

RESEARCH MODELS AND SERVICES

Product Guide, North America

Enhancing discovery

Inotiv's Comprehensive Solutions Empower Your Innovation from Discovery through Development

We offer a comprehensive suite of advanced nonclinical and analytical services, and a wide and innovative range of research models to accelerate customer lead optimization. Every research model is designed to enhance a life, with a profound focus on animal welfare and a culture of care toward the animals used and bred at Inotiv. Delivering an exceptional experience to our customers is at the center of everything we do.

At Inotiv, we're committed to supporting your discovery and development objectives to help you realize the full potential of your critical R&D projects to bring life-changing therapies to people around the world.

Discover your own enhanced
outcomes at [inotiv.com](https://www.inotiv.com) today.



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* available from EU

Discovery through approval

At Inotiv, we deliver a comprehensive portfolio of drug discovery services and an integrated range of safety assessment, analytical support, DMPK, and consulting solutions essential to your success.

We have a multidisciplinary scientific staff with the expertise and technological capabilities to support you throughout the drug development life cycle. From lead selection and optimization to IND programs and beyond, our team takes a true collaborative approach working in partnership with you to find the right path that focuses on your objectives.

	Discovery		Preclinical Development	Clinical Development		
	Lead Selection	Optimization		I	II	III
Computational Tox/ Toxicogenomics	In Silico Chemical Structure Evaluation/QSAR, PBPK Modeling, Gene Expression Profiling		IVIVE Modeling, Gene Expression Profiling			
Pharmacology	In Vivo Efficacy Models, Rodent Telemetry		Targeted Proteomics, Disease Biomarkers, PK/PD Modeling			
Drug Metabolism	Metabolic Stability, Metabolic Soft-Spots, Discovery PK Screening, Cell & Molecular Biology		In Vitro DDI (CYP & Transporters), Metabolite ID, PK/TK Analysis	DDI, Circulating Human Metabolites (MIST), PK Modeling		
Safety Pharmacology	Exploratory Screening Using Large & Small Animal CNS, CV, Respiratory		Large Animal CV, Large & Small Animal Respiratory, Small Animal CNS			
General Tox	In Vitro Tox, Exploratory Toxicology (MTD/DRF)		IND Enabling Rodent/Non-Rodent	Sub Chronic & Chronic Tox	Carcino-genicity <small>(Including Transgenic Mouse)</small>	
Genetic Tox	Screening, Mini Ames & In Vitro Micronucleus		Ames, In Vitro Cytogenetics, In Vivo MN/Comet			
Bioanalysis	Exposure Analysis, Dose Formulation Analysis, Discovery Biotherapeutics & Biomarkers		Regulated Preclinical, Immunogenicity, Biomarkers	Regulated Bioanalysis, Biomarkers		
Histology/Pathology	Target Tissue Assessment, Immunohistochemistry, Digital Imaging, Clinical Pathology		Histology & Pathology, Clinical Pathology			
DART				Fertility & Early Embryonic Development		
				Embryo-Fetal Development		Pre & Postnatal Development
Research Models and Services	General Purpose Models, GEMS Models, Model Support Services					
Teklad Diets	Standard Diets, Custom Diets, Bedding and Enrichment					

Worldwide production locations



Worldwide stocks and strains

Production locations

COMMON NAME	NOMENCLATURE	CODE	US	UK	NED	PG#
INBRED MICE						
129	129S2/SvHsd	215	+	+		*
A	A/JOlaHsd	049			+	*
BALB/c	BALB/cAnNHsd	047	+			10
	BALB/cNHsd (IR)	113		+		
	BALB/cOlaHsd	162		+	+	*
C3H	C3H/HeNHsd	040	+		+	11
C57BL/6	C57BL/6JOlaHsd	057		+	+	*
	C57BL/6JRccHsd	043			+	*
	C57BL/6NHsd	044	+		+	12
	C57BL/6NHsd (IR)	112		+		
	C57BL/6NHsd DIO	044	+			12
C57BL/Ka	C57BL/KaLwRijHsd	940			+	*
CBA/Ca	CBA/CaOlaHsd	209			+	*
CBA	CBA/JCrHsd	055	+			13
DBA/1	DBA/1OlaHsd	105	+	+	+	14
DBA/2	DBA/2JRccHsd	343			+	*
	DBA/2NHsd	042	+			14
	DBA/2OlaHsd	870		+		*
FVB	FVB/NHan®Hsd	862		+	+	*
	FVB/NHsd	118	+			15
NIH	NIH/OlaHsd	059		+		*
SAMP8	SAMP8/TaHsd	954			+	*
SAMR1	SAMR1/TaHsd (control)	956			+	*
SJL	SJL/JCrHsd	052	+			15
OUTBRED MICE						
ICR (CD-1®)	Hsd:ICR (CD-1®)	030	+	+	+	16
ND4 Swiss Webster	Hsd:ND4	032	+			16
NIH Swiss	Hsd:NIHS	035	+	+		17
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.

Worldwide stocks and strains

Production locations

COMMON NAME	NOMENCLATURE	CODE	US	UK	NED	PG#
OUTBRED MICE						
Non-Swiss Albino	Hsd:NSA (CF-1®)	033	+			17
TO	HsdOla:TO	876		+		*
MUTANT MICE (Spontaneous)						
Nudes						
AthyMIC Nude	Hsd:AthyMIC Nude- <i>Foxn1^{nu}</i>	069	+	+	+	20
	Hsd:AthyMIC Nude- <i>Foxn1^{nu}/Foxn1⁺</i>	070	+	+	+	20
BALB/c Nude	BALB/cOlaHsd- <i>Foxn1^{nu}</i>	165			+	*
	BALB/cOlaHsd- <i>Foxn1^{nu}/Foxn1⁺</i>	886			+	*
NMRI Nude	HsdCpb:NMRI- <i>Foxn1^{nu}</i>	889			+	*
	HsdCpb:NMRI- <i>Foxn1^{nu}/Foxn1⁺</i>	890			+	*
SCIDs						
NOD.SCID	NOD.CB17- <i>Prkdc^{scid}</i> /NCrHsd	170	+		+	21
SCID	C.B-17/lcrHan®Hsd- <i>Prkdc^{scid}</i>	883		+	+	*
	C.B-17/lcrHsd- <i>Prkdc^{scid}</i>	182	+			22
SCID/Beige	C.B-17/lcrHsd- <i>Prkdc^{scid}</i> <i>Lyst^{bg-j}</i>	186	+		+	22
Diabetic/Obese						
Diabetic (<i>db/db</i>)	BKS.Cg- + <i>Lepr^{db}</i> /+ <i>Lepr^{db}</i> /OlaHsd	173	+			23
	BKS.Cg- <i>Dock7^m</i> /+ <i>Lepr^{db}</i> /OlaHsd	175	+			23
	BKS.Cg-(Lean)/OlaHsd	174	+			23
Other						
Albino C57BL/6	C57BL/6BrdCrHsd- <i>Tyr^c</i>	103	+	+	+	24
GEMS MICE						
R2G2®	B6.129- <i>Rag2^{tm1Fwa}</i> <i>Il2rg^{tm1Rsky}</i> /DwlHsd	021	+	+	+	25
B-NDG	NOD.CB17- <i>Prkdc^{scid}</i> <i>Il2rg^{tm1}</i> /BcgenHsd	126	+		+	26

Worldwide stocks and strains

Production locations

COMMON NAME	NOMENCLATURE	CODE	US	UK	NED	PG#
HYBRID MICE**						
B6C3F1	B6C3F1/Hsd	061	+			27
	B6C3F1/OlaHsd	946			+	*
B6CBAF1	B6CBAF1/OlaHsd	045			+	*
B6D2F1	B6D2F1/Hsd	063	+			27
	B6D2F1/JRccHsd	344			+	*
CB6F1	CB6F1/Hsd	065	+			28
	CB6F1/OlaHsd	949			+	*
CD2F1	CD2F1/Hsd	060	+			28
INBRED RATS						
Brown Norway	BN/RijHsd	147	+			29
DA (Dark Agouti)	DA/OlaHsd	092			+	*
Fischer 344	F344/NHsd	010	+			30
Lewis	LEW/SsNHsd	017	+			30
Spontaneously Hypertensive	SHR/NHsd	022	+			31
Wistar Kyoto	WKY/NHsd	023	+			32
OUTBRED RATS						
Holtzman®	HsdHot:Holtzman®	003	+			33
Lister Hooded	HsdOla:LH	119		+	+	*
Long Evans	HsdBlu:LE	140	+			33
Sprague Dawley®	Hsd:Sprague Dawley® SD®	002	+	+	+	35
Wistar	Hsd:WI	001	+			34

* 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

COMMON NAME	NOMENCLATURE	CODE	US	UK	NED	PG#
OUTBRED RATS						
Wistar Han®	RccHan®.WIST	168	+	+	+	43
MUTANT RATS						
<i>Nudes</i>						
Athymic Nude	Hsd:RH-Foxn1 ^{nu}	005	+		+	45
	Hsd:RH-Foxn1 ^{nu} /Foxn1 ⁺	006	+		+	45
Spontaneous Mutants						
GEMS RATS						
Pink1	HsdSage: LE-Pink1 ^{em1Sage}	372	+			47
Mdr1a	HsdSage: SD-Mdr1a ^{em1Sage}	364	+			48
Mdr1a-Bcrp	HsdSage: SD-Mdr1a ^{em1Sage} Abcg2 ^{em1Sage}	363	+			49
HYBRID RATS**						
Any hybrid combination may be bred on demand. Please inquire.						
GUINEA PIGS						
Dunkin Hartley	HsdDhl:DH	459			+	*
HAMSTERS						
Golden Syrian	HsdHan®.AURA	089	+	+		52
COTTON RATS						
Cotton Rat	Hsd:Cotton Rat	201	+			53
RABBITS						
New Zealand White	HsdHra:(NZW) SPF	221	+			54
	HsdIf:NZW	444		+		*
Dutch Belted	HsdHra:DB (SPF)	222	+			55
NONHUMAN PRIMATES						
Cynomolgus macaques	<i>M. fascicularis</i>	226/ 228	+			56
Rhesus macaques	<i>M. mulatta</i>	224	+			56

* 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.

Inbred mice



MODEL CODE
047

BALB/c

NOMENCLATURE: BALB/cAnNHsd

AGE (WEEKS)	APPROX. WEIGHT (G)		PRICE PER ANIMAL	
	MALE	FEMALE	MALE	FEMALE
3-4	up to approx 12g	up to approx 12g	\$39.10	\$40.80
4-5	13-17g	12-15g	\$41.65	\$42.60
5-6	17-20g	15-18g	\$46.60	\$45.45
6-7	18-22g	15-19g	\$47.55	\$46.60
7-8	20-23g	17-19g	\$48.70	\$50.35
8-9			\$51.55	\$55.75
9-10			\$57.05	\$58.45
Over 10 weeks, add per week			\$6.25	\$5.90
Proven breeder			\$52.35	\$56.25
Retired breeder			\$37.30	\$40.55
Untimed pregnant*				\$338.85
Timed mated*				\$370.65
Female with litter				\$418.45

* For our pregnant animal policy, refer to page 91.

