



# US Product **guide**

Research models and services

Effective October 1, 2018

# Positive discovery

Welcome to a world in which every research model is designed to enhance a life - a world in which animal welfare is of paramount importance and our customers are at the heart of everything we do.

Working together with our customers, Envigo is contributing to a world in which human lives are improved and scientific knowledge is advanced on a daily basis.

Discover your own positive outcomes at [envigo.com](http://envigo.com) today.





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\* available from EU



# Worldwide production locations



# Worldwide stocks and strains

## Production locations



MODEL	NOMENCLATURE	CODE	US	UK	NED	FRA	ISR	JPN	KOR	PG#
<b>INBRED MICE</b>										
129	129S2/SvHsd	215		+						*
A/J	A/JOlaHsd	049	+	+	+					7
BALB/C	BALB/cAnNHsd	047	+						+	8
	BALB/cOlaHsd	162		+	+		+			*
C3H	C3H/HeNHsd	040	+		+		+		+	9
C57BL/6	C57BL/6JOlaHsd	057		+	+		+			*
	C57BL/6JRccHsd	043			+		+			*
	C57BL/6NHsd	044	+		+				+	10
C57BL/Ka	C57BL/KaLwRijHsd	940			+					*
CBA/Ca	CBA/CaOlaHsd	209		+	+			+		*
CBA/J	CBA/JCrHsd	055	+						+	11
DBA/1	DBA/1OlaHsd	105	+	+	+					12
DBA/2	DBA/2JRccHsd	343			+					*
	DBA/2NHsd	042	+				+		+	12
	DBA/2OlaHsd	870		+						*
FVB	FVB/NHan®Hsd	862		+	+		+			*
	FVB/NHsd	118	+						+	13
NIH	NIH/OlaHsd	059		+						*
NZB	NZB/OlaHsd	100		+						*
NZW	NZW/OlaHsd	102		+						*
SAMP8	SAMP8/TaHsd	954			+					*
SAMR1	SAMR1/TaHsd (control)	956			+					*
SJL/J	SJL/JCrHsd	052	+		+		+			13
<b>OUTBRED MICE</b>										
Black Swiss	Hsd:NIHBS	188					+			*
CD-1	CrHli:CD-1	435					+			*
ICR (CD-1®)	Hsd:ICR (CD-1®)	030	+	+	+		+			14
ND4 Swiss Webster	Hsd:ND4	032	+							14
NIH Swiss	Hsd:NIHS	035	+	+						15
NMRI	HsdWin:NMRI	275			+					*

\* Not described in this guide. We invite inquiries about items not listed. Our Customer Service and Veterinary Sciences, Research and Support representatives are ready to discuss your special requirements. We will work with you to select the stocks and strains that best suit your needs.

■ Will be eliminated and/or cryopreserved in 2019.

# Worldwide stocks and strains

## Production locations



MODEL	NOMENCLATURE	CODE	US	UK	NED	FRA	ISR	JPN	KOR	PG#
<b>OUTBRED MICE</b>										
Non-Swiss Albino	Hsd:NSA (CF-1®)	033	+							15
SABRA-M	HsdHu:SABRA-M	992					+			*
TO	HsdOla:TO	876		+						*
<b>MUTANT MICE (Spontaneous)</b>										
<i>Nudes</i>										
Athymic Nude	Hsd:Athymic Nude-Foxn1 <sup>nu</sup>	069	+	+		+	+			18
	Hsd:Athymic Nude-Foxn1 <sup>nu</sup> /Foxn1 <sup>+</sup>	070	+	+		+	+			18
BALB/c Nude	BALB/cOlaHsd-Foxn1 <sup>nu</sup>	165		+		+	+			*
	BALB/cOlaHsd-Foxn1 <sup>nu</sup> /Foxn1 <sup>+</sup>	886		+		+	+			*
CD1 Nude	HsdHli:CD1-Foxn1 <sup>nu</sup>	437					+			*
NMRI Nude	HsdCpb:NMRI-Foxn1 <sup>nu</sup>	889				+				*
	HsdCpb:NMRI-Foxn1 <sup>nu</sup> /Foxn1 <sup>+</sup>	890				+				*
<i>SCIDs</i>										
NOD.SCID	NOD.CB17-Prkdc <sup>scid</sup> /NcrHsd	170	+			+	+			19
SCID	C.B-17/lcrHan®Hsd-Prkdc <sup>scid</sup>	883		+		+		+		*
	C.B-17/lcrHsd-Prkdc <sup>scid</sup>	182	+				+			20
SCID/Beige	C.B-17/lcrHsd-Prkdc <sup>scid</sup> Lyst <sup>bsg-J</sup>	186	+			+	+			20
SHrN® ("Shorn")	NOD.Cg-Prkdc <sup>scid</sup> Hr <sup>hr</sup> /NcrHsd	179				+				*
R2G2®	B6;129-Rag2 <sup>m1Fwa</sup> Il2rg <sup>m1Rskj</sup> /DwlHsd	021	+	+		+				21
<i>Diabetic/Obese</i>										
Diabetic (db/db)	BKS.Cg- + Lepr <sup>db</sup> /+Lepr <sup>db</sup> /OlaHsd	173	+	+	+					22
	BKS.Cg-Dock7 <sup>m</sup> /+ Lepr <sup>db</sup> /OlaHsd	H174	+	+	+					22
	BKS.Cg-Dock7 <sup>m</sup> /+ Lepr <sup>db</sup> /OlaHsd	H174	+	+	+					22
	BKS.Cg-(Lean)/OlaHsd	174	+	+	+					22
Obese (ob/ob)	B6.V-Lep <sup>ob</sup> /OlaHsd	177		+						*
	B6.V-Lep <sup>ob</sup> /Lep <sup>+</sup> /OlaHsd	H178		+						*
	B6.V-Lep <sup>+</sup> /Lep <sup>+</sup> /OlaHsd	W178		+						*
	B6.V-(Lean)/OlaHsd	178		+						*
<i>Other</i>										
Albino C57BL/6	C57BL/6BrdCrHsd-Tyr <sup>c</sup>	103	+			+				24

# Worldwide stocks and strains

## Production locations



MODEL	NOMENCLATURE	CODE	US	UK	NED	FRA	ISR	JPN	KOR	PG#
<b>HYBRID MICE**</b>										
B6C3F1	B6C3F1/Hsd	061	+							24
	B6C3F1/OlaHsd	946			+					*
B6CBAF1	B6CBAF1/OlaHsd	045			+					*
B6D2F1	B6D2F1/Hsd	063	+				+		+	24
	B6D2F1/JRccHsd	344			+					*
CB6F1	CB6F1/Hsd	065	+							25
	CB6F1/OlaHsd	949			+		+			*
CD2F1	CD2F1/Hsd	060	+							25
CSJLF1	CSJLF1/HliHsd	969					+			*
NZBNZWF1	NZBNZWF1/OlaHsd	098		+						*
<b>INBRED RATS</b>										
ACI	ACI/SegHsd	013	+							26
Brown Norway	BN/RijHsd	147	+	+	+					26
DA	DA/OlaHsd	092	+	+	+					27
Dahl Salt-Sensitive/ Resistant (Rapp)	SS/JrHsd	008	+							27
	SR/JrHsd	011	+							27
Fischer 344	F344/NHsd	010	+						+	28
Lewis	LEW/Han <sup>®</sup> Hsd	861			+					*
	LEW/SsNHsd	017	+	+			+			28
Spontaneously Hypertensive	SHR/NHsd	022	+	+						29
Wistar Furth	WF/NHsd	012	+							29
Wistar Kyoto	WKY/NHsd	023	+	+						30
<b>OUTBRED RATS</b>										
Holtzman <sup>®</sup>	HsdHot:Holtzman <sup>®</sup>	003	+							31
Lister Hooded	HsdOla:LH	119		+	+					*
Long Evans (Blue Spruce)	HsdBlu:LE	140	+							31
SABRA-R	HsdHu:SABRA-R	991					+			*
Sprague Dawley <sup>®</sup>	Hsd:Sprague Dawley <sup>®</sup> SD <sup>®</sup>	002	+	+	+		+	+		33
Wistar	Hsd:WI	001	+							32

\* Not described in this guide. We invite inquiries about items not listed. Our Customer Service and Veterinary Sciences, Research and Support representatives are ready to discuss your special requirements. We will work with you to select the stocks and strains that best suit your needs.

\*\* This is a brief selection of available hybrids; any combination may be bred on demand. Any existing hybrid combination may be discontinued at any time without prior notice.

# Worldwide stocks and strains

## Production locations



MODEL	NOMENCLATURE	CODE	US	UK	NED	FRA	ISR	JPN	KOR	PG#
<b>OUTBRED RATS</b>										
Wistar Han®	HsdHan®:WIST	141					+			*
	RccHan®:WIST	168	+	+	+			+		35
Wistar Unilever	HsdCpb:WU	111			+					*
<b>MUTANT RATS (Spontaneous)</b>										
<i>Nudes</i>										
Athymic Nude	Hsd:RH-Foxn1 <sup>nu</sup>	005	+			+				37
	Hsd:RH-Foxn1 <sup>nu</sup> /Foxn1 <sup>+</sup>	006	+			+				37
<i>Obese</i>										
Zucker	HsdHlr:ZUCKER-Lepr <sup>fa</sup>	194	+							38
	HsdHlr:ZUCKER-Lepr <sup>fa</sup> /Lepr <sup>+</sup>	H195	+							38
	HsdHlr:ZUCKER-Lepr <sup>+</sup>	W195	+							38
	HsdHlr:ZUCKER (Lean)	195	+							38
<b>HYBRID RATS</b>										
Any hybrid combination may be bred on demand. Please inquire.										
<b>GUINEA PIGS</b>										
Dunkin Hartley	HsdDhl:DH	459			+					*
<b>HAMSTERS</b>										
Golden Syrian	HsdHan®:AURA	089	+							39
<b>COTTON RATS</b>										
Cotton Rat	Hsd:Cotton Rat	201	+							40
<b>RABBITS</b>										
New Zealand White	HsdIf:NZW	444		+						*
	HsdOkd:NZW	081					+			*

\* Not described in this guide. We invite inquiries about items not listed. Our Customer Service and Veterinary Sciences, Research and Support representatives are ready to discuss your special requirements. We will work with you to select the stocks and strains that best suit your needs.

\*\* This is a brief selection of available hybrids; any combination may be bred on demand. Any existing hybrid combination may be discontinued at any time without prior notice.





MODEL CODE  
**049**

**A/J**  
NOMENCLATURE A/JOl<sup>a</sup>Hsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$128.65	\$150.10
4-5	138.65	158.95
5-6	148.65	177.45
6-7	155.40	185.95
7-8	177.15	222.85
8-9	194.80	240.45
9-10	212.35	257.95
Over 10 weeks, add per week	17.55	17.55
Untimed pregnant*		672.65
Timed mated*		896.30
Female with litter		933.85
Proven breeder	258.95	283.70
Retired breeder	243.40	243.40

\* For our pregnant animal policy, refer to page 66.

**Albino.** From G.D. Searle to Harlan Olac, United Kingdom, in 1978; to Harlan, United States, in 1993. Harlan became Envigo in 2015.



MODEL CODE  
**047**

## BALB/c

NOMENCLATURE BALB/cAnNHsd

AGE (WEEKS)	Approx. Weight (g)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
3-4	Up to 12	Up to 12	\$28.90	\$30.25
4-5	13-15	13-15	30.85	31.50
5-6	16-18	16-17	34.45	33.60
6-7	19-21	16-18	34.85	36.90
7-8	22-24	17-19	38.60	39.90
8-9	22-24	18-19	40.85	44.20
9-10	22-25	18-20	45.25	46.30
Over 10 weeks, add per week			4.50	4.30
Untimed pregnant*				245.90
Timed mated*				269.00
Female with litter				303.70
Proven breeder			38.00	40.80
Retired breeder			27.05	29.40

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### Characteristics

- Litter average: 6.0
- Docile disposition
- Haplotype: *H-2<sup>d</sup>*
- Experimental allergic encephalomyelitis resistant

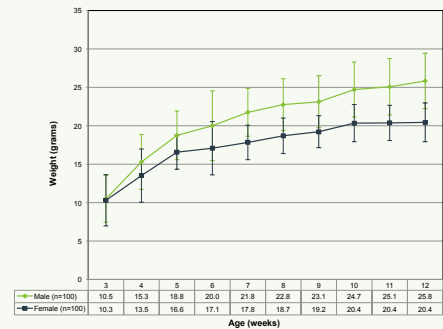
### Additional available data

- Hematology
- Clinical chemistry

### Research use

- Cardiovascular
- Monoclonal antibody production
- Toxicology
- Oncology
- Immunology
- Pharmacology
- Aging
- Teratology
- General purpose

### BALB/cAnNHsd



Maintained on Teklad Global Rodent Diet 2018S (16% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Cage floor space: 71.5 in<sup>2</sup>. Growth chart includes mean ± 2 SD's representative of population distribution.



MODEL CODE  
**040**



## C3H

NOMENCLATURE C3H/HeNHsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$34.60	\$34.80
4-5	35.95	37.65
5-6	38.45	42.25
6-7	41.75	44.85
7-8	46.20	46.30
8-9	51.70	52.00
9-10	57.20	57.75
Over 10 weeks, add per week	5.50	5.70
Untimed pregnant*		310.20
Timed mated*		323.30
Female with litter		346.90
Proven breeder	48.55	54.60
Retired breeder	30.55	34.80

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### Characteristics

- Litter Average: 5.0
- Haplotype: *H-2<sup>K</sup>*
- Carrier of the retinal degeneration (*Pde6b<sup>rd</sup>*) mutation
- Normal response to LPS
- Highly susceptible to Anthrax toxin

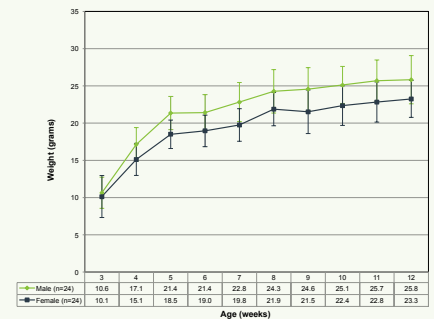
### Research use

- General Purpose
- Ocular Disease
- Immunology

### Additional available data

- Clinical chemistry
- Hematology

### C3H/HeNHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 120.75 in<sup>2</sup>. Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.



MODEL CODE  
**044**

# C57BL/6

NOMENCLATURE C57BL/6NHsd

AGE (WEEKS)	Approx. Weight (g)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
3-4	Up to 12	Up to 12	\$28.35	\$31.60
4-5	13-15	13-15	30.90	32.40
5-6	16-18	16-18	33.95	35.15
6-7	19-21	19-21	37.90	35.20
7-8	22-24	22-24	39.95	37.10
8-9			45.90	41.90
9-10			50.75	46.75
Over 10 weeks, add per week			4.85	4.80
Untimed pregnant*				263.70
Timed mated*				306.05
Female with litter				375.25
Proven breeder			44.60	46.00
Retired breeder			28.50	28.50

\* For our pregnant animal policy, refer to page 66.

**Black.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

## Characteristics

- Litter average: 6.0
- Haplotype: *H-2<sup>b</sup>*
- Most widely-used inbred strain
- Low tumor incidence
- High preference for alcohol
- Microphthalmia
- Incidence of microphthalmia

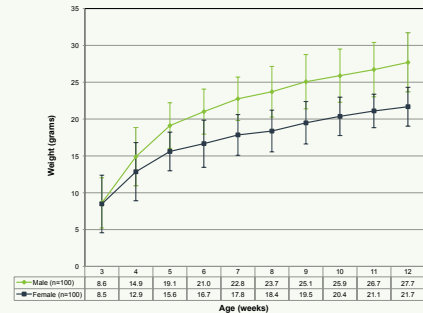
## Research use

- Background for induced and genetically-modified models
- Diet-induced obesity
- Toxicology
- Aging
- Cardiovascular
- Superovulation
- Immunology
- Oncology

## Additional available data

- Hematology
- Clinical chemistry
- Drug addiction
- Alcoholism
- General purpose

## C57BL/6NHsd



Maintained on Teklad Global Rodent Diet 20185 (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Cage floor space: 71.5 in<sup>2</sup>. Growth chart includes mean ± 2 SD's representative of population distribution.

**Aging available**  
See page 57

MODEL CODE  
**055**



## CBA/J

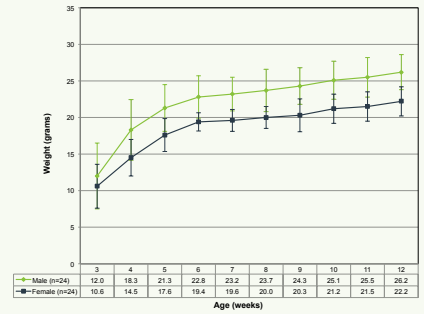
NOMENCLATURE: CBA/JCrHsd

AGE (WEEKS)	Price per animal	
	MALE	FEMALE
3-4	\$40.75	\$43.85
4-5	43.85	47.65
5-6	47.65	51.65
6-7	51.65	55.60
7-8	55.60	59.40
Over 8 weeks, add per week	5.90	5.90
Untimed pregnant*		298.20
Timed mated*		414.65
Female with litter		331.40
Proven breeder	58.55	69.05
Retired breeder	43.90	51.85

\* For our pregnant animal policy, refer to page 66.

**Agouti.** From Jackson Laboratories, Bar Harbor, Maine, to National Cancer Institute, Frederick, Maryland, in 1983. To Harlan in 1987. Harlan became Envigo in 2015.

### CBA/JCrHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) | Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Cage floor space: 120.75 in<sup>2</sup> | Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Litter average: 4.0
- Haplotype: *H-2<sup>k</sup>*
- Carrier of the retinal degeneration (*Pde6b<sup>rd1</sup>*) mutation
- Susceptible to radiation
- High incidence of mammary tumors in females

### Additional available data

- Hematology
- Clinical chemistry

### Research use

- Only approved mouse strain for use in the Local Lymph Node Assay, a refined alternative research method for evaluating the allergic contact dermatitis potential of chemicals and compounds (replaces the guinea pig maximization test)
- Immunology
- General purpose



MODEL CODE  
**105**

## DBA/1

NOMENCLATURE: DBA/1OlaHsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$52.85	\$52.85
4-5	56.20	56.20
5-6	59.70	59.70
6-7	62.95	62.95
7-8	66.25	66.25
Over 10 weeks, add per week	6.35	6.35
Untimed pregnant*		336.60
Timed mated*		363.75
Female with litter		385.85
Proven breeder	59.70	74.25
Retired breeder	36.65	45.65

\* For our pregnant animal policy, refer to page 66.

**Dilute brown, non-agouti.** Originally developed by Little. Acquired by Laboratory Animals Centre, Carshalton, United Kingdom in 1955; to Olac, United Kingdom, in 1979; to Harlan, United States, in 2002. Harlan became Envigo in 2015.

### Characteristics

- Litter average: 4.5
- Haplotype: *H-2<sup>g</sup>*

### Research use

- Adjuvant-induced arthritis
- Immunology
- Inflammation



MODEL CODE  
**042**

## DBA/2

NOMENCLATURE: DBA/2NHsd

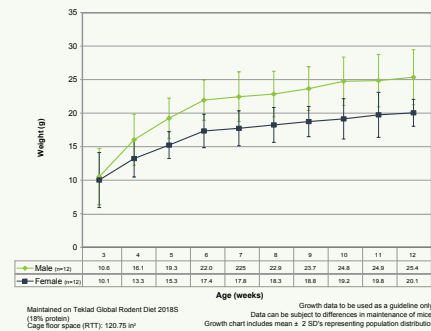
Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$65.60	\$68.50
4-5	71.80	75.05
5-6	73.20	80.25
6-7	79.05	84.10
7-8	88.45	87.55
8-9	96.65	95.70
9-10	104.90	103.80
Over 10 weeks, add per week	8.30	8.10
Untimed pregnant*		411.70
Female with litter		471.95
Proven breeder	80.95	92.45
Retired breeder	55.20	55.45

\* For our pregnant animal policy, refer to page 66.

**Dilute brown, non-agouti.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### DBA/2NHsd



### Characteristics

- Litter average: 4.5
- Haplotype: *H-2<sup>d</sup>*
- Dystrophic myocardial calcinosis

### Research use

- Progressive hearing loss
- Audiogenic seizures



MODEL CODE  
**118**

# FVB

NOMENCLATURE: FVB/NHsd

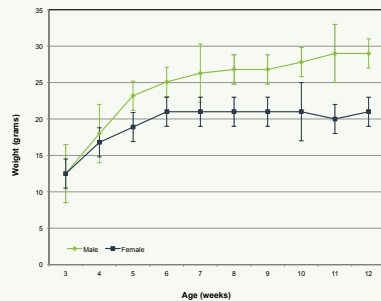
Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$31.20	\$34.05
4-5	35.85	38.15
5-6	41.60	44.65
6-7	50.80	51.30
7-8	56.70	57.45
8-9	57.00	60.25
9-10	57.30	63.85
Over 10 weeks, add per week	3.35	3.70
Untimed pregnant*		358.50
Timed mated*		358.50
Female with litter		274.00
Proven breeder	45.20	53.45
Retired breeder	35.05	41.50

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland, in 1988.

## FVB/NHsd



Growth data to be used as guideline only.  
Data can be subject to differences in maintenance of mice.  
Growth chart includes mean ± 50% representative of population distribution.



MODEL CODE  
**052**

# SJL/J

NOMENCLATURE: SJL/JCrHsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$60.50	\$64.65
4-5	64.20	68.30
5-6	67.85	77.15
6-7	72.90	79.30
7-8	77.70	83.70
8-9	94.80	101.10
9-10	100.75	111.20
10-11	107.45	113.45
11-12	114.05	120.10
12-13	120.35	127.65
Untimed pregnant*		573.60
Female with litter		674.80

\* For our pregnant animal policy, refer to page 66.

**Albino.** From The Jackson Laboratories, Bar Harbor, Maine, to National Institutes of Health, Frederick, Maryland, in 1983. To Harlan in 1987. Harlan became Envigo in 2015.



