus (John Cunningham virus)		•	•
Polyomavirus (BK virus)		•	•
Herpesvirus type 6		•	•
Herpesvirus type 7		•	•
Herpesvirus type 8		•	•
Parvovirus B19		•	•
Epstein-Barr virus		•	•
Hepatitis A virus	•	•	•
Hepatitis B virus	•	•	•
Hepatitis C virus	•	•	•
Papillomavirus type 16		•	•
Papillomavirus type 18		•	•
Human T-lymphotropic virus (1 & 2)		•	•
Human cytomegalovirus		•	•
Human immunodeficiency virus type 1	•	•	•
Human immunodeficiency virus type 2	•	•	•
Adeno-associated virus		•	•
Human foamy virus		•	•
<i>Mycoplasma</i> (genus) (including <i>Acholeplasma laidlawii</i>)	•	•	•
Lymphocytic choriomeningitis virus			•
Hantavirus hantaan			•
Hantavirus seoul			•
Herpes simplex 1		•	•
Herpes simplex 2		•	•
Spike inhibition control	•	•	•
Nucleic acid recovery control (NARC)	•	•	•
Positive template control	•	•	•
Negative template control	•	•	•

CONTAMINATION CLEAR

Our CLEAR (cell line examination and report) PCR Panels are performed non-GXP; this service is available for research purposes only. Once you are ready to submit samples, visit LTM™ to create your order online.

Detect contamination of cell lines with cells of another species.

Item
Stand-alone service
Add to any rodent or human CLEAR panel or <i>Mycoplasma</i> PCR

MICROBIOME DIAGNOSTIC SERVICES

Comprehensive Germ-Free Colony Health Screening

The single most important specification for germ-free mouse colonies is that they remain free of bacteria. Charles River offers and recommends that both culture-dependent and culture-independent screening methods be used to assure that even fastidious bacteria that are difficult to isolate are detected. Fecal pellets collected per our recommended specifications can be submitted for all methods of germ-free monitoring described below. For a more complete assessment, whole animals, antemortem samples, or environmental samples can also be submitted to our laboratory for standard health monitoring procedures. Our health monitoring experts are available to provide guidance on establishing a routine germ-free assessment program specific to your colony and research.

Anaerobic and Aerobic Culture

We use state-of-the-art anaerobic chambers, not canister methods, to provide the most sensitive isolation procedures for fastidious obligate anaerobic bacteria, which may take up to 10-12 days to grow. Fecal pellets submitted for culture can also be screened for motile bacteria by wet mount analysis, a culture independent method.

16S Ribosomal RNA PCR

This PCR screening, a culture independent method, uses broadly reactive PCR primers to detect all bacterial phyla. The assay and technology used for this assay prevents false-positive detection commonly caused by other PCR detection methods.

Services	Tests
Germ-Free Testing	Anaerobic and aerobic culture of fecal pellets or isolator samples with identification via MALDI-TOF
	Motility testing by wet mount analysis of cecum (live animal only), feces or swab
	Mycotic (i.e. fungal) culture of cage/isolator swab with identification
	16S ribosomal RNA PCR of feces
Standard Health Evaluation: Whole animal, antemortem and environmental screening	Necropsy with histology of gross lesions
	Aerobic culture of upper respiratory and gastrointestinal tracts with identification via MALDI-TOF mass spectrometry
	Anaerobic culture of cecal contents with identification via MALDI-TOF mass spectrometry
	Serologic viral antibody detection
	PCR Rodent Infectious Agent (PRIA®) testing of postmortem, antemortem, and environmental sampling for viral, bacterial, and fungal/parasitic agents

16 Next Generation Sequencing (NGS)

16S Next Generation Sequencing (NGS) analysis provides a snapshot of the bacteria colonizing the intestinal tract of your research mice using GI contents or fecal pellets. 16S NGS analysis is an important part of routine monitoring of your research colonies' microbiome to verify that custom or complex bacteria consortia remain stable. 16S NGS can also be used for microbiome investigations that require monitoring of control and treatment groups before, during and after experiments. The relative abundance of bacteria at multiple taxonomical levels is provided for each sample so that increases and decreases in bacteria abundance can be determined. A provided standard report compares samples or treatment groups using Alpha and Beta Diversity Analysis.



Genetic Testing Services

From assay design to results interpretation, we provide a full portfolio of customized genetic testing services to meet your needs in genotyping, genetic background characterization, colony management, and genetic quality control. Coupled with our online Laboratory Testing Management® (LTM™) system, we provide unparalleled turnaround time, data accuracy, and seamless communication with our lab.

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GENETIC TESTING SERVICES

Our full-service, high-throughput genotyping laboratory is committed to providing accurate, timely, and cost-effective answers to researchers who rely on genetically modified animal models. We offer a comprehensive set of molecular-based genetic tests for characterization of various mutations, such as allele-specific assays targeting specific mutations critical for genetic quality control (GQC), compound mutations, and complex breeding schemes involving Cre/Flpe mediated recombination events. Our real-time qPCR assays are capable of detecting three versus four copies of a transgene, uniquely suitable for characterization of transgenic lines with potential segregation and instability issues that may result in various transgene expressions. Our standard PCR platform is very sensitive in detecting small INDELs leading to heteroduplex formation, particularly useful for initial screening of cell lines or animal models generated using CRISPR/Cas9 technology. Finally, our expert geneticists provide scientific guidance and consultation in colony management and complex breeding strategies.

Genotyping

All assays are custom designed to optimize specificity. Once the assay has been validated, a final report is provided to the customer.

Service	Method							
	Allele-Specific PCR	Generic PCR	qPCR (real-time)	qPCR (endpoint)	LOA* qPCR	SNP† Assay	LRPCR‡	Sequencing
Zygosity testing for targeted mutation	•	•		•	•	•		
Zygosity testing for transgenics			•					
Identification of transgene carriers	•	•		•			•	•
Transgene segregation and instability			•					
Absolute transgene copy number determination			•					
Screening CRISPR/Cas9-generated mutations§	•							
Screening of gene targeting event in ES cells					•		•	
Troubleshooting colony issue(s)	•	•	•	•	•	•	•	•

* Loss-of-allele (LOA)

† Single nucleotide polymorphisms (SNP)

‡ Long-range PCR; an alternative to Southern blot analysis

§ See Efficient Method for Screening CRISPR/Cas9-Generated Mutations section for more information.

Assay Development and Genetic Quality Control (GQC)

Each protocol is reviewed by our team of scientists and custom designed based on client information to ensure specificity of allele detection and accurate genotype determinations. As part of this process, a complete assay validation report accompanies each approved assay. Our scientists can work with your internal project managers to help resolve any issues and deploy new breeding strategies to overcome any challenges.

Service	Method							
	Allele-Specific PCR	Generic PCR	qPCR (real-time)	qPCR (endpoint)	LOA* qPCR	SNP† Assay	LRPCR‡	Sequencing
Assay transfer and validation <i>Transfer of customer-provided protocol and validation of assay</i>	•	•	•	•	•	•	•	
Assay development <i>Design and validation of a new assay</i>	•		•	•	•	•	•	•
Colony management	<i>Consultation for conditional targeted mutations available upon request</i>							
Genetic quality control	<i>Consultation available upon request</i>							

* Loss-of-allele (LOA)

† Single nucleotide polymorphisms (SNP)

‡ Long-range PCR; an alternative to Southern blot analysis

GENETIC TESTING SERVICES

Background Strain Characterization

Service	Description
Mouse MAX-BAX® speed congenics*	Marker-assisted accelerated backcrossing utilizing 384 SNP panel
Background strain characterization (BSC)	Mouse 384 SNP or rat 240 SNP complete background analysis panels
C57BL/6 mouse substrain panel†	128 SNP
SNP QC (mouse and rat panels available)	32-marker assay for contamination detection

* See below 'MAX-BAX® Congenic Strain Production Strategies' for additional information.

† The 128 SNP panel is used to differentiate between the mouse C57 substrains. Animals should be confirmed C57 congenic (>98% C57 by 384 SNP) prior to testing; the BSC Mouse 384 SNP complete background analysis panel is available for this confirmation step.

MAX-BAX® Congenic Strain Production Strategies

Marker-assisted accelerated backcrossing (MAX-BAX®) could save a year and a half or more of breeding by screening the background strain genetics of your research animals and selecting those with the highest percentage of the desired background. Our MAX-BAX® service is a custom microarray platform that utilizes robust fluorescence-based assays. The 384 SNP marker screens are strategically spaced across the genome to analyze common polymorphisms found between inbred strains.

Traditional Backcross		Speed Congenic Backcross	
Generation	Recipient Genome	Generation	Recipient Genome
F1	50.00%	F1	50%
N2	75.00%	N2	~80%
N3	87.50%	N3	~94%
N4	93.75%	N4	~99%
N5	96.88%	N5	~100%
N6	98.44%		
N7	99.22%		
N8	99.61%		
N9	99.81%		
N10	99.90%		

Expression Testing

Service	Description
Expression testing	RNA expression testing

Strain-Specific Genetic Variation

Service	Including, but not limited to
Disease model testing*	<i>Foxn1^{nu}</i> , NOD, <i>Prkdc^{scid}</i> , Ly5.1/5.2 (<i>Ptprc</i>), Tyr

* Please contact LabServices@crl.com to inquire on the availability of assays for your particular model.