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^d*
- Experimental allergic encephalomyelitis resistant

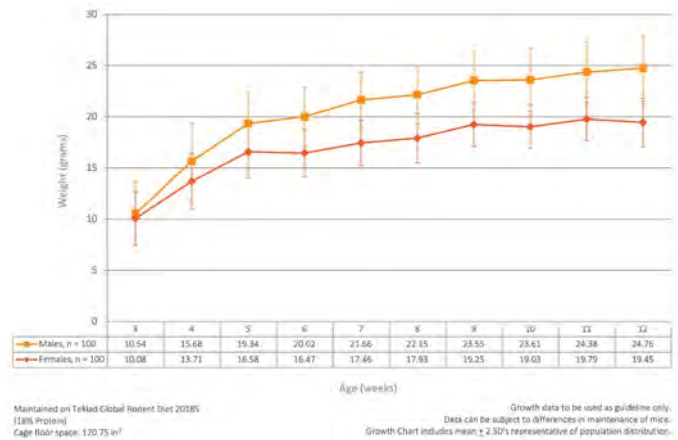
ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

RESEARCH USE

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

BALB/cAnNHsd



Inbred mice



MODEL CODE
040

C3H

NOMENCLATURE: C3H/HeNHsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$52.45	\$52.80
4-5	\$54.50	\$57.15
5-6	\$58.35	\$64.10
6-7	\$63.25	\$68.00
7-8	\$70.10	\$70.30
8-9	\$78.35	\$78.85
9-10	\$86.70	\$87.65
Over 10 weeks, add per week	\$8.35	\$8.60
Proven breeder	\$73.65	\$82.80
Retired breeder	\$46.30	\$52.80
Untimed pregnant*		\$470.35
Timed mated*		\$490.20
Female with litter		\$525.90

* For our pregnant animal policy, refer to page 91.

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

CHARACTERISTICS

- Litter Average: 5.0
- Haplotype: *H-2^K*
- Carrier of the retinal degeneration (*Pde6br^{d1}*) mutation
- Normal response to LPS
- Highly susceptible to Anthrax toxin

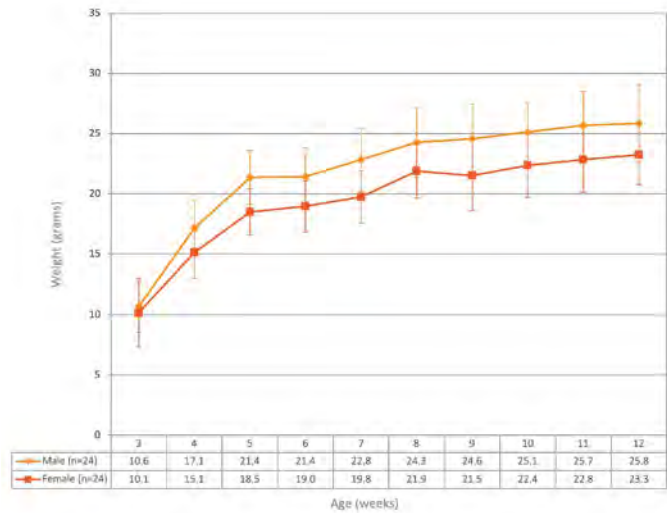
RESEARCH USE

- General Purpose
- Ocular Disease
- Immunology

ADDITIONAL AVAILABLE DATA

- Clinical chemistry
- Hematology

C3H/HeNHsd



Maintained on Teklad Global Rodent Diet 20185 (18% Protein)
Cage floor space: 320.75 in²

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.

A black mouse is shown from a side profile, facing right. It has a long, thin tail and small ears. The background is white.

NEW

NOMENCLATURE: C57BL/6NHsd

AGE (WEEKS)	PRICE PER ANIMAL
	MALE
7-8 weeks	\$66.50
8-9 weeks	\$75.95
9-10 weeks	\$83.95
10-11 weeks	\$103.75
11-12 weeks	\$109.10
12-13 weeks	\$118.25
13-14 weeks	\$128.00
14-15 weeks	\$138.20
15-16 weeks	\$149.15
16-17 weeks	\$167.10
17-18 weeks	\$177.75
18-19 weeks	\$187.90
19-20 weeks	\$193.50
20-21 weeks	\$199.50
21-22 weeks	\$210.00
22-23 weeks	\$224.50
Over 22 weeks, add/week	upon request
Female with litter	upon request
Retired breeder	upon request

* For our pregnant animal policy, refer to page 91.

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

ADDITIONAL AVAILABLE DATA

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

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

RESEARCH USE

- Obese phenotype
- Glucose intolerance
- Insulin intolerance
- Elevated blood glucose
- Dyslipidemia
- Liver steatosis

- Obesity
- Metabolic disease
- Inflammatory disease
- Cardiovascular disease
- Liver disease

Age (weeks)	Male (n=334-362) (g)	Female (n=344-365) (g)
3-4	10.8	10.2
4-5	16.5	14.5
5-6	19.4	16.7
6-7	21.7	17.9
7-8	23.1	18.2
8-9	24.4	19.1
9-10	25.4	20.7
10-11	26.0	20.7
11-12	26.8	21.6
12-13	27.4	22.3
13-14	28.1	22.3
14-15	28.6	22.9

Aging available
See page 73

Inbred mice



MODEL CODE
055

CBA

NOMENCLATURE: CBA/JCrHsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$64.20	\$69.00
4-5	\$69.00	\$75.10
5-6	\$75.10	\$81.30
6-7	\$81.30	\$87.65
7-8	\$87.65	\$93.60
Over 8 weeks, add per week	\$9.30	\$9.30
Proven breeder	\$92.30	\$108.85
Retired breeder	\$69.05	\$81.75
Untimed pregnant*		\$469.65
Timed mated*		\$653.15
Female with litter		\$521.95

* For our pregnant animal policy, refer to page 91.

Agouti. From Jackson Laboratories, Bar Harbor, Maine, to National Cancer Institute, Frederick, Maryland, in 1983 to Harlan in 1987. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

CHARACTERISTICS

- Litter average: 4.0
- Haplotype: *H-2^k*
- Carrier of the retinal degeneration (*Pde6brd*) mutation
- Susceptible to radiation
- High incidence of mammary tumors in females

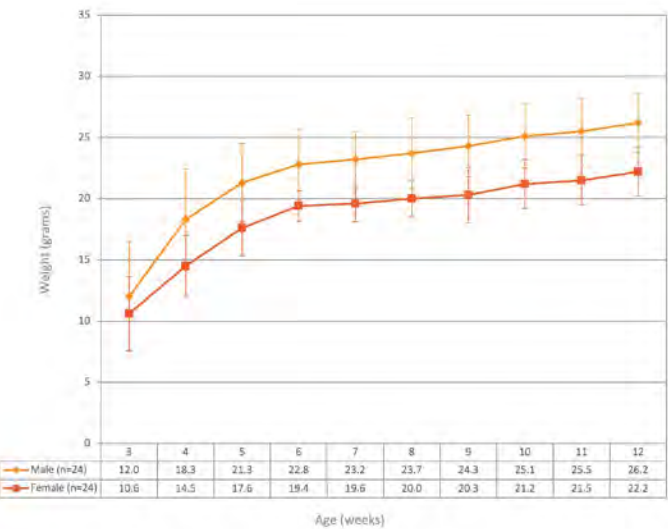
RESEARCH USE

- 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

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

CBA/JCrHsd



Maintained on Teklad Global Rodent Diet 20185 (18% Protein)
Cage floor space: 120.75 in²

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.

Inbred mice



MODEL CODE
105



MODEL CODE
042

DBA/1

NOMENCLATURE: DBA/10laHsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$83.25	\$83.25
4-5	\$88.55	\$88.55
5-6	\$94.05	\$94.05
6-7	\$99.10	\$99.10
7-8	\$104.30	\$104.30
8-9	\$114.40	\$114.40
9-10	\$124.45	\$124.45
Over 10 weeks, add per week	\$10.05	\$10.05
Proven breeder	\$94.05	\$116.90
Retired breeder	\$57.60	\$71.85
Untimed pregnant*		\$530.15
Timed mated*		\$572.95
Female with litter		\$607.75

* For our pregnant animal policy, refer to page 91.

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, then Envigo was acquired by Inotiv in 2021.

CHARACTERISTICS

- Litter average: 4.5
- Haplotype: *H-2^d*

RESEARCH USE

- Adjuvant-induced arthritis
- Immunology
- Inflammation

DBA/2

NOMENCLATURE: DBA/2NHsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$96.60	\$100.85
4-5	\$105.70	\$110.50
5-6	\$107.75	\$118.15
6-7	\$116.35	\$123.80
7-8	\$130.20	\$128.90
8-9	\$142.30	\$140.95
9-10	\$154.45	\$152.80
Over 10 weeks, add per week	\$12.25	\$12.00
Proven breeder	\$119.20	\$136.10
Retired breeder	\$81.25	\$81.60
Untimed pregnant*		\$606.00
Timed mated*		\$619.20
Female with litter		\$694.70

* For our pregnant animal policy, refer to page 91.

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

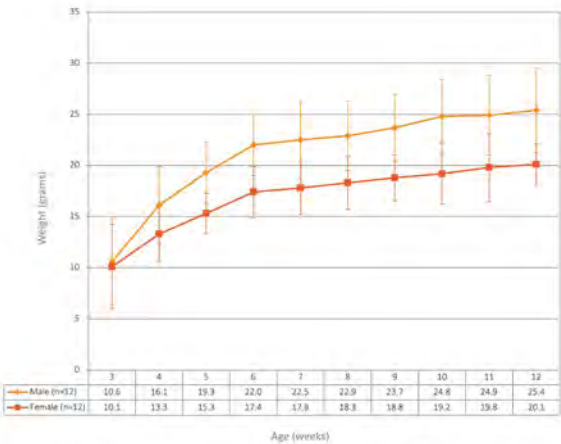
CHARACTERISTICS

- Litter average: 4.5
- Haplotype: *H-2^d*
- Dystrophic myocardial calcinosis

RESEARCH USE

- Progressive hearing loss
- Audiogenic seizures

DBA/2NHsd



Maintained on Teklad Global Rodent Diet 2018S (18% Protein)
Cage floor space: 120.75 in²

Growth data to be used as guideline only.
Data can be subject to differences in maintenance of mice.
Growth chart includes mean \pm 2.50% representative of population distribution.

Inbred mice



MODEL CODE
118

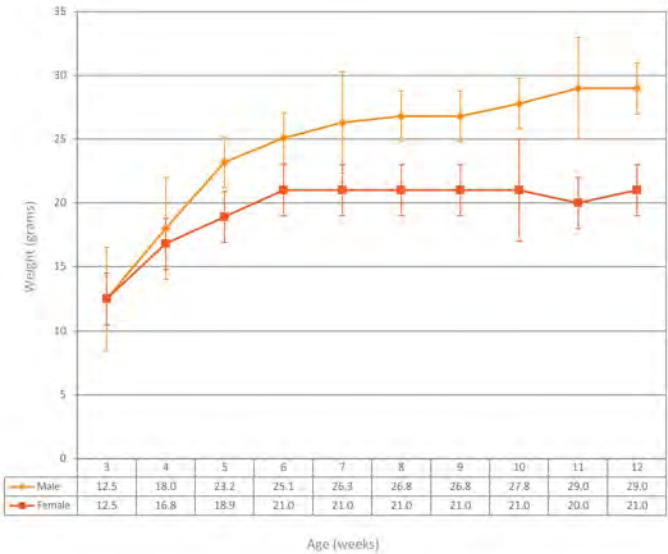
FVB
NOMENCLATURE: FVB/NHsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$48.20	\$52.70
4-5	\$55.45	\$59.00
5-6	\$64.35	\$69.00
6-7	\$78.45	\$79.30
7-8	\$87.70	\$88.70
8-9	\$88.10	\$93.10
9-10	\$88.55	\$98.65
Over 10 weeks, add per week	\$5.20	\$5.75
Proven breeder	\$69.80	\$82.60
Retired breeder	\$54.20	\$64.20
Untimed pregnant*		\$554.10
Timed mated*		\$554.10
Female with litter		\$423.50

* For our pregnant animal policy, refer to page 91.