MODEL CODE  
**030**



## ICR (CD-1®)

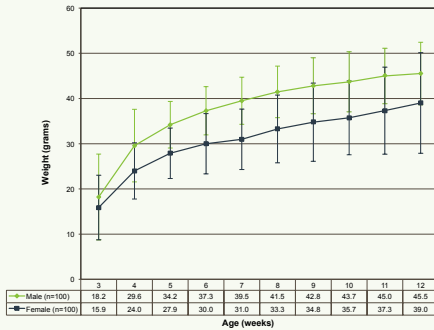
NOMENCLATURE: Hsd:ICR (CD-1®)

WEIGHT (g)	Price per animal
Up to 11	\$8.30
12-14	9.10
15-17	9.15
18-20	9.25
21-24	9.45
25-30	10.00
31-34	10.70
35+	11.75
Untimed pregnant*	51.35
Timed mated*	80.20
Female with litter	113.60
Proven breeder	51.00
Retired breeder	9.45

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from animals from Charles River Laboratories, Wilmington, Massachusetts.

### Hsd:ICR (CD-1®)



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean  $\pm$  2 SD's representative of population distribution. Cage floor space: 120.75 in<sup>2</sup>.

### Characteristics

- Litter average: 11.5
- Docile disposition
- Most widely-used outbred mouse
- Excellent reproductive and maternal characteristics
- High incidence of retinal degeneration (*Pde6b1*)

### Research use

- Oncology
- Toxicology
- Vaccines
- Aging
- Teratology
- General purpose

### Additional available data

- Hematology
- Clinical chemistry

MODEL CODE  
**032**



## ND4 Swiss Webster

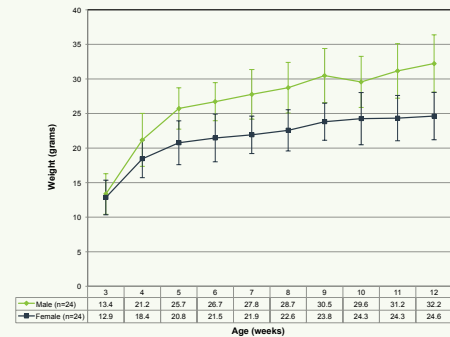
NOMENCLATURE: Hsd:ND4

WEIGHT (g)	Price per animal
Up to 11	\$10.40
12-14	11.35
15-17	11.45
18-20	11.55
21-24	11.80
25-30	12.15
31-34	13.25
35+	14.25
Untimed pregnant*	Upon request
Timed mated*	Upon request
Female with litter	Upon request
Proven breeder	Upon request
Retired breeder	Upon request

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from animals from Swiss Webster stock derived by the University of Notre Dame, Notre Dame, Indiana.

### Hsd:ND4



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean  $\pm$  2 SD's representative of population distribution. Cage floor space: 120.75 in<sup>2</sup>.



# Outbred mice



MODEL CODE  
**035**

## NIH Swiss

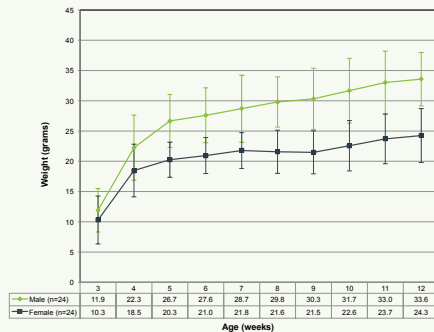
NOMENCLATURE: Hsd:NIHS

WEIGHT (g)	Price per animal
Up to 11	\$20.60
12-14	21.30
15-17	21.70
18-20	22.05
21-24	22.35
25-30	23.00
31-34	23.35
35+	24.05
Untimed pregnant*	91.10
Female with litter	215.45
Proven breeder	87.30
Retired breeder	16.05

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from animals from Charles River Laboratories, Wilmington, Massachusetts.

### Hsd:NIHS



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) Cage floor space: 120.75 in<sup>2</sup>  
Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.



MODEL CODE  
**033**

## NSA (Non-Swiss Albino)

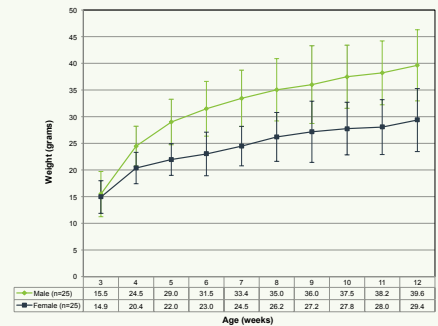
NOMENCLATURE: Hsd:NSA (CF-1®)

WEIGHT (g)	Price per animal
Up to 11	\$8.40
12-14	9.15
15-17	9.20
18-20	9.25
21-24	9.50
25-30	9.85
31-34	10.45
35+	11.55
Untimed pregnant*	50.70
Timed mated*	80.95
Female with litter	113.60
Proven breeder	46.40
Retired breeder	9.10

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from animals from Charles River Laboratories, Wilmington, Massachusetts.

### Hsd:NSA (CF-1®)



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) Cage floor space: 141.75 in<sup>2</sup>  
Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.



# Proven performance. Globally referenced.

Researchers choose Envigo oncology models for tumor uptake and growth.

Our models have been extensively referenced by leading institutions around the world.

MODEL	PAGE	HAIR	T CELLS	B CELLS	NK CELLS
Athymic Nude Mouse	18	No	Nonfunctional	Functional	Functional
SCID Mouse	20	Yes	Nonfunctional	Nonfunctional	Functional
SCID/Beige Mouse	20	Yes	Nonfunctional	Nonfunctional	Impaired
NOD.SCID Mouse	19	Yes	Nonfunctional	Nonfunctional	Impaired
Athymic Nude Rat	38	No	Nonfunctional	Functional	Functional
Rag2 Mouse (R2G2®)	21	Yes	Nonfunctional	Nonfunctional	Nonfunctional

## Models

Global availability of high-quality models with proven performance in tumor growth.

**Pages 18-21, 37**

## Diets

Largest global provider of lab animal diets designed to minimize research variables.

**Pages 41-49**

## Services

Global Molecular Oncology Services and Custom Monoclonal Antibody Production.

**Pages 51-63**



# Choose the right rodent model for your oncology research.

Below is a representation of the cell lines used successfully with Envigo models.

For access to a full listing and references\* from peer-reviewed journals, please visit [envigo.com/onco](http://envigo.com/onco)

Rodent tissue	Cell lines	Nude mice	SCID mice	Nude rats	C57 mice
Brain (rat glioma)	C6 <sup>58, 59, 78, 140, 180</sup>	+	+		
Liver	MC38-Luc1 <sup>387</sup>				+
Lung (murine)	LL2 <sup>10</sup>	+			
Lymphoma	E.G7-OVA <sup>373</sup>				+
Melanoma (murine)	B16F10 <sup>35, 36, 250</sup>	+			

Patient-derived tumors (Human tissue)	Cell lines	Nude mice	SCID mice	Nude rats
Brain	(PDX) <sup>271</sup>		+	
Breast	HBCX 1 <sup>270</sup>		+	
	HBCX 6 <sup>270</sup>		+	
	HBCX 7 <sup>270</sup>		+	
	HBCX 9 <sup>270</sup>		+	
	TNBC (MC1) <sup>273</sup>			+
	MC1 <sup>274</sup>			+
	BMC-2147 <sup>274</sup>			+
Liver	AKH23 <sup>307</sup>			+
	KFJ18 <sup>307</sup>			+
Lung	(NSCLC PDX) <sup>272</sup>			+
Pancreatic	JH033 <sup>272</sup>		+	

Evaluate our tumor growth rates by visiting our online library of *in vivo* tumor growth data at [envigo.com/tumor](http://envigo.com/tumor).

\* Superscript numbers correspond to publication references on the online cell line reference tool.

Human tissue	Cell lines	Nude mice	SCID mice	Nude rats
Bladder	KU-7 <sup>148, 149, 150, 151</sup>	+		
	T24 <sup>52</sup>			+
Brain	A-172 <sup>198</sup>	+		
	G55 <sup>3</sup>			+
	HTLA-230 <sup>5, 125</sup>	+	+	
	SH-SY5Y <sup>2</sup>			+
	TB10 <sup>200</sup>	+		
	U251 <sup>81, 202</sup>	+		
	U251 MG <sup>198, 199</sup>	+		
	U251-NG2 <sup>1, 285</sup>	+		
	U87 <sup>71, 81, 117, 173, 196</sup>	+	+	
	U87ΔEGFR <sup>197</sup>	+		
	U87 MG <sup>4, 78, 80, 83, 133, 134, 164, 195, 198, 201, 205, 206, 209, 224, 249</sup>	+	+	+
	U87Fluc <sup>79, 82</sup>	+		
	U87MG.wt EGFR <sup>203</sup>	+		
	U87-TARTK <sup>208</sup>			+
U138MG <sup>203, 266</sup>	+	+		
U373 <sup>207</sup>				+

Human tissue (Cancer stem cells)	CSC designation	Nude mice	SCID mice	Nude rats
Brain	BTSC83 <sup>200</sup>	+		
	LA-N-5 <sup>231</sup>	+		
	NGC-407-GFP <sup>206</sup>			+
	U87-SC <sup>232</sup>	+		
Breast	2LMP (MDA-MB-231 subclone) <sup>234</sup>		+	
	MCF-7 (CSC-like) <sup>236</sup>	+		
	MCF-7 (mammospheres) <sup>235</sup>	+		
	SUM159 <sup>234</sup>		+	
Lung	A549 <sup>108</sup>	+		
	H1299 <sup>108</sup>	+		
Ovarian	SKOV-3 (spherical cells) <sup>213</sup>	+		
Prostate	DU-145 (spheroid cells) <sup>233</sup>		+	



MODEL CODE  
069



# Athymic Nude

NOMENCLATURE: Hsd:Athymic Nude-Foxn1<sup>nu</sup>

Price per animal

QUANTITY	1-100 ANIMALS		101-250 ANIMALS		251+ ANIMALS	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
AGE (WEEKS)						
3-4	\$78.35	\$91.05	\$59.05	\$68.10	\$46.05	\$56.90
4-5	78.65	91.15	59.10	68.55	47.95	57.45
5-6	78.85	91.20	59.65	69.00	48.50	57.60
6-7	87.15	101.25	67.55	79.95	56.30	68.40
7-8	87.65	101.80	68.70	80.30	57.90	68.50
8-9	95.15	109.35	76.25	87.80	68.35	76.00
				MALE	FEMALE	
Over 8 weeks, add per week				\$7.30	\$7.50	
Heterozygous female with litter						Upon request
Proven breeder				202.40		
Retired breeder				64.45		

**Albino.** Derived from a nucleus colony obtained from the National Cancer Institute, Frederick, Maryland.

This immunodeficient model was originally thought to be a BALB/c congenic, but was later reported by NCI to be outbred.

## Characteristics

- The *nu* allele on chromosome 11 is an autosomal recessive mutation
- Dysfunctional rudimentary thymus
- Phenotypically hairless (sparse hair growth possible)
- T-cell deficient
- B cells function normal
- No generation of cytotoxic effector cells
- No graft versus host response
- Nude-Foxn1<sup>nu</sup>/Foxn1 heterozygotes do not show partial expression of the *nu* phenotype

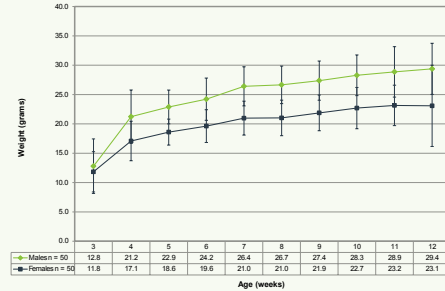
## Additional available data

- Hematology
- Clinical chemistry
- Proven models with extensive references (see page 17)

## Research use

- Oncology
- Transplantation
- Tumor cell growth
- Immunology
- Autoimmune disease
- Antibody production
- Sentinel model - Heterozygous Hsd:Athymic Nude-Foxn1<sup>nu</sup>/Foxn1<sup>+</sup>

## Hsd:Athymic Nude-Foxn1<sup>nu</sup>



Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth Chart includes mean ± 2 SD's representative of population distribution. Maintained on Teklad Global Rodent Diet 2018S (18% Protein)

MODEL CODE  
070

# Athymic Nude - heterozygous

NOMENCLATURE: Hsd:Athymic Nude-Foxn1<sup>nu</sup>/Foxn1<sup>+</sup>

AGE (WEEKS) Price per animal

3-4	\$26.95
4-5	32.40
5-6	38.75
6-7	43.90
7-8	49.45
Over 8 weeks, add per week	8.50
Untimed pregnant*	Upon request
Timed mated*	Upon request
Female with litter	Upon request
Proven breeder	161.25
Retired breeder	32.10

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Cancer Institute, Frederick, Maryland.

**This animal model is heterozygous for the *nu* mutation and is haired. Immune-competent control model.**



MODEL CODE  
170



# NOD.SCID

NOMENCLATURE: NOD.CB17-Prkdc<sup>scid</sup>/NCrHsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$135.45	\$143.50
4-5	135.45	143.50
5-6	135.45	143.50
6-7	146.10	158.45
7-8	146.60	158.75
Over 8 weeks, add per week	15.80	14.55

**Albino.** Received by National Cancer Institute, Frederick, Maryland in 2004 from National Institutes of Health, Bethesda, Maryland. Harlan acquired from National Cancer Institute in 2006. Harlan became Envigo in 2015.

## Characteristics

- Autosomal-recessive, single-nucleotide polymorphism within *Prkdc* gene on chromosome 16
- Severe combined immunodeficiency affecting T- and B-cell development
- Natural Killer (NK) cell, macrophage and granulocyte cell numbers and function are reduced
- As SCID mice age, a variable percentage become "leaky" from spontaneous development of functional T- and B-lymphocytes
- Highly susceptible to opportunistic viral and bacterial infection
- Development of autoimmune diabetes does not occur due to severe combined immunodeficiency
- Spontaneous thymic lymphomas

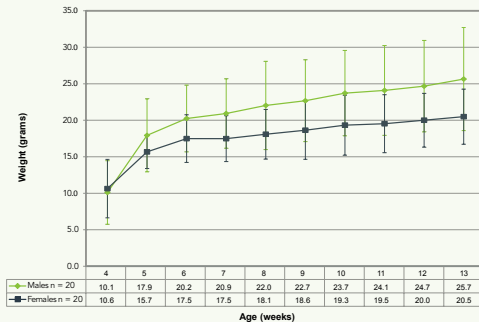
## Research use

- Oncology
- Transplantation
- Tumor cell growth
- Immunology
- Imaging

## Additional available data

- Hematology
- Proven models with extensive references (see page 17)

## NOD.CB17-Prkdc<sup>scid</sup>/NCrHsd



Maintained on Teklad Global Rodent Diet 2919 (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth Chart includes mean ± 2 SD's representative of population distribution. Cage floor space: 71.5 in

## Mutant mice - SCIDs



MODEL CODE  
**182**

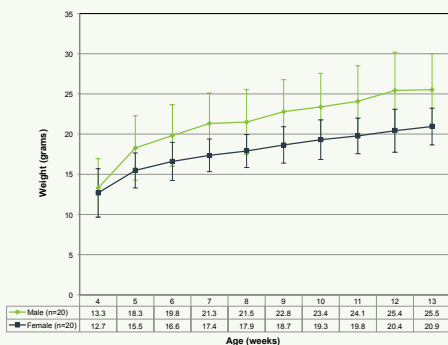
### SCID

NOMENCLATURE: C.B-17/lcrHsd-Prkdc<sup>scid</sup>

AGE (WEEKS)	Price per animal
4-5	\$99.35
5-6	106.40
6-7	112.10
7-8	118.75
Over 8 weeks, add per week	10.00

**Albino.** Harlan acquired from the Fox Chase Cancer Center, Philadelphia, Pennsylvania, in 1991. Harlan became Envigo in 2015.

#### C.B-17/lcrHsd-Prkdc<sup>scid</sup>



Maintained on Teklad Global Rodent Diet 2919 (18% Protein).  
Cage floor space: 71.5 in<sup>2</sup>

Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Autosomal-recessive, single-nucleotide polymorphism within *Prkdc* gene on chromosome 16
- Severe combined immunodeficiency affecting T- and B-cell development
- Natural Killer (NK) cell, macrophage, and granulocyte cell numbers and function are normal
- As SCID mice age, a variable percentage become "leaky" from the spontaneous development of functional T- and B-lymphocytes
- Highly susceptible to opportunistic viral and bacterial infection

### Research use

- Oncology
- Transplantation
- Tumor cell growth
- Immunology
- Imaging

### Additional available data

- Proven models with extensive references (see page 17)



MODEL CODE  
**186**

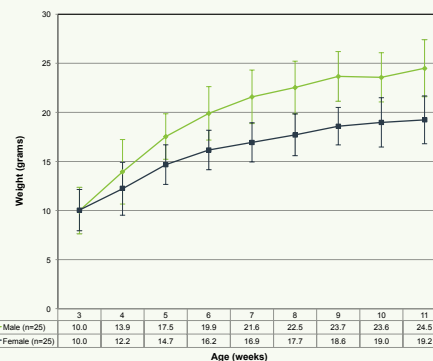
### SCID/Beige

NOMENCLATURE: C.B-17/lcrHsd-Prkdc<sup>scid</sup> Lyst<sup>bg-J</sup>

AGE (WEEKS)	Price per animal
4-5	\$101.05
5-6	107.20
6-7	113.10
7-8	118.55
Over 8 weeks, add per week	10.10

**Albino.** Harlan acquired from the Fox Chase Cancer Center, Philadelphia, Pennsylvania, in 1991. Harlan became Envigo in 2015.

#### C.B-17/lcrHsd-Prkdc<sup>scid</sup>Lyst<sup>bg-J</sup>



Maintained on Teklad Global Rodent Diet 2018S (18% Protein).  
Cage floor space: 71.5 in<sup>2</sup>

Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Autosomal-recessive, single-nucleotide polymorphism within *Prkdc* gene on chromosome 16
- Autosomal-recessive *beige* (*bg-J*) mutation on chromosome 13
- Severe combined immunodeficiency affecting T- and B-cell development
- Severe lymphopenia
- Diminished Natural Killer (NK) cell activity relative to other SCID models
- Rudimentary thymus
- "Leaky" phenotype significantly suppressed relative to other SCID models
- Highly susceptible to opportunistic viral and bacterial infection

### Research use

- Oncology
- Teratology
- Transplantation
- Tumor cell growth
- Immunology

### Additional available data

- Proven models with extensive references (see page 17)



# Rag2/Il2rg Double Knockout (R2G2®)

NOMENCLATURE: B6;129-Rag2<sup>tm1Fwa</sup>Il2rg<sup>tm1Rsky</sup>/DwlHsd

**White-bellied, light chinchilla (light tan).** The R2G2® model is a double knockout mouse with an ultra immunodeficient phenotype. The model was created by backcrossing the Il2rg (common gamma chain) mutation on to a mixed background mouse (C57BL/6 and 129 mix) with a mutation in Rag2. The recombination activating gene 2 (Rag2) interruption causes a deficiency in T and B cells. The common gamma chain gene (IL2RG) interruption results in a lack of functional receptors for IL-2, IL-4, IL-7, IL-9 and IL-15. Envigo acquired from Fox Chase Cancer Center in 2016, where the model had been maintained since 2005.

## Characteristics

- Recombination activating gene 2 (Rag2) knocked out
- Common gamma chain gene (Il2rg) knocked out
- Lacks functional receptors for IL-2, IL-4, IL-7, IL-9 and IL-15
- Severe lymphocyte development impairment
- Deficient in T cells
- Deficient in B cells
- Lacks NK cells
- Decreased macrophage cells
- Decreased dendritic cells
- Decreased neutrophils

## Research use

- Oncology research
- Cancer cell transplantation
- Immunology
- Infectious disease

## Features and advantages

- **Severe immunodeficiency** => Ultra immunodeficient phenotype enhances tumor cell acceptance
- **Less radiosensitive** => Higher tolerance for radiation as compared to models with the scid mutation
- **Reduced leakiness** => Decreased leakiness as compared to SCID models

## Additional available data

- Hematology
- Flow cytometry data
- Tumor growth chart
- Radiation sensitivity
- Chemotherapy tolerability
- Estrogen supplement tolerability



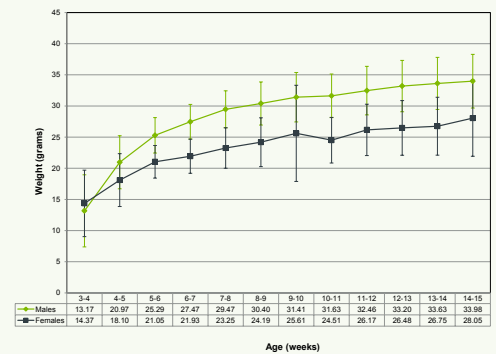
For-profit (commercial) / Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$135.00	\$142.50
4-5	135.00	142.50
5-6	138.00	145.50
6-7	141.00	148.50
7-8	144.00	151.50
Over 8 weeks, add/week	4.50	4.50

Not-for-profit (academic) / Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$88.75	\$94.00
4-5	88.75	94.00
5-6	91.75	97.00
6-7	94.75	100.00
7-8	94.75	103.00
Over 8 weeks, add/week	4.75	4.75

## B6;129-Rag2<sup>tm1Fwa</sup>Il2rg<sup>tm1Rsky</sup>/DwlHsd



Maintained on Teklad Global Rodent Diet 2918 (18% Protein) Cage floor space: 71.5 in<sup>2</sup> Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.