GENETIC TESTING SERVICES

Efficient Method for Screening CRISPR/Cas9-Generated Mutations

Charles River offers PCR-based screening services for CRISPR/Cas9-generated models to quickly and accurately identify which founders or cell lines carry mutations with small INDELs at the intended targeting site. Our PCR analysis platform based on microfluidic, laser-induced fluorescence technology allows sensitive detection of heteroduplex formation when small INDELs are present, which is the basis for T7 endonuclease digestion, the most commonly used screening method for CRISPR/Cas9 generated mutations. Furthermore, as demonstrated in the figures below, our testing platform combined with our proprietary assays (Figure 1) produce much cleaner data compared to T7 digestion (Figure 2), which often produces background noise, making mutation detection ambiguous. To learn more about this exciting development or to obtain a custom quote for your project, contact LabServices@crl.com.

Figure 1: Microfluidic, Laser-induced Fluorescence PCR Analysis

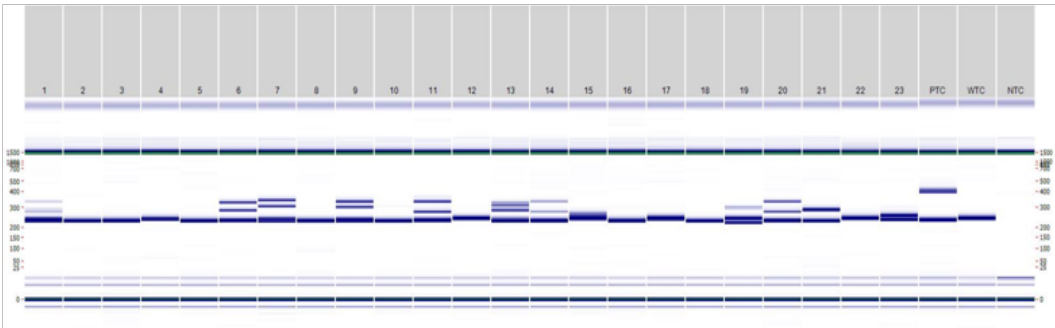
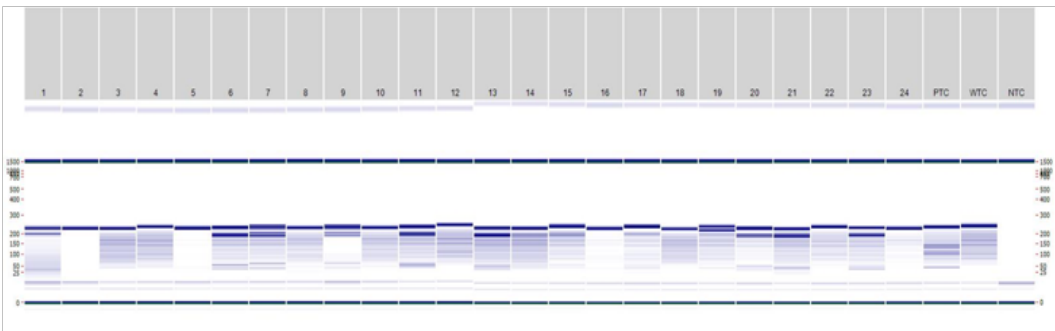


Figure 2: T7 Endonuclease Digestion Analysis





Genetically Engineered Models and Services

Charles River has taken pride in being a comprehensive provider of integrated services, including customized breeding programs, quarantine space, genetic testing, rederivation, IVF, and cryopreservation. We developed a custom-designed software solution called ICM™ (Internet Colony Management) for both project and vivarium management. Tablet computers and RFID are used to capture data and colony information in real time, instantly providing full visibility of activities with easy online access. To learn more or to view a video of the system in action, visit www.criver.com/icm.

GENETICALLY ENGINEERED MODELS AND SERVICES

BREEDING SERVICES

Charles River provides off-site space for holding, breeding, and developing genetically engineered mouse and rat colonies. All colonies are assigned a dedicated project manager and clients are granted access to Charles River's innovative Internet Colony Management (ICM™) system. Whether you want to simply maintain a line, produce regular animal shipments for your studies, or backcross your strain to a different genetic background, each breeding colony is scalable to your specific research needs.

Service	Requirements	Deliverables	Estimated Timeline
<ul style="list-style-type: none">BreedingIsolator rentalHusbandryMatingWeaningDedicated project manager	Project-based	Project-based	Project-based
MAX-BAX® speed congenic strain production service	2-3 homozygous or heterozygous males between 12 weeks and 6 months of age	All fully congenic mice produced	15 months

GENETICALLY ENGINEERED MODELS AND SERVICES

QUARANTINE SERVICES

Charles River provides isolator-based space reserved for assessing the health profile of animals coming from outside institutions. Charles River’s PRIA®-based quarantine program offers fast and comprehensive test results in only a month. We can also develop custom protocols to meet your animal facility requirements.

Service	Requirements	Deliverables	Estimated Timeline
PRIA® rapid quarantine	Up to 10 animals or 6 rats	Direct animal samples tested via Surveillance Plus PRIA®	2 weeks
Sentinel-based quarantine	Up to 17 mouse cages or 8 rat cages	Sentinels (immunocompetent and immunodeficient) tested via HM Plus with <i>Helicobacter</i> PCR	12 weeks
Custom quarantine	Project-based	Project-based	Project-based

TRANSGENIC MODEL CREATION

Charles River has joined forces with leading genomic engineering providers to deliver a complete and integrated solution for mouse and rat model creation. Our combined expertise provides an optimum environment for creating, characterizing, preserving, and distributing your transgenic lines.

CRISPR/Cas9 Genome Editing for Mice and Rats

Depending on allele complexity, we can obtain transgenic mice in as few as 4 months. Our team of scientists work with clients to determine which technique is best suited to achieve their goals. When needed, a combination of techniques may be applied.

Services offered	Deliverable
<ul style="list-style-type: none"> • CRISPR/Cas9 knock-out • SNP modification • Knock-in • Conditional knock-out • Transgenes 	<ul style="list-style-type: none"> • Scoping conversation on the design and strategy of your model • Guide RNA design and validation • Microinjection into mouse or rat embryos • Birth and founder screening • Breeding/delivery of F1 animals

MICROINJECTION SERVICES

Charles River can help you bridge the gap from *in vitro* to *in vivo* models. Our dedicated team will prepare and inject your ES cells or genetic material (DNA, CRISPR, ES recombinant clones). Choose the appropriate package described below and provide us your biological material to receive your VAF/Elite® mice.

Service	Description	Deliverables
ES CELLS		
ES cell injection (Partial)	<ul style="list-style-type: none"> • Expansion of ES cells for injection and freezing • ES cells injected into blastocysts • Reimplantation into VAF/Elite® foster females • Husbandry • Weaning 	VAF/Elite® chimeric mice with full health monitoring report
CRISPR		
CRISPR injection (Partial)	<ul style="list-style-type: none"> • Injection into mouse one-cell embryos • Reimplantation into VAF/Elite® foster females • Husbandry • Weaning • Biopsies for genetic testing 	VAF/Elite® F0 founder mice with full health monitoring report
DNA		
Plasmid or BAC (Partial)	<ul style="list-style-type: none"> • Injection up to 500 embryos • Reimplantation into VAF/Elite® foster females • Husbandry • Weaning • Biopsies for genetic testing 	VAF/Elite® F0 founder mice with full health monitoring report

NOTE: CRISPR-Cas9 used under licenses to granted and pending US and international patents from The Broad Institute and ERS Genomics Limited.

GENETICALLY ENGINEERED MODELS AND SERVICES

MODEL CREATION PRODUCTS AND SERVICES

Charles River provides core-lab support products and services to ease the process of model creation.

Product/Service	Deliverables	Estimated Timeline
BlastoKit® C57 small	400 C57BL/6NCrl embryos	Off-the-shelf availability
BlastoKit® C57 large	1,600 C57BL/6NCrl embryos	Off-the-shelf availability
BlastoKit® BALB/c small	400 BALB/cAnNCrl embryos	Off-the-shelf availability
BlastoKit® BALB/c large	1,600 BALB/cAnNCrl embryos	Off-the-shelf availability
BlastoKit® B6 albino small	400 B6N- <i>Tyr^{c-Brd}</i> /BrdCrCrI embryos	Off-the-shelf availability
BlastoKit® B6 albino large	1,600 B6N- <i>Tyr^{c-Brd}</i> /BrdCrCrI embryos	Off-the-shelf availability
BlastoKit® custom	Custom quantity or strain of embryos	Inquire

GENETICALLY ENGINEERED MODELS AND SERVICES

REDERIVATION SERVICES

Rederivation can eliminate unwanted parasites, viruses, bacteria, and other opportunistic agents from research colonies. We offer a number of different rederivation options based on the genetics of your strain and/or the quantity of animals available.