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 \pm 2 SD's representative of population distribution



MODEL CODE
052

SJL
NOMENCLATURE: SJL/JCrHsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$98.00	\$104.70
4-5	\$103.95	\$110.60
5-6	\$109.90	\$124.90
6-7	\$118.05	\$128.50
7-8	\$125.80	\$135.50
8-9	\$153.55	\$163.70
9-10	\$163.15	\$180.00
10-11	\$173.95	\$183.75
11-12	\$184.70	\$194.45
12-13	\$194.85	\$206.65
Untimed pregnant*		\$928.80
Female with litter		\$1,092.70

* For our pregnant animal policy, refer to page 91.

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, then Envigo was acquired by Inotiv in 2021.

Outbred mice



MODEL CODE
030



MODEL CODE
032

ICR (CD-1®)

NOMENCLATURE: Hsd:ICR (CD-1®)

WEIGHT (G)	PRICE PER ANIMAL
Up to 11	\$12.50
12-14	\$13.75
15-17	\$13.80
18-20	\$14.05
21-24	\$14.30
25-30	\$15.10
31-34	\$16.25
35+	\$17.80
Proven breeder	\$77.25
Retired breeder	\$14.30
Untimed pregnant*	\$77.70
Timed mated*	\$121.55
Female with litter	\$172.15

* For our pregnant animal policy, refer to page 91.

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

CHARACTERISTICS

- Litter average: 11.5
- Docile disposition
- Most widely-used outbred mouse
- Excellent reproductive and maternal characteristics
- High incidence of retinal degeneration (*Pde6brd*)

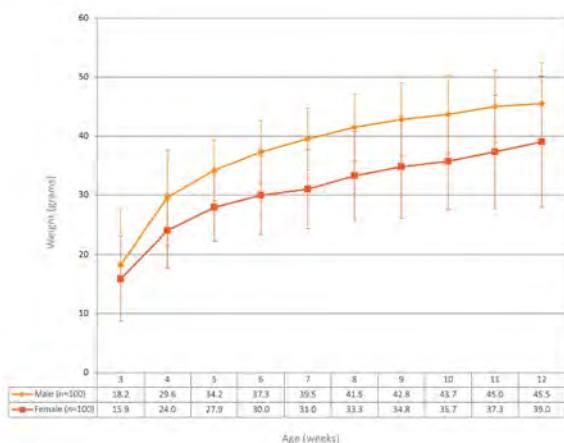
RESEARCH USE

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

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

Hsd:ICR (CD-1®)



ND4 Swiss Webster

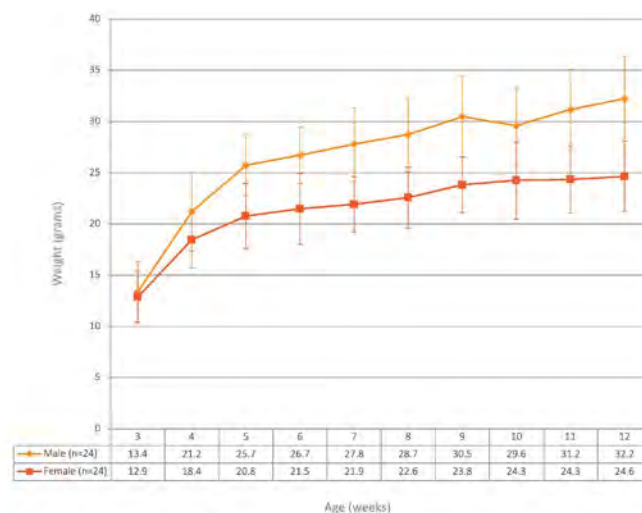
NOMENCLATURE: Hsd:ND4

WEIGHT (G)	PRICE PER ANIMAL
Up to 11	\$15.50
12-14	\$16.90
15-17	\$17.00
18-20	\$17.25
21-24	\$17.55
25-30	\$18.05
31-34	\$19.70
35+	\$21.20
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 91.

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)
Cage floor space: 120.75 in²

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.

Outbred mice

MODEL CODE
035

MODEL CODE
033



NIH Swiss

NOMENCLATURE: Hsd:NIHS

WEIGHT (G)	PRICE PER ANIMAL
Up to 11	\$34.30
12-14	\$35.50
15-17	\$36.15
18-20	\$36.60
21-24	\$37.25
25-30	\$38.30
31-34	\$38.90
35+	\$39.95
Proven breeder	\$145.40
Retired breeder	\$26.80
Untimed pregnant*	\$151.60
Timed mated*	\$279.40
Female with litter	\$358.70

* For our pregnant animal policy, refer to page 91.

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

NSA (Non-Swiss Albino)

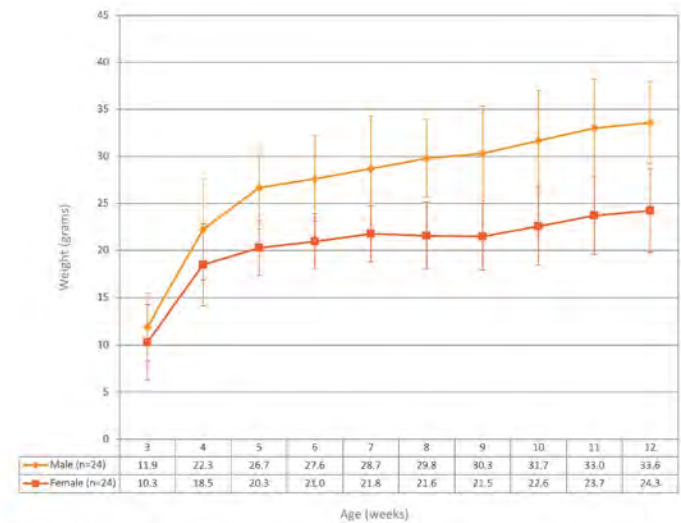
NOMENCLATURE: Hsd:NSA (CF-1®)

WEIGHT (G)	PRICE PER ANIMAL
Up to 11	\$13.30
12-14	\$14.55
15-17	\$14.60
18-20	\$14.65
21-24	\$15.00
25-30	\$15.65
31-34	\$16.60
35+	\$18.40
Proven breeder	\$73.70
Retired breeder	\$14.50
Untimed pregnant*	\$80.50
Timed mated*	\$128.60
Female with litter	\$180.50

* For our pregnant animal policy, refer to page 91.

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

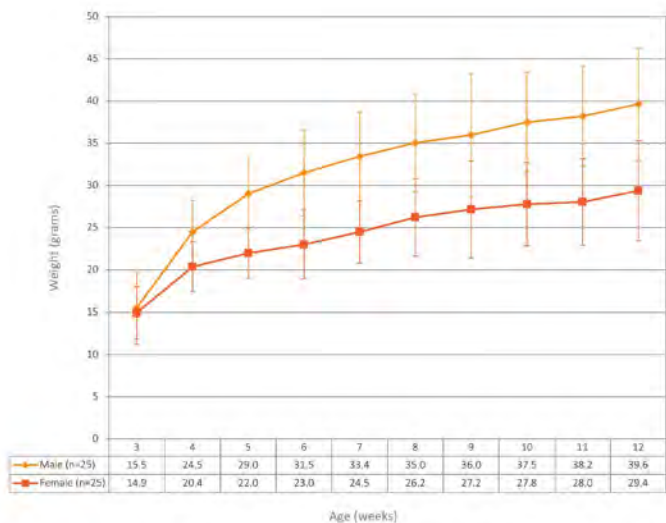
Hsd:NIHS



Maintained on Teklad Global Rodent Diet 20185 (18% Protein)
Cage floor space: 120.75 in²

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.

Hsd:NSA (CF-1®)



Maintained on Teklad Global Rodent Diet 20185 (18% Protein)
Cage floor space: 141.75 in²

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.

Proven performance. Globally referenced.

Researchers choose Inotiv 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	22	No	Nonfunctional	Functional	Functional
SCID Mouse	24	Yes	Nonfunctional	Nonfunctional	Functional
SCID/Beige Mouse	24	Yes	Nonfunctional	Nonfunctional	Impaired
NOD.SCID Mouse	23	Yes	Nonfunctional	Nonfunctional	Impaired
Athymic Nude Rat	46	No	Nonfunctional	Functional	Functional
Rag2 Rat	*	Yes	Nonfunctional	Nonfunctional	Functional
Rag2 Mouse (R2G2®)	27	Yes	Nonfunctional	Nonfunctional	Nonfunctional
B-NDG Mouse	28	Yes	Nonfunctional	Nonfunctional	Nonfunctional

Models

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

Pages 10-57

Diets

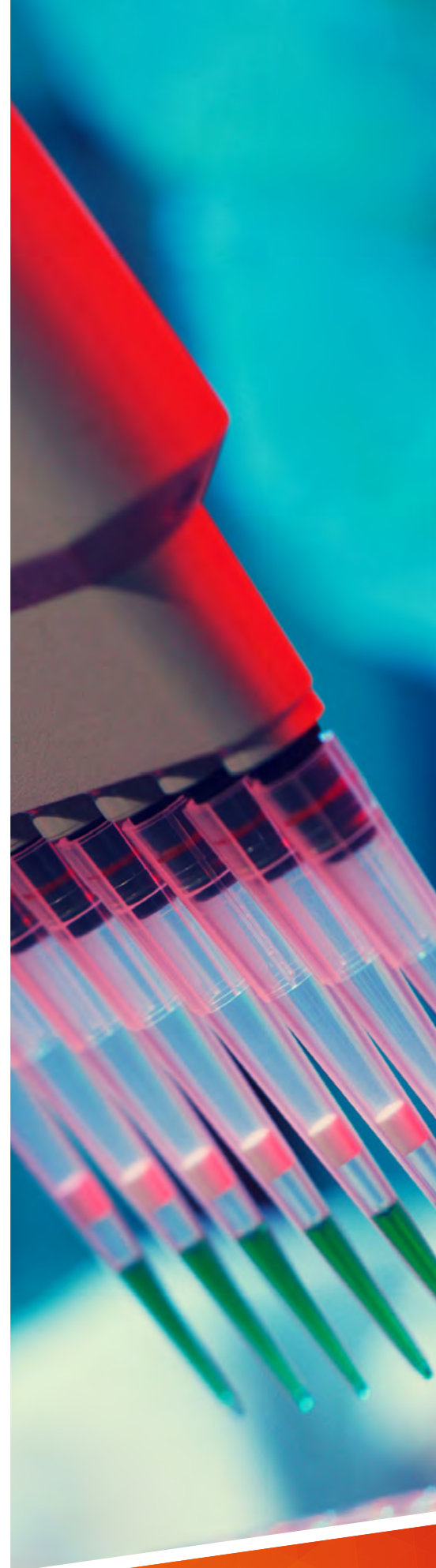
Largest global provider of lab animal diets designed to minimize research variables.

Pages 58-67

Services

Custom model generation, genetic testing, and antibody production.

Pages 21, 69-78



Choose the right rodent model for your oncology research.