# Mutant mice - Diabetic



MODEL CODES  
**173, H174\***  
**W174\*, 174**

## Diabetic (db/db)

### NOMENCLATURE:

BKS.Cg- + *Lepr<sup>db</sup>/+* *Lepr<sup>db</sup>/OlaHsd* - fat, black, homozygous (Code 173)  
BKS.Cg-*Dock7<sup>m</sup>/+* + *Lepr<sup>db</sup>/OlaHsd* - lean, black, heterozygous (Code H174\*)  
BKS.Cg-*Dock7<sup>m</sup>/+* + *Dock7<sup>m</sup>/+* + *OlaHsd* - lean, misty, homozygous (Code W174\*)  
BKS.Cg-(Lean)/*OlaHsd* - lean, not genotyped (Code 174)

Price per animal

AGE (WEEKS)	db/db	Lean*
3-4	\$178.00	\$119.20
4-5	178.00	119.20
5-6	180.10	121.85
6-7	182.20	125.00
7-8	184.35	127.80
Over 8 weeks, add per week	6.45	4.60
Retired breeder	192.80	101.70

**Black or misty.** From Dunn Nutritional Laboratory, Cambridge, United Kingdom; to Olac, United Kingdom, in 1979; to Harlan, United States in 2000. Harlan became Envigo in 2015.

\* Our breeding scheme maintains *Dock7<sup>m</sup>* and *Lepr<sup>db</sup>* in repulsion. These genes are closely linked; however, recombination could occur. Our mice are most likely nonrecombinants, but they have not been tested. See page 52 for genotyping services available from Envigo.

### Characteristics

- *Lepr<sup>db</sup>* is an autosomal-recessive mutation on chromosome 4
- Obesity expressed at 4-5 weeks of age
- Elevation of plasma insulin demonstrated at 10-14 days
- Hyperglycemia expressed at 4-8 weeks of age
- Polyphagia
- Proteinuria
- Glycosuria
- Polyuria/Polydipsia
- Hyperinsulinemia despite severe depletion of pancreatic islet insulin-producing B-cells
- Leptin receptor deficient

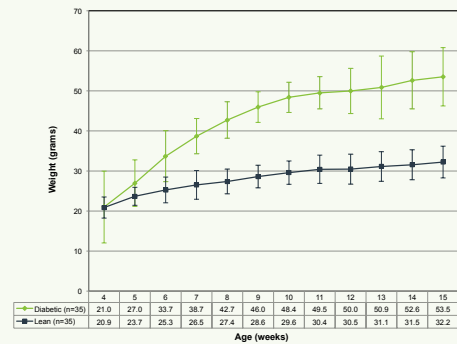
### Research use

- Type 2 Diabetes
- Peripheral neuropathy
- Myocardial disease
- Immunodeficiency
- Immunology
- Metabolism
- Obesity

### Additional available data

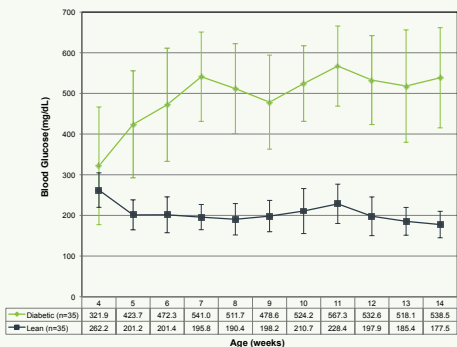
- Hematology
- Clinical chemistry
- Glucose tolerance test

### BKS.Cg- + *Lepr<sup>db</sup>/+* *Lepr<sup>db</sup>/OlaHsd* (male)



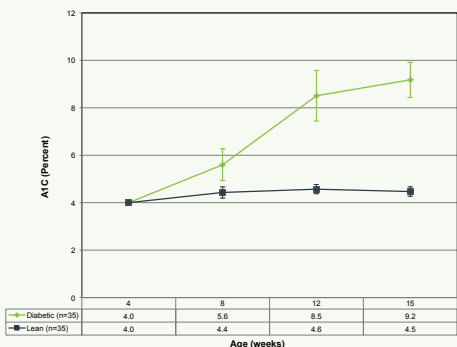
Maintained on Teklad Global Rodent Diet 20185 (18% Protein). Cage floor space: 71.5 in<sup>2</sup>. Diabetic data to be used as guideline only. (18% Protein) Data can be subject to differences in maintenance of mice. Glucose chart includes mean ± 2 SD's representative of population distribution. Phenotypic discrimination only. Mice were not genotyped.

### BKS.Cg- + *Lepr<sup>db</sup>/+* *Lepr<sup>db</sup>/OlaHsd* Blood Glucose (male)



Maintained on Teklad Global Rodent Diet 20185 (18% Protein). Cage floor space: 71.5 in<sup>2</sup>. Non-fasted. Diabetic data to be used as guideline only. (18% Protein) Data can be subject to differences in maintenance of mice. Glucose chart includes mean ± 1 SD representative of population distribution. Phenotypic discrimination only. Mice were not genotyped.

### BKS.Cg- + *Lepr<sup>db</sup>/+* *Lepr<sup>db</sup>/OlaHsd* A1c (male)



Maintained on Teklad Global Rodent Diet 20185 (18% Protein). Cage floor space: 71.5 in<sup>2</sup>. Non-fasted. A1C data to be used as guideline only. (18% Protein) Data can be subject to differences in maintenance of mice. A1C chart includes mean ± 1 SD representative of population distribution. Phenotypic discrimination only. Mice were not genotyped.





MODEL CODE  
103



## Albino C57BL/6

NOMENCLATURE: C57BL/6BrdCrHsd-Tyr<sup>c</sup>

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$41.85	\$39.95
4-5	42.25	44.45
5-6	43.45	47.45
6-7	50.85	55.70
7-8	57.65	58.30
Over 8 weeks, add per week	6.85	6.85
Untimed pregnant*		334.05
Female with litter		493.95
Proven breeder	60.80	60.80
Retired breeder	38.80	37.65

\* For our pregnant animal policy, refer to page 66.

**Albino.** From Allan Bradley at Baylor College of Medicine to National Cancer Institute (NCI) in 2000; to Harlan in 2008. Harlan became Envigo in 2015.

### Characteristics

- Contains a mutation in the c (tyrosinase) gene
- Litter average: 6.5
- Haplotype: H-2<sup>b</sup>

### Research use

- Source of albino C57BL/6 embryos for chimera generation
- Ovarian transfer



MODEL CODE  
**061**

## B6C3F1

NOMENCLATURE: B6C3F1/Hsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$31.85	\$34.65
4-5	33.70	35.30
5-6	40.70	38.90
6-7	42.80	39.05
7-8	46.85	41.60
Over 8 weeks, add per week	5.55	5.65
Untimed pregnant*		183.95
Timed mated*		206.95
Female with litter		206.95
Proven breeder	43.65	42.35
Retired breeder	27.50	26.65

\* For our pregnant animal policy, refer to page 66.

**Agouti.** Offspring of a cross between the C57BL/6NHsd inbred female and the C3H/HeNHsd inbred male.



MODEL CODES  
**063**

## B6D2F1

NOMENCLATURE: B6D2F1/Hsd

Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$29.50	\$32.60
4-5	32.50	33.90
5-6	38.15	36.35
6-7	46.05	40.05
7-8	49.35	43.40
Over 8 weeks, add per week	6.50	5.50
Untimed pregnant*		198.55
Timed mated*		217.90
Female with litter		217.90
Proven breeder	56.40	48.65
Retired breeder	38.45	30.65

\* For our pregnant animal policy, refer to page 66.

**Black.** Offspring of a cross between the C57BL/6NHsd inbred female and the DBA/2NHsd inbred male.



MODEL CODES  
**065**



## CB6F1

NOMENCLATURE: CB6F1/Hsd

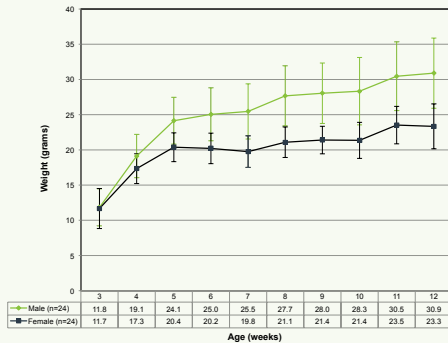
Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$46.90	\$52.90
4-5	50.35	56.10
5-6	53.35	59.00
6-7	58.40	62.45
7-8	60.60	64.85
Over 10 weeks, add per week	7.20	
Over 9 weeks, add/week		7.20
Untimed pregnant*		250.95
Timed mated*		282.20
Female with litter		282.20
Proven breeder	56.55	56.55
Retired breeder	46.90	46.90

\* For our pregnant animal policy, refer to page 66.

**Agouti.** Offspring of a cross between the BALB/cAnNHsd inbred female and the C57BL/6NHsd inbred male.

### CB6F1/Hsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 71.5 in<sup>2</sup>. Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.

MODEL CODES  
**060**



## CD2F1

NOMENCLATURE: CD2F1/Hsd

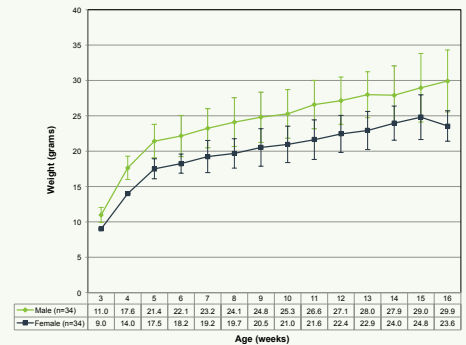
Price per animal

AGE (WEEKS)	MALE	FEMALE
3-4	\$31.65	\$34.65
4-5	34.90	36.50
5-6	37.30	40.05
6-7	42.15	44.00
7-8	43.60	44.55
Over 8 weeks, add per week	5.65	5.40
Untimed pregnant*		163.40
Timed mated*		199.30
Female with litter		179.40
Proven breeder	41.75	33.95
Retired breeder		29.90

\* For our pregnant animal policy, refer to page 66.

**Agouti.** Offspring of a cross between the BALB/cAnNHsd inbred female and the DBA/2NHsd inbred male.

### CD2F1/Hsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 120.75 in<sup>2</sup>. Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution.

## Inbred rats



MODEL CODE  
**013**

### ACI

NOMENCLATURE: ACI/SegHsd

AGE (WEEKS)	Approx weight (g)		Price per animal
	MALE	FEMALE	
3-4	Up to 50	Up to 50	\$189.90
4-5	51-75	51-70	210.00
5-6	76-110	71-100	227.60
6-7	111-135	101-115	252.00
7-8	136-155	116-125	275.45
8-9	156-180	126-135	301.40
9-10	181-195	136-145	328.80
10-11	196-210	146-155	352.20
Untimed pregnant*			797.10
Female with litter			972.65
Proven breeder			434.35
Retired breeder			219.60

\* For our pregnant animal policy, refer to page 66.

**Black agouti.** Derived from a nucleus colony obtained from Dr. A. Segaloff's colony at the Ochsner Medical Center, Jefferson, Louisiana.



MODEL CODE  
**147**

### Brown Norway

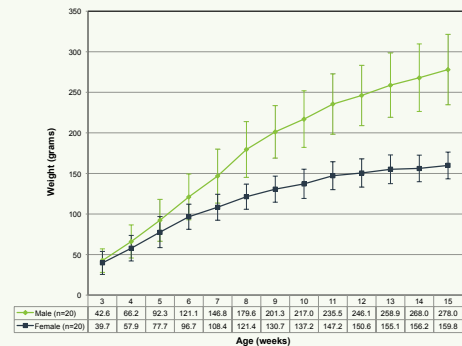
NOMENCLATURE: BN/RijHsd

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
Less than 49g	21 - 22	21 - 22	\$137.80	\$144.80
50-74	23 - 30	23 - 35	148.55	158.55
75-99	31 - 37	36 - 43	158.55	176.00
100-124	38 - 43	44 - 55	169.85	211.05
125-149	44 - 50	56 - 72	189.95	247.65
150-174	51 - 54	73 - 84	217.15	318.50
175-199	55 - 63	85+	233.20	351.30
200-224	64 - 71		250.20	375.10
225-249	72 - 82		266.00	389.85
250-299	83+		294.30	
300+			Upon request	
Untimed pregnant*				730.00
Timed mated*				797.50
Female with litter				940.75
Proven breeder			318.55	422.30
Retired breeder			127.85	169.00

\* For our pregnant animal policy, refer to page 66.

**Brown, non-agouti.** BN/RijHsd rats were derived from a nucleus colony obtained directly from the TNO Institute, the Netherlands.

#### BN/RijHsd



Maintained on Teklad Global Rodent Diet 2018S  
(18% Protein)  
Cage floor space: 120.75 cm<sup>2</sup>

Growth data to be used as guideline only.  
Data can be subject to differences in maintenance of rats.  
Growth chart includes mean ± 2 SD's representative of population distribution.

#### Characteristics

- Litter average: 4.5
- Haplotype: *RT1<sup>n</sup>*
- Hyper-responsive lungs
- High incidence of bladder tumors in males

#### Research use

- Allergic respiratory disease
- Oncology
- Aging
- Leukemia
- Nephrology

# Inbred rats



MODEL CODE  
**092**

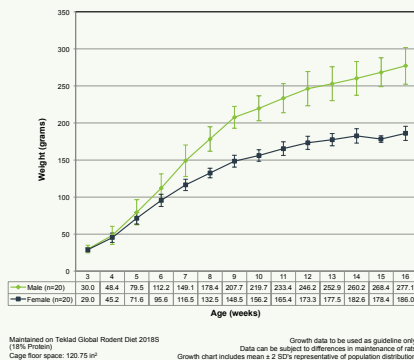
## DA

NOMENCLATURE: DA/OlaHsd

AGE (WEEKS)	Price per animal
3-4	\$149.85
4-5	149.85
5-6	149.85
6-7	189.95
7-8	189.95
8-9	189.95
9-10	239.85
10-11	239.85
11-12	239.85
12-13	299.80
13-14	299.80
14-15	299.80
15-16	299.80

**Agouti.** From A.R.C. Cambridge, United Kingdom; to Olac, United Kingdom, in 1979; to Harlan, United States, in 1992. Harlan became Envigo in 2015

### DA/OlaHsd



### Characteristics

- Litter average: 6.0
- Haplotype: *RT1<sup>av1</sup>*
- Females have a defective bile acid transport

### Research use

- Experimental allergic encephalomyelitis
- Induced rheumatoid arthritis
- Oncology
- Cardiovascular
- Transplantation



MODEL CODES  
**008, 011**

## Dahl Salt-Sensitive/Resistant (Rapp)

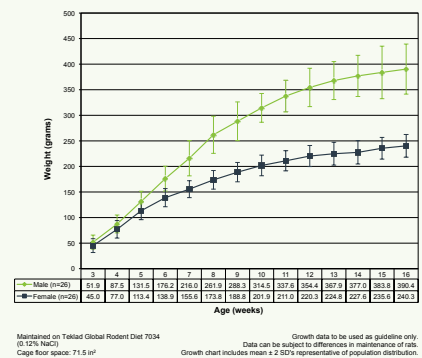
NOMENCLATURE: SS/JrHsd (Code 008)  
NOMENCLATURE: SR/JrHsd (Code 011)

AGE (WEEKS)	Price per animal
3- 4	\$350.65
4- 5	376.55
5- 6	395.35
6- 7	420.50
7- 8	438.60
8- 9	453.05
9- 10	470.90
10- 11	487.95
11- 12	505.40
12- 13	520.45
13- 14	539.70
14- 15	558.90
Untimed mated*	1,107.60
Female with litter	1,392.10
Proven breeder	464.05
Retired breeder	321.50

\* For our pregnant animal policy, refer to page 66.

**Albino.** From Dr. John P. Rapp, Medical College of Ohio, Toledo, Ohio; to Harlan in 1986. Harlan became Envigo in 2015.

### SS/JrHsd



### Characteristics

- Litter average: 6.5 (SS), 4.0 (SR)
- Nephropathy
- Periarteritis nodosa
- Salt-sensitive hypertension (8% NaCl Diet, BP>140mm Hg)
- Insulin resistance
- Hyperinsulinemia
- Hypertriglyceridemia
- Hypercholesterolemia

- Aortic and cardiac hypertrophy
- Heart failure
- Stroke

### Research use

- Salt-sensitive hypertension
- Heart failure
- Stroke
- Nephropathy

## Inbred rats



MODEL CODE  
**010**

# Fischer 344

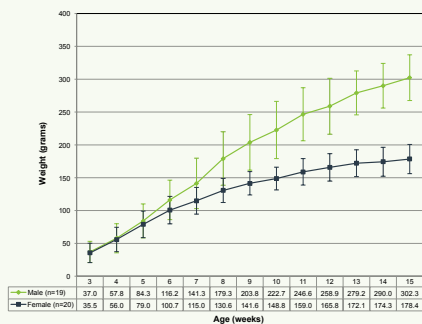
NOMENCLATURE: F344/NHsd

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
50-74	26 - 31	26 - 33	\$40.35	\$44.20
75-99	32 - 38	34 - 43	46.65	54.30
100-124	39 - 44	44 - 54	55.80	60.75
125-149	45 - 51	55 - 72	61.25	73.70
150-174	52 - 58	73 - 84	68.90	95.35
175-199	59 - 64	85+	73.40	120.40
200-224	65 - 72		85.80	128.75
225-249	73 - 81		92.30	
250-299	82 - 84		98.65	
300+	85+		104.95	
Untimed pregnant*				Upon request
Timed mated*				Upon request
Female with litter				Upon request
Proven breeder				Upon request
Retired breeder				Upon request

\* For our pregnant animal policy, refer to page 66.

**Albino.** Descended from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### F344/NHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of rats. Cage floor space: 120.75 in<sup>2</sup>. Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Litter average: 7.5
- Haplotype: *RT1<sup>N</sup>*
- Hydrocephalic resistant

### Additional available data

- Hematology
- Clinical chemistry
- Two-year growth

### Research use

- Experimental allergic encephalomyelitis
- Carcinogenicity
- Oncology
- Toxicology
- Aging
- Ophthalmology
- Autoimmunity
- General purpose

**Aging available for F344 rats**

See page 57



MODEL CODE  
**017**

# Lewis

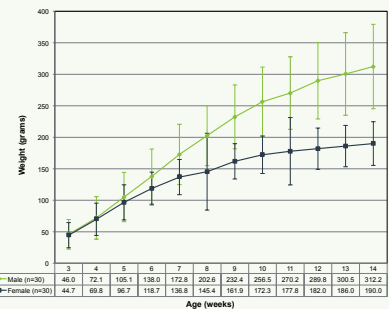
NOMENCLATURE: LEW/SsNHsd

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
Less than 49	19 - 20	19 - 22	\$38.70	\$38.85
50-74	21 - 28	23 - 28	43.95	44.05
75-99	29 - 33	29 - 32	48.45	49.60
100-124	34 - 36	33 - 40	51.95	54.90
125-149	37 - 39	41 - 49	63.65	63.60
150-174	40 - 43	50 - 69	72.90	71.40
175-199	44 - 48	70+	78.40	79.05
200-224	49 - 54		82.45	82.60
225-249	55 - 58		89.40	
250-299	59 - 70		95.45	
300+	71+		104.80	
Untimed pregnant*				224.05
Timed mated*				288.45
Female with litter				333.10
Proven breeder			76.95	176.35
Retired breeder			51.50	57.95

\* For our pregnant animal policy, refer to page 66.

**Albino.** Descended from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### LEW/SsNHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of rats. Cage floor space: 120.75 in<sup>2</sup>. Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Litter average: 7.5
- Docile disposition
- Haplotype: *RT1<sup>I</sup>*
- Inbred recipient for several congenic strains
- Increased levels of serum thyroxine, insulin, and growth hormone
- Susceptible to induction of autoimmune disease

### Research use

- Adjuvant-induced arthritis
- Experimental allergic encephalomyelitis
- Transplantation

### Additional available data

- Clinical chemistry



MODEL CODE  
**022**

## Spontaneously Hypertensive

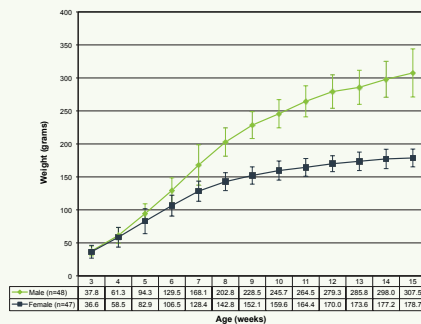
NOMENCLATURE: SHR/NHsd

AGE (WEEKS)	Price per animal
3-4	\$151.40
4-5	163.75
5-6	177.50
6-7	199.90
7-8	219.05
8-9	238.10
9-10	256.70
10-11	274.60
11-12	298.55
12-13	326.00
13-14	348.00
14-15	379.20
Untimed pregnant*	1,000.20
Female with litter	1,359.60
Proven breeder	430.70
Retired breeder	249.65

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### SHR/NHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) Data can be used as guideline only. Growth chart includes mean ± 2 SD's representative of population distribution.



MODEL CODE  
**012**

## Wistar Furth

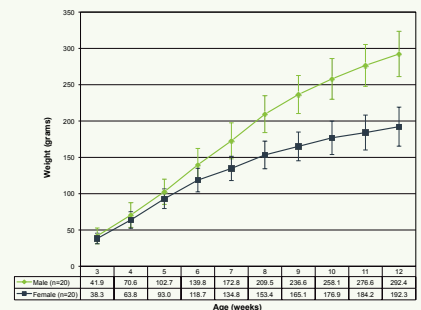
NOMENCLATURE: WF/NHsd

AGE (WEEKS)	APPROX WEIGHT (g)		Price per animal
	MALE	FEMALE	
3-4	Up to 60	Up to 60	\$199.30
4-5	61-90	61-85	219.65
5-6	91-125	86-110	244.25
6-7	126-160	111-130	287.35
7-8	161-195	131-140	318.50
8-9	196-220	141-150	351.25
9-10	221-250	151-160	381.00
10-11	251-275	161-175	412.80
11+	276+	176+	776.15
Timed mated*			1,090.10
Female with litter			1,284.90
Proven breeder			713.70
Retired breeder			238.05

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

### WF/NHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) Data can be used as guideline only. Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Litter average: 5.5
- Haplotype: *RT1<sup>u</sup>*
- Heteropyknotic Y chromosome cell marker
- Macrothrombocytopenia

### Research use

- Immunology
- Leukemia
- Transplantation
- Oncology

### Additional available data

- Clinical chemistry



MODEL CODE  
**023**

# Wistar Kyoto

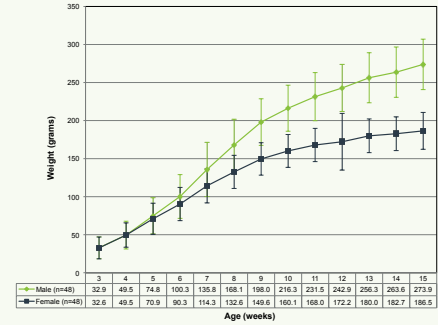
NOMENCLATURE: WKY/NHsd

AGE (WEEKS)	Price per animal
3-4	\$132.35
4-5	143.00
5-6	153.30
6-7	175.55
7-8	204.20
8-9	220.30
9-10	246.05
10-11	256.85
11-12	288.95
12-13	317.10
13-14	342.55
14-15	374.80
Untimed pregnant*	936.55
Female with litter	1,285.55
Proven breeder	367.30
Retired breeder	242.10

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from a nucleus colony obtained from the National Institutes of Health, Bethesda, Maryland.