Service	Animal Requirements*	Deliverables/Description	Estimated Timeline
Sperm rederivation with health report	Mouse: • 2 males, < 6 months old • 10 females, 3-4 weeks old (strain specific)	<ul style="list-style-type: none"> • Minimum 10 offspring • Complete health report • VAF/Elite® mice 	12-15 weeks
	Rat: N/A		
IVF rapid expansion	Project-based	<ul style="list-style-type: none"> • Quantity based on parameters of the project • Complete health report • VAF/Elite® mice 	15 weeks
Embryo rederivation with health report	Mouse: • 2 males, < 6 months old • 10 females, 3-4 weeks old	<ul style="list-style-type: none"> • Minimum 10 offspring • Complete health report • Conventional colony held until project completion • For homozygous x homozygous strains • VAF/Elite® mice/rats 	12-15 weeks
	Rat: • 4 males, < 6 months old • 10-15 females, 10-12 weeks old		
Embryo rederivation with homozygous expansion breeding	Minimum of 5 breeding pairs	<ul style="list-style-type: none"> • Minimum 10 offspring • Complete health report • Conventional colony held until project completion • For homozygous x homozygous strains • VAF/Elite® mice/rats 	6-9 months
Rapid rederivation—sperm or embryo	Mouse: • 2 males, < 6 months old • 10 females, 3-4 weeks old	<ul style="list-style-type: none"> • Minimum 2 visibly pregnant embryo recipient females 	6 weeks
	Rat: N/A		

* Charles River commercially available wild-type females can be supplied by Charles River.

CRYOPRESERVATION

Cryopreservation provides a permanent solution to archiving genetically engineered lines no longer being actively used, as well as safeguarding valuable lines in the event of a problem with the health or genetics of the line, or a major disaster.

Service	Description	Animal Requirements	Deliverables
Embryo cryopreservation	For mouse and rat strains	Mouse: • 8-10 males, < 6 months old • 20 females, 3-4 weeks old* Rat: • 8-10 males, < 6 months • 20 females, 8-10 weeks old*	• 250-300 embryos (heterozygous lines) • 150-200 embryos (homozygous lines)
Embryo cryopreservation with homozygous expansion breeding	Homozygous embryo cryopreservation with preliminary expansion breeding	5 homozygous breeding pairs	• 150-200 embryos • Homozygous expansion breeding
Sperm cryopreservation	Cryopreservation of sperm from 2 males (mice only)	2 males between 12 weeks and 6 months old (proven breeder preferred)	• Pre- and post-thaw QC • 15 straws preserved, most strains
Germplasm cryostorage	Secure cryostorage in two independent facilities		

* May require multiple shipments

CRYORECOVERY

While cryopreserving your valuable genetically engineered animals is an important part of protecting your research against unforeseen events, having the ability to recover live animals from frozen stock quickly and efficiently is equally critical to safeguarding your lines. Charles River can recover live animals in as few as ten to twelve weeks.

Service	Description	Deliverables	Timeline
Embryo reconstitution	<ul style="list-style-type: none">• 50-60 embryos• 3 embryo transfers	<ul style="list-style-type: none">• Minimum of 10 offspring from cryopreserved embryos frozen and stored by Charles River• Complete health report• VAF/Elite® mice/rats	10-12 weeks
Sperm reconstitution	Live animal recovery from cryopreserved sperm (mice only)	<ul style="list-style-type: none">• Minimum 10 offspring• Complete health report• VAF/Elite® mice	10-12 weeks

ADVANCED ASSISTED REPRODUCTION

Charles River continually invests in new innovations and sophisticated techniques within our embryology program.

A comprehensive Mouse Rescue Package is offered to help aid in the rescue options for strains that experience unexpected breeding difficulties. In addition, Charles River offers laser assisted *in vitro* fertilization to aid in embryo production using IVF technology for non-optimal sperm samples.

Charles River high-throughput embryology laboratory offers non-regulated testing using both mouse embryo assay (MEA) and human sperm assay (HSA) to screen media, reagents, and disposable laboratory supplies. These bioassays are used for assessing functionality and toxicity of the client's media and materials.

Service	Requirements/Description	Deliverables	Timeline
Mouse rescue package	<ul style="list-style-type: none"> Recovery of a mouse line that is having difficulties producing offspring 	<ul style="list-style-type: none"> All offspring produced Sperm cryopreservation if applicable Complete health report on offspring VAF/Elite mice 	15 weeks
MEA (Mouse Embryo Assay)	<ul style="list-style-type: none"> The MEA is used for toxicity and functionality testing of media, labware, disposables or any device which may encounter gametes or embryos Fresh or frozen one-or two-cell embryos from F1 hybrid cross Minimum of 25 embryos per test article and 25 control embryos 	<ul style="list-style-type: none"> Assessment of embryos at 72, 96 or 120 hours Minimum of 80% blastocyst development required for passing test Final Report One failure repeat at no charge 	7 days
HSA (Human Sperm Assay)	<ul style="list-style-type: none"> The HSA is used for toxicity and functionality testing of media, labware, disposables or any device which may encounter gametes Frozen vial of human sperm 	<ul style="list-style-type: none"> Assessment of sperm motility at 0 and 24 hours Cryosurvival Index calculation Sperm Motility Recovery Index calculation 	3-5 days



Isolators

Isolators are an effective housing solution for safeguarding the health and genetic status of research animals.

ISOLATORS

Isolators

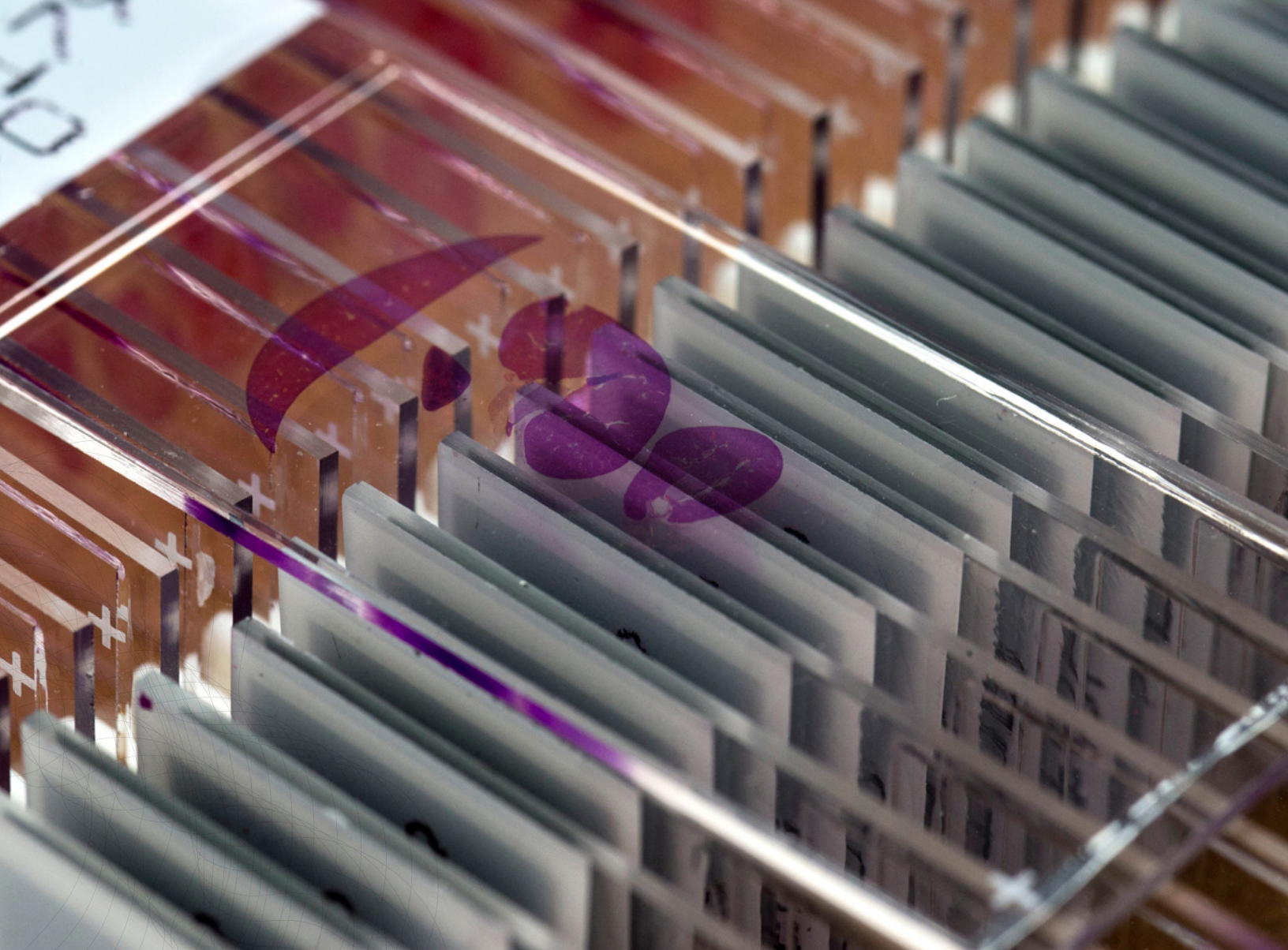
Isolators are critical for safeguarding your animals' health and genetic status, ensuring the welfare of your research models, and protecting the integrity of your research data. We offer semi-rigid and flexible isolators in three different sizes. We also can provide custom designs to meet individual client requirements. Upon isolator purchase, we can schedule an on-site setup and training, as well as provide SOPs based on your need. For further information, please contact us at 1.877.274.8371, or to request a quote, visit www.criver.com/request-isolator-quote.