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

RODENT TISSUE	CELL LINES	NUDE MICE	SCID MICE	NUDE RATS	C57 MICE
Brain (rat glioma)	C6 ^{58, 59, 78, 140, 180}	+	+		
Liver	MC38-Luc1 ³⁸⁷				+
Lung (murine)	LL2 ¹⁰	+			
Lymphoma	E.G7-OVA ³⁷³				+
Melanoma (murine)	B16F10 ^{35, 36, 250}	+			

PATIENT-DERIVED TUMORS (HUMAN TISSUE)	CELL LINES	NUDE MICE	SCID MICE	NUDE RATS
Brain	(PDX) ²⁷¹	+		
Breast	HBCX 1 ²⁷⁰	+		
	HBCX 6 ²⁷⁰	+		
	HBCX 7 ²⁷⁰	+		
	HBCX 9 ²⁷⁰	+		
	TNBC (MC1) ²⁷³		+	
	MC1 ²⁷⁴		+	
Liver	BMC-2147 ²⁷⁴		+	
	AKH23 ³⁰⁷		+	
Lung	KFJ18 ³⁰⁷		+	
	(NSCLC PDX) ²⁷²		+	
Pancreatic	JH033 ²⁷²	+		

For access to a full listing and references* from peer-reviewed journals, please visit inotiv.com/onco

Evaluate our tumor growth rates by visiting our online library of *in vivo* tumor growth data at inotiv.com/tumor

HUMAN TISSUE	CELL LINES	NUDE MICE	SCID MICE	NUDE RATS	RAG2
Bladder	KU-7 ^{148, 149, 150, 151}	+			
	T24 ⁵²			+	
Brain	A-172 ¹⁹⁸	+			
	G55 ³			+	
	HTLA-230 ^{5, 125}	+	+		
	SH-SY5Y ²			+	
	TB10 ²⁰⁰	+			
	U251 ^{81, 202}	+			
	U251 MG ^{198, 199}	+			
	U251-NG2 ^{1, 285}	+			
	U87 ^{71, 81, 117, 173, 196}	+	+		+
	U87ΔEGFR ¹⁹⁷	+			
	U87 MG ^{4, 78, 80, 83, 133, 134, 164, 195, 198, 201, 205, 206, 209, 224, 249}	+	+	+	
	U87Fluc ^{79, 82}	+			
	U87MG.wt EGFR ²⁰³	+			
	U87-TARTK ²⁰⁸		+		
	U138MG ^{203, 266}	+	+		
	U373 ²⁰⁷			+	

HUMAN TISSUE (CANCER STEM CELLS)	CSC DESIGNATION	NUDE MICE	SCID MICE	NUDE RATS
Brain	BTSC83 ²⁰⁰	+		
	LA-N-5 ²³¹	+		
	NGC-407-GFP ²⁰⁶			+
	U87-SC ²³²	+		
Breast	2LMP (MDA-MB-231 subclone) ²³⁴		+	
	MCF-7 (CSC-like) ²³⁶	+		
	MCF-7 (mammospheres) ²³⁵	+		
	SUM159 ²³⁴		+	
Lung	A549 ¹⁰⁸	+		
	H1299 ¹⁰⁸	+		
Ovarian	SKOV-3 (spherical cells) ²¹³	+		
Prostate	DU-145 (spheroid cells) ²³³		+	

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

Mutant mice

Nudes



MODEL CODE
069



Athymic Nude

NOMENCLATURE: Hsd:Athymic Nude-Foxn1^{nu}

AGE (WEEKS)

PRICE PER ANIMAL

QUANTITY	1-100 ANIMALS		101-250 ANIMALS		251+ ANIMALS	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
3-4	\$109.00	\$126.65	\$84.50	\$97.40	\$66.55	\$82.15
4-5	\$109.35	\$126.85	\$84.55	\$98.10	\$69.30	\$82.90
5-6	\$109.65	\$126.90	\$85.30	\$98.75	\$70.05	\$83.15
6-7	\$121.20	\$140.85	\$96.75	\$114.35	\$81.30	\$98.80
7-8	\$121.95	\$141.60	\$98.25	\$114.90	\$83.70	\$98.95
8-9	\$132.30	\$152.10	\$109.10	\$125.60	\$98.65	\$109.75
					MALE	FEMALE
Over 9 weeks, add per week					\$10.55	\$10.85
Proven breeder					\$292.20	
Retired breeder					\$93.05	

Heterozygous female with litter

Upon request

**When packing males, all animals will need to be packed as cage mates only.

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^{nu}/Foxn1 heterozygotes do not show partial expression of the *nu* phenotype

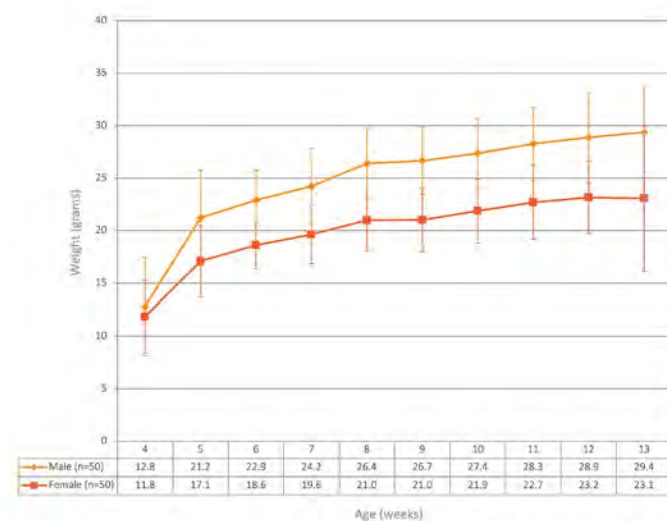
RESEARCH USE

- Oncology
- Transplantation
- Tumor cell growth
- Immunology
- Autoimmune disease
- Antibody production
- Sentinel model - Heterozygous Hsd:Athymic Nude-Foxn1^{nu}/Foxn1⁺

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry
- Proven models with extensive references (see page 20)

Hsd:Athymic Nude-Foxn1^{nu}



Maintained on Teklad Global Rodent Diet 2018S (18% Protein)
Cage floor space: 71.5 in²

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
070

Athymic Nude - heterozygous

NOMENCLATURE: Hsd:Athymic Nude-Foxn1^{nu}/Foxn1⁺

AGE (WEEKS)

PRICE PER ANIMAL

3-4	\$41.30
4-5	\$49.55
5-6	\$59.35
6-7	\$67.20
7-8	\$75.70
Over 8 weeks, add per week	\$13.05
Proven breeder	\$246.95
Retired breeder	\$49.15

* For our pregnant animal policy, refer to page 91.

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. Since heterozygotes do not show partial expression of the *nu* phenotype, this is an immune-competent control for the homozygous nude mice.*

Mutant mice SCID_s



MODEL CODE
170

NOD.SCID

NOMENCLATURE: NOD.CB17-*Prkdc*^{scid}/NCrHsd

AGE (WEEKS)

PRICE PER ANIMAL

	MALE	FEMALE
3-4	\$191.90	\$203.30
4-5	\$191.90	\$203.30
5-6	\$191.90	\$203.30
6-7	\$207.00	\$224.55
7-8	\$207.80	\$224.90
Over 8 weeks, add per week	\$22.40	\$20.65

**When packing males, all animals will need to be packed as cage mates only.

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, then Envigo was acquired by Inotiv in 2021.

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

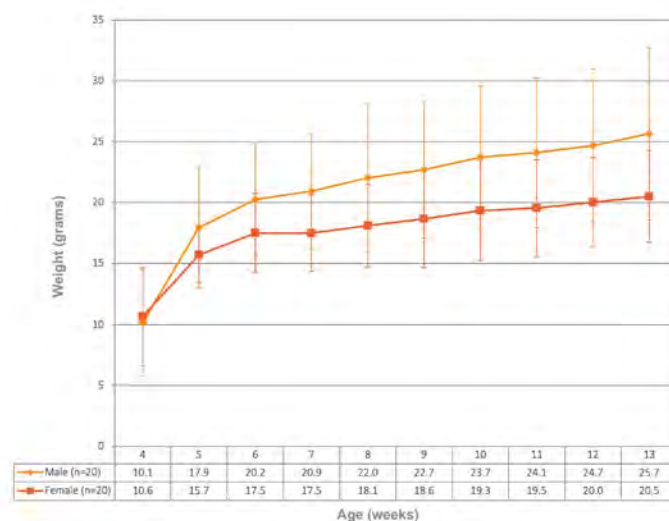
RESEARCH USE

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

ADDITIONAL AVAILABLE DATA

- Hematology
- Proven models with extensive references (see page 20)

NOD.CB17-*Prkdc*^{scid}/NCrHsd



Maintained on Teklad Global Rodent Diet 2919 (19% Protein)
Cage floor space: 71.5 in²

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.

Mutant mice SCID_s



MODEL CODE
182



MODEL CODE
186

SCID

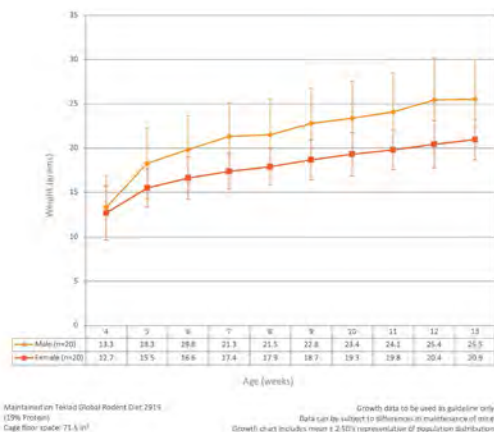
NOMENCLATURE: C.B-17/lcrHsd-Prkdc^{scid}

AGE (WEEKS)	PRICE PER ANIMAL
3-4	\$144.95
4-5	\$144.95
5-6	\$155.30
6-7	\$163.55
7-8	\$173.25
Over 8 weeks, add per week	\$14.50

**When packing males, all animals will need to be packed as cage mates only.

Albino. Harlan acquired from the Fox Chase Cancer Center, Philadelphia, Pennsylvania, in 1991. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

C.B-17/lcrHsd-Prkdc^{scid}



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 20)

SCID/Beige

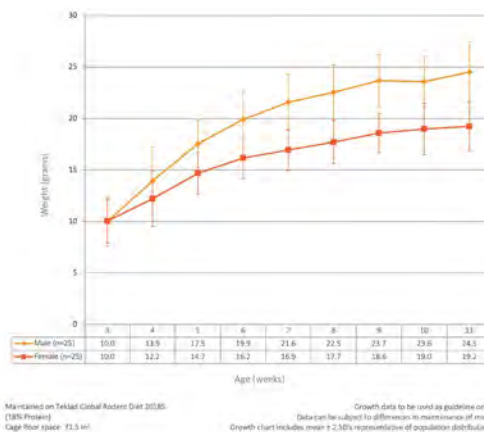
NOMENCLATURE: C.B-17/lcrHsd-Prkdc^{scid} Lyst^{bg-J}

AGE (WEEKS)	PRICE PER ANIMAL
3-4	\$147.50
4-5	\$147.50
5-6	\$156.45
6-7	\$165.10
7-8	\$173.00
Over 8 weeks, add per week	\$14.75

**When packing males, all animals will need to be packed as cage mates only.

Albino. Harlan acquired from the Fox Chase Cancer Center, Philadelphia, Pennsylvania, in 1991. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

C.B-17/lcrHsd-Prkdc^{scid} Lyst^{bg-J}



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 20)

Mutant mice

Diabetic



MODEL CODES
173, H174*
W174*, 174

Diabetic (db/db)

NOMENCLATURE:

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

AGE (WEEKS)

PRICE PER ANIMAL

	db/db	Lean*
3-4	\$280.35	\$187.80
4-5	\$280.35	\$187.80
5-6	\$283.65	\$191.95
6-7	\$287.00	\$196.85
7-8	\$290.30	\$201.35
Over 8 weeks, add per week	\$10.20	\$7.25
Retired Breeder	\$303.65	\$160.15

**When packing males, all animals will need to be packed as cage mates only.

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, then Envigo was acquired by Inotiv in 2021.

* Our breeding scheme maintains *Dock7^m* and *Lepr^{db}* 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 Inotiv.