## WKY/NHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) Cage floor space: 120.75 cm<sup>2</sup>

Growth data to be used as guideline only. Data can be subject to differences in maintenance of rats. Growth chart includes mean ± 2 SD's representative of population distribution.



# Outbred rats



MODEL CODE  
**003**

## Holtzman®

NOMENCLATURE: HsdHot:Holtzman® SD®

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
35-49	18 - 20	18 - 20	\$75.25	\$76.50
50-74	21 - 24	21 - 24	91.40	92.70
75-99	25 - 28	25 - 30	99.25	101.15
100-124	29 - 33	31 - 34	108.80	110.30
125-149	34 - 37	35 - 40	120.55	124.75
150-174	38 - 41	41 - 46	129.15	134.25
175-199	42 - 45	47 - 52	140.05	145.80
200-224	46 - 48	53 - 58	148.95	155.55
225-249	49 - 51	59 - 63	158.85	170.10
250-274	52 - 54	64 - 70	171.70	179.75
275-299	55 - 59	71 - 90	189.90	195.00
300-324	60 - 64	91+	201.20	
325-349	65 - 70		211.00	
350-374	71 - 74		222.90	
375-399	75 - 80		230.85	
400+	81+		Upon request	
Untimed pregnant*				Upon request
Timed mated*				Upon request
Female with litter				Upon request
Proven breeder				Upon request
Retired breeder				Upon request

\* For our pregnant animal policy, refer to page 66.

**Albino.** Originally developed by the Holtzman Company in Madison, Wisconsin, from Sprague Dawley® stock in 1947; to Harlan through acquisition in 1986. Harlan became Envigo 2015.



MODEL CODE  
**140**

## Long Evans (Blue Spruce)

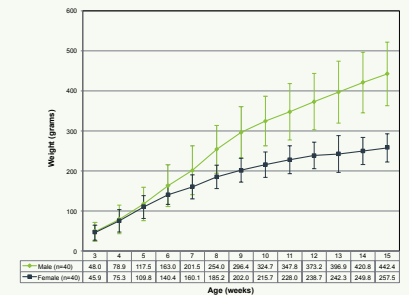
NOMENCLATURE: HsdBlu:LE

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
35-49	20 - 23	20 - 24	\$23.80	\$24.35
50-74	24 - 29	25 - 30	27.75	30.30
75-99	30 - 33	31 - 35	33.65	35.45
100-124	34 - 37	36 - 41	37.65	39.50
125-149	38 - 41	42 - 49	41.10	43.15
150-174	42 - 45	50 - 56	44.60	49.80
175-199	46 - 49	57 - 69	48.50	53.20
200-224	50 - 57	70 - 89	52.65	58.55
225-249	58 - 64	90 - 110	59.60	63.55
250-274	65 - 70	111+	64.35	72.05
275-299	71 - 79		68.20	77.00
300-324	80 - 90		72.15	
325-349	91 - 100		80.20	
350-374	101 - 110		85.65	
375+	111+		Upon request	
Untimed pregnant*				233.50
Timed mated*				285.25
Female with litter				307.50
Proven breeder			108.95	121.65
Retired breeder			72.20	69.05

\* For our pregnant animal policy, refer to page 66.

**Black-hooded.** From the University of Rochester, Rochester, New York; to Blue Spruce Farms, Altamont, New York, in 1964; to Harlan through acquisition in 1988. Harlan became Envigo in 2015.

### HsdBlu:LE



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of site. Growth chart includes mean ± 2 SD's representative of population distribution.

### Characteristics

- Litter average: 10.0
- Individual housing of males recommended
- Good maternal characteristics

- Nutrition
- Behavior
- General purpose

### Additional available data

### Research use

- Diet-induced obesity

- Hematology
- Clinical chemistry

# Outbred rats



MODEL CODE  
**001**

## Wistar

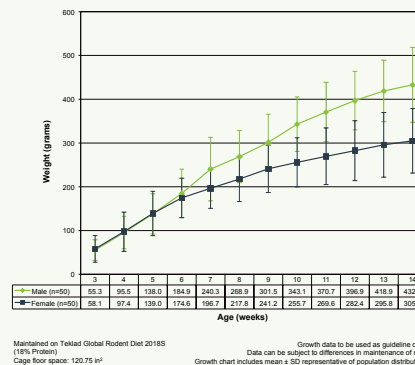
NOMENCLATURE: Hsd:WI

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
50-74	21 - 25	21 - 26	\$23.50	\$25.60
75-99	26 - 28	27 - 30	28.55	30.30
100-124	29 - 32	31 - 34	33.35	35.10
125-149	33 - 35	35 - 38	37.15	39.55
150-174	36 - 40	39 - 41	39.50	44.15
175-199	41 - 42	42 - 49	45.75	47.40
200-224	43 - 44	50 - 56	49.40	50.65
225-249	45 - 48	57 - 63	53.45	54.65
250-274	49 - 52	64 - 76	57.45	61.10
275-299	53 - 55	77+	60.00	69.55
300-324	56 - 58		62.55	
325-349	59 - 63		70.45	
350-374	64 - 69		78.80	
375-399	70 - 75		79.95	
400+	76+		Upon request	
Untimed pregnant*				174.25
Timed mated*				208.60
Female with litter				220.10
Proven breeder			82.00	92.40
Retired breeder			51.65	52.80

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived from animals from the Wistar Institute, Philadelphia, Pennsylvania

### Hsd:WI



### Characteristics

- Litter average: 9.5
- Docile disposition
- Spontaneous corneal degeneration

### Research use

- Teratology
- Nutrition
- Aging
- Oncology
- General purpose

### Additional available data

- Hematology
- Clinical chemistry

# Outbred rats



MODEL CODE  
**002**

## Sprague Dawley®

NOMENCLATURE: Hsd:Sprague Dawley® SD®

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
35-49	20 - 21	20 - 21	\$17.90	\$18.05
50-74	22 - 26	22 - 29	22.70	23.85
75-99	27 - 31	30 - 34	28.35	29.45
100-124	32 - 35	35 - 39	32.15	33.70
125-149	36 - 40	40 - 44	37.50	41.70
150-174	41 - 43	45 - 53	39.55	45.60
175-199	44 - 48	54 - 64	46.30	48.70
200-224	49 - 52	65 - 75	49.75	52.30
225-249	53 - 58	76+	54.05	56.85
250-274	59 - 63		58.40	63.95
275-299	64 - 69		61.70	69.00
300-324	70 - 75		65.30	
325-349	76 - 85		71.75	
350-374	86 - 95		75.75	
375-399	96 - 115		78.80	
400+	116+		Upon request	
Untimed pregnant*				161.35
Timed mated*				190.30
Female with litter				204.20
Proven breeder			88.05	90.55
Retired breeder			54.95	52.05

\* For our pregnant animal policy, refer to page 66.

**Albino.** Originated by the Sprague-Dawley Company in 1925 through a series of crosses begun with a single-hooded male and six albino females of unknown origin. Current Envigo colonies are direct descendants of this original colony.

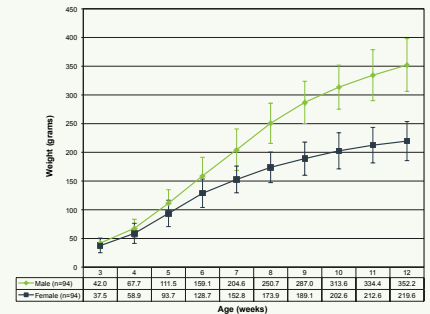
### Characteristics

- Most widely-used outbred rat in animal research
- Litter average: 11.0
- Docile disposition
- Excellent reproductive performance and maternal characteristics

### Research use

- Toxicology
- Aging
- Teratology
- Oncology
- Nutrition
- Diet-induced obesity
- General purpose

### Hsd:Sprague Dawley® SD®



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Growth data to be used as guideline only. Data can be subject to differences in maintenance of rat. Cage floor space: 120.75 in². Growth chart includes mean ± 2 SD's representative of population distribution.

**Aging available for Sprague Dawley rats**

See page 57



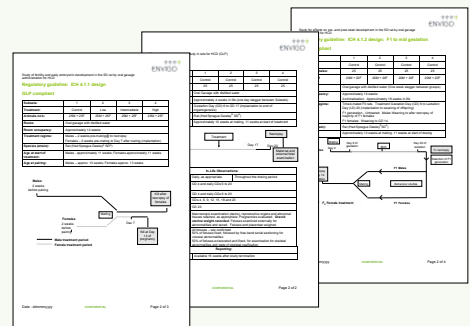
# The Envigo DART program in Haslett, Michigan offers ready availability of large cohorts of timed-mated Hsd:Sprague Dawley® SD® rats for your toxicology studies

- + Standard operating procedures ensure model consistency
- + Breeder selection ensures maximum heterogeneity
- + Animals maintained on Teklad Global Diets® 2018S (18% protein, 6% fat)
- + Dedicated deliveries allowing for receipt of early gestation females
- + Historical control data available on request
  - + Dam clinical observations, body weight, and pregnancy data
  - + Fetal variations and malformations consistent with comparable models
- + Bridging study protocols available (GLP-compliant, ICH regulatory guidelines) to allow for seamless transition to the SD® rat

Fetal data*	
<b>External Malformations and Developmental Deviations</b>	
No. Litters Evaluated	99
No. Fetuses Evaluated	1250
Total Malformations	
No. Litters (%)	2 (2.0)
No. Fetuses (%)	2 (0.2)
Total Variations	
No. Litters (%)	0 (0.0)
No. Fetuses (%)	0 (0.0)
<b>Visceral Malformations and Developmental Deviations</b>	
No. Litters Evaluated	98
No. Fetuses Evaluated	624
Total Malformations	
No. Litters (%)	1 (1.0)
No. Fetuses (%)	1 (0.2)
Total Variations	
No. Litters (%)	0 (0.0)
No. Fetuses (%)	0 (0.0)
<b>Skeletal Malformations and Developmental Deviations</b>	
No. Litters Evaluated	99
No. Fetuses Evaluated	626
Total Malformations	
No. Litters (%)	0 (0.0)
No. Fetuses (%)	0 (0.0)
Total Variations	
No. Litters (%)	61 (61.6)
No. Fetuses (%)	127 (20.3)

Timed-mated female data*	
	Mean ± Standard Deviation
Pregnancy Index (%)	99
Litter size	12.6 ± 2.76
Fetal Sex Ratio (Mean % males per animal)	51 ± 17.02
Mean Fetal Body Weight, Males + Females (g)	3.93 ± .229

\* Data provided from single-study performed at third-party contract research organization



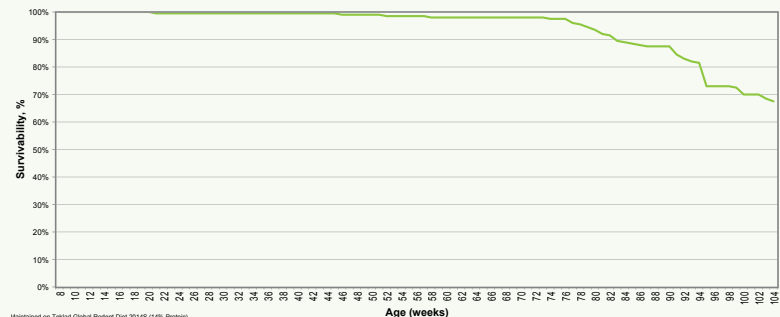
\* Data provided from single-study performed at third-party contract research organization

## 104-Week data available

Go to [envigo.com/SDtox](http://envigo.com/SDtox) to find:

- Protocol summary
- Growth curve
- Survival rates
- Complete blood count
- Organ weights
- Serum chemistry
- Neoplastic and non-neoplastic lesions

### Survival rate



Maintained on Teklad Global Rodent Diet 2014S (14% Protein)  
Cage floor space: 120.75 sq"



MODEL CODE  
**168**

## Wistar Han<sup>®</sup>

NOMENCLATURE: RccHan<sup>®</sup>:WIST

WEIGHT (g)	Approx age (days)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
35-49	21 - 24	21 -24	19.70	\$20.75
50-74	25 - 30	25 - 31	25.50	27.25
75-99	31 - 36	32 - 43	30.05	32.20
100-124	37 - 42	44 - 54	34.30	36.50
125-149	43 - 47	55 - 65	37.85	42.55
150-174	48 - 54	66 - 76	39.85	46.15
175-199	55 - 60	77 - 85	45.40	53.25
200-224	61 - 66	86+	50.35	56.35
225-249	67 - 73		54.50	62.75
250-274	74 - 79		58.80	Upon request
275-299	80 - 85		62.30	Upon request
300-324	86+		67.55	
325-349			73.75	
350-374			76.35	
375-399			79.95	
Untimed pregnant*				147.45
Timed mated*				165.20
Female with litter				177.45
Proven breeder			77.40	88.85
Retired breeder			49.95	48.35

\* For our pregnant animal policy, refer to page 66.

**Albino.** Derived at Biological Research Laboratories Limited (BRL), formerly RCC Ltd., Füllinsdorf, Switzerland, from original colony at Zentralinstitute für Versuchstierzucht, Hannover, in 1989. Transferred to Harlan Sprague-Dawley, Inc. in 1993 (nomenclature HsdHan<sup>®</sup>:WIST). In 2004, Harlan acquired RCC Ltd. and new breeding stock was transferred in 2008 (nomenclature RccHan<sup>®</sup>:WIST). Harlan became Envigo in 2015. Unlike competitive models, the RccHan<sup>®</sup>:WIST rat has been maintained from the original nucleus of 156 breeding pairs in Hannover, Germany.

### Characteristics

- Litter average: 9.5
- Docile disposition

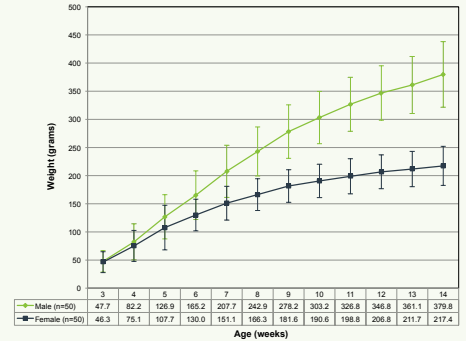
### Research use

- Toxicology
- Oncology
- Teratology
- Aging
- General purpose

### Additional available data

- Hematology
- Clinical chemistry

### RccHan<sup>®</sup>:WIST



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 120.75 in<sup>2</sup>. Growth data to be used as guideline only. Data can be subject to differences in maintenance of rats. Growth chart includes mean ± 2 SD's representative of population distribution.

20 years of stable control data at [envigo.com/toxicology](http://envigo.com/toxicology)

Acute to Oncogenicity studies - 3, 6, 12, and 24 months

- Survival rates
- Growth
- Food and water consumption
- Clinical observations
- Functional observation battery
- Ophthalmoscopy
- Clinical pathology
- P450 enzymes
- Gross lesions and organ weights
- Bone marrow differentiation
- Incidence and images of spontaneous neoplastic and non-neoplastic changes
- Reproductive and developmental data



## + Key advantages

- + Reduced body size
  - + Reduced compound use
  - + More efficient housing
  - + Reduced food consumption
  - + Diet restriction not required
- + Increased longevity compared with the CrI:CD(SD)
  - + Ensures study completion with confidence
  - + Fewer animals required to start the study, meeting the 3Rs
- + Reduced tumor incidence
  - + Fewer background tumors



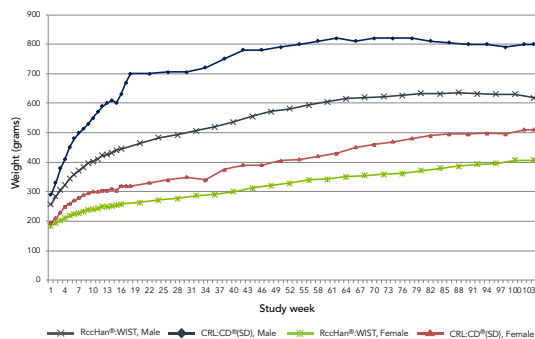
### Latest 103-week data available

- Growth and survival
- Food consumption
- Clinical observations

For all available data, go to [envigo.com/toxicology](http://envigo.com/toxicology)

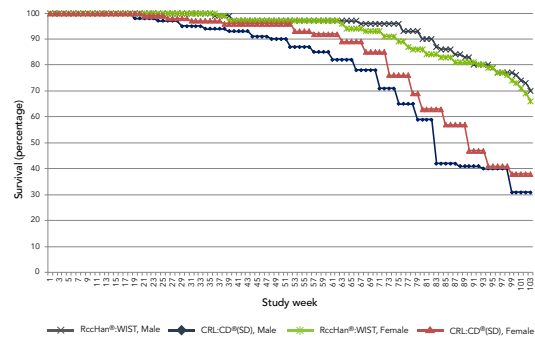
#### RccHan<sup>®</sup>:WIST 103-week survival curve

Figure 2: Growth curve for Wistar Han<sup>®</sup> and CRL:CD<sup>®</sup> rats



#### RccHan<sup>®</sup>:WIST 103-week growth curve

Figure 3: Comparing Wistar Han<sup>®</sup> and CRL:CD<sup>®</sup>(SD) survival data





MODEL CODES  
**005, 006**

## Athymic Nude

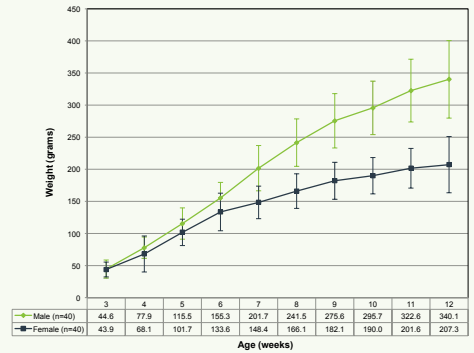
NOMENCLATURE: Hsd:RH-Foxn1<sup>rmu</sup> (Code 005)

NOMENCLATURE: Hsd:RH-Foxn1<sup>rmu</sup>/Foxn1<sup>+</sup> (Code 006)

AGE (WEEKS)	Price per animal	
	<i>rmu/rmu</i>	<i>rmu/+</i>
3-4	\$170.55	\$116.20
4-5	210.05	157.00
5-6	252.65	202.10
6-7	292.10	238.55
7-8	334.75	277.50
8-9	373.65	316.20
9-10	417.50	354.60
Over 10 weeks, add per week	47.80	46.40

**Hooded (pigmented).** Derived from animals obtained from the Rowett Research Institute, Aberdeen, Scotland.

### Hsd:RH-Foxn1<sup>rmu</sup>



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 141.75 in<sup>2</sup>. Growth data to be used as guideline only. Data can be subject to differences in maintenance of rats. Growth chart includes mean ± 2 SD% representative of population distribution.

### Characteristics

- The *rmu* allele on chromosome 10 is an autosomal recessive mutation associated with hairlessness and thymic aplasia
- The thymus-dependent lymph node areas are depleted of lymphocytes (T-cells)
- Phenotypically hairless (sparse hair growth possible)
- Rudimentary thymic tissue
- Increased Natural Killer (NK) cell population
- *Foxn1<sup>rmu</sup>/Foxn1<sup>+</sup>* heterozygotes do not show partial expression of *rmu* phenotype

### Research use

- Oncology
- Immunology
- Xenograft and allograft transplantation

### Additional available data

- Proven model with extensive references (see page 17)

# Mutant rats



**MODEL CODES**  
**194, H195\***  
**W195\*, 195**

## Zucker

### NOMENCLATURE:

HsdHlr:ZUCKER-*Lep<sup>fa</sup>* - fat, homozygous (Code 194)  
 HsdHlr:ZUCKER-*Lep<sup>fa</sup>/Lepr<sup>+</sup>* - lean, heterozygous (Code H195\*)  
 HsdHlr:ZUCKER-*Lepr<sup>+</sup>* - lean, homozygous wildtype (Code W195\*)  
 HsdHlr:ZUCKER-(Lean) - lean, not genotyped (Code 195)

AGE (WEEKS)	Price per animal	
	<i>fa/fa</i>	Lean*
3-4	\$294.55	\$78.35
4-5	307.90	81.05
5-6	322.85	85.25
6-7	340.45	94.85
7-8	365.60	105.80
8-9	385.60	116.65
9-10	404.85	122.05
Over 10 weeks, add per week	28.20	15.75

### Black, brown, brown/white, black/white.

Derived from a colony obtained in 1992 from Hoffmann-La Roche, Nutley, New Jersey.

\* Genetic testing is required to determine *Lep<sup>fa</sup>/Lepr<sup>+</sup>* or *Lepr<sup>+</sup>/Lepr<sup>+</sup>* genotype. See page 52 for genotyping services available from Envigo.