Items	Description
Flexible Film	
3' flexible film	<ul style="list-style-type: none">• Overall dimensions: 48" L x 36" W x 37" H• Capacity: 15 mouse cages
6' flexible film	<ul style="list-style-type: none">• Overall dimensions: 78" L x 34.75" W x 41" H• Capacity: 30 mouse cages or 12 rat cages
Semi-Rigid	
3' semi-rigid	<ul style="list-style-type: none">• Overall dimensions:<ul style="list-style-type: none">- 55" L x 36.5" W x 37" H (left-handed)- 57" L x 36.5" W x 37" H (right-handed)• Capacity: 18 mouse cages or 9 rat cages
6' semi-rigid	<ul style="list-style-type: none">• Overall dimensions: 91" L x 36.5" W x 47" H• Capacity: 48 mouse cages or 18 rat cages
8' semi-rigid	<ul style="list-style-type: none">• Overall dimensions: 121" L x 40" W x 47" H• Capacity: 64 mouse cages or 27 rat cages
4' semi-rigid poultry	<ul style="list-style-type: none">• Overall dimensions: 72" L x 36" W x 72" H

ISOLATORS

Isolators Accessories

Category	Items	
Caging	<ul style="list-style-type: none"> • Interior mouse caging • Mouse cage top • Mouse cage top with card holder • Rat cages • Rat cage lids- #10428 - wirebar rat top • Water bottle, complete unit (40 per case) 	
Filters	<ul style="list-style-type: none"> • 3" intake filters • 4" intake filters • 8" exhaust filters • 8" exhaust filters (for 8' isolator) • 14" intake HEPA filter • Isolator prefilter, 3.54", irradiated • Isolator prefilter, 10.625, blue and white, irradiated 	
Gaskets	<ul style="list-style-type: none"> • Door gaskets • Semi-rigid silicon o-ring gasket (for 3' semi-rigid isolator) • Semi-rigid silicon o-ring gasket (for 6' semi-rigid isolator) • Semi-rigid silicon o-ring gasket (for 8' semi-rigid isolator) 	
Germ-Free Components	<ul style="list-style-type: none"> • Autoclavable cylinder • Mylar film • Vinyl tape 	
Glove Accessories	<ul style="list-style-type: none"> • Cuff rings (each) • Glove clamp • Gloves, light tested (per pair) • Glove o-rings (set of 3) • Glove tape (per roll) 	
Miscellaneous	<ul style="list-style-type: none"> • Acrylic tube light enclosure • Centrifugal fan assembly (including magnahelic assembly) • DESTACO clamps • DESTACO opener/closer • Interior light bulb • Magnahelic assembly only • Port band strap • Port door • Safety scissors (each) • Small portable dip cart • Urethane isolator repair kit 	
Isolator Racks	<ul style="list-style-type: none"> • 3' adjustable double rack • 3' single rack • 6' adjustable rack • 6' rack • 8' adjustable rack • Custom rack • Custom rack (9' semi-rigid isolator) 	
Replacement Fronts	<ul style="list-style-type: none"> • 3' Semi-rigid isolator front • 6' Semi-rigid isolator front • 8' Semi-rigid isolator front • 9' Semi-rigid isolator front 	
Set-up Kits	<ul style="list-style-type: none"> • Irradiated paper bags • Irradiated plastic zip bags • Irradiated tissue paper 	



Clinical Pathology and Biomarkers Testing

Charles River offers a complete range of clinical pathology and biomarker laboratory services to support animal models. Our laboratory staff has extensive knowledge of animal/ human hematology, coagulation, clinical biochemistry, urinalysis, and metabolic pathways. Specialized laboratory services are also available to meet your assay or biomarker development needs for specific research or drug safety studies.

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CLINICAL CHEMISTRY PROFILES AND INDIVIDUAL TESTS

Samples collected at your facility can be submitted directly to our laboratory for testing. Please contact SHR-ClinPathServices@crl.com for submission information or a formal quote.

Clinical Chemistry Profiles and Individual Tests

Analyte	Complete	Lipid	Liver	Kidney	Iron
Alanine aminotransferase (ALT)	•		•		
Albumin (ALB)	•		•	•	
Alkaline phosphatase (ALP)	•		•		
Aspartate aminotransferase (AST)	•		•		
Bilirubin (total) (TBIL)	•		•		
Blood urea nitrogen (BUN)	•			•	
Calcium (CA)	•			•	
Chloride (CL)	•			•	
Cholesterol (CHOL)	•	•			
Creatinine (CREAT)	•			•	
Creatinine kinase (CK)	•				
Ferritin (FER)*					•
Free fatty acids (FFA)*		•			
Gamma-glutamyl transferase (GGT)	•		•		
Glucose (GLU)	•				
High-density lipoprotein (HDL)*		•			
Iron (FE)*					•
Low-density lipoprotein (LDL)*		•			
Phosphorus (PHOS)	•			•	
Potassium (K)	•			•	
Sodium (NA)	•			•	
Total iron binding capacity (TIBC)*					•
Total protein (TP)	•		•	•	
Transferrin (TRFN)*					•
Triglycerides (TRIG)	•	•			
Price†	60.00	65.00	45.00	45.00	75.00

* Premium chemistry parameter. Panels with premium tests require a minimum submission of 5 samples.

† \$5 per standard analyte added to existing panels

‡ \$15 per premium analyte added to existing panels (minimum batch charge of 5 samples)

CLINICAL PATHOLOGY AND BIOMARKERS TESTING

CUSTOMIZED PANELS

Select from the following to run a custom selection of tests. Panels including non-standard parameters require a minimum submission of 5 samples. Premium tests are an additional \$10.00 per parameter.

1 Parameter	25.00
2 Parameters	30.00
3-5 Parameters	35.00
6-10 Parameters	45.00
11-15* Parameters	55.00

* 5.00 per additional parameter in excess of 15

Please contact SHR-ClinPathServices@crl.com for submission information or a formal quote.

Standard Chemistry Parameters

Test	Abbreviation	Test	Abbreviation
Alanine aminotransferase	ALT	Creatinine	CREAT
Albumin	ALB	Creatinine kinase	CK
Alkaline phosphatase	ALP	Gamma-glutamyl transferase	GGT
Aspartate aminotransferase	AST	Glucose	GLU
Bilirubin (total)	TBIL	Phosphorus	PHOS
Blood urea nitrogen	BUN	Potassium	K
Calcium	CA	Sodium	NA
Chloride	CL	Total protein	TP
Cholesterol, TOTAL	CHOL	Triglycerides	TRIG

Non-Standard Chemistry Parameters

Non-Standard Parameters are as follows, with name of test followed by abbreviation.
Panels with non-standard parameters included require a minimum batch of 5 samples.

Non-Standard Minimum submission of 5 samples.		Premium (non-standard) \$10.00 per parameter added, minimum submission of 5 samples.	
Test	Abbreviation	Test	Abbreviation
Amylase	AMY	Ferritin	FER
Bicarb	CO ²	Free fatty acids	FFA
Direct Bilirubin	DBIL	High-density lipoprotein	HDL
Glutamate dehydrogenase	GLDH	Iron	FE
Lactate dehydrogenase	LDH	Low-density lipoprotein	LDL
Lipase	LIP	Sorbitol dehydrogenase	SDH
Magnesium	MG	Total bile acids	TBA
Uric acid	UA	Total iron binding capacity	TIBC
		Transferrin	TRFN
		Unsaturated iron binding cap.	UIBC

HEMATOLOGY

Samples collected at your facility can be submitted directly to our laboratory for testing. Please contact SHR-ClinPathServices@crl.com for submission information or a formal quote.

Hematology

Item	Price
CBC	35.00
CBC with differential	45.00
CBC with differential and reticulocytes	65.00

COAGULATION

Samples collected at your facility can be submitted directly to our laboratory for testing. Please contact SHR-ClinPathServices@crl.com for submission information or a formal quote.

Coagulation

Item	Price
Prothrombin time (PT)	30.00
Partial prothrombin time (PTT)	30.00
Fibrinogen	35.00
Coagulation profile (PT, PTT, Fibrinogen)	80.00

URINE CHEMISTRIES

Samples collected at your facility can be submitted directly to our laboratory for testing. Please contact SHR-ClinPathServices@crl.com for submission information or a formal quote.