CHARACTERISTICS

- *Lepr^{db}* 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

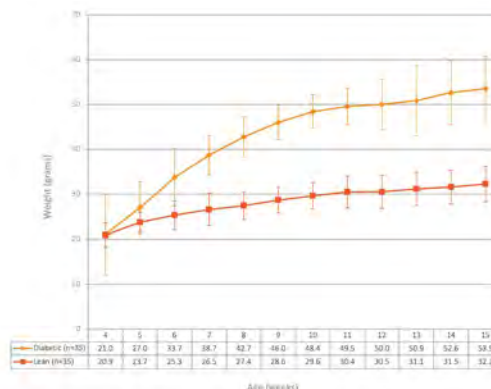
- Type 2 Diabetes
- Peripheral neuropathy
- Myocardial disease
- Immunodeficiency
- Immunology
- Metabolism
- Obesity

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry
- Glucose tolerance test

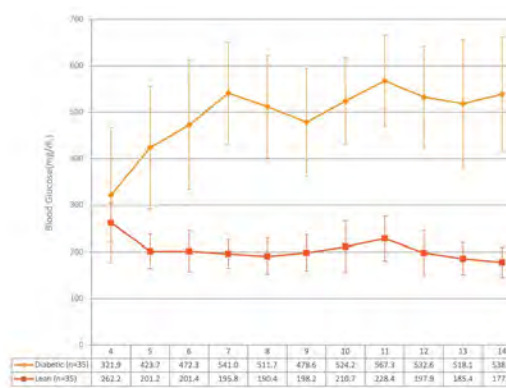


BKS.Cg- + *Lepr^{db}* / + *Lepr^{db}* / OlaHsd (male)



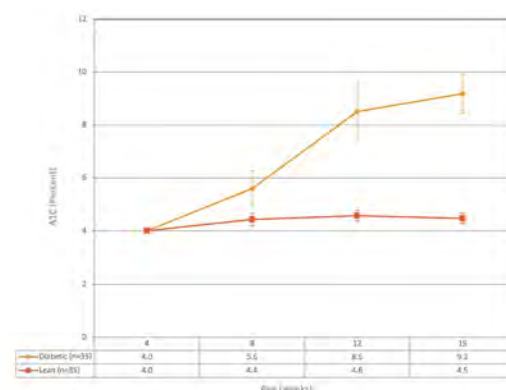
Maintained on Teklad Global Rodent Diet 2018S (18% Protein).
Cage floor space: 71.5 in².
Growth data to be used as guideline only. Data can be subject to differences in maintenance of mice. Growth chart includes mean ± 2 SD's representative of population distribution. Phenotypic discrimination only. Mice were not genotyped.

BKS.Cg- + *Lepr^{db}* / + *Lepr^{db}* / OlaHsd Blood Glucose (male)



Maintained on Teklad Global Rodent Diet 2018S (18% Protein).
Cage floor space: 71.5 in².
Non-fasted.
Glucose data to be used as guideline only. Data can be subject to differences in maintenance of mice. Glucose chart includes mean ± 1.50 representative of population distribution. Phenotypic discrimination only. Mice were not genotyped.

BKS.Cg- + *Lepr^{db}* / + *Lepr^{db}* / OlaHsd A1c (male)



Maintained on Teklad Global Rodent Diet 2018S (18% Protein).
Cage floor space: 71.5 in².
Non-fasted.
A1c data to be used as guideline only. Data can be subject to differences in maintenance of mice. A1c chart includes mean ± 1.50 representative of population distribution. Phenotypic discrimination only. Mice were not genotyped.



MODEL CODE
103

Albino C57BL/6

NOMENCLATURE: C57BL/6BrdCrHsd-Tyr^c

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
4-5	\$66.50	\$70.00
5-6	\$68.50	\$74.70
6-7	\$80.05	\$87.75
7-8	\$90.80	\$91.80
Over 8 weeks, add per week	\$10.75	\$10.75
Proven breeder	\$95.70	\$95.70
Retired breeder	\$61.15	\$59.25
Untimed pregnant*		\$526.15
Timed mated*		\$622.55
Female with litter		\$778.05

* For our pregnant animal policy, refer to page 91.

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, then Envigo was acquired by Inotiv in 2021.

CHARACTERISTICS

- Contains a mutation in the c (tyrosinase) gene
- Litter average: 6.5
- Haplotype: H-2^b

RESEARCH USE

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

MODEL CODE
021

Rag2/Il2rg double knockout (R2G2®)

NOMENCLATURE: B6;129-Rag2^{tm1Fwa}Il2rg^{tm1Rsky}/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 the model from Fox Chase Cancer Center in 2016, where the model had been maintained since 2005. Envigo was acquired by Inotiv in 2021.

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



AGE (WEEKS)

FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

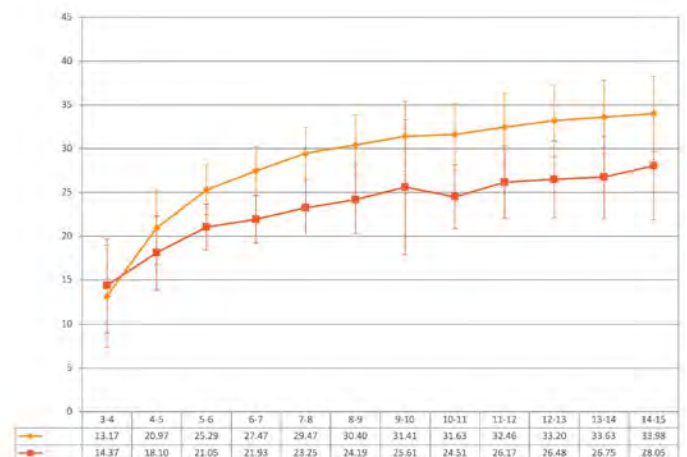
	MALE	FEMALE
3-4	\$204.65	\$216.10
4-5	\$204.65	\$216.10
5-6	\$209.20	\$220.55
6-7	\$213.75	\$225.10
7-8	\$218.25	\$229.70
Over 8 weeks, add per week	\$6.85	\$6.85

AGE (WEEKS)

NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

	MALE	FEMALE
3-4	\$137.15	\$145.30
4-5	\$137.15	\$145.30
5-6	\$145.85	\$149.85
6-7	\$150.60	\$154.50
7-8	\$155.40	\$159.15
Over 8 weeks, add per week	\$7.30	\$7.30

B6;129-Rag2^{tm1Fwa}Il2rg^{tm1Rsky}/DwlHsd



** When packing males, all animals will need to be packed as cage mates only.



MODEL CODE
126

B-NDG knockout mouse

NOMENCLATURE: NOD.CB17-*Prkdc*^{scid} *IL2rg*^{tm1}/BcgenHsd

Albino. The B-NDG model is a single knockout mouse with an ultra-immunodeficient phenotype. The model was generated by Biocytogen by deleting the *IL2rg* gene from NOD.scid mice. *Prkdc* (protein kinase DNA-activated catalytic) null scid mutation is characterized by significantly deficient of functional T cells and B cells. The common gamma chain gene (*IL2RG*) deletion results in the lack of functional NK cells. Envigo licensed the mouse model from Biocytogen in 2019, where the model had been maintained. Envigo was acquired by Inotiv in 2021.

CHARACTERISTICS

- Common gamma chain gene (*IL2rg*) interrupted
- Lacks functional receptors for IL-2, IL-4, IL-7, IL-9, IL-15, and IL-21
- Autosomal recessive, single nucleotide polymorphism with *Prkdc* gene on chromosome 16
- Severe lymphocyte development impairment
- Deficient in T cells
- Deficient in B cells
- Lacks NK cells
- Deficiency in cytokine signaling
- High humanization capability

RESEARCH USE

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

FEATURES AND ADVANTAGES

- **Severe Immunodeficiency** → Ultra immunodeficient phenotype enhances tumor cell acceptance
- **High humanization capability** → Minimal rejection of human-derived cells and tissue

ADDITIONAL AVAILABLE DATA

- Hematology
- Flow cytometry data
- Tumor growth charts
- PDX model data
- Humanization data

For more information on model development and characterization updates, visit inotiv.com/bndg

** When packing males, all animals will need to be packed as cage mates only.

AGE (WEEKS)

FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

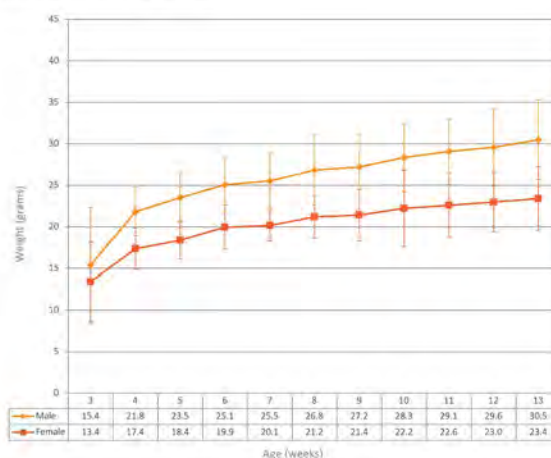
	MALE	FEMALE
3-4	\$216.55	\$267.55
4-5	\$216.55	\$267.55
5-6	\$216.55	\$267.55
6-7	\$217.80	\$268.80
7-8	\$219.10	\$270.05
8-9	\$221.65	\$272.60
9-10	\$222.95	\$273.90
Over 10 weeks, add per week	\$6.35	\$6.35

AGE (WEEKS)

NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

	MALE	FEMALE
3-4	\$99.35	\$127.40
4-5	\$99.35	\$127.40
5-6	\$99.35	\$127.40
6-7	\$99.35	\$127.40
7-8	\$99.35	\$127.40
8-9	\$105.75	\$133.75
9-10	\$112.10	\$138.85
Over 10 weeks, add per week	\$6.35	\$6.35

NOD.CB17-*Prkdc*^{scid} *IL2rg*^{tm1}/BcgenHsd



Maintained on Teklad Global Rodent Diet 2919 (18% Protein)
Cage floor space (M83): 1016 cm²

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.

Hybrid mice



MODEL CODE
061



MODEL CODE
063

B6C3F1

NOMENCLATURE: B6C3F1/Hsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$50.20	\$54.60
4-5	\$53.10	\$55.55
5-6	\$64.15	\$61.25
6-7	\$67.45	\$61.55
7-8	\$73.80	\$65.55
Over 8 weeks, add per week	\$8.70	\$8.90
Proven breeder	\$68.75	\$66.70
Retired breeder	\$43.30	\$41.95
Untimed pregnant*		\$289.85
Timed mated*		\$326.05
Female with litter		\$326.05

* For our pregnant animal policy, refer to page 91.

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

B6D2F1

NOMENCLATURE: B6D2F1/Hsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$45.70	\$50.40
4-5	\$50.25	\$52.40
5-6	\$59.00	\$56.15
6-7	\$71.15	\$61.90
7-8	\$76.20	\$67.10
Over 8 weeks, add per week	\$10.10	\$8.55
Proven breeder	\$87.10	\$75.20
Retired breeder	\$59.35	\$47.45
Untimed pregnant*		\$306.95
Timed mated*		\$336.80
Female with litter		\$336.80

* For our pregnant animal policy, refer to page 91.

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

Hybrid mice



MODEL CODES
065

CB6F1

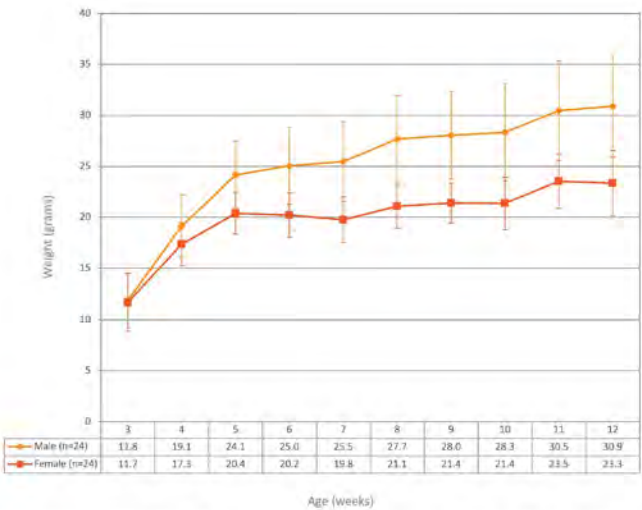
NOMENCLATURE: CB6F1/Hsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$73.85	\$83.30
4-5	\$79.30	\$88.40
5-6	\$84.05	\$92.90
6-7	\$92.10	\$98.35
7-8	\$95.45	\$102.10
Over 8 weeks, add per week	\$11.35	\$11.35
Proven breeder	\$89.10	\$89.10
Retired breeder	\$73.85	\$73.85
Untimed pregnant*		\$395.25
Timed mated*		\$444.45
Female with litter		\$444.45

* For our pregnant animal policy, refer to page 91.