### Characteristics

- *Lep<sup>fa</sup>/Lepr<sup>+</sup>* heterozygotes do not show partial expression of *fa* phenotype
- *fa* is an autosomal-recessive mutation on chromosome 5
- Exhibit obesity at 4 to 5 weeks of age
- Animals have not been selectively bred to induce hyperglycemia
- Insulin resistant
- Adipocyte hypertrophy and hyperplasia
- Hyperphagia
- Muscle atrophy
- Hyperlipemic
- Hypercholesterolemia
- Hyperinsulinemia

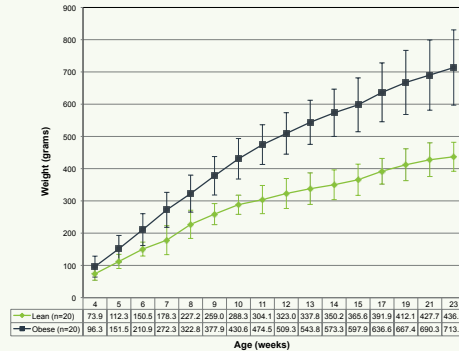
### Research use

- Genetic obesity
- Type 2 Diabetes

### Additional available data

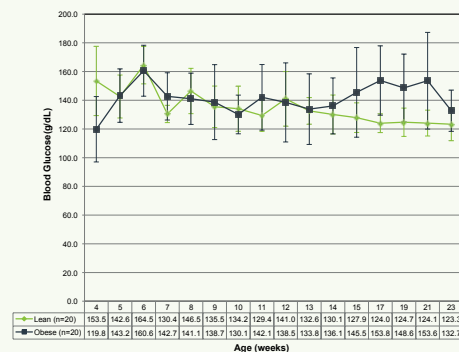
- Hematology
- Clinical chemistry

### ZUCKER-*Lep<sup>fa</sup>* (male)



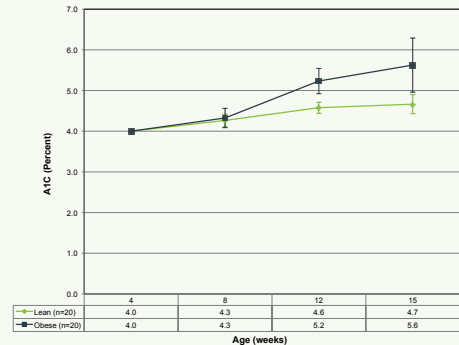
Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 120.75 in<sup>2</sup>. Growth data to be used as guideline only. Data can be subject to differences in maintenance of rats. Growth chart includes mean ± 2 SD's representative of population distribution. Phenotypic discrimination only. Rats were not genotyped.

### ZUCKER-*Lep<sup>fa</sup>* Blood Glucose (male)



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 120.75 in<sup>2</sup>. Non-fasted. Glucose data to be used as guideline only. Data can be subject to differences in maintenance of rats. Glucose chart includes mean ± 1 SD representative of population distribution. Phenotypic discrimination only. Rats were not genotyped.

### ZUCKER-*Lep<sup>fa</sup>* A1c (male)



Maintained on Teklad Global Rodent Diet 2018S (18% Protein). Cage floor space: 120.75 in<sup>2</sup>. Non-fasted. A1C data to be used as guideline only. Data can be subject to differences in maintenance of rats. A1C chart includes mean ± 1 SD representative of population distribution. Phenotypic discrimination only. Rats were not genotyped.





MODEL CODE  
**089**

# Golden Syrian Hamster

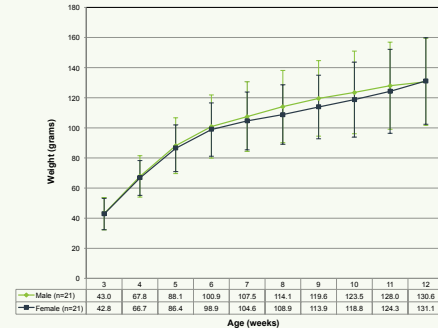
NOMENCLATURE: HsdHan<sup>®</sup>:AURA

AGE (WEEKS)	Approx weight (g)		Price per animal	
	MALE	FEMALE	MALE	FEMALE
3-4	40 - 75	40 - 75	\$39.10	\$39.10
4-5	65 - 90	65 - 90	42.85	42.85
5-6	75 - 100	75 - 100	49.10	49.10
6-7	85 - 105	85 - 105	55.15	55.15
7-8	90 - 110	85 - 110	61.25	61.25
8-9	90 - 115	90 - 115	66.25	66.25
9-10	95 - 120	90 - 120	73.45	73.45
10-11	100 - 130	95 - 130	93.25	93.25
Pregnant female*				190.45
Female with litter				170.75
Proven breeder			80.10	85.50

\*For our pregnant animal policy, refer to page 66.

**Golden brown and white.** Colony established in 1994 with stock originating from Zentralinstitut für Versuchstiere, Hannover, Germany. The source for the Hannover colony was the Sprague-Dawley Company in 1973.

## HsdHan<sup>®</sup>:AURA



Maintained on Teklad Global Rodent Diet 2018S (18% Protein) Cage floor space: 141.75 in<sup>2</sup> Growth data to be used as guideline only. Data can be subject to differences in maintenance of hamsters. Growth chart includes mean ± 2 SD's representative of population distribution.

## Characteristics

- Litter average: 9.0
- Excellent reproductive performance

## Research use

- Syrian Hamster Embryo (SHE) Cell Transformation Assay
- Toxicology
- Carcinogenesis Behavior
- Hypercholesterolemia
- Infectious disease (*Clostridium difficile*)
- Hibernation

## Additional available data

- Hematology
- Clinical chemistry
- 12-week growth



MODEL CODE  
201

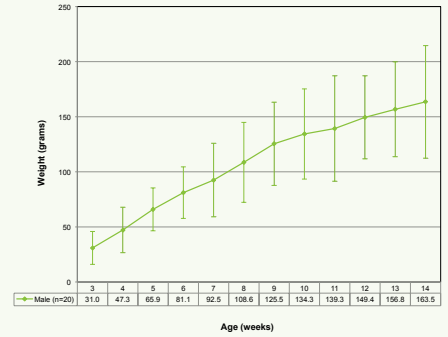
# Cotton Rat

NOMENCLATURE: Hsd:Cotton Rat

AGE (WEEKS)	Price per animal
3-4	\$293.00
4-5	325.45
5-6	354.20
6-7	389.45
7-8	413.70
8-9	454.50
9-10	473.15
Over 10 weeks, add per week	26.90

**Color combination varies: gray, brown, black.** *Sigmondon hispidus* (Cotton Rat) is a New World rodent that was developed by the National Institutes of Health, Bethesda, Maryland, and Virion Systems, Inc. In 1996, Harlan obtained a breeding nucleus from Virion Systems, Inc. Harlan became Envigo in 2015.

## Hsd:Cotton Rat



Maintained on Teklad Global Rodent Diet 2019S (19% Protein)  
Cage floor space: 120.75 in<sup>2</sup>

Growth data to be used as guideline only.  
Data can be subject to differences in maintenance of rats.  
Growth chart includes mean ± 2 SD's representative of population distribution.

## Characteristics

- Litter average: 5.5
- Susceptible to a wide range of human infectious disease agents

## Research use

- Adenoviral vector-based gene therapy
- Infectious disease pathogenesis
  - Respiratory Syncytial Virus
  - Herpes Simplex
  - Parainfluenza Type 3
  - Polio
  - Measles
  - Monkeypox

# Innovation and consistency

Diet should *reduce*, rather than introduce, variation. Teklad Global Diets® are the world's leading laboratory animal diets.

It's not enough to meet basic nutritional criteria. Diets should *reduce*, rather than introduce, variation. Innovatively designed for biomedical research, Teklad Global Diets® are an integrated range of natural ingredient diets for specific life stages.

## Teklad Global Diets® - your formula for success

- + Diets for multiple laboratory animal species
- + Fixed formulation
- + High-quality ingredients from approved regional suppliers
- + Life stage and application appropriate
- + Industry-recognized certified quality systems
- + Global supply chain

By combining fixed formulation with rigorous ingredient control, the variation in nutrient and non-nutrient levels is minimized, meaning consistent results for you.





# Quality Processes drive consistency

Fixed formula diets contain the **same ingredients, in the exact same quantities, in every batch of diet.**

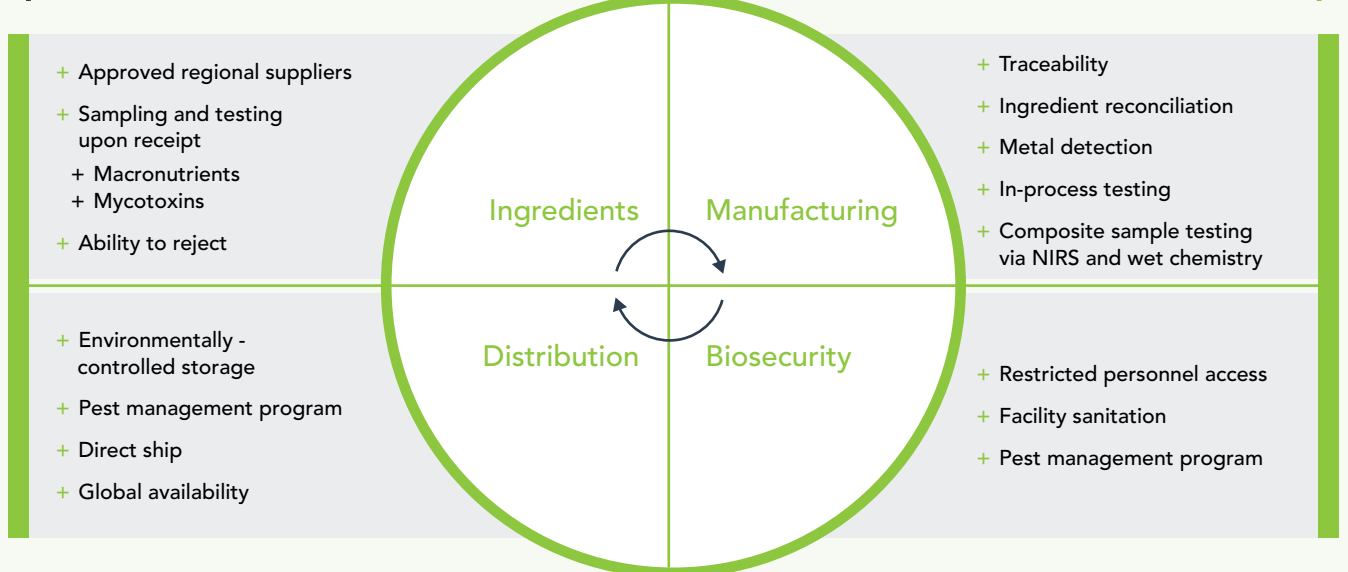
- + Diet is a critical variable in any study
- + Our fixed formulation philosophy and quality practices translate to consistent research results for you
- + Other manufacturers may use variable formula diets in which both ingredients and inclusion rates are changed to an extent unknown to the investigator

TEKLAD DIETS: A FIXED FORMULATION APPROACH	
<b>Method</b>	Ingredients from approved suppliers are tested prior to acceptance and use.
<b>Rationale</b>	Both nutrients and non-nutrients can have important effects.
<b>Result</b>	Minimize nutrient variation and manage non-nutrient variation while maintaining formula integrity.



- + Bulk ingredients are sampled across the depth and length of the load and tested for macronutrients and mycotoxins

+ **Teklad Diet sites in Madison, WI received recertification to the new ISO9001:2015 standard** +



# Teklad Global Rodent Diets

A related family of diets for specific life stages and research purposes

TEKLAD GLOBAL RODENT DIETS					
Diet	2014	2016	2018	2019	2020X
<b>Primary ingredients (Order of inclusion)</b>	Wheat midds Wheat Corn Corn gluten meal Soy oil	Wheat Corn Wheat midds Corn gluten meal Soy oil	Wheat Corn Wheat midds <b>Soybean meal</b> Corn gluten meal Soy oil	Wheat Corn Corn gluten meal Wheat midds Soy oil	Wheat Corn Corn gluten meal Wheat midds Soy oil
CALCULATED NUTRIENT PROFILE (AS FORMULATED)					
<b>Protein %</b>	14.3	16.4	18.6	19.0	19.1
<b>Fat %</b>	4.0	4.0	6.2	9.0	6.5
<b>Metabolizable energy</b>	2.9 kcal/g 12.1 kJ/g	3.0 kcal/g 12.6 kJ/g	3.1 kcal/g 13.0 kJ/g	3.3 kcal/g 13.8 kJ/g	3.1 kcal/g 13.0 kJ/g
<b>Isoflavone content*</b>	<20 mg/kg	<20 mg/kg	<b>150-340 mg/kg</b>	<20 mg/kg	<20 mg/kg
USE AND FEATURES					
<b>Life stage</b>	Long-term maintenance	Growth, maintenance	Breeding, growth	Breeding, higher energy	Breeding, growth
<b>Purpose and benefits</b>	+ Prolonged maintenance + Aging + Toxicology + Oncology	+ Growth + Maintenance + Toxicology + Oncology	+ Breeding + Growth + Maintenance + General purpose	+ Breeding + Genetically - engineered mice + Poorly performing strains + Oncology	+ Breeding + General purpose + Estrogen-sensitive breeding studies + Reproductive toxicology + Oncology

\* Expected range of genistein + daidzein (aglycone) based on quarterly measurement of diet

## Teklad Global Rodent Diets - designed to reduce experimental variability

- + Modern formulations
- + Levels of protein, energy, vitamins and minerals more closely align with nutritional requirements
- + Reduce or eliminate **soybean meal**, and exclude alfalfa meal, the major sources of phytoestrogens in rodent diets
- + Vegetarian diets eliminate nitrosamines as a research variable
- + Available globally to promote protocol consistency

## Variations in product code nomenclature

- + '9' in the second digit - the diet has been irradiated
- + 'S' - the autoclavable version, supplemented with vitamins to account for presumed losses
- + 'X' - extruded form; exception is 2019 which is extruded
- + 'C' - certified; a representative sample is tested for a panel of contaminants
- + 'M' - meal form

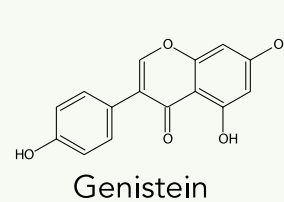
*Not all product combinations are produced regularly or stocked locally.*



# Ingredient selection

## The key to reducing rather than introducing variation

INGREDIENT	COMPONENT	SIGNIFICANCE
Soybean meal	Isoflavones: Genistein, Daidzein	Selective Estrogen Receptor Modulator
Alfalfa meal	Coumestrol Chlorophyll	Selective Estrogen Receptor Modulator Interferes with fluorescent imaging
Fish meal Meat meal	Nitrosamines	Potential carcinogen

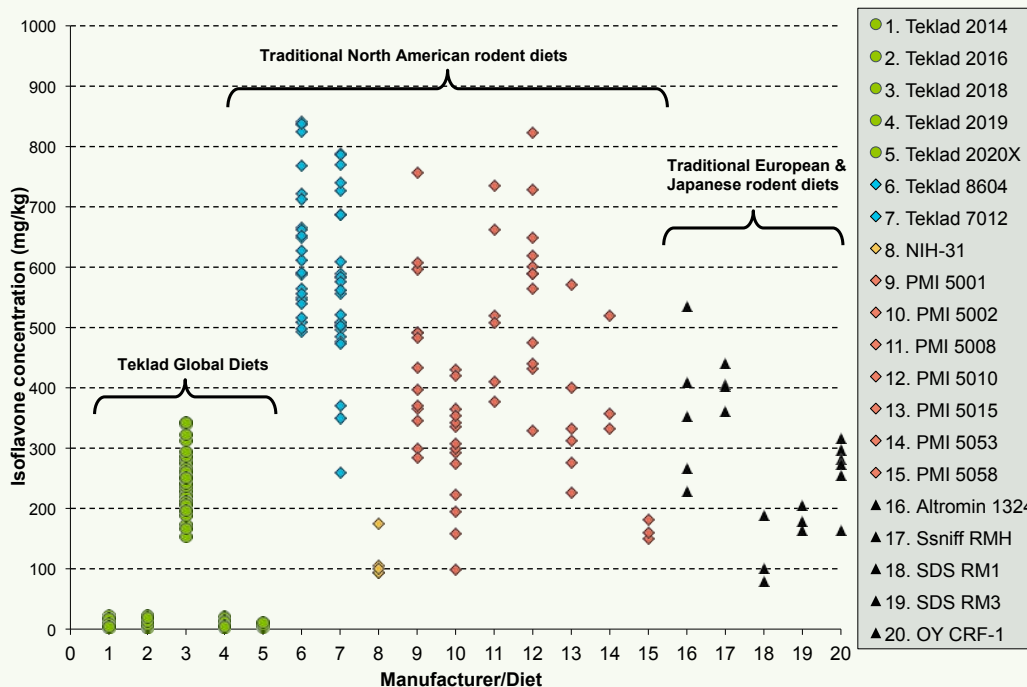


### Variation in isoflavone levels (genistein + daidzein) between diets and within batches of the same diet

Plot shows isoflavone levels for traditional diets from North America (blue, yellow, red), Europe and Japan (black) and Teklad Global Rodent Diets (green).

Data is compiled from published literature and commercial laboratory analysis.

Each symbol is one value; symbols within a column denote multiple values for that diet.



For experimental endpoints sensitive to isoflavones, batch-to-batch variation can lead to inconsistency, confounding your interpretation of results.

# Repeatable, reliable results

## Key principles

- + Isoflavone range in rodent diets that contain soybean meal is 100-700 mg/kg
- + Estrogen receptors (ER) are widely distributed in tissues
- + Isoflavones have considerable access to ER by virtue of high serum levels

**References:**

[envigo.com/phytoestrogen-references](http://envigo.com/phytoestrogen-references)

## Ways in which isoflavones impact research

RESEARCH AREA	EFFECTS DESCRIBED IN THE LITERATURE
Oncology	Modulate tumor growth, latency, multiplicity, metastasis; diminish action of drugs such as tamoxifen and letrozole.
Reproductive	Increase uterine weight; accelerate vaginal opening; affect response to exogenous estrogens/xenobiotics.
Endocrine	Differences in body composition (weight, adiposity), glucose and insulin homeostasis, bone density, and blood pressure.
Neuroscience	Performance differences on tests measuring anxiety behaviors and response to pain stimuli.
Immunology	Modulate immune organ development; display anti-inflammatory and antioxidant actions.

## Challenge: Isoflavones impact research

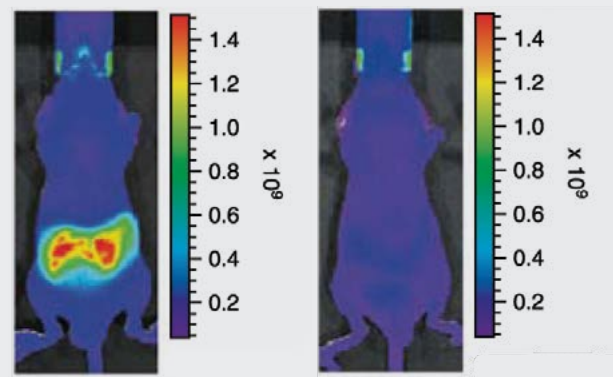
- + No simple absolute threshold for the physiological effects of phytoestrogens
- + Difficult to predict magnitude and direction of response
- + Their action reduces effectiveness of animal model
- + Preclinical research in rodent models fed diets containing soybean meal may not translate to human populations due to differences in consumption levels and metabolism



**Solution: Envigo's minimal isoflavone Teklad diets lead to reliable, repeatable research results.**

## Teklad Global Rodent Diets for fluorescent imaging

- + Exclusion of alfalfa meal practically eliminates chlorophyll, the source of autofluorescence in the gut region
- + Teklad Global Rodent Diets significantly reduce background autofluorescence and are suitable for many imaging applications

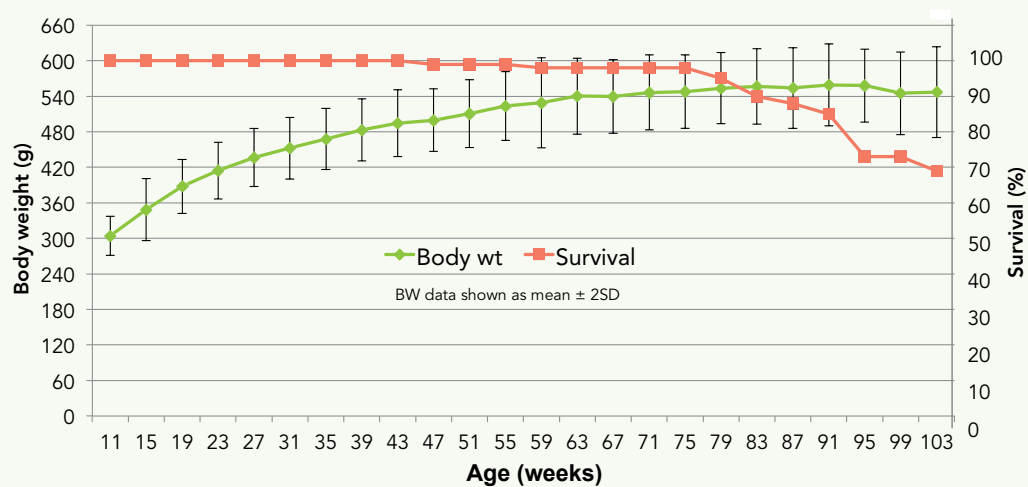




# Teklad Global Rodent Diets Designed to improve animal welfare

- + Other commonly used diets supply protein well in excess of requirements and can contribute to early mortality
- + There are benefits to lower protein, lower energy standard diets for toxicology and safety studies

## Growth and survival curves



**Model:** + Hsd:Sprague Dawley® SD® males (n=200)

**Diet:** + Teklad 2014 (14% protein) starting at 8 weeks of age

**Results:** + Body weight plateaus at ~550 grams without diet restriction; compare to CD® IGS rat which are 100-200 grams heavier when fed more typical standard diets

+ Survival at 2 years ~68%; compare to typical 2 year survival in CD® IGS rat of ~35-40%





# Teklad Global Diets® at a glance

SPECIES	RODENT					DOG		
Product	2014	2016	2018	2019	2020X	2021	2025	2027
Irradiated (29xx)	2914	2916	2918	2919	2920X			
Certified (C)	2014C	2016C	2018C			2021C	2025C	2027C
Autoclavable (S)	2014S	2016S	2018S 2018SX	2019S	2020SX			
Extruded (X)			2018SX	Standard	Standard	Standard	Standard	Standard
KEY FEATURES								
	14% Protein 4% Fat	16% Protein 4% Fat	18% Protein 6% Fat + Moderate phytoestrogen	19% Protein 9% Fat	19% Protein 6% Fat	21% Protein 6% Fat	25% Protein 9% Fat	27% Protein 16% Fat
	+ Vegetarian (no nitrosamines) + Minimal phytoestrogens (2014, 2016, 2019, 2020X) + Suitable for imaging studies (no alfalfa meal) + Extruded versions dramatically reduce clumping and hardening after autoclaving and reduce waste					+ High-quality poultry by-products + Smooth transition between diets + Options for all life stages + All options stocked as certified		
PURPOSE AND BENEFITS								
	+ Prolonged maintenance + Aging + Toxicology + Oncology	+ Growth + Maintenance + Toxicology + Oncology	+ Breeding + Growth + Maintenance + General purpose	+ Breeding + Genetically engineered mice + Poorly performing strains + Oncology	+ Breeding + General purpose + Estrogen-sensitive breeding studies + Reproductive toxicology + Oncology	+ Maintenance	+ Gestation + Lactation + Growth + Maintenance	+ Gestation + Lactation + Growth
CALCULATED AVERAGE NUTRIENT PROFILE								
Protein %	14.3	16.4	18.6	19.0	19.1	21.0	26.0	28.6
Fat %	4.0	4.0	6.2	9.0	6.5	7.1	10.5	16.3
Crude Fiber %	4.1	3.3	3.5	2.6	2.7	4.0	3.0	2.5
NDF % <sup>1</sup>	18.0	15.2	14.7	12.1	12.3	13.7	11.5	9.5
Metabolizable energy	2.9 kcal/g 12.1 kJ/g	3.0 kcal/g 12.6 kJ/g	3.1 kcal/g 13.0 kJ/g	3.3 kcal/g 13.8 kJ/g	3.1 kcal/g 13.0 kJ/g	3.2 kcal/g 13.4 kJ/g	3.5 kcal/g 14.6 kJ/g	3.8 kcal/g 15.9 kJ/g
FIXED FORMULA - achieving high consistency of nutrients coupled with the same ingredient inclusions in every batch								
	+	+	+	+	+	+	+	+

<sup>1</sup> Neutral detergent fiber (NDF) is an estimate of insoluble fiber, including cellulose, hemicellulose, and lignin. Crude fiber methodology underestimates total fiber.