Urine Chemistries

Urine chemistry analytes are available individually or as a custom panel.

Pricing is \$25 per sample for 1 parameter and \$10 per sample for each additional parameter added.

Test	Abbreviation
Urine urea nitrogen	UUN
Calcium	CA
Chloride	CL
Creatinine	CREAT
Glucose	GLU
Magnesium	MG
Microalbumin	mALB
Phosphate	PHOS
Potassium	K
Total protein	TP
Sodium	NA

BIOMARKER IMMUNOASSAYS AND MORE

Biomarker Immunoassays and More

Testing can be performed on samples from large and small *in vivo* study models in multiple sample matrices (e.g., blood, urine, and samples run in singlicate, duplicate, or triplicate). Biomarker immunoassays are available on several platforms, including enzyme-linked immunosorbent assay (ELISA), Luminex®, and Meso Scale Discovery (MSD®), covering a broad continuum of dynamic ranges and providing the ability to multiplex. Other methods are also available, such as FACS, ADA, bDNA, large molecule PK, and high-sensitivity single-molecule assays. Testing performed can be qualified to different levels depending on your needs, up to GLP level qualification and analysis. The below is not a comprehensive list; please contact Charles River for inquiries regarding what assays are available and related pricing.

Mouse Comprehensive Cytokine/Chemokine Panel

IL-12, IL-23, IL-27, CCL2 (MCP-1), CCL5 (RANTES), CCL7 (MCP-3), CXCL1 (GRO alpha), CXCL10 (IP-10), Eotaxin, G-CSF, GM-CSF, IFN- α , IFN- γ , IL-1 α , IL-1 β , IL-10, IL-13, IL-15/IL-15R complex, IL-17A, IL-18, IL-2, IL-22, IL-28, IL-3, IL-31, IL-4, IL-5, IL-6, IL-9, LIF, M-CSF, MIP-1 α , MIP-1 β , TNF- α , ENA-78, MIP-2

Mouse Proinflammatory Panel

IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-6, KC/GRO, IL-10, IL-12, TNF- α

Rat Proinflammatory Panel

IFN- γ , IL-1 β , IL-4, IL-5, IL-6, KC/GRO, IL-10, IL-13, TNF- α

Rat Kidney Injury Panel

Albumin, NGAL, OPN, KIM-1

Human/NHP Comprehensive Cytokine/Chemokine Panel

BDNF, β -NGF, EGF, Eotaxin, FGF-2, GM-CSF, GRO- α , HGF, IFN- α , IFN- γ , IL-1 α , IL-1 β , IL-1RA, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12p70, IL-13, IL-15, IL-17A, IL-18, IL-21, IL-22, IL-23, IL-27, IL-31, IP-10, LIF, MCP-1, MIP-1 α , MIP-1 β , RANTES, PDGF-BB, PIGF-1, SCF, SDF-1 α , TNF- α , TNF- β , VEGF-A, VEGF-D

For information on our biomarker testing services, visit our website at www.criver.com/modalities/biomarker-services.



Resources

If you've run into an unfamiliar acronym, or are wondering which animal models are available in your region, this Glossary and Stocks and Strains Worldwide appendix are here to help.

GLOSSARY OF TERMS

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Agent	Abbreviation	Family/Order	Subfam/Genus	Host Species*
Adenovirus	MAV, RAD	Adenoviridae	Mastadenovirus	M, R
Aleutian disease virus	ADV	Parvoviridae	Amdovirus	F
Cilia-associated respiratory bacillus	CARB	Unclassified	Unclassified	M, R, Rb
Clostridium piliforme	CPIL	Clostridaceae	Clostridium	M, R, Rb, F
Distemper virus	CDV	Paramyxoviridae	Morbillivirus	F
Ectromelia virus (Mousepox)	ECTRO	Poxviridae	Orthopoxvirus	M
Eimeria	EIM	Eimeriidae	Eimeria	Rb
Encephalitozoon cuniculi	ECUN	Pleistophoridae	Encephalitozoon	M, R, GP, H, Rb
Encephalomyocarditis virus	EMCV	Picornaviridae	Cardiovirus	M, R
Guinea pig adenovirus	GAV	Adenoviridae	Mastadenovirus	GP
Guinea pig cytomegalovirus	GpCMV	Herpesviridae	Betaherpesvirus	GP
Hantaan	HTNV (HANT)	Bunyviridae	Hantavirus	M, R
Infectious pancreatic necrosis virus	IPNV	Birnaviridae	Aquabirnavirus	Z
Infectious spleen and kidney necrosis virus	ISKNV	Iridoviridae	Megalocytivirus	Z
Influenza A virus	INFA	Orthomyxoviridae	Influenzavirus A	F
Kilham rat virus	KRV	Parvoviridae	Parvovirus	R
Lactate dehydrogenase-elevating virus	LDV/LDH	Arteriviridae	Arterivirus	M
Ljungan virus	LV	Picornaviridae	Parechovirus	R
Lymphocytic choriomeningitis virus	LCMV	Arenaviridae	Arenavirus	M, R, GP, H
Minute virus of mice	MVM	Parvoviridae	Parvovirus	M
Mouse cytomegalovirus	MCMV	Herpesviridae	Betaherpesvirus	M
Mouse hepatitis virus	MHV	Coronaviridae	Coronavirus	M
Mouse parvovirus	MPV-1/-2/-5	Parvoviridae	Parvovirus	M
Mouse pneumonitis virus	K	Polyomaviridae	Polyomavirus	M
Mouse thymic virus	MTLV	Herpesviridae	Unclassified	M
Murine norovirus	MNV	Caliciviridae	Norovirus	M
Murine rotavirus	EDIM/ROTA-A	Reoviridae	Rotavirus	M
Mycoplasma arthritidis	MARTH	Mycoplasmataceae	Mycoplasma	M, R
Mycoplasma pulmonis	MPUL	Mycoplasmataceae	Mycoplasma	M, R
Myxomatosis virus	MYXO	Poxviridae	Leporipoxvirus	Rb
Parainfluenza virus (type 1)	PIV-1	Paramyxoviridae	Respirovirus	Rb
Parainfluenza virus (type 2)	PIV-2	Paramyxoviridae	Rubulavirus	Rb
Parainfluenza virus (type 3)	PIV-3	Paramyxoviridae	Respirovirus	GP
Parainfluenza virus (type 5)	PIV-5	Paramyxoviridae	Rubulavirus	GP, H
Parvovirus NS-1	NS-1	Parvoviridae	Parvovirus	M, R
Pneumocystis carinii	PCAR	Pneumocystidaceae	Pneumocystis	R
Pneumonia virus of mice	PVM	Paramyxoviridae	Pneumovirus	M, R, GP, H
Polyoma virus	POLY	Polyomaviridae	Polyomavirus	M
Prospect Hill virus	PHV	Bunyviridae	Hantavirus	M
Rabbit adenovirus	RbAV	Adenoviridae	Mastadenovirus	Rb
Rabbit hemorrhagic disease virus	RHDV	Caliciviridae	Lagovirus	Rb
Rabbit rotavirus	ROTA	Reoviridae	Rotavirus	Rb
Rat coronavirus/sialodacryoadentitis virus	RCV, SDAV	Coronaviridae	Coronavirus	R
Rat cytomegalovirus	RCMV	Herpesviridae	Betaherpesvirus	R
Rat minute virus	RMV	Parvoviridae	Parvovirus	R
Rat parvovirus	RPV	Parvoviridae	Parvovirus	R
Rat polyomavirus	RatPyV2/RPyV2	Polyomaviridae	Unclassified	R
Rat rotavirus (infectious diarrhea of infant rats)	IDIR/ROTA-B	Reoviridae	Rotavirus	R
Rat theilovirus (Theiler's-like virus of rats)	RTV	Picornaviridae	Theilovirus	R
Reovirus	REO	Reoviridae	Orthoreovirus	M, R, GP, H
Rabbit picobirnavirus	RPBV	Picobirnaviridae	Picobirnavirus	Rb
Sendai virus	SEND	Paramyxoviridae	Respirovirus	M, R, GP, H
Seoul virus	SEO	Bunyviridae	Hantavirus	M, R
Theiler's murine encephalomyelitis virus	TMEV (GDVII)	Picornaviridae	Cardiovirus	M, R
Toolan's H-1 virus	H-1	Parvoviridae	Parvovirus	R
Toxoplasma gondii	TOXO	Sarcocystidae	Toxoplasma	Rb
Treponema paraluis-cuniculi	TREP	Spirochaetales	Treponema	Rb

* Species: M = mouse, R = rat, GP = guinea pig, H = hamster, Rb = rabbit, F = ferret, Z = zebrafish