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 in²

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.



MODEL CODES
060

CD2F1

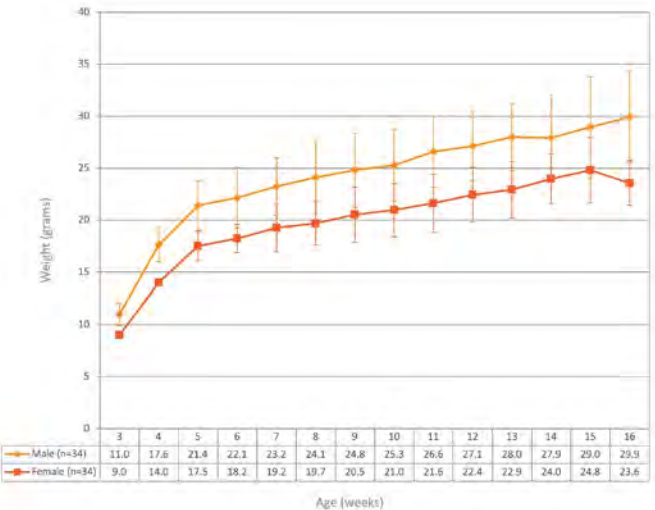
NOMENCLATURE: CD2F1/Hsd

AGE (WEEKS)	PRICE PER ANIMAL	
	MALE	FEMALE
3-4	\$49.85	\$53.50
4-5	\$55.00	\$56.40
5-6	\$58.80	\$61.90
6-7	\$66.40	\$68.00
7-8	\$68.70	\$68.85
Over 8 weeks, add per week	\$8.90	\$8.35
Proven breeder	\$65.75	\$52.45
Retired breeder		\$46.15
Untimed pregnant*		\$252.55
Timed mated*		\$308.00
Female with litter		\$277.30

* For our pregnant animal policy, refer to page 91.

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 in²

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.



MODEL CODE
147

Brown Norway

NOMENCLATURE: BN/RijHsd

AGE (WEEKS)	APPROX AGE (DAYS)		PRICE PER ANIMAL	
	MALE	FEMALE	MALE	FEMALE
Less than 49g	21 - 22	21 - 22	\$227.45	\$238.95
50-74	23 - 30	23 - 35	\$245.05	\$261.55
75-99	31 - 37	36 - 43	\$261.55	\$290.45
100-124	38 - 43	44 - 55	\$280.25	\$348.25
125-149	44 - 50	56 - 72	\$313.40	\$408.60
150-174	51 - 54	73 - 84	\$358.30	\$525.45
175-199	55 - 63	85+	\$384.70	\$579.65
200-224	64 - 71		\$412.80	\$618.95
225-249	72 - 82		\$438.90	\$643.20
250-299	83+		\$485.65	
Proven breeder			\$525.50	\$696.80
Retired breeder			\$211.00	\$278.85
Untimed pregnant*				\$1,204.50
Timed mated*				\$1,315.75
Female with litter				\$1,552.25

* For our pregnant animal policy, refer to page 91.

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

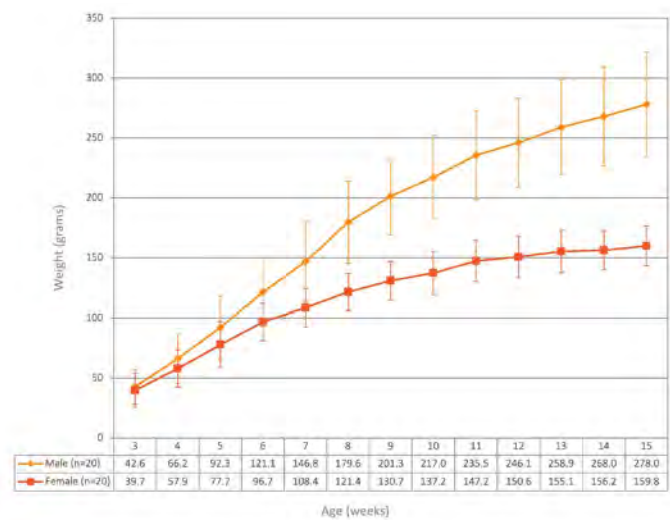
CHARACTERISTICS

- Litter average: 4.5
- Haplotype: *RT1ⁿ*
- Hyper-responsive lungs
- High incidence of bladder tumors in males

RESEARCH USE

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

BN/RijHsd



Maintained on Teklad Global Rodent Diet 20185 (18% Protein)
Cage floor space: 120.25 in²

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

Inbred rats



MODEL CODE
010

Fischer 344

NOMENCLATURE: F344/NHsd

WEIGHT (G)	APPROX AGE (DAYS)		PRICE PER ANIMAL	
	MALE	FEMALE	MALE	FEMALE
35-49	26-31	26-33		\$63.30
50-74	32-38	34-43	\$63.50	\$69.60
75-99	39-44	44-54	\$73.50	\$85.50
100-124	45-51	55-72	\$87.90	\$95.70
125-149	52-58	73-84	\$96.45	\$116.10
150-174	59-64	85+	\$108.50	\$150.15
175-199	65-72		\$115.55	\$189.55
200-224	73-81		\$135.20	\$202.80
225-249	82-84		\$145.35	
250-299	85+		\$155.50	
300+			\$165.30	
Proven breeder			Upon request	Upon request
Retired breeder			Upon request	Upon request
Untimed pregnant*				Upon request
Timed mated*				Upon request
Female with litter				Upon request

* For our pregnant animal policy, refer to page 91.

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

CHARACTERISTICS

- Litter average: 7.5
- Haplotype: *RT1^l*
- Hydrocephalic resistant

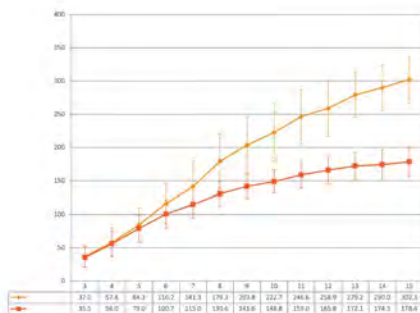
RESEARCH USE

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

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry
- Two-year growth

F344/NHsd



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	\$62.05	\$61.20
50-74	21 - 28	23 - 28	\$70.50	\$69.35
75-99	29 - 33	29 - 32	\$77.75	\$78.15
100-124	34 - 36	33 - 40	\$83.40	\$86.55
125-149	37 - 39	41 - 49	\$102.10	\$100.20
150-174	40 - 43	50 - 69	\$117.00	\$112.40
175-199	44 - 48	70+	\$125.85	\$124.50
200-224	49 - 54		\$132.25	\$130.10
225-249	55 - 58		\$143.55	Upon request
250-299	59 - 70		\$153.25	
300+	71+		\$168.20	
Proven breeder			\$123.50	\$277.70
Retired breeder			\$82.60	\$91.35
Untimed pregnant*				\$352.80
Timed mated*				\$454.30
Female with litter				\$524.65

* For our pregnant animal policy, refer to page 91.

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

CHARACTERISTICS

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

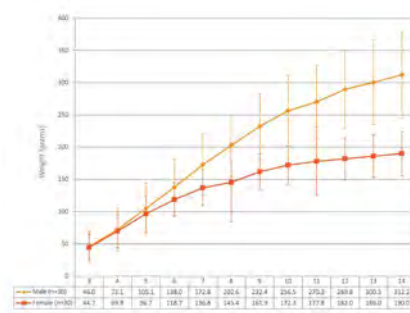
RESEARCH USE

- Adjuvant-induced arthritis
- Experimental allergic encephalomyelitis
- Transplantation

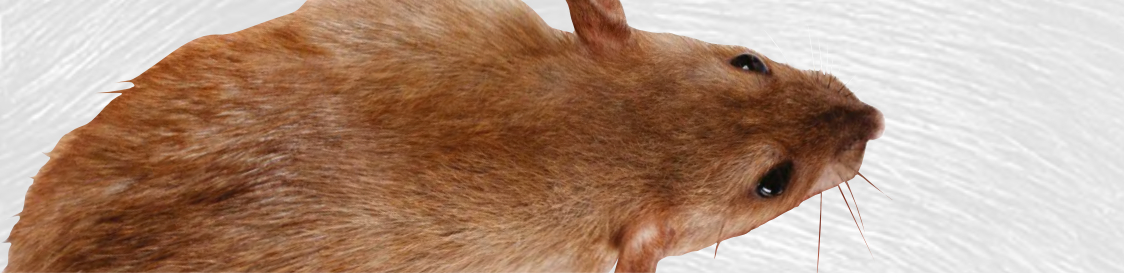
ADDITIONAL AVAILABLE DATA

- Clinical chemistry

LEW/SsNHsd



Inbred rats



MODEL CODE
022

Spontaneously
Hypertensive

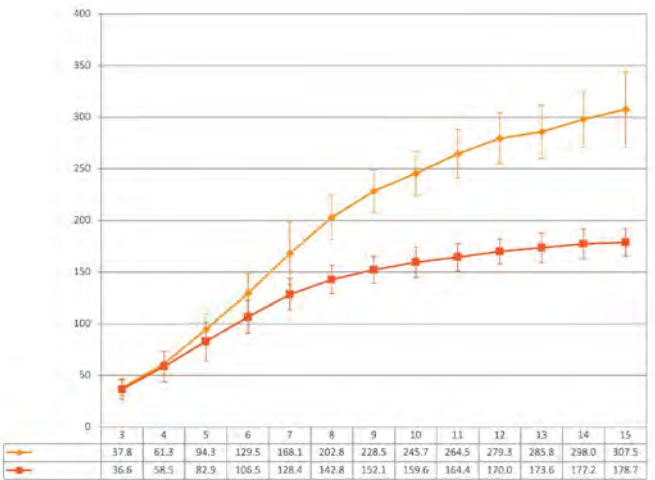
NOMENCLATURE: SHR/NIHsd

AGE (WEEKS)	PRICE PER ANIMAL
3-4	\$249.90
4-5	\$270.20
5-6	\$292.80
6-7	\$329.85
7-8	\$361.45
8-9	\$392.85
9-10	\$423.50
10-11	\$453.10
11-12	\$492.55
12-13	\$537.90
13-14	\$574.15
14-15	\$625.65
Proven breeder	\$710.65
Retired breeder	\$411.90
Untimed pregnant*	\$1,650.20
Timed mated*	\$1,745.95
Female with litter	\$2,243.20

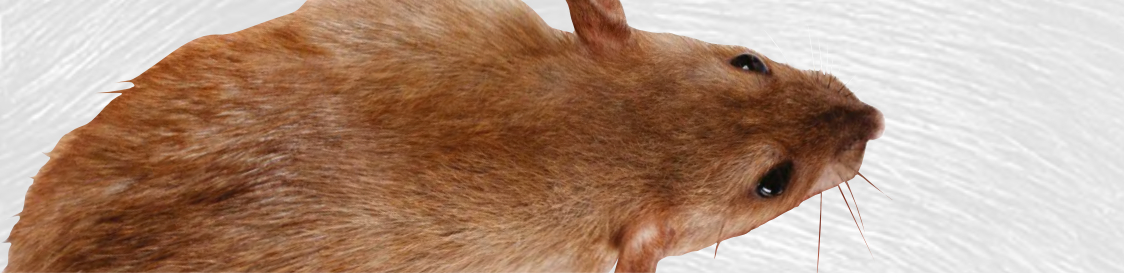
* For our pregnant animal policy, refer to page 91.