## Product

- Not all product combinations are produced regularly or stocked locally; extended lead times and additional fees may apply
- Most products available in meal (M) form; extended lead time and additional fees may apply

## Irradiated

- The irradiated version is identical to the standard version, with the exception of packaging
- The '9' in the second position of the product code denotes the product has been irradiated

## Autoclavable

- The autoclavable version (S) differs in the level of vitamin supplementation, which is increased to account for presumed losses due to autoclaving



# Teklad Global Diets® at a glance

SPECIES	RABBIT		GUINEA PIG		PRIMATE		CAT	FERRET
Product	2030	2031	2040	2041	2050	2055	2060	2072
Irradiated (29xx)	2930	2931	2940	2941				
Certified (C)	2030C	2031C	2040C		2050C	2055C	2060C	2072C
Autoclavable (S)								
Extruded (X)					Standard	Standard	Standard	Standard
KEY FEATURES								
	16% Protein 3% Fat + Vegetarian	14% Protein 2% Fat + Vegetarian + Higher fiber	18% Protein 3% Fat	17% Protein 4% Fat + Higher fiber	20% Protein 4% Fat + Higher fiber	25% Protein 5% Fat	32% Protein 12% Fat + Includes a urinary acidifier	36% Protein 18% Fat + Highly digestible + Low ash poultry by-products
			Global Guinea Pig Diets are fortified with stabilized vitamin C		Global Primate Diets are fortified with stabilized vitamin C			
PURPOSE AND BENEFITS								
	+ Gestation + Lactation + Growth	+ Maintenance + Long term studies	+ Gestation + Lactation + Growth	+ Maintenance	+ Gestation + Lactation + Growth + Maintenance	+ Gestation + Lactation + Growth + Maintenance	+ Gestation + Lactation + Growth + Maintenance	+ Gestation + Lactation + Growth + Maintenance
CALCULATED AVERAGE NUTRIENT PROFILE								
Protein %	17.7	14.8	18.7	17.6	20.0	25.6	34.0	39.0
Fat %	3.3	2.3	3.3	4.4	5.4	5.9	12.5	19.0
Crude Fiber %	13.7	21.8	11.9	14.8	8.1	3.5	1.7	1.2
NDF % <sup>1</sup>	29.2	39.4	25.2	32.0	18.4	9.2	6.7	4.4
Metabolizable energy	2.4 kcal/g 10.0 kJ/g	2.0 kcal/g 8.4 kJ/g	2.5 kcal/g 10.5 kJ/g	2.4 kcal/g 10.0 kJ/g	2.8 kcal/g 11.7 kJ/g	3.2 kcal/g 13.4 kJ/g	3.5 kcal/g 14.6 kJ/g	3.8 kcal/g 15.9 kJ/g
FIXED FORMULA - achieving high consistency of nutrients coupled with the same ingredient inclusions in every batch								
	+	+	+	+	+	+	+	+

## Extruded

- For rodent diets, the combination of the extruded form and appropriate forification allows for superior autoclaving quality (decreased hardness and clumping) where problems are experienced with the autoclavable pellet form

## Certified

- There are no differences in the formula, ingredients, manufacturing standards, and quality control processes between non-certified and certified diets
- A representative sample is tested for a panel of contaminants. This panel varies by region (US vs. Europe) reflecting differences in regulatory standards; contact local representatives for more information
- If diet is not stocked as certified, certification can be made available by request; expect minimum order size and additional charges to apply



# Custom research diets, medicated diets

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ENVIGO

# Teklad

## Diets

### Custom research diets

Custom diets are developed for a specific purpose and benefit from your input and our expertise. With more than 20,000 formulas in our database attained over 40 years, Envigo nutritionists have vast experience to draw upon. We are committed to developing and maintaining long-term customer relationships.

#### Use custom research diets to:

##### + Control nutrients

- Vitamin or mineral adjusted
- Protein or amino acid adjusted
- Lipid or fatty acid adjusted

##### + Induce disease

- Atherogenic (cholesterol, fat, cholate)
- Diet-induced obesity (40-60% fat kcal)
- High carbohydrate (fructose, sucrose)
- NaCl adjusted
- Cuprizone demyelination

##### + Dose animals

- Control of gene expression - doxycycline or tamoxifen containing diets
- Addition of customer-supplied ingredients/compounds

### Medicated diets

Several medicated diets are available from stock. Use as directed by a veterinarian.

- TD.01432** Sterilizable Fenbendazole Diet (2018S, 150 ppm)
- TD.01432.I** Irradiated Fenbendazole Diet (2018S, 150 ppm)
- TD.06596** Irradiated Uniprim Diet (2018, 4100 ppm)
- TD.130755** Irradiated Ivermectin Diet (2018, 12 ppm)

Other medicated diets can be available in small-scale or large-scale production. Contact us for more details.

### Ask a nutritionist!

Chat with one of our nutritionists online to discuss lab animal diet options, get technical support and product codes.

[envigo.com/products-services/teklad](http://envigo.com/products-services/teklad)



### Ask a nutritionist

Our nutritionists are available to chat live



# Bedding

Your animals are in continuous contact with bedding, yet its importance is often overlooked.

Envigo offers a full line of Teklad bedding, including corn cob, wood and paper products, with these advantages:

- + Most have been thoroughly tested in our animal barriers
- + Several are produced in a bedding plant, uniquely dedicated to production for the research community
- + Many certified options are available
- + Most beddings are also available in irradiated format

## Bedding – Paper

- + 7070C Certified Diamond Dry Bedding
- + 7084 Pelleted Paper Bedding
- + 7089C Certified Diamond Soft Bedding
- + 7099 TEK-Fresh™ Bedding
- + 7099W White TEK-Fresh™ Bedding

## Bedding – Wood ⚠️

- + 7086G Pelleted Aspen Bedding
- + 7088 Laboratory Grade Pine Shavings
- + 7090A Sani-Chips® Bedding - Aspen
- + 7090M Sani-Chips® Bedding - Maple
- + 7090C Certified Sani-Chips® Bedding
- + 7093 Shredded Aspen Bedding

## Bedding – Corncob

- + 7092 1/8" Corncob Bedding
- + 7097 1/4" Corncob Bedding
- + 7087C Certified Soft Cob Enrichment Bedding

## Custom Cut Liners

- + Diamond-TEK white dimpled cage board
- + Diamond Pad white multi-ply tissue liners with poly backing

## Enrichment

In addition to our diet and bedding lines, Teklad provides a number of enrichment products, including:

- + 7087C Certified Soft Cob Enrichment Bedding
- + 7979C.CS Certified Irradiated Diamond Twists
- + 6105.CS iso-PADS™ Environmental Enrichment Pads (6" x 10")
- + 6060.CS iso-BLOX™ Environmental Enrichment squares (2" x 2")



**WARNING:** This product can expose you to wood dust, a chemical which is known to the State of California to cause cancer. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

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ENVIGO

# Teklad

## Bedding





# Envigo genetic testing services

The Envigo genetic services operations in North America provide global DNA and RNA analysis services. For more than 10 years, Envigo has partnered with the Bionomics Research Technology Center (BRTC) at Rutgers University to offer a full spectrum of quality genetic testing services. This strategic partnership allows access to the worldwide experts in functional genomics.



## Features

**DNA/Mutation Analyses** – investigate the structure of the genetic architecture in your model with the following services:

- Genotyping
- Zygosity Testing
- SNP Profiling for Speed Congenics
- Whole Genome Array-Based Analysis
- Array Comparative Genomic Hybridization (CGH)
- Methylation Analysis
- Next-Gen Sequencing

**RNA/Expression Analyses** – investigate the function of the gene or genes of interest in your model with the following services:

- Quantitative PCR (qPCR)
- Whole Transcriptome Microarray Analysis
- RNAseq

## Advantages

- + Reduces testing variables due to sourcing from one high-quality vendor
- + Offers customized testing for maximum flexibility and value
- + Supports your project with technical and bioinformatics specialists
- + Provides experimental design consultation
- + Delivers quick turnaround times
- + Archives data securely for up to five years

Contact your Envigo representative or visit [envigo.com](http://envigo.com)



# Surgical services

Envigo's state of the art surgical facilities are dedicated to providing the highest quality surgical models to our customers from our barrier-dedicated surgical facilities. We are committed to enhancing and enriching your research, through quality, collaboration, development, and animal welfare.

Under close veterinary supervision, our AAALAC accredited facilities offer multiple rodent surgical models from experienced and highly-trained, certified surgical technicians.

Envigo offers many standard surgical models and has the flexibility to collaborate with customers to create custom models. Please contact us if your model isn't listed on the following pages.



## + Quality

- + Consistent quality across all surgical facilities
- + Continuous training, evaluation and certification for all surgical personnel
- + Customer feedback is documented and reviewed by a team consisting of Quality, Veterinary Sciences, and Surgical Management

## + Development

- + Working with researchers to develop new surgical models and improve current models
- + Commitment to continuing education opportunities for Envigo surgical staff
- + Continuous investment in Envigo surgical facilities

## + Collaboration

- + Developing partnerships with customers to enhance their research outcomes
- + Partnering with industry professionals to bring new products and services to the research community
- + Global best practice sharing between all Envigo surgical personnel

## + Animal welfare

- + Dedicated to the humane and ethical care of research animals
- + All surgical modifications are reviewed and approved by the Envigo IACUC
- + Envigo veterinarians provide oversight and technical and professional support to all surgical personnel





## Rodent catheterizations

Envigo uses a rounded-tip catheter made of medical-grade polyurethane for all standard vascular catheterizations. Our standard catheter exteriorization option is a fixed exteriorization of 2.5 cm of exposed catheter exiting between the animal's shoulder blades. We currently offer several additional exteriorization options to access catheterized vessels for infusion and/or sample withdrawal. Furthermore, we will meticulously collaborate with our customers to develop a catheter model that fulfills their particular research needs.

Catheter patency is verified by our surgical staff intra-operatively and again prior to the animals being placed in the shipping containers.

Our recommended flushing regimen can be found on the "Post-Operative Care Sheet for Catheterizations" (sent with each order and available at [envigo.com](http://envigo.com)).

When our recommended flushing regimen is followed, vascular catheterized models are guaranteed patent up to the first five (5) days from arrival at your facility.

- For vascular catheterized rat models, patency of the rounded-tip catheter must be confirmed by the customer within four (4) days following arrival at their facility
- For vascular catheterized mouse models, patency should be confirmed on the day of arrival to customer's facility
- Non-vascular catheterized models are guaranteed patent upon the day of arrival

## Rat catheterizations

	6 or more animals (per animal)	Up to 5 animals (per animal)
<b>Vascular catheterizations</b>		
Carotid Artery	\$127.45	\$131.10
Femoral Artery*	146.80	209.70
Femoral Vein	125.60	198.55
Jugular Vein	102.40	162.25
Portal Vein	200.10	277.50
<b>Non-vascular catheterizations</b>		
Bile Duct - Closed Loop	\$209.85	\$295.20
Intestinal-Duodenal	102.35	252.65
Intestinal-Jejunal	223.95	309.60
Gastric	160.20	229.75
Intra-Colonic	208.55	280.90
Ileum	211.45	215.25
Intra-Cecum	172.35	232.15
Intrathecal	220.00	255.00

\* On certain animal models only

## Mouse catheterizations

	6 or more animals (per animal)	Up to 5 animals (per animal)
<b>Vascular catheterizations</b>		
Carotid Artery	\$179.95	\$186.40
Jugular Vein	135.00	141.40
<b>Non-vascular catheterizations</b>		
Intestinal-Duodenal*	\$284.25	\$299.50
Gastric	172.15	179.15
Intra-colonic	204.55	211.65
Ileum	285.70	295.60
Intra-Cecum	169.05	295.55
<b>Double vascular catheterizations</b>		
JVC/CAC	\$341.25	\$355.15

## Surgical enrichment program

- All singly-housed surgically-modified rodents receive enrichment postoperatively and during transit
- All surgically-modified rodents are acclimated to ClearH<sub>2</sub>O gel prior to shipment

All catheterizations can be performed using Instech's PinPort™ for an additional charge of \$9.90 (to include the PinPort™ and injectors for use during surgery and shipping). See page 56 for pricing on injectors for flushing maintenance.

## Multiple procedures - single animal

Multiple surgical procedures, including catheterizations, can be performed on a single animal. If you require an unlisted combination, including triples, pricing is provided upon request.

	6 or more animals (per animal)	Up to 5 animals (per animal)
<b>Double vascular catheterizations</b>		
JVC/CAC	\$206.65	\$297.60
JVC/JVC	183.10	254.20
FAC/FVC	245.35	328.20
JVC/FVC	205.40	281.10
JVC/FAC	224.25	308.05

Envigo also performs customer-specific surgical procedures. Please contact Veterinary Sciences, Research and Support, at 800.793.7287 to discuss your specific needs. In most cases, a surgical procedure development fee of \$350 is assessed and includes the provision of surgically-modified animals for evaluation.



## Catheterizations options\*

In addition to the standard catheterization procedure, Envigo offers these options:

	Price per item
<b>Rat Harnesses</b>	
Harness, single port	\$59.95
Harness, dual port	88.90
Harness, quad port	113.95
Harness, dual port w/connector	135.15
Harness, quad port w/connector	164.35
Connector, dual/quad harness	50.20
Quik Connect Harness, single port	58.00
Harness, custom, dual port	74.40
<b>Culex Catheters</b>	
CAC	\$40.65
FVC, short	40.65
FAC	40.65
JVC, short	40.65
BDCCCL	143.15
PVC	40.65
Culex Catheter SS Plug, 19g	8.40
Culex BDCCCL U-Tube Connector	56.80
<b>Catheter Buttons</b>	
Single Vascular Access Button - rat	\$49.35
Double Vascular Access Button - rat	49.35
Triple Vascular Access Button - rat	71.75
Single Vascular Access Button - mouse	64.30
Double Vascular Access Button - mouse	88.20
<b>Catheter Ports</b>	
Vascular Access Port, JVC	\$84.75
Vascular Access Port, FVC	84.75
<b>Miscellaneous</b>	
Additional Catheter Tubing (per ft)	\$12.20
Blunt Needles	5.85
Huber Needles	9.20
Rat Jacket w/Pouch	49.45
Stainless Steel Plugs	4.40
Catheter Couplers	13.25
Hep/Gly Soln, sterile, 500 IU/mL, 10 mL bottle	51.30

\* Supplier partners include: Access™ Technologies, SAI Infusion Technologies, Inc., Instech Laboratories, Inc., Bioanalytical Systems, Inc. (BASi), Data Sciences International (DSI™), and Lomir Biomedical, Inc.

Surgical procedure prices are in addition to the cost of animals, shipping, and taxes. Sham operations are priced at 75 percent of the prices shown.

No additional charges are assessed based upon the use of gas or injectable anesthesia.

## Soft tissue surgical procedures

	6 or more animals (per animal)	Up to 5 animals (per animal)
<b>Reproductive</b>		
Castration - rat	\$28.75	\$52.45
Castration - mouse	31.30	55.60
Ovariectomy - rat	30.65	59.30
Ovariectomy - mouse	31.45	56.30
Vasectomy - rat	40.10	69.15
Vasectomy - mouse	40.10	71.50
<b>Endocrine</b>		
Adrenalectomy - rat	\$33.40	\$41.75
Adrenalectomy - mouse	33.40	41.75
<b>Additional</b>		
Nephrectomy-Unilateral - rat	\$50.80	\$89.55
Nephrectomy-Unilateral - mouse	54.20	94.70
<b>Cardiovascular</b>		
Telemetry - rat	TBD	TBD
Telemetry - mouse	TBD	TBD

## Immunodeficient models

Surgical modification of immunodeficient rodents that are maintained in flexible-film isolators is also available. These surgical procedures are performed within surgical isolators.

	6 or more animals (per animal)	Up to 5 animals (per animal)
<b>Reproductive</b>		
Castration - rat	\$49.50	\$70.00
Castration - mouse	51.25	68.10
Ovariectomy - rat	50.80	67.15
Ovariectomy - mouse	51.25	63.05
Vasectomy - rat	59.40	79.80
Vasectomy - mouse	61.10	77.35

## Additional charges

	Each
Custom surgeries not listed	Available on request

Cancellations must be received two business days prior to the scheduled date of surgery. The date of surgery is indicated on the order confirmation. Surgical orders cancelled after the required 48-hour notice will be subject to the cost of surgery and any unrecoverable cost such as, but not limited to, preconditioning, treatment and maintenance of the animal model.

## Myocardial infarction model

In the mid 1990's, research concluded the rat model has many pathophysiological and clinical similarities as the human heart. Progression to heart failure is similar to human progression. Envigo now offers a myocardial infarction rat model.

### Uses

- + Identify molecular signaling mechanisms
- + Evaluate therapeutic treatments
- + Investigate disease combinations

### Current research

- + Combination of models
  - + Diabetes and MI
  - + Obesity and MI
  - + MI and aging/sex (young, middle age and old)

## Envigo MI surgical performance

### Success measures

- + Less than 40% ejection fraction (EF)  
*Ejection fraction (EF) is a measurement of the percentage of pumped blood leaving the heart*
- + Ensuring consistent study results with minimal deviation
- + Able to run on treadmill
- + Low ejection fraction deviations between animals
- + Minimal adhesion
- + No infection or lung damage
- + Muscle damage

### Rat myocardial infarction

- + Severe blanching
- + Thin anterior wall
- + EF = 31%

## Beating expectations

Typical heart	60 - 75% EF
Model requirement	40% EF
++++ ENVIGO	31% EF

## The Envigo difference

- + Consultative approach
- + High quality surgical models
- + Knowledgeable technical support
- + Responsive customer support



## Preconditioned models and services

### Custom research diet animal maintenance

Cohorts of HsdBlu:LE rats, Hsd:Sprague Dawley® SD® rats, C57BL/6NHsd mice, and other stocks and strains of Envigo rodents can be maintained on custom research diets within our maximum security production barriers.

The rodents are fed diets specified by the customer for defined periods of time prior to shipment. Animals are shipped to the customer using Envigo environmentally-controlled vehicles.

### Benefits of Envigo custom diet animal maintenance

- + Envigo Teklad nutritionists, in collaboration with requesting investigators, customize research diets to adjust nutrients and achieve experimental objectives
- + Animals are maintained on customer-specified diets within Envigo's maximum security production barriers until shipment
- + Health and genetic integrity of the models are protected
- + Allows for reallocation of labor and other institutional resources
- + Development of in-house diet maintenance protocols is eliminated

### Research use

- Obesity
- Hypertension
- Osteoporosis
- Nutrition
- Diabetes mellitus
- Hypercholesterolemia
- Physiology
- Pharmacology

### Diet-Induced Obesity (DIO) rodent models

- + Envigo has developed standard protocols for raising DIO HsdBlu:LE rats and C57BL/6NHsd mice
- + Randomly-selected rats and mice are fed Envigo Teklad irradiated custom research diets as specified
- + Animals are provided *ad libitum* diet, automated water and weighed per customer's protocol
- + Data for C57BL/6NHsd male mice, initiated on diet at six weeks of age, available upon request

## Commercially-aged rats and mice

Cohorts of the listed male rat models are reserved monthly for aged-animal inventory. Pricing of aged animals from the aging inventory is available upon request. If the requested aged animals are not available from our aging inventory, or require three or more months of maintenance prior to shipment, Envigo will age a reserved cohort of animals to accommodate customer research requirements and account for anticipated loss from natural attrition.

Pricing for customer-reserved aging cohorts will be developed based on the requirements of the project. Prior to initialization of an aging project, Envigo will confirm customer expectations, the project work scope, and animal pricing with a written agreement of understanding.