Agent	Abbreviation	Family/Order	Subfam/Genus	Host Species
Epstein-Barr virus	EBV	Herpesviridae	Lymphocryptovirus	Simian
Hepatitis A	HEP-A	Picornaviridae	Hepatovirus	Simian
Herpes B virus	HBV	Herpesviridae	Alphaherpesvirus	Simian
Herpes virus papio-2	HVP-2	Herpesviridae	Alphaherpesvirus	Simian
Lymphocryptovirus	LCV	Herpesviridae	Lymphocryptovirus	Simian
Macaque (Rhesus) rhadinovirus	MRV	Herpesviridae	Rhadinovirus	Simian
Malaria (Plasmodium)	MAL	Plasmodiidae	Plasmodium	Simian
Measles virus	MV	Paramyxoviridae	Morbillivirus	Simian
Parainfluenza virus (type 5)	PIV-5 (SV-5)	Paramyxoviridae	Rubulavirus	Simian
Simian agent 8	SA-8	Herpesviridae	Simplexvirus	Simian
Simian cytomegalovirus	SCMV/CMV	Herpesviridae	Cytomegalovirus	Simian
Simian foamy virus	SFV	Retroviridae	Spumavirus	Simian
Simian immunodeficiency virus	SIV	Retroviridae	Lentivirus	Simian
Simian rotavirus	SA-11	Reoviridae	Rotavirus	Simian
Simian T-lymphotropic virus	STLV	Retroviridae	Deltaretrovirus	Simian
Simian type D retrovirus	SRV	Retroviridae	Betaretrovirus	Simian
Simian varicella virus	SVV	Herpesviridae	Varicellovirus	Simian
Simian virus 40	SV-40	Polyomaviridae	Polyomavirus	Simian
Trypanosoma cruzi (Chagas Disease)	T. cruzi/CHA	Trypanosomatidae	Trypanosoma	Simian

RATS

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Inbred Rats

Nomenclature	North America	Europe	Japan
BDIX			
BDIX/CrCrl	•		
Brown Norway			
BN/Crl	•	•	
BN/CrlCrlj			•
Buffalo			
BUF/CrCrl	•		
Copenhagen			
COP/CrCrl	•		
Dahl/SS			
SS/JrHsdMcwiCrl	•		
Fawn Hooded			
FHH/EurMcwiCrl	•		
Fischer			
F344/DuCrl	•	•	
F344/DuCrlCrlj			•
F344/IcoCrl		•	
F344/NCrl	•		
GK			
GK/TohiCskCrljCrl	•		
Lewis			
LEW/Crl	•	•	
LEW/CrlCrlj			•
Noble			
NBL/CrCrl	•		
PCK			
PCK/CrljCrl-Pkhd1 ^{Pck} /Crl	•		
PCK/CrljCrl-Pkhd1 ^{Pck} /CrlCrlj			•
SHHF			
SHHF/MccGmiCrl-Lepr ^{CP} /Crl	•		
SHROB			
SHROB/KolGmiCrl-Lepr ^{CP} /Crl	•		
Stroke Prone			
SHRSP/A3NCrl	•		
SHR			
SHR/NCrl	•	•	
SHR/NCrlCrlj			•
WAG			
WAG/RijCrl		•	
Wistar Furth			
WF/CrCrl	•		
WF/IcoCrl		•	
WKY			
WKY/NCrl	•	•	
WKY/NCrlCrlj			•
ZDF			
ZDF-Lepr ^{fa} /Crl	•	•	
ZDF-Lepr ^{fa} /CrlCrlj			•

Outbred Rats

Nomenclature	North America	Europe	Japan
CD®			
Crl:CD(SD)	•	•	•
Sprague Dawley®			
Crl:SD	•		
OFA			
Crl:OFA(SD)		•	
CD® Hairless			
Crl:CD-Prss8 ^{hr}	•		
Long-Evans			
Crl:LE	•	•	
Crlj:LE			•
Lister Hooded			
Crl:LIS		•	
Obese Prone			
Crl:OP(CD)	•		
Obese Resistant			
Crl:OR(CD)	•		
Wistar			
Crl:WI	•	•	
Crlj:WI			•
Wistar Han			
Crl:WI(Han)	•	•	•
Wistar WU			
Crl:WI(WU)		•	
Zucker			
Crl:ZUC-Lepr ^{fa}	•		
Crl:ZUC(Orl)-Lepr ^{fa}		•	
Crlj:ZUC-Lepr ^{fa}			•

Hybrid Rats

ZSF1			
ZSF1-Lepr ^{fa} Lepr ^{CP} /Crl	•		

Consomic Rats

SS-13BN			
SS-Chr 13 ^{BN} /McwiCrl	•		

MICE

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Outbred Mice

Nomenclature	North America	Europe	Japan
Black Swiss			
Crl:NIHBL(S)	•		
CD-1®			
Crl:CD1 (ICR)	•	•	•
CF-1™			
Crl:CF1	•		
Crl:OF1		•	
CFW®			
Crl:CFW(SW)	•		
NMRI			
Crl:NMRI(Han)		•	
PGP			
Crl:CF1- <i>Abcb1a^{mds}</i>	•		
NCI Sencar			
Cr:ORL	•		
SKH1			
Crl:SKH1- <i>Hr^{hr}</i>	•	•	
SKH3			
Crl:SKH3(SKH2)- <i>Hr^{hr}</i>	•		

Inbred Mice

129			
129S2/SvPasCrl	•	•	
NCI A/J			
A/JCr	•		
AKR			
AKR/NCrI	•		
B6 Albino			
B6N- <i>Tyr^{c-Brd}</i> /BrdCrCrl	•	•	
NCI B6-Ly5.1			
B6.SJL- <i>Ptprc^aPepc^b</i> /BoyCr	•		
NCI B10.A/Cr			
B10.A- <i>H2^a H2-T18^a</i> /SnSgCr	•		
BALB/c			
BALB/cAnNCrI	•	•	
BALB/cAnNCrICrlj			•
BALB/cByJ		•	
BALB/cJ		•	
C3H			
C3H/HeNCrI	•	•	•
C3H/HeOuJCrl		•	
C57BL/6			
C57BL/6J		•	•
C57BL/6NCrI	•	•	•

Nomenclature	North America	Europe	Japan
CBA			
CBA/CaCrI		•	
CBA/J		•	•
CB17™			
C.BKa- <i>Igh^b</i> /IcrCrl	•		
DBA/1			
DBA/1J		•	•
DBA/2			
DBA/2J		•	
DBA/2NCrI	•	•	
DBA/2NCrICrlj			•
FVB			
FVB/NCrI	•	•	
NC			
NC/NgaTndCrlj			•
NOD			
NOD/ShiLtJ		•	
POUND			
C57BL/6NCrI- <i>Lepr^{db-db}</i> /Crl	•		
SJL			
SJL/J		•	•
SJL/JOrlIcoCrl	•		

Hybrid Mice

B6C3F1			
B6C3F1/CrI	•	•	•
B6CBAF1			
B6CBAF1/CrI		•	
B6CBAF1/J		•	
BDF1 (B6D2F1)			
B6D2F1/CrI	•	•	
B6D2F1/J		•	
CBAB6F1			
CBAB6F1/CrI		•	
CB6F1			
CB6F1/CrI	•	•	
CDF1 (CD2F1)			
CD2F1/CrI	•	•	
CD2F1/Crlj			•
NMRCF1			
NMRCF1/CrI		•	

IMMUNODEFICIENT MODELS

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Immunodeficient Models

Nomenclature	North America	Europe	Japan
Athymic Nude			
Crl:NU(NCr)-Foxn1 ^{nu}	•		
BALB/c Nude			
CAnN.Cg-Foxn1 ^{nu} /Crl	•	•	
CAnN.Cg-Foxn1 ^{nu} /CrlCrlj			•
CBy.Cg-Foxn1 ^{nu} /J		•	
CB17SCID			
CB17/lcr-Prkdc ^{scid} /lcrIcoCrl	•	•	
CB17/lcr-Prkdc ^{scid} /CrlCrlj			•
CD-1® Nude			
Crl:CD1-Foxn1 ^{nu}	•	•	
Crlj:CD1-Foxn1 ^{nu}		•	•
NCG			
NOD-Prkdc ^{em26Cd52} Il2rg ^{em26Cd22} /NjuCrl	•		
NOD SCID			
NOD.CB17-Prkdc ^{scid} /J		•	•
NOD.CB17-Prkdc ^{scid} /NCrCrl	•	•	
NSG			
NOD.Cg-Prkdc ^{scid} Il2rg ^{tm1Wjl} /SzJ		•	•
NU/NU Nude			
Crl:NU-Foxn1 ^{nu}	•	•	
Crl:NU(lco)-Foxn1 ^{nu}		•	
NIH-III Nude			
Crl:NIH-Lyst ^{bg-j} Foxn1 ^{nu} Btk ^{xid}	•		
NMRI Nude			
Crl:NMRI-Foxn1 ^{nu}		•	
Nude Rat			
Crl:NIH-Foxn1 ^{nu}	•	•	
SCID Beige			
CB17.Cg-Prkdc ^{scid} Lyst ^{bg-j} /Crl	•	•	
CB17.Cg-Prkdc ^{scid} Lyst ^{bg-j} /CrlCrlj			•
NCI SCID/NCr			
CB17/lcr-Prkdc ^{scid} /lcrCr	•		
SHC™			
CB17.Cg-Prkdc ^{scid} Hr ^{hr} /lcrCrl	•		
SHO®			
Crl:SHO-Prkdc ^{scid} Hr ^{hr}	•		
Crlj:SHO-Prkdc ^{scid} Hr ^{hr}			•