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

SHR/NIHsd



Inbred rats



MODEL CODE
023

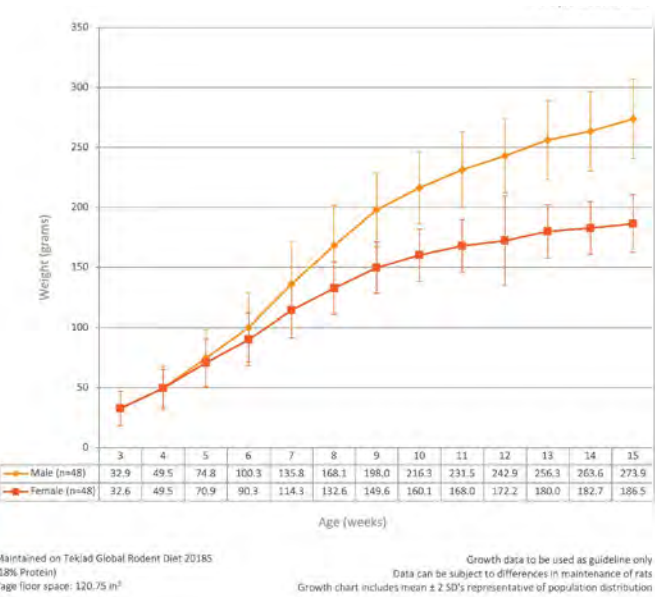
Wistar Kyoto
NOMENCLATURE: WKY/NHsd

AGE (WEEKS)	PRICE PER ANIMAL
3-4	\$218.40
4-5	\$235.90
5-6	\$253.05
6-7	\$289.60
7-8	\$336.90
8-9	\$363.45
9-10	\$405.95
10-11	\$423.80
11-12	\$476.80
12-13	\$523.25
13-14	\$565.25
14-15	\$618.35
Proven breeder	\$606.00
Retired breeder	\$399.50
Untimed pregnant*	\$1,545.25
Timed mated*	\$1,656.30
Female with litter	\$2,121.10

* For our pregnant animal policy, refer to page 91.

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

WKY/NHsd



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	\$158.00	\$160.65
50-74	21 - 24	21 - 24	\$191.85	\$194.75
75-99	25 - 28	25 - 30	\$208.40	\$212.40
100-124	29 - 33	31 - 34	\$228.45	\$231.60
125-149	34 - 37	35 - 40	\$253.15	\$261.95
150-174	38 - 41	41 - 46	\$271.20	\$282.00
175-199	42 - 45	47 - 52	\$294.05	\$306.10
200-224	46 - 48	53 - 58	\$312.90	\$326.60
225-249	49 - 51	59 - 63	\$333.60	\$357.20
250-274	52 - 54	64 - 70	\$360.60	\$377.45
275-299	55 - 59	71 - 90	\$398.80	\$409.45
300-324	60 - 64	91+	\$422.55	
325-349	65 - 70		\$443.05	
350-374	71 - 74		\$468.00	
375-399	75 - 80		\$484.70	
Proven breeder			Upon request	Upon request
Retired breeder			Upon request	Upon request
Untimed pregnant*				Upon request
Timed mated*				Upon request
Female with litter				Upon request

* For our pregnant animal policy, refer to page 91.

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 in 2015, then Envigo was acquired by Inotiv in 2021.

CHARACTERISTICS

- Litter average: 11.0



MODEL CODE
140

Long Evans (Blue Spruce)

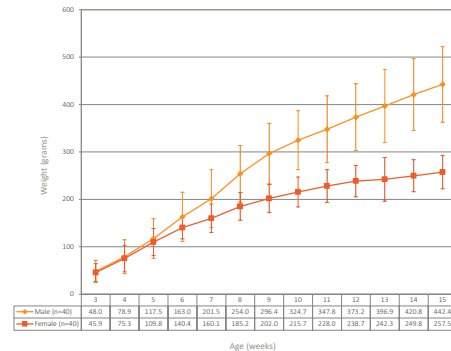
NOMENCLATURE: HsdBlu:LE

WEIGHT (G)	APPROX AGE (DAYS)		PRICE PER ANIMAL	
	MALE	FEMALE	MALE	FEMALE
35-49	20 - 23	20 - 24	\$38.15	\$39.05
50-74	24 - 29	25 - 30	\$44.50	\$48.60
75-99	30 - 33	31 - 35	\$53.95	\$56.90
100-124	34 - 37	36 - 41	\$60.50	\$63.40
125-149	38 - 41	42 - 49	\$65.95	\$69.15
150-174	42 - 45	50 - 56	\$71.55	\$79.95
175-199	46 - 49	57 - 69	\$77.85	\$85.40
200-224	50 - 57	70 - 89	\$84.50	\$94.00
225-249	58 - 64	90 - 110	\$95.65	\$102.00
250-274	65 - 70	111+	\$103.30	\$115.60
275-299	71 - 79		\$109.40	\$123.60
300-324	80 - 90		\$115.75	
325-349	91 - 100		\$128.70	
350-374	101 - 110		\$137.60	
Proven breeder			\$204.30	\$228.10
Retired breeder			\$135.35	\$129.45
Untimed pregnant*				\$437.85
Timed mated*				\$534.80
Female with litter				\$576.55

* For our pregnant animal policy, refer to page 91.

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, then Envigo was acquired by Inotiv in 2021.

HsdBlu:LE



CHARACTERISTICS

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

RESEARCH USE

- Diet-induced obesity
- Nutrition
- Behavior
- General purpose

ADDITIONAL AVAILABLE DATA

- 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	\$37.10	\$40.35
75-99	26 - 28	27 - 30	\$45.00	\$47.70
100-124	29 - 32	31 - 34	\$52.50	\$55.30
125-149	33 - 35	35 - 38	\$58.50	\$62.30
150-174	36 - 40	39 - 41	\$62.25	\$69.45
175-199	41 - 42	42 - 49	\$72.10	\$74.65
200-224	43 - 44	50 - 56	\$77.75	\$79.80
225-249	45 - 48	57 - 63	\$84.15	\$86.10
250-274	49 - 52	64 - 76	\$90.45	\$96.25
275-299	53 - 55	77+	\$94.50	\$109.50
300-324	56 - 58		\$98.60	
325-349	59 - 63		\$110.90	
350-374	64 - 69		\$124.10	
375-399	70 - 75		\$125.90	
400+	76+		Upon request	
Proven breeder			\$135.30	\$152.50
Retired breeder			\$85.25	\$87.15
Untimed pregnant*				\$287.60
Timed mated*				\$344.15
Female with litter				\$363.10

* For our pregnant animal policy, refer to page 91.

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

CHARACTERISTICS

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

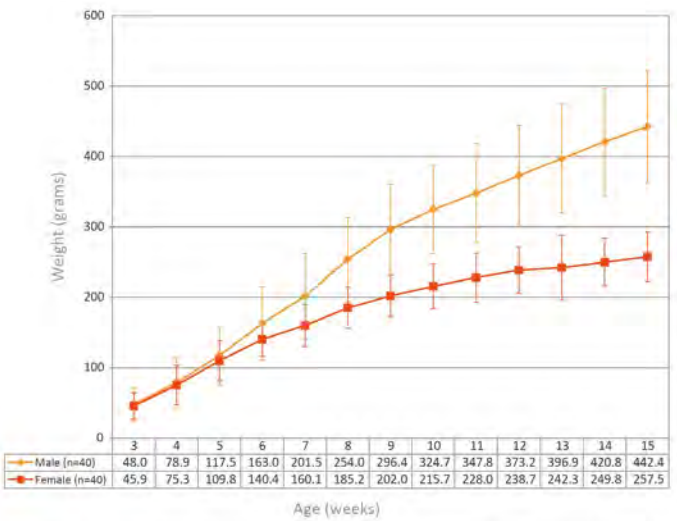
RESEARCH USE

- Teratology
- Nutrition
- Aging
- Oncology
- General purpose

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

Hsd:WI



Maintained on Teklad Global Rodent Diet 20185 (18% Protein)
Cage floor space: 120.75 in²

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
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	\$26.80	\$27.05
50-74	22 - 26	22 - 29	\$34.10	\$35.75
75-99	27 - 31	30 - 34	\$42.55	\$44.20
100-124	32 - 35	35 - 39	\$48.20	\$50.50
125-149	36 - 40	40 - 44	\$56.30	\$62.50
150-174	41 - 43	45 - 53	\$59.30	\$68.45
175-199	44 - 48	54 - 64	\$69.45	\$73.05
200-224	49 - 52	65 - 75	\$74.65	\$78.45
225-249	53 - 58	76+	\$81.10	\$85.35
250-274	59 - 63		\$87.65	\$95.90
275-299	64 - 69		\$91.65	\$103.55
300-324	70 - 75		\$97.00	
325-349	76 - 85		\$106.60	
350-374	86 - 95		\$113.60	
375-399	96 - 115		\$118.15	
400+	116+		Upon request	
Proven breeder			\$134.50	\$139.70
Retired breeder			\$83.90	\$80.25
Untimed pregnant*				\$248.90
Timed mated*				\$293.45
Female with litter				\$314.90

* For our pregnant animal policy, refer to page 91.

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. The original Sprague Dawley rat colony was obtained by Harlan in 1980 through the acquisition of Sprague-Dawley, Inc. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021. Current Inotiv colonies are direct descendants of this original colony.

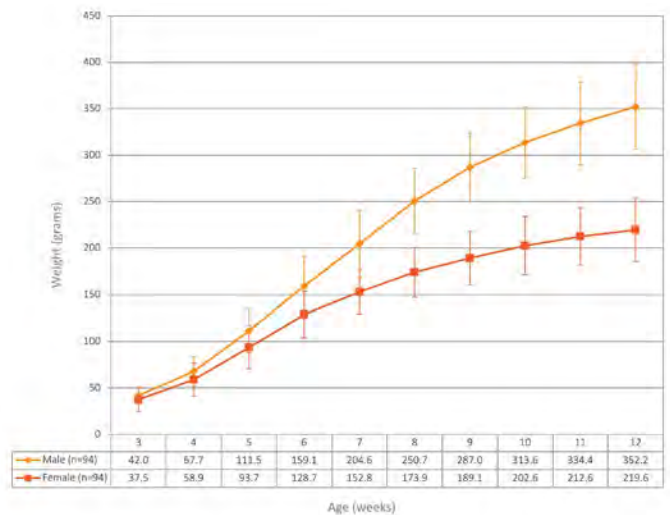
CHARACTERISTICS

- 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 20185 (18% Protein)
Cage floor space: 120.75 in²

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

Aging available for Sprague Dawley rats

See page 73

Outbred rats



MODEL CODE
168

Wistar Han®

NOMENCLATURE: RccHan®:WIST

WEIGHT (G)	APPROX AGE (DAYS)		PRICE PER ANIMAL	
	MALE	FEMALE	MALE	FEMALE
35-49	21 - 24	21 - 24	\$30.75	\$32.95
50-74	25 - 30	25 - 31	\$39.85	\$43.30
75-99	31 - 36	32 - 43	\$46.90	\$51.15
100-124	37 - 42	44 - 54	\$53.45	\$58.00
125-149	43 - 47	55 - 65	\$59.10	\$67.65
150-174	48 - 54	66 - 76	\$62.25	\$72.00
175-199	55 - 60	77 - 85	\$70.80	\$81.55
200-224	61 - 66	86+	\$80.05	\$86.20
225-249	67 - 73		\$86.60	\$99.85
250-274	74 - 79		\$93.50	Upon request
275-299	80 - 85		\$97.15	Upon request
300-324	86+		\$105.40	
325-349			\$115.10	
350-374			\$119.15	
375-399			\$124.75	
Proven breeder			\$120.70	\$141.20
Retired breeder			\$77.90	\$76.90
Untimed pregnant*				\$234.45
Timed mated*				\$262.65
Female with litter				\$282.10

* For our pregnant animal policy, refer to page 91.