### Research use

- Memory
- Osteoarthritis
- Neoplasia
- Immune response
- Longevity
- Vision and hearing
- Motor skills
- Renal degeneration
- Age-associated pathology
- Metabolism
- Neurobiology
- Cardiovascular
- Reproductive senescence

### Common age-associated conditions include

- Hair loss
- Loss of motor skills and sensory perception
- Presence of spontaneous tumors
- Reduced immunologic and physiologic function
- Loss of vision, e.g. retinal degeneration, development of cataracts

When planning for your aged animal requirements, please consider the need to reserve extra animals on your order to replace any losses due to natural causes.

### Prices available on request

Sprague Dawley® - Hsd:Sprague Dawley® SD®

Fischer 344 - F344/NHsd

C57BL/6 - C57BL/6JRccHsd

Available from Europe



# Contract research services

Our contract research services are market leading, with more than 60 years of experience in testing, registration and consulting services for pharmaceutical, crop protection and chemical companies.

Envigo maintains the highest standards of quality and customer service, offering a broad range of practical support, consultancy and problem solving, all of which can be customized to meet your specific research requirements. Envigo is committed to providing you with the support you need, from outsourced single studies, through managing complex programs, to the development of long term strategic partnerships.

	Pharmaceutical development	Crop protection	Chemical
Program management	+	+	+
Toxicology	+	+	+
<i>In vitro</i> safety assessment	+	+	+
Discovery services and lead candidate selection	+		
Bioanalytical	+		
Non-clinical safety assessment	+		
Regulatory affairs	+		
Product development and strategy	+		
Clinical	+		
Chemical, manufacturing and control support	+		
Archiving	+		
Metabolism	+		+
Environmental fate			
Terrestrial ecotoxicology		+	
Aquatic ecotoxicology		+	
Large animal and avian studies		+	
Field trials		+	
Residue analytical services		+	
Endocrine disruptor screening program		+	+
Product chemistry		+	+
<i>In silico</i> services and read-across			+
Worldwide registration		+	
Regulatory consultancy		+	+
Program management	+	+	+
Reprotoxicology	+	+	+
Inhalation toxicology	+		+
Ecotoxicology		+	+
Genetic toxicology	+		+
Product chemistry			+

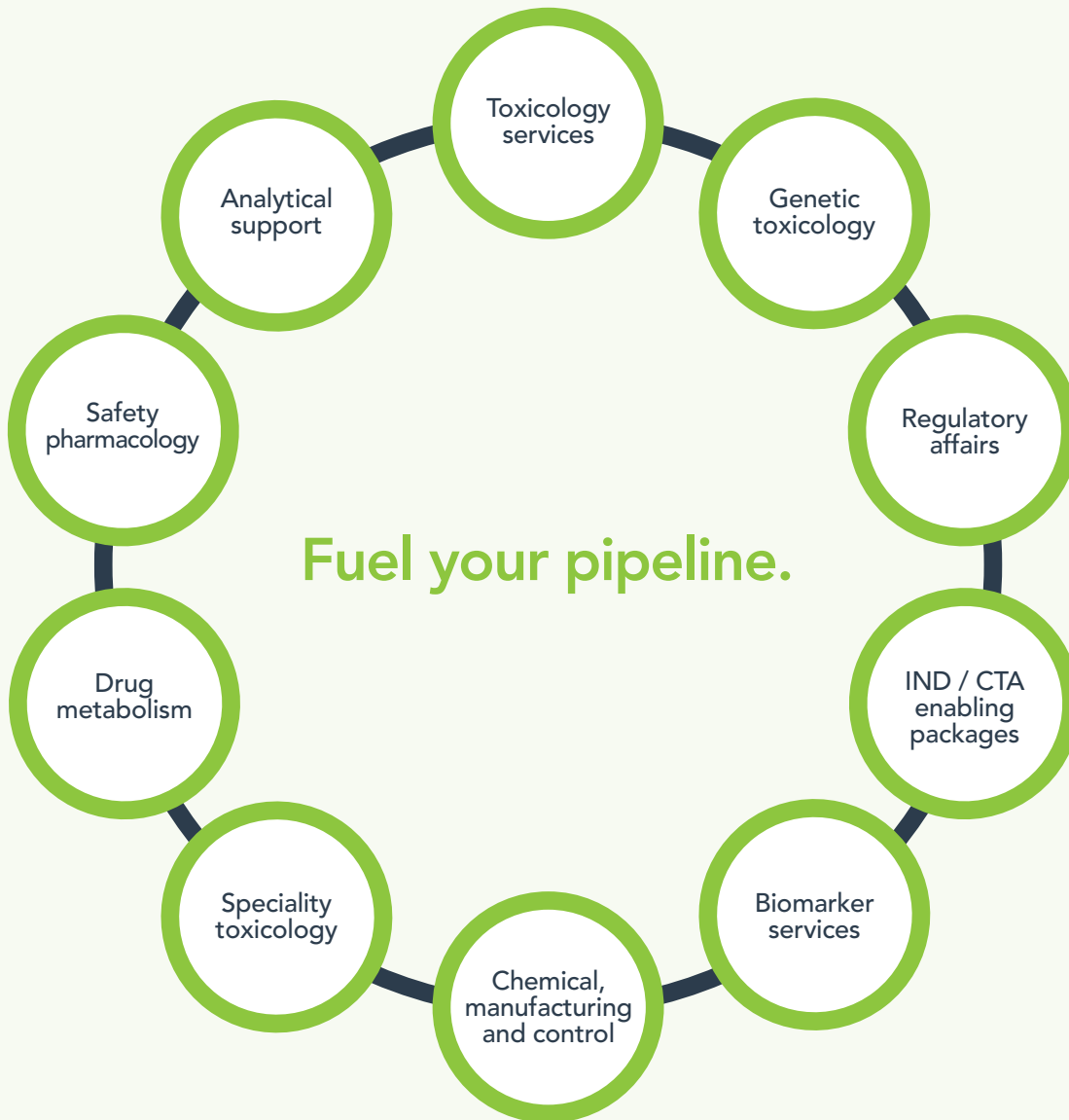
Our Contract Research Services team provides laboratory research services worldwide, tailored to your specific needs, to ensure your research makes that all important difference in improving people’s lives.

Visit our website [envigo.com](http://envigo.com) for our full program or contact us at [salescrsus@envigo.com](mailto:salescrsus@envigo.com) with detailed questions.



# Your full-service drug assessment partner

Envigo supports your drug development pipeline with a comprehensive range of solutions. *In vitro* and multi-species *in vivo* experience, scientific depth, regulatory understanding, innovative routes of administration and broad therapy area expertise combine to provide you with integrated drug assessment programs to help you fuel your pipeline.



## Get started today

Get in touch to find out how partnering with **Envigo** can fuel your pipeline and help you achieve your development milestones. Visit [envigo.com](http://envigo.com) or call us on **UK** +44 (0) 1480 892 000 or **USA** +1 732 873 2550.

# Production locations

WORLDWIDE RESEARCH SERVICES



	US	UK	NED	FRA	ISR	ITA	ESP
<b>Teklad Global Diets® and Bedding</b>							
Standard Diets (pelleted and extruded)	+	+			+	+	
Autoclavable Diets	+				+	+	
Irradiated Diets	+				+	+	
Certified Diets	+	+			+	+	
Medicated Diets	+	+			+		
Custom Research Diets	+				+		
Bedding	+				+		
Cage Enrichment	+						
Cage Liners	+						
<b>Preconditioned models</b>							
Aging Research Models	+	+	+		+		
Animal Model Development					+		
Animal Identification (tattooing, implantation etc.)	+	+	+	+	+	+	
Diabetic Induced Models (STZ induced)					+		
Diet-Induced Obesity Models	+	+	+	+	+		
Diet Maintenance Studies	+	+	+	+	+	+	
<b>Genetic testing services</b>							
PCR Zygosity Testing	+						
Inbred Strain Verification	+						
Gene Expression	+						
Next-Gen Sequencing	+						
Speed Congenics	+						
Prevalidated SNP Zygosity Testing	+						
Prevalidated Reporter and Conditional Model Testing	+						
<b>Surgical services</b>							
Surgical services	+	+	+		+		
<b>Health monitoring</b>							
Serology							+
Bacteriology					+	+	
Parasitology					+	+	
Pathology					+	+	
Molecular Biology							+
<b>Biological products</b>							
Serum	+	+	+		+		
Plasma	+	+	+		+		
Complement	+	+			+		
Tissues, Organs, Glands	+	+			+		
Whole Embryo Culture Serum	+						
EGF, 2.5S and 7.0S Nerve Growth Factor	+						
Cytokines	+						

	US	UK	NED	FRA	ISR	ITA	ESP
<b>Processing and cell line services</b>							
Bioburden Testing	+						
Endotoxin Testing	+						
Sterility Testing	+						
Subcloning	+						
Cell Banking	+	+				+	
Cell Line Sterility	+						
Cell Line Viability Testing	+						
Mycoplasma Cleanup	+						
Cell Weaning	+						
Cell Recovery	+						
Cell Line Isotyping	+						
IgG Concentration Testing	+						
<b>Custom antibody production</b>							
cGMP <i>In Vivo</i> Production (Diagnostic and Therapeutic Use)	+						
Non-cGMP <i>In Vivo</i> Production (Diagnostic and Research Use)	+					+	
cGMP <i>In Vitro</i> production (Diagnostic and Therapeutic Use)	+					+	
Non-GMP <i>In Vitro</i> production (Diagnostic and Therapeutic Use)	+					+	
Hybridoma Development	+					+	
Polyclonal Antibody Production	+					+	
Mouse Antibody Production (MAP) Testing	+					+	
Antibody Purification	+					+	
Fragmentation/Conjugation	+						
<b>Colony management services</b>							
Maintenance Research Models	+	+	+	+	+	+	+
Contract Breeding	+	+	+	+	+	+	+
Import/Export Services	+	+	+	+	+	+	+
Quarantine	+					+	
<b>Facility services</b>							
Facility Management					+	+	+
<b>Transgenic services</b>							
Embryo Transfer	+					+	
Cryopreservation	+					+	
Revitalization	+					+	
Sperm Cell Freezing	+					+	
<b>Contract research services (see page 56 for further details)</b>							
Non-Clinical CRO Services	+					+	+

**Although the above Research Model Services are listed by location, these are globally available.**

Items Not Listed - We invite inquiries about services not listed in this overview. Our technical service representatives are ready to discuss your special requirements. We will work with you to select the services that best suit your needs.

## Custom antibody production

BIOPRODUCTS



At Envigo Bioproducts, we believe that when it comes to making antibodies, experience matters. For more than 40 years, we have consistently provided the research community high-quality custom antibody production services. From the more traditional *in vivo* approach, to the leading-edge *in vitro* production method, to hybridoma development, Envigo Bioproducts can tailor a program to meet your specific needs. Our technical staff will work with you to determine the best production approach for your research.

We understand the research process and how unexpected variability can negatively impact the quality and timeliness of results. Through our proven Quality Management System, our cGMP/OLAW-compliant and USDA-licensed facility, and our team of highly-qualified and experienced professionals, we provide antibody products and services that you can depend on to support and enhance your research. By providing consistent high-quality products and services in a timely manner, Envigo Bioproducts helps you focus on your research, rather than on unwanted distractions.

### *In vivo* production

For an economical approach, Envigo Bioproducts offers monoclonal antibody production in our cGMP-compliant and AAALAC accredited facility. Our ready access to large numbers of high-quality, genetically-defined adventitious virus-free mice and rats ensures a rapid turn-around time at a competitive price. We can also help maximize your yield time through our innovative Optimization Program.





# Custom antibody production

Envigo Bioproducts is a global market leader with more than 40 years of experience in developing, scaling up and testing antibodies.

## Cell Line and processing services

We have expanded our cell line and processing capabilities to offer a wider selection of services, thus helping you to complete your research more efficiently.

- Bioburden
- Endotoxin
- Sterility
- Subcloning
- Cell banking
- Cell line stability
- Mycoplasma cleanup
- Viability
- Cell weaning
- Cell recovery
- Cell line isotyping
- IgG testing

Our technical staff has extensive experience in microbiology, virology, cell biology, pathology, and lab animal medicine. This translates into reliability in knowing that your projects will be dealt with in a professional and timely manner.

## The BPS advantage:

- + AAALAC accredited, cGMP-compliant facility
- + Expertise > 40 years
- + Rapid turnaround time
- + Scientific expertise
- + Superior quality management system
- + Vendor qualification expertise

SERVICE	Description	Cell Line	Production type	Capacity	Advantages
Optimization Program	Different doses tested Small to large run sizes	Hybridomas, NSO and SP2/0	BALB/c, Nude, SCID, and other species	Small to large scale (10mg-100g)	Determine optimal cell dose Allows maximal yield Verifies specifications Saves time
Research in vivo Production (non-cGMP)	When cGMP is not needed Unique service Same phases as cGMP	Hybridomas, NSO and SP2/0	BALB/c, Nude, SCID, and other species	Small to large scale (10mg-100g)	No MAP Testing requirement Quicker turn-around time Custom protocols Reduced cost
cGMP Production	Diagnostic/Therapeutic Use Extensive Quality Program Fully tested	Hybridomas, NSO and SP2/0	BALB/c, Nude, SCID, and other species	Small to large scale (10mg-100g)	AAALAC accredited, cGMP compliant Optimized production Large animal inventory Complete documentation





## Antibody purification

Envigo Bioproducts can purify from mg to gram quantities of your monoclonal or polyclonal antibodies utilizing a wide array of protein purification methods, for research or cGMP diagnostic use. We can also purify any raw antibodies that have been produced in your lab or from another supplier. Our scientific staff will work with you to discuss the best options available to meet your needs. Our goal is to develop a procedure which provides the best balance between yield, purity and cost.

Service	Production type	Method	Production capacity	Area of use	advantages
Antibody Purification	Monoclonals	Protein A and G,	Small to large scale	Diagnosics,	Variety of Methods
IEF, SEC, MW Testing	Polyclonals	Antigen affinity,	(20mg - 20g scale	cGMP	Low endotoxin for <i>in vivo</i>
Fab and F(ab) <sup>2</sup>	Secreted Proteins	Hydrophobic	available)	Diagnostic	use cGMP compliant for
Fragmentation	IgM	interaction, Size		Research	diagnostic use
FITC, Biotin, Alk Phos, and	IgY	exclusion,			Purify customer's in-house
HRP Conjugation		Ammonium sulphate,			antibody
		Ion exchange			Standard/Custom Protocols

## Immunogenicity immunization

Envigo Bioproducts provides a unique Immunogenicity Immunization service in a variety of species, such as rats, mice, guinea pigs, and rabbits. We provide serum samples from a wide range of antigens, bacteria, viruses, lipids, nucleic acids and other proteins. Non-immunogenic haptens require conjugation with an epitope such as a protein or polysaccharide before they can illicit an immunologic response. Standard protocols are available for each species, or we can follow your specific protocol. All our procedures and production records are fully documented, allowing complete traceability.



Service	Antigen	Production Type	Production Capacity	Area of Use	Advantages
Immunogenicity	Proteins, viruses,	Rabbits, Mice	Small to large scale	Vaccine,	Variety of Species
Immunization	variety of antigens	Rats, Guinea Pigs	(all size runs available)	Research	USDA Licensed
				Discovery	Standard/Custom Protocols

## MAP/RAP/HAP testing

- + If your production must be free of Mycoplasma or adventitious viral contamination, we recommend our MAP, RAP, and HAP testing programs
- + These programs can screen your cell line against the adventitious viruses associated with your cell line's origin. Testing is available by both PCR and serology

## Whole embryo culture serum/EGF, 2.5S and 7.0S nerve growth factor

- + Envigo Bioproducts offers a custom-collected serum for use in Whole Embryo Culture (WEC) of seven- to nine-day-old rat and mouse embryos, as well as the best and most competitively priced mouse-derived NGF and EGF. Custom orders are available upon request

## Rodent sera and tissues

- + We have ready access to rodent tissues and sera from high-quality, genetically-defined, adventitious virus-free mice and rats
- + Quotes from specific strains are available upon request

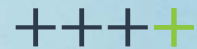
## Your custom antibody production partner

Whether your needs call for *in vivo* or *in vitro* production, we can supply a reliable stream of antibody to meet your research development and production needs. Our staff can perform an evaluation/optimization run to scale up, utilizing the proper regulatory documentation. We can also purify and further process your antibody to meet your desired specifications.



Visit our website, [envigo.com/bioproducts](http://envigo.com/bioproducts), for our full program, or contact us at **800.972.4362** or by e-mail at [Bioproducts.na@envigo.com](mailto:Bioproducts.na@envigo.com) to place an order.





## Quality programs

Envigo is unique among suppliers of research models and services in the breadth of our programs for providing quality products and services to reduce variables to help you do research better.

Diet manufacturing facilities in North America and animal production facilities in Europe and Israel are ISO 9001 certified. North American animal production facilities follow standard operating procedures aligned with the ISO 9001 standard, but are not ISO certified, and are fully accredited to AAALAC International. Our animal operations in the Netherlands are both ISO and AAALAC certified.

Please visit [envigo.com](http://envigo.com) to view a list of all certifications and accreditations for all Envigo diet manufacturing and animal production sites globally.

### **Animal welfare** [envigo.com/animalwelfare](http://envigo.com/animalwelfare)

Envigo is dedicated to the humane care and use of research animals. The IACUC and dedicated veterinary staff manage policies and procedures to ensure that all animal use is performed in accordance with the highest standards.

These include AAALAC International accreditation, assurance of compliance with PHS/OLAW policy, and USDA Animal Care registration.

All animal production sites in the US are covered by a PHS Assurance and we are fully USDA registered. Globally, all Envigo sites maintain compliance with national animal welfare regulations. All EU animal operations comply with the European Directive 2010/63/EU.

### **Diet and bedding monitoring** [envigo.com/teklad](http://envigo.com/teklad)

Teklad standard laboratory animal diets meet the highest nutritional and hygiene standards. All diets are manufactured under ISO 9001 procedures with careful ingredient sourcing and monitoring.

Many diets are offered certified for contaminant analysis. High-quality bedding and bedding enrichment products are manufactured following appropriate quality standards and screened periodically for contaminants, and can be certified on request.

### **Health monitoring** [envigo.com/healthreports](http://envigo.com/healthreports)

We are committed to providing the highest quality animals to the research community and our health testing program provides you assurance of that commitment.

If any significant changes occur in colony genetic, health or microbiologic status, customers are notified upon confirmation. Animal colonies will be restarted to eliminate significant pathogens or genetic contamination.

Microbiologically-defined rodent colonies are maintained within production barriers and flexible-film isolators. Colonies are monitored daily by trained personnel supported by our veterinary medical staff for clinical signs of disease or abnormalities.

Monitoring at our US animal production facilities is conducted by IDEXX BioResearch.

Our health surveillance program in Europe is based on 2014 FELASA recommendations. Monitoring is carried out at our laboratories in Italy as well as by outside laboratories.

### **Genetic monitoring** [envigo.com/GIAP](http://envigo.com/GIAP)

Envigo's global routine genetic monitoring program consists of collecting tissue samples from inbred models quarterly in North America, Israel, and Europe from all new pedigreed Foundation Colony breeding cages in non-isolator-bred colonies. Tests are conducted on all pedigreed Foundation Colony breeding cages in newly-populated isolator-bred colonies, and then five (5) new Foundation Colony breeder cages annually thereafter. Routine genetic monitoring is also performed on select outbred stocks to determine heterogeneity and compare allelic frequencies across locations globally. In addition, various mutant models on either outbred or inbred backgrounds are tested annually to confirm the mutation of interest.

Tissue samples are sent to the Envigo genetic testing services laboratory located at the Bionomics Research and Technology Center (BRTC) in Piscataway, NJ.

Our laboratory employs a customized panel of single nucleotide polymorphisms (SNPs) to evaluate strain differences in both rats and mice. Our routine inbred panel consists of 48 markers and our outbred panel consists of 96 markers.

**For any questions or reports, please contact our Veterinary Sciences, Research and Support team at [RMSTechnicalServices.na@envigo.com](mailto:RMSTechnicalServices.na@envigo.com) or 800.793.7287.**

### **Custom antibody production** [envigo.com/bioproductions](http://envigo.com/bioproductions)

Custom antibody production facilities in North America are cGMP compliant (210, 211, and 820).

**For any questions, please contact BPS at [Bioproducts.na@envigo.com](mailto:Bioproducts.na@envigo.com), or 800.972.4362.**

# Microbiological testing

## Microbiological monitoring

The Envigo comprehensive monitoring program includes monthly evaluations of barrier-produced rodents and monthly or quarterly evaluations of flexible-film isolator-produced rodents.

**Updated health reports are available at:**  
[envigo.com/healthreports](http://envigo.com/healthreports)

## Microbiological evaluation

### Mouse serology

- Cilia Associated Respiratory Bacillus
- *Clostridium piliforme*
- Ectromelia
- *Encephalitozoon cuniculi*
- Hantaan virus
- Lactic Dehydrogenase-Elevating Virus (LDEV)
- Lymphocytic Choriomeningitis (LCM)
- Mouse Adenovirus 1 + 2
- Mouse Cytomegalovirus (MCMV)
- Mouse Hepatitis Virus (MHV)
- K Virus
- Minute Virus of Mice (MVM)
- Mouse Norovirus (MNV)
- Mouse Parvovirus (MPV)
- Mouse Rotavirus (EDIM)
- Mouse Thymic Virus (MTV)
- *Mycoplasma pulmonis*
- Polyoma
- Pneumonia Virus of Mice (PVM)
- Reovirus 3 (Reo-3)
- Sendai
- Theiler's Mouse Encephalomyelitis (TMEV)

### Rat serology

- Cilia Associated Respiratory Bacillus
- *Clostridium piliforme*
- *Encephalitozoon cuniculi*
- Hantaan virus

- Kilham Rat Virus (KRV)
- Lymphocytic Choriomeningitis (LCM)
- Mouse Adenovirus 1 + 2
- *Mycoplasma pulmonis*
- Pneumonia Virus of Mice (PVM)
- Rat Coronavirus (SDA/RCV)
- Rat Parvovirus (RPV)
- Rat Minute Virus (RMV)
- Rat Theiler Virus (RTV)
- Reovirus 3 (Reo-3)
- Sendai
- Toolan's H-1 (H-1)

### Hamster serology

- *Clostridium piliforme*
- *Encephalitozoon cuniculi*
- Lymphocytic choriomeningitis (LCM)
- Pneumonia Virus of Mice (PVM)
- Reovirus 3 (Reo-3)
- Sendai
- Simian Virus 5

### PCR

- *Campylobacter jejuni* (Hamsters only)
- *Corynebacterium bovis* (Immunodeficient mice only)
- *Lawsonia intracellularis* (Hamsters only)
- *Helicobacter* spp
- *Pneumocystis* spp
- *Streptobacillus moniliformis*

### Microscopic evaluations

- Ectoparasites
- Endoparasites
- Enteric protozoan

Cultures from the nasopharynx or cecum are routinely cultured for the presence of the following microorganisms:

- *Bordetella bronchiseptica*
- *Citrobacter rodentium*
- *Corynebacterium kutscheri*
- Dermatophytes (hair)
- *Klebsiella oxytoca*
- *Klebsiella pneumoniae*
- *Pasteurella multocida*
- *Pasteurella pneumotropica*
- *Proteus mirabilis* (isolator-produced rodents only)
- *Pseudomonas aeruginosa*
- *Salmonella* spp
- *Staphylococcus aureus*
- *Streptobacillus moniliformis*
- *Streptococcus pneumoniae*
- *Streptococcus* spp Group B beta

The lists of bacteria included in routine health monitoring reports vary according to species.