GUINEA PIGS, RABBITS, HAMSTERS, GERBILS

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Guinea Pig

Nomenclature	North America	Europe	Japan
Hartley			
Crl:HA	•	•	

Hairless Guinea Pig

Nomenclature	North America	Europe	Japan
Hairless Guinea Pig			
Crl:HA-Hr ^{hr}	•		

Rabbits

Nomenclature	North America	Europe	Japan
New Zealand White			
Crl:KBL(NZW)	•	•	
Ora:NZW	•		

Hamsters

Nomenclature	North America	Europe	Japan
Golden Syrian			
Crl:LVG(SYR)	•	•	

Gerbils

Nomenclature	North America	Europe	Japan
Mongolian			
Crl:MON(Tum)	•	•	

GENETICALLY ENGINEERED MODELS

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Genetically Engineered Models

Nomenclature	North America	Europe	Japan
B6.129P2-Apoe ^{tm1Unc} /J		●	●
B6.129S7-Icam1 ^{tm1Bay} /Crl		●	
B6.129S7-Selp ^{tm1Bay} /Crl		●	
B6.CBA-Tg(APOA1)427Bres/Crl	●		
B6.Cg-Apoe ^{tm1Unc} Icam1 ^{tm1Bay} /Crl		●	
B6.Cg-Apoe ^{tm1Unc} Icam1 ^{tm1Bay} Selp ^{tm1Bay} /Crl		●	
B6.Cg-Apoe ^{tm1Unc} Selp ^{tm1Bay} /Crl		●	
B6.SJL-Ptprc ^a Pepc ^b /BoyCrl	●	●	
B6.Cg-Lep ^{ob} /J		●	●
BKS.Cg-Dock7 ^m +/+ Lep ^{ob} /J		●	●
C57BL/6-Tg(TcraTcrb)425Cbn/Crl		●	
C57BL/6-Tg(TcraTcrb)1100Mjb/Crl		●	
CBA;B10-Tg(H2K ^b -tsA58)6Kio/Crl	●		

RESOURCES:

GENERAL TERMS & CONDITIONS OF SALE ("TERMS AND CONDITIONS")

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Charles River Laboratories, Inc. and its affiliates ("Charles River") will provide the products ("Products") and services ("Services") described in the Charles River acknowledgment, quotation, protocol, or statement of work as applicable ("SOW") and Charles River's customer ("Customer") will purchase the Products and Services pursuant to the specifications contained in the SOW and in accordance with these Terms and Conditions. These Terms and Conditions will also apply to all future purchases of Products and Services by Customer.

1. Binding Character

Customer's acceptance of delivery of Products or Services will be deemed agreement to the Terms and Conditions.

No other document attempting to negate or otherwise modify the terms hereof will be binding upon Charles River unless expressly agreed to Charles River in writing.

2. Provision of the Products and Conduct of the Services

If an amendment to the SOW requires additional or different work by Charles River, Charles River may agree to conduct such work and will be paid an amount mutually agreed to by the parties. Deviations from the SOW may be made in an emergency without Customer's approval, if Charles River uses commercially reasonable efforts to obtain Customer's verbal approval, which will then be confirmed in writing. If Charles River is unable to contact Customer, Customer agrees that Charles River may proceed accordingly, and recover such additional costs from Customer.

3. Restrictions on Use and Breeding

Customer will use Products in accordance with all applicable laws. Customer will ensure that all animals purchased from Charles River, descendants of those animals derived by inbreeding or crossbreeding, including derivatives of those animals or their descendants ("Models") will not be: (i) used for any purpose other than the internal research of Customer, or (ii) bred (for sale or otherwise) or provided to any third party for any use, unless Charles River provides Customer with prior written consent. Customer will not, without the prior written consent of Charles River, return Products or shipping containers to Charles River.

Customer cannot sell, transfer or make available to a third party the Products or their components or the Services for Commercial Purposes. "Commercial Purposes" means any activity for cash or other consideration including, but not limited to: (1) use of the Products or their components or materials made using the Products or their components in manufacturing, or to provide a service, information or data, or for clinical, therapeutic, diagnostic or prophylactic purposes or (2) resale of the Products or their components or materials made using the Product or their components, except by licensed distributors of Charles River, whether or not resold for use in research. To the extent that Charles River owns or controls (with the right to sublicense) intellectual property rights applicable to the Products, those rights are licensed to Customer on a limited, revocable, non-exclusive, non-transferable, and non-sublicensable basis only for the internal uses expressly permitted above.

4. Compensation

Unless otherwise agreed to by the parties, prices will be as per the price list (if applicable, price of Models is based on highest weight range) on the day of delivery, and do not include taxes, packaging, insurance, or shipment expenses. Charles River may modify the price list from time to time. Customer will pay Charles River as set forth in the SOW. All invoices are due and payable thirty (30) days from the date of the invoice and Customer agrees to pay all invoices submitted. All amounts not paid by Customer when due will accrue interest from the applicable due date until paid, at the highest rate permitted under applicable law. Charles River may also elect to cease or suspend the supply of Products and any work on the Services, or withhold required reports or other deliverables if Customer does not make payments when due and payable.

All termination, delay or cancellation fees are set forth in the current Research Models and Services catalog.

If in the judgment of Charles River, Customer's financial condition is precarious or there has been a materially adverse change in Customer's financial condition, Charles River will have the right to demand payment or other assurances which it deems adequate before providing any Products or Services.

5. Test Articles

Customer will provide Charles River with sufficient amounts of compounds, materials, animals, substances, devices, and protocols meeting relevant specifications, including health and genetic data ("Test Articles") with which to perform the Services. Customer will provide Charles River with complete and accurate data to apprise Charles River of the identity, strength, purity, stability, composition or other characteristics, proper storage, and safe handling requirements of the Test Articles, including a material safety data sheet or equivalent documentation. Customer will certify to Charles River that the methods of synthesis, fabrication, or derivation of the Test Articles have been documented. All costs associated with shipping the Test Articles to Charles River will be the responsibility of Customer, and Charles River will not be responsible for any loss, damage, or destruction of the Test Articles while in transit. All Test Articles and Products used in connection with the Services will remain the property of Customer.

6. Reports

Charles River will keep complete and accurate records of the status and progress of the Services if, and as required by, the SOW. Charles River will furnish a report or data containing information as specified in the SOW. All reports will be prepared in the standard format of Charles River.

Neither Charles River nor Customer will publish any report or data prepared for Customer by Charles River without the prior written consent of the other party, which will not be unreasonably withheld.

If Charles River provides electronic access to the data, records, reports and other documentation and Customer elects to use such electronic access, the use of such electronic access will be governed by Charles River's standard access terms and conditions which are available on request.

7. Inspections

Upon reasonable advance written notice and during regular business hours, Charles River will permit Customer to visit the Charles River facilities where the Services are performed to monitor Charles River's performance of the Services, in compliance with Charles River's biosecurity measures and business requirements.

Charles River will notify Customer as soon as practical of any regulatory inspection of Charles River's facilities that directly impacts the Services provided to Customer.

8. Ownership

Any inventions, techniques, intellectual property, technology, commercial and industrial secrets, regardless of whether patented or registered, for providing the Products or performing the Services are, and will remain, Charles River's exclusive property including, but not limited to, present and future documentation, scientific and technical data, test procedures and other information that is owned or licensed by Charles River and is not developed hereunder.

Charles River will have the right to use concurrent control data as part of its general historical database. Any data, discoveries, or inventions developed or generated, which directly relate to any information or materials provided by Customer will be the property of Customer. Charles River agrees to assist Customer in securing any patents, copyrights, or other proprietary rights in such data, discoveries or inventions, and to perform all reasonable acts to vest in Customer all right, title and interest in such data, discoveries or inventions, and Charles River will be compensated at its standard rates for such assistance. All costs and expenses associated with establishing Customer's rights therein will be Customer's responsibility.

9. Archiving

All reports and supporting documentation resulting from the Services are Customer's property ("Materials"). Charles River will retain the Materials for the period set forth in the SOW. At the end of such period, Charles River will contact Customer to determine whether to: (a) extend storage of the Materials; (b) return the Materials to Customer at Customer's expense or (c) dispose of the Materials at Customer's expense. If Customer requests Charles River to continue to store the Materials and Charles River agrees, Charles River will invoice Customer at its then current rates. If Customer fails to give such instructions, Charles River will notify Customer, and if instructions are not forthcoming within thirty (30) days of said notification, Charles River may store the Materials or return them to Customer at Customer's expense. Customer will be liable for storage charges until the Materials are returned to Customer. While the Materials are in transit to Customer, all risk of loss or exposure to the Materials will be borne by Customer.