Current microbiological monitoring reports and cumulative summaries are provided upon delivery of our animals, or can be reviewed on our website. Reports are also available on request for each animal shipment. Significant changes in health status are promptly reported to customers by phone, fax, or email.



# Ordering information

Direct orders for Research Models and Services to:  
 Envigo  
 8520 Allison Pointe Blvd., Suite 400  
 Indianapolis, IN 46250  
 Attn: Customer Service Department

**T 800.793.7287**  
**F 317.806.6090**  
**E CSDorders@envigo.com**

Orders may also be initiated via our website at [envigo.com/CSDorders](http://envigo.com/CSDorders)

List prices are subject to change without notice. Current pricing will be listed on [envigo.com](http://envigo.com). Major price and product line changes will be communicated to customers with a 30-day notification via e-mail. Terms are granted by individual review and stated on customer invoices and account statements. Unless otherwise requested, shipping charges will be prepaid and added to your invoice. Customer is responsible for all taxes (whether federal, state or local), or other charges (including interests and penalties thereon), imposed by law with respect to the sale or use from the purchase of goods.

To ensure fast processing, please draft your purchase orders using the correct name, age, weight, and sex of the animals. Standing orders are encouraged to assure an adequate supply of the animals you require. With a standing order, we will establish and maintain an agreed-upon shipping schedule.

### Shipping

Our standard shipping is via environmentally-controlled vehicles. Our vehicles, ranging in size from sprinter vans to semitractor trailer units, make regularly scheduled deliveries over a network of truck routes encompassing most of North America. Air shipments will be made from airports located near our production facilities.

### Weight Specifications

In the event that an order for animals includes a weight specification, Envigo will assume that such specification pertains to the packaging weight. The customer must take this into account when placing an order. It is known that animals may experience weight changes during transport. Depending on the age, sex, and developmental status of the animal as well as the duration of the transport itself, animals may lose or gain weight during transport. In almost all cases, animals will return to their weight at shipping within 24–48 hours after arrival. This statement is to be used as a guideline only as the rate of weight recovery may be strain-specific and is also influenced by external factors, e.g. maintenance on arrival in a new facility, diet composition, and/or position of individuals in a new animal hierarchy. Contact our Customer Service Department for animals required with a narrowly-defined weight range.

### Special Services

If special pre-shipment animal treatment is required, please let us know at the time your order is placed so that your animals will arrive in the condition specified.

### Use of Envigo's Animals

Animals purchased from Envigo or the offspring of these animals may not be bred for sale or sold, transferred, licensed or otherwise provided to any party aside from the original purchaser. Animals purchased from Envigo are for research use only.

### Use and Distribution of Envigo Teklad's Diet, Bedding and Enrichment Products

Teklad Diets, Bedding and Enrichment Products purchased from Envigo may not be distributed or transferred to any commercial partner or any other third party for any commercial purpose; unless expressly agreed in a separate written contract between the parties.

### Pregnant animal policy

Envigo uses well-established techniques to successfully produce time mated rats, mice and hamsters. We use an Impedence Meter for determining the stage of estrus in rats prior to breeding. Time mated rats and mice are determined by observation of a vaginal plug. Plug date is considered to be day zero (0) of gestation. Due to the natural variation in the length of gestation, the exact day of parturition cannot be guaranteed. In addition, Envigo cannot guarantee the minimum number of offspring per litter. Please be aware that late-term pregnant animals may deliver their litter prematurely while in transit, and depending on the circumstances involved, requests for credit or replacement of these animals may be declined at our sole discretion.

If problems regarding gestational age or pregnancy are encountered, customers should immediately contact Envigo's Customer Service Department and provide detailed information regarding the animals involved.

### Expected pregnancy rate

	Timed mated <13 days gestation (at shipping)	Timed mated ≥13 days gestation (at shipping)	Untimed pregnant ≥13 days gestation (at shipping)
STOCK OR STRAIN			
All Outbred Rats/Mice	*	90%	90% **
All Inbred Rats/Mice	*	90%	90% **

\* Plug guarantee only; no guaranteed pregnancy. Plug date = Day 0.  
 \*\* Untimed pregnant rodents will be selected from our breeding colonies on the basis of palpation or visual confirmation. A variation of three to four days gestation can be expected. Therefore, Envigo cannot be held responsible for actual gestation and/or exact day of littering.

To avoid charges, cancellations for timed mated animals must be received one week prior to mating date.

### Additional charges

The following charges will be added when applicable:

2-gram weight range (mice only)	add 15%
5-gram weight range (rats only)	add 20%
10-gram weight range (rats only)	add 10%
Littermates	add 10%
Extra specifications for timed mated or retired breeder rodents	Priced upon request
Shipping container/gel transit packets*	\$24.00
Special heavy-wire shipping container with gel*	40.00
Zip Top MicroShipper with two Innocages and gel*	70.00
Tattoo (rodents)	12.00
Ear Tag (rodents)	6.75
Import or export charges	1000.00
Fish and Wildlife Declaration Fee	400.00
Veterinary Certificate	300.00

\* Dimensions 24.5" x 16.25" x 8"



# Shipping guidelines

## Shipping

- Viewing windows, plus mylar lid liner for easy, convenient viewing of animal models
- Woven-edge screen for smooth handling
- ClearH<sub>2</sub>O<sup>®</sup> gel hydration source
- Dimensions are 24.5"x16.25"x8"

ClearH<sub>2</sub>O<sup>®</sup> gel is recognized by the research industry as an innovative hydration source.

Our veterinary staff recommends ClearH<sub>2</sub>O<sup>®</sup> gel to ensure proper hydration of your research models in transit.

The following are guidelines for you to use to determine the number of containers required to ship your orders. Special considerations for shipment may apply depending on order specifications.

## Mice

WEIGHT (G)	Maximum quantity
8-24	40
25-34	36
35+	36
Pregnant females	20
Female with litter	4
Proven or Retired breeders (male)	8
Proven or Retired breeders (female)	36

Male inbred, retired, or proven breeder mice are shipped in compartmentalized containers; two, four, six, or eight per container.

## Rats

WEIGHT (G)	Maximum quantity
35-75	22
76-100	18
101-125	16
126-150	14
151-175	12
176-225	10
226-300	8
301+	6
Pregnant females	6
Female with litter	2
Proven breeders (male and female)	6*
Proven breeders (male and female)	6*
Aged	6*

\* Long Evans proven breeders and retired breeders require a maximum pack quantity of four (4).

## Hamsters

WEIGHT (G)	Maximum quantity
25-60	20
61-74	18
74+	16
Pregnant females	4
Female with litter	1
Retired breeders (male)	14
Retired breeders (female)	4

Female retired breeder and pregnant hamsters are shipped in four compartments. Female hamsters with litters must be in a divided box.

## Cotton Rats

WEIGHT (G)	Maximum quantity
Less than 60	4
61-90	4
91+	4
Pregnant females	1
Female with litter	1
Retired breeders (male and female)	1

Cotton rats must be cage mates.

## Microshipper guidelines

Zip Top MicroShipper with two Innocages and gel

	Maximum quantity
Rats	3/Innocage
Mice	15/Innocage



## GENERAL TERMS AND CONDITIONS

Envigo shall provide the products ("Products") and services ("Services") described in the Envigo invoice, quotation, order acknowledgement, protocol, price list, statement of work or other commercial document utilized by Envigo from time to time, to describe the Products or Services ("Envigo Document"), and customer shall purchase the Products and Services pursuant to the specifications contained in the Envigo Document and in accordance with the following terms and conditions:

### I. BINDING CHARACTER

All sales and/or purchases of Products and Services are governed by these terms and conditions. Any and all terms and conditions (including any which may be delivered by customer with any purchase order or other commercial document) which are different than, or inconsistent with, or supplement these terms and conditions are rejected unless otherwise expressly agreed to by Envigo in writing. Instructions in a purchase order relating to the date and method of delivery for Products or Services shall be controlling only if accepted by Envigo in writing. No modification of these terms and conditions shall be binding or enforceable unless expressly agreed to by Envigo in writing.

### II. PROVISION OF PRODUCTS AND SERVICES

Envigo will provide the Products and perform the Services in accordance with the Envigo Document, which may be amended from time to time upon the mutual agreement of Envigo and the customer. Envigo will adhere to all applicable government regulatory laws, rules and regulations in the jurisdiction from which the Products or Services are supplied (collectively referred to herein as "Laws"). If an amendment requires additional or different services on the part of Envigo, Envigo may agree to perform such services and will be paid an amount mutually agreed to by the parties. Deviations from the Envigo Document may be made in an emergency without the customer's approval, provided that Envigo shall use commercially reasonable efforts to obtain the customer's verbal approval, which shall be subsequently confirmed by the customer in writing. The parties acknowledge that during the course of performing the Services in accordance with the Envigo Document, additional costs may be incurred by Envigo as a result of procedural changes which do not amount to or require a change in the Envigo Document, but which are deemed necessary by Envigo to successfully perform the Services, and which could not be foreseen at the date of the Envigo Document. If such procedural changes occur, Envigo shall advise the customer prior to their implementation and solicit the customer's agreement as to the necessity and additional cost thereof. Should Envigo be unable to contact the customer in advance, the customer agrees that, in order to maintain the integrity of the Services, Envigo may proceed accordingly and Envigo shall be entitled to recover such additional costs from the customer upon presentation of an explanation of such procedural changes and the necessity thereof.

### III. RESTRICTIONS ON USE AND BREEDING

i. Any Products purchased from Envigo shall be used by customer in a safe manner, and in accordance with all applicable Laws. In consideration of Envigo's valuable proprietary rights in the genetic composition responsible for the unique genetic characteristics of all animals purchased from Envigo and descendants of those animals derived by inbreeding or crossbreeding, including unmodified derivatives of those animals or their descendants ("Animals"), the customer, including its employees, agrees that no Animals or other Products may be directly or indirectly: (a) used for any purpose other than the internal research of the customer whether or not for cash or other consideration including, without limitation using any of the Products or any components thereof in manufacturing or to provide a product or a service for clinical, therapeutic, diagnostic or prophylactic purposes or for any other commercial purposes, (b) bred, generated, cross bred, reproduced, licensed or provided (for sale or otherwise) to any third party for any use, or (c) provided to any agent or other third party to provide breeding or other services with respect to such Animals, unless Envigo provides the customer with prior written authorization for deviation from these terms and conditions or an appropriate license.

ii. The purchase of any Products conveys to the customer the non-transferable right to use the Product and the components of the Products only in research conducted by the customer and specifically in accordance with the Envigo Document provided with the Products. If customer fails to comply with the foregoing limitations, in addition to any other remedies available to Envigo, the warranty provided for Products will be automatically voided.

### IV. PAYMENT TERMS

i. Unless otherwise set forth in an Envigo Document, prices will be as per Envigo's published price lists on the day of delivery. If the customer is tax exempt, then it will be the customer's responsibility to provide Envigo with written proof of the customer's tax exempt status. The price list may be adjusted by Envigo without notice. Customer is responsible for all taxes (whether federal, state or local), or other charges (including interest and penalties thereon), imposed by law with respect to the sale or use from the purchase of goods.

ii. The customer will pay Envigo as set forth in the Envigo Document. All invoices are due and payable within thirty (30) days from the date of the invoice, and the customer agrees to pay all invoices submitted. All amounts not paid by the customer when due may, at the option of Envigo, accrue interest from the applicable due date until paid, at a rate that is the lower of (a) the highest rate permitted under applicable Laws and (b) 1.5% per month. In addition, Envigo may elect to cease or suspend the Services or withhold required reports or other deliverables in the event that the customer does not make payments when due and payable. Termination, delay or cancellation fees will be set forth in the Envigo Document and shall be payable, as applicable, in accordance with the terms hereof.

iii. If, in the reasonable opinion of Envigo, customer's financial condition is precarious or there has been a materially adverse change in customer's financial condition, Envigo shall have the right to demand accelerated payment or other assurances that it deems adequate before providing any additional Products or Services.

### V. CONFIDENTIALITY

In the course of providing the Products or performing the Services, Envigo and the customer may exchange proprietary or confidential information. The parties will identify, in writing, such information as confidential and/or proprietary. If a party intends to disclose confidential information to the other party orally, the disclosing party shall (a) alert the other party of the confidential nature of the disclosure prior to the disclosure and (b) provide written notice to the other party of the confidential nature and contents of such disclosure within ten (10) days after making 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 publication or disclosure unless required to disclose such information by applicable Laws. Neither party shall use the other party's proprietary and/or confidential information for any purpose other than in performance of this Agreement. The confidentiality provisions of this Section shall not apply to any part of such information, which (a) is known to the receiving party at the time it was obtained from the disclosing party; (b) is acquired by the receiving party from a third party, and such third party is not known to the receiving party to be bound by an obligation of confidentiality to the disclosing party or otherwise prohibited from transmitting such information to the receiving party; (c) is or becomes published or otherwise in the public domain other than by violation of this Agreement by the receiving party; (d) is independently developed by the receiving party without reference to or reliance upon the information provided by the disclosing party; or (e) 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.

### VI. LIMITED WARRANTY

i. Although Envigo maintains strict control over its environment, breeding and maintenance operations and engages in a comprehensive Health and Genetic Monitoring Quality Control Program, changes in health and genetic status can occur. Genetic and environmental pressures can affect the general health of animals. For this reason, Envigo recommends that its Animals be monitored and tested after delivery. If customer is unable to perform such monitoring and testing, Envigo will provide assistance to customer upon request. Any testing of the type discussed in this Section must commence no later than seven (7) calendar days after customer's initial receipt of the Animals and be completed no later than twenty-one (21) calendar days after customer's receipt of the Animals. Should customer accept delivery of Products, customer will not be entitled to return the Products to Envigo for any reason.

ii. Envigo warrants that the Products and Services shall conform in all material respects to the specifications contained in the Envigo Document and applicable Laws at the time of delivery or completion. Envigo does not warrant or



represent that the results of the Services will be acceptable to any regulatory or governmental agency to which they are presented or that the results of the Services will enable the customer to further develop, market or otherwise exploit any product or service.

iii. Other than described herein, **ENVIGO MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OF ANY PATENT, TRADEMARK OR OTHER INTELLECTUAL PROPERTY RIGHTS OR OTHERWISE. CUSTOMER ASSUMES ALL RISK AND LIABILITY RESULTING FROM THE USE OF THE PRODUCTS AND SERVICES. ALL OBLIGATIONS OR LIABILITIES OF ENVIGO FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE PRODUCTION, USE, OR PERFORMANCE OF ITS SERVICES OR PRODUCTS, EXCEPT AS PROVIDED HEREIN, ARE FULLY DISCLAIMED AND EXCLUDED.**

iv. Any claim for breach of this limited warranty must be made in writing to Envigo upon discovery of such loss or damage and no later than: (a) in the case of Products, seven (7) calendar days after the date the Products are delivered, or (b) in the case of Services, the date that the Services are completed, after which time the Products or Services shall be deemed finally accepted. The customer must retain for Envigo's inspection all Products alleged to be defective.

v. Risk of loss and title to the Products shall pass to customer once the Products leave Envigo's facility or are delivered to a common carrier, as applicable.

#### VII. LIMITATION OF LIABILITY

i. Envigo will not be liable for penalties or liquidated damages or for special, indirect, consequential, punitive, exemplary or incidental damages or loss of profits, revenue or amounts expended in using, storing, or maintaining any such Products regardless of whether any such losses or damages are characterized as arising from breach of contract, breach of warranty, tort, strict liability or otherwise, even if Envigo is advised of the possibility of such losses or damages, or if such losses or damages are foreseeable.

ii. Envigo's liability, regardless of the form of action, shall be limited to actual damages and shall not exceed the total price paid for the Products or Services with respect to which such liability arises. In no event shall Envigo be liable for any damages arising from or in connection with any decision by the customer or any third party to use, further research, develop or market any test articles or any derivative, product or service related thereto (or to the Products or Services).

iii. Subject to the limitations set forth in this Section VII, in the event that Envigo commits a breach of the limited warranty set forth in the Limited Warranty Section above, Envigo's sole liability, and the customer's sole remedy, shall be for Envigo to (a) replace the Products or issue a credit therefore or (b) conform the portion of the Services giving rise to the breach to the relevant specifications.

iv. If any provision or part provision of this Section VII is invalid, illegal or unenforceable, Envigo and the customer shall negotiate in good faith to amend such provision or part provision so that, as amended, it achieves to the greatest extent possible, the intended commercial result of the original provision.

v. Nothing contained herein shall exclude or restrict a Party hereunder for death or personal injury caused by that Party's negligence or for fraud or fraudulent misrepresentation.

#### VIII. INDEMNIFICATION

The customer agrees to defend, indemnify, save and hold harmless Envigo and its parent, subsidiaries and affiliates and their respective directors, managers, members, shareholders, officers, employees and agents ("Indemnified Parties") from and against any claims, demands, suits, actions, causes of action, losses, costs, damages, fines and liabilities, including reasonable attorney, expert and other professional fees ("Claims") arising out of or in connection with or attributable to (a) the research, development, manufacture, distribution, use, sales or other disposition by the customer, or any distributor, collaborator, customer, sublicensee, representative or agent of the customer, of any test articles and/or any other substances upon which the Services were performed or for which the Products were used, (b) any infringement of any third party's patent rights or unauthorized use or misappropriation of its know-how, (c) the customer's negligence or willful misconduct, (d) personal injury related to contact with the Products during visits to Envigo's facilities or after delivery of the Products to the customer, or (e) the harmful or otherwise unsafe effect of any product resulting from research involving the Products and Services, and will pay any costs and damages which may be assessed against the Indemnified Parties.

#### IX. FORCE MAJEURE

Envigo shall not be responsible for any delays arising, directly or indirectly, from fires, floods, earthquakes, explosions, strikes, labor difficulties, acts of terrorism, riots, war, insurrection, embargo, government decrees or orders, civil or military authority, acts of animal activism, failure or curtailment of Envigo's usual sources of supply, disease, acts of God, or any other event, occurrence or condition which is beyond Envigo's reasonable control.

#### X. APPLICABLE LAW

These terms and conditions will in all events and for all purposes be governed by, and construed in accordance with, the laws of the State of Indiana in the United States of America ("US") in circumstances where the Envigo Document is generated by an Envigo legal entity in the US, and the laws of England and Wales where the Envigo Document is generated by an Envigo legal entity outside the US. Any choice of law principle or international treaty that would dictate the application of the law of another jurisdiction is specifically excluded to the fullest extent possible.

#### XI. SEVERABILITY

Each provision of these terms and conditions is severable, and subject to Section VII iv, if any provision shall at any time be held to be contrary to law or invalid or unenforceable, the remaining terms, conditions and provisions shall not be affected thereby but shall remain in full force and effect. As used in this Section "provision" shall mean and include any word, clause, sentence, sub-paragraph, paragraph, section or portion of these terms and conditions.

ClearH2O® is a registered trademark of ClearH2O®, Portland, Maine, USA.

PinPort™ is a trademark of Instech Laboratories, Inc., Plymouth Meeting, Pennsylvania, USA.

CD-1®, CF-1®, CFW® and CD® are registered trademarks of Charles River Laboratories, Wilmington, Massachusetts, USA.



# Envigo

## Who we are

Envigo provides essential research services, models and products for biopharmaceutical, crop protection, and chemical companies as well as universities, governments, and other research organizations. Our business is founded on a dedication to customer service and the experience and expertise of our 3,300 people. With more than 50 locations worldwide, we are committed to helping customers realize the full potential of their research and products as we work together to build a healthier and safer world.

### **In partnership with our customers**

Our customers conduct research and develop products that have the potential to improve lives. But achieving this potential is becoming increasingly difficult. We believe that for our customers to achieve their goals, they need to trust and be absolutely confident in the company they choose to help them with their research, products and services. You can be confident that we at Envigo are dedicated to understanding your challenges, appreciating your perspectives and helping you achieve your goals.

### **Outstanding customer service**

We are proud of our customer-centric culture which makes us responsive to every customer, no matter their size, as we continually optimize their product delivery and research programs to help ensure consistently clear results.

### **Fostering and developing scientific excellence**

Our ability to combine scientific excellence with empathetic working relationships is what differentiates us. We always seek to understand our customers' goals and challenges, appreciate our customers' perspectives, and work together for a better future.

Beyond our responsibility to customers, we at Envigo are responsible to people, animals and the communities in which we live. We are dedicated to assuring people that the products they use have been tested properly for safety and efficacy. We are committed to the highest levels of animal welfare. And, we provide services that help develop new products to improve health as well as protect food supplies and the environment.

At Envigo, we exist to help our customers secure the potential of their research and products that enhance and enrich life.

Read more at [envigo.com](http://envigo.com).