If the Materials require special storage, additional charges will be assessed and invoiced to Customer. Invoices will be issued annually in advance and are due and payable upon receipt.

10. Warranties

Customer warrants that it owns all rights, title and interest in the Test Articles and the intellectual property related thereto, and that Charles River's use of the Test Articles does not infringe any third party rights.

Charles River warrants that the Products and Services will conform to the specifications contained in the SOW and applicable law. Charles River does not warrant or represent that the results of the Services will be acceptable to any regulatory or governmental agency nor that the results of the Services will enable Customer to further develop, market or otherwise exploit the Test Articles or any other product or service.

THE WARRANTY BY CHARLES RIVER SET FORTH HEREIN IS IN LIEU OF ANY AND ALL OTHER REPRESENTATIONS OR WARRANTIES, EXPRESS, IMPLIED OR STATUTORY INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SUITABILITY OF THE PRODUCTS AND SERVICES FOR CUSTOMER'S PURPOSES, IMPACT OF THE PRODUCTS AND SERVICES ON CUSTOMER'S OPERATIONS, OR NON-INFRINGEMENT OF A PATENT, TRADEMARK OR OTHER INTELLECTUAL PROPERTY RIGHT.

Any claim for breach of warranty must be made in writing to Charles River within ten business days after the Products are delivered or the completion of Services, after which time the Products or Services will be deemed finally accepted.

Risk of loss and title to the Products will pass to Customer once the Products leave Charles River's facility or are delivered to a common carrier, as applicable.

RESOURCES:

GENERAL TERMS & CONDITIONS OF SALE ("TERMS AND CONDITIONS")

1.877.criver1 | www.criver.com | askcharlesriver@crl.com

11. Limitation of Liability

Charles River will not be liable for penalties or liquidated damages or for special, indirect, consequential punitive, exemplary, or incidental damages of any type or kind regardless of whether any such losses or damages are characterized as arising from breach of contract, breach of warranty, tort, negligence, strict liability, or otherwise.

Charles River's liability, regardless of the form of action, will be limited to actual and foreseeable damages and will not exceed the total price paid for the Products or Services pursuant to which such liability arises. Charles River will not be liable for any damages arising from, or in connection with, any decision by Customer or any third party to further research, develop or market the Test Articles or any derivative or product or service related thereto, or the use made of the Products, Services or Test Articles or service related thereto.

Subject to the limitations set forth in this Section, if Charles River commits a breach of the warranty set forth above, Charles River's sole liability, and Customer's sole remedy, will be for Charles River to replace the Products or issue a credit therefore, or conform the work or portion of the Services affected by the breach to the relevant specification.

12. Indemnities

Customer will defend, indemnify, save, and hold harmless Charles River, its parent and affiliates and their respective directors, officers, employees, and agents from and against any claims, demands, suits, actions, causes of action, losses, damages, fines, and liabilities, including reasonable professional fees ("Claim") arising out of or in connection with (a) the research, development, manufacture, distribution, use, sales or other disposition by Customer, or any distributor, collaborator, representative or agent of Customer, of the Test Articles and/or any other substances upon which the Services were performed or any use made of the Products, (b) any infringement of any third party's intellectual property rights or unauthorized use or misappropriation of its know-how or trade secrets, (c) Customer's negligence, willful misconduct, or breach of this agreement, or (d) personal injury related to contact with the Products during visits to Charles River's facilities or after delivery of the Products to Customer and will pay any costs and damages, provided that Customer is given written notice of the Claim within five (5) days of the date of notice to Charles River and is given information, reasonable assistance and sole authority to defend and/or settle the Claim.

13. Insurance

Each party will have insurance sufficient to cover its interest or potential liabilities hereunder including, but not limited to, worker's compensation, if applicable, and comprehensive general liability.

14. Confidentiality

In the course of providing the Products or performing the Services, Charles River and Customer may exchange proprietary and confidential information. The parties will identify such information as confidential and/or proprietary.

If a party intends to disclose confidential information to the other party orally, the disclosing party will (i) alert the other party of the confidential nature of the disclosure prior to the disclosure and (ii) provide written notice to the other party of the confidential nature and contents of such disclosure within ten days of the original disclosure. Each party will use its commercially reasonable efforts to maintain such information in confidence and will employ reasonable and appropriate procedures to prevent its unauthorized disclosure. Neither party will use the other party's proprietary and/or confidential information other than in performance of this Agreement. These obligations of confidentiality will survive termination or expiration of the Terms and Conditions for a period of five (5) years.

These confidentiality provisions will not apply to any information, which (i) is known to the receiving party at the time it was obtained from the disclosing party; (ii) is acquired by receiving party from a third party, and such third party did not obtain such information under an obligation not to disclose; (iii) is or becomes in the public domain other than by violation of these Terms and Conditions by the receiving party; (iv) is independently developed by the receiving party without reference to or reliance upon the information provided by the disclosing party; or (v) is required to be disclosed by the receiving party to comply with applicable laws; provided that the receiving party provides prompt written notice of such disclosure to the disclosing party and cooperates with the disclosing party's reasonable and lawful actions to avoid and/or minimize the extent of such disclosure, at the disclosing party's expense.

15. Termination

Unless otherwise specified in the SOW, Customer may terminate the SOW at any time without cause upon thirty (30) days prior written notice to Charles River. In the event of such termination, Charles River will be paid for all Products provided or Services rendered, together with any additional expenses incurred to shut down the Services, any irrevocably committed costs and any cancellation or termination fee set forth in the SOW.

Either party may terminate these Terms and Conditions or SOW, as applicable, at any time upon thirty (30) days prior written notice to the other party, for material breach of the Terms and Conditions by the other party if such breach is not remedied within the thirty (30) day notice period.

Upon termination, neither party will have any further obligations, except that (i) the liabilities accrued through the date of termination and (ii) the obligations which by their terms survive termination, will survive termination.

16. Force Majeure

Except with respect to the payment of any amount due hereunder, neither party will be in default of any obligation to the extent that the performance of such obligation is prevented or delayed by fire, flood, earthquake, hurricane, explosion, disease, contamination, strike, acts of terrorism, war, insurrection, embargo, government requirement, civil or military authority, animal activism, act of God, or any other event, occurrence or condition which is not caused, in whole or in part, by that party, and which is beyond the reasonable control of that party.

17. Governing Law and Dispute Resolution

These Terms and Conditions and any dispute arising from or in connection with the sale of the Products and/or Services are governed by, and will be construed in accordance with, the laws of Delaware, excluding the United Nations Convention on the International Sale of Goods and without regard to any choice of law principle that would dictate the application of the law of another jurisdiction.

The parties will attempt to resolve through negotiations any controversy, claim, or dispute. If the negotiations are not successful, upon written demand of either party, the claim, controversy or dispute will be submitted to arbitration. Such arbitration will take place in Boston, Massachusetts, will be conducted in English, and will proceed in accordance with the United Nations Commission on International Trade Law Arbitration Rules in force from time to time. A record and transcript of the proceedings will be maintained. Any award will be made in writing. The determination of a majority of the panel of arbitrators will be the decision of the arbitrators, which will be binding regardless of whether one of the parties fails or refuses to participate in the arbitration. The arbitrators will decide on the recovery of the costs of the arbitration, except expert and attorneys' fees.

18. Miscellaneous

All notices from one party to the other will be in writing. Notices will be sent by internet transmission, overnight courier, or certified mail, return receipt requested. All notices will be effective upon receipt.

The business relationship of Charles River to Customer is that of an independent contractor and not of a partnership, joint venture, employer, agent, or any other kind of relationship.

These Terms and Conditions, and the rights and obligations hereunder, may not be assigned or transferred by either party without the prior written consent of the other party.

These Terms and Conditions, together with the SOW, set forth the entire agreement and understanding between the parties, superseding any and all previous statements, negotiations, documents, agreements and understandings, whether oral or written, as to the subject matter hereof.

In the event that any one or more of the provisions contained in these Terms and Conditions is held to be invalid, illegal or unenforceable in any respect, that invalidity, illegality or unenforceability will not affect any other term or condition, and all other terms and conditions will remain in full force and effect.

19. Intellectual Property

Charles River® and Charles River Laboratories® are registered trademarks of Charles River. VAF/Plus®, VAF/Elite®, BlastoKit®, CD®, CD-1®, CFW®, EAD®, Gnoto-safe®, PRIA®, SHO®, THE POUND MOUSE®, Multiplexed Fluorometric ImmunoAssay® (MFIA®), I-CRYO®, EZ-Spot®, Laboratory Testing Management® and MAX-BAX® are registered trademarks of Charles River. CDF™, CF-1™, Sew Easy™, ICM™ and LTM™ are trademarks of Charles River. The SourceSM is a service mark of Charles River.

20. Privacy

The privacy policy of Charles River can be found at <https://www.criver.com/about-us/privacy-policy>.

21. Language

The parties acknowledge that they have required that the Terms and Conditions, as well as all documents, notices and legal proceedings executed, given or instituted pursuant to or relating directly or indirectly hereto, be drawn up in English.

NOTES