Albino. Derived at Biological Research Laboratories Limited (BRL), formerly RCC Ltd., Füllinsdorf, Switzerland, from original colony at Zentralinstitut für Versuchstierzucht, Hannover, in 1989. Transferred to Harlan Sprague-Dawley, Inc. in 1993 (nomenclature HsdHan®:WIST). In 2004, Harlan acquired RCC Ltd. and new breeding stock was transferred in 2008 (nomenclature RccHan®:WIST). Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021. Unlike competitive models, the RccHan®:WIST rat has been maintained from the original nucleus of 156 breeding pairs in Hannover, Germany.

CHARACTERISTICS

- Litter average: 9.5
- Docile disposition

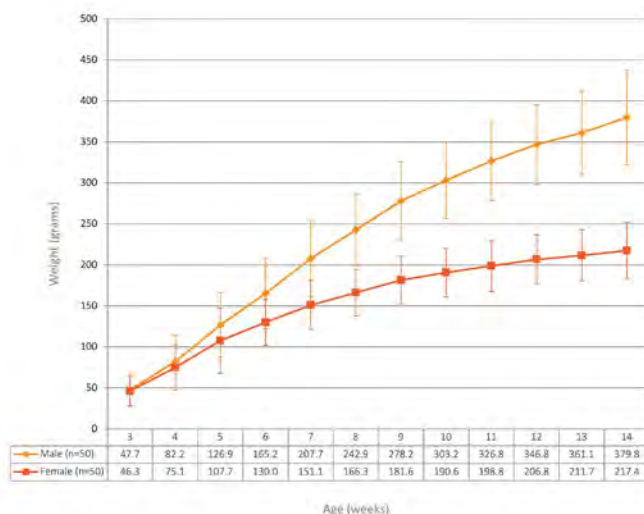
RESEARCH USE

- Toxicology
- Oncology
- Teratology
- Aging
- General purpose

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

RccHan®:WIST



Maintained on Teklad Global Rodent Diet 2018S (18% Protein)
Cage floor space: 120.75 in²

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.

25 years of stable control
data at inotiv.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 CRL:CD(SD)

- Ensures study completion with confidence
- Fewer animals required to start the study, meeting the 3Rs

REDUCED TUMOR INCIDENCE

- Fewer background tumors

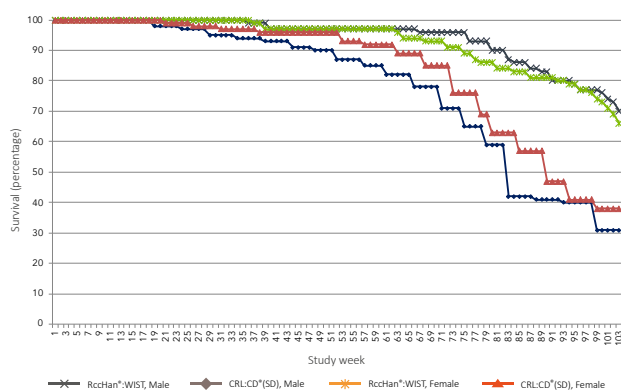


LATEST 103-WEEK DATA AVAILABLE

- Growth and survival
- Food consumption
- Clinical observations

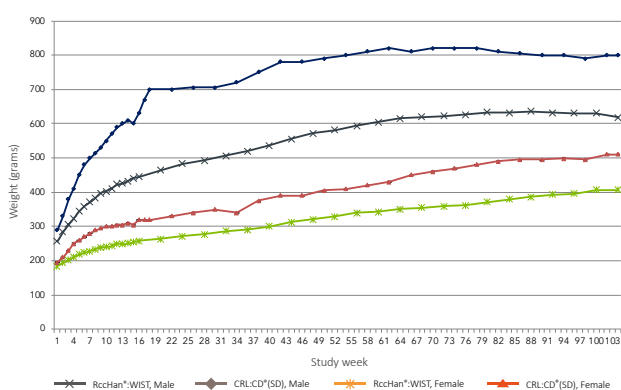
RccHan®:WIST 103-week growth curve

Figure 3: Comparing Wistar Han® and CRL:CD®(SD) survival data



RccHan®:WIST 103-week survival curve

Figure 2: Growth curve for Wistar Han® and CRL:CD® rats



For all available data, go to
inotiv.com/toxicology



MODEL CODES
005, 006

Athymic Nude

NOMENCLATURE: *Hsd:RH-Foxn1^{nu}* (Code 005)
NOMENCLATURE: *Hsd:RH-Foxn1^{nu}/Foxn1⁺* (Code 006)

AGE (WEEKS)	PRICE PER ANIMAL	
	<i>rnu/rnu</i>	<i>rnu/+</i>
3-4	\$261.00	\$184.75
4-5	\$321.40	\$249.55
5-6	\$386.60	\$321.30
6-7	\$447.00	\$379.25
7-8	\$512.30	\$441.20
8-9	\$571.85	\$502.65
9-10	\$638.95	\$563.65
Over 10 weeks, add per week	\$73.20	\$73.85

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

CHARACTERISTICS

- The *rnu* 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^{nu}/Foxn1⁺* heterozygotes do not show partial expression of *rnu* phenotype

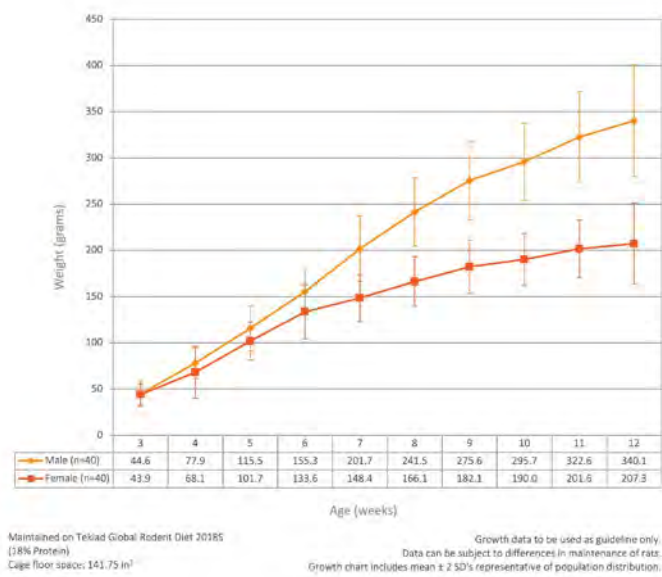
RESEARCH USE

- Oncology
- Immunology
- Xenograft and allograft transplantation

ADDITIONAL AVAILABLE DATA

- Proven model with extensive references (see page 20)

Hsd:RH-Foxn1^{nu}





Pink1 knockout rat - Park6

NOMENCLATURE: HsdSage: LE-Pink1^{em1Sage}

Developed in collaboration with The Michael J. Fox Foundation, this model contains a deletion of the Pink1 (PTEN-induced putative kinase 1) gene, encoding for a serine/threonine protein kinase. Mutations in Pink1 are implicated in early-onset Parkinson's disease. Pink1 knockout rats show both motor impairments and dopaminergic cell loss, making this a useful model of Parkinson's disease.

Pink1 protein kinase localizes to the mitochondria and is thought to protect cells from stress-induced mitochondrial dysfunction. Mutations within this gene result in one form of autosomal recessive early-onset Parkinson's.

In humans, loss of function of Park6 leads to a form of early-onset Parkinson's disease. This occurs due to the role Park6 plays in protecting neurons from oxidative stress and cell death, making this an ideal model for the study of Parkinson's disease.

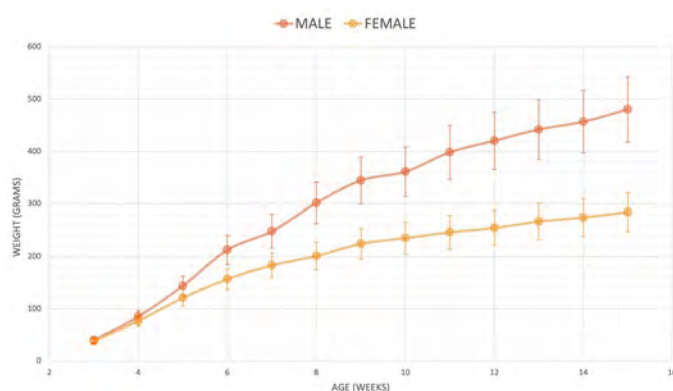
CHARACTERISTICS

- Homozygous knockout rats exhibit complete loss of target protein
- Approximately 30% of Pink1 knockout rats display a hindlimb-dragging phenotype at 5 months of age
- Pink1 knockout rats show increased hindlimb fatigue at 7 weeks of age
- Pink1 knockout rats show increased number of hindlimb foot slips at 5 and 9 weeks of age as assessed by tapered balance beam
- Reports have suggested Pink1 knockout rats show a ~50% reduction in dopaminergic neurons in the substantia nigra at 8 months of age
- Background strain: Long Evans Hooded

RESEARCH USE

- Parkinson's disease
- Stress-induced neurological dysfunction

HsdSage: LE-Pink1^{em1Sage}



** When packing males, all animals will need to be packed as cage mates only. Otherwise, males will be packed separately.



Mdr1a knockout rat

NOMENCLATURE: HsdSage: SD-Mdr1a^{em1Sage}

P-glycoprotein plays a critical role in efflux for both brain and liver. Homozygous null Mdr1a rats display increased exposure to CNS drugs in the brain, as well as increased bioavailability in the plasma for P-glycoprotein-specific substrates.

MDR1 encodes for P-glycoprotein and is a membrane-bound drug transporter expressed in the brain and intestine. It effectively blocks drugs from crossing the blood-brain barrier. P-glycoprotein can confer multiple drug resistance to tumor cells. Absence of P-glycoprotein creates a functional deficiency in the blood-brain barrier and results in elevated drug levels in many tissues, making this a useful model for efflux assay, efficacy, formulation, tissue distribution, studying neurotoxicology and chemotherapeutic agents.

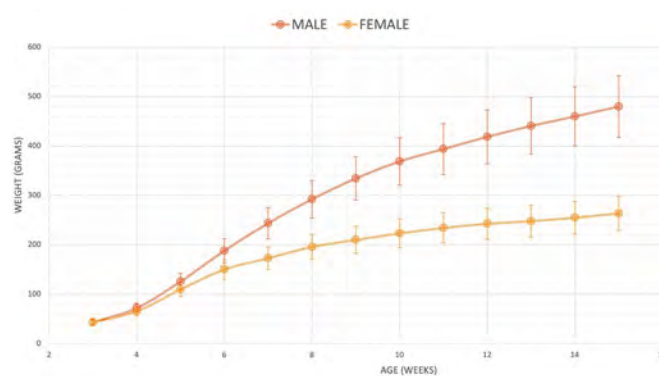
CHARACTERISTICS

- Biallelic 20 bp deletion within *Abcb1a* gene
- Increased oral bioavailability of P-glycoprotein-specific substrates
- Homozygous knockout rats display total loss of protein via Western blot
- Background strain: Sprague Dawley

RESEARCH USE

- DMPK assay
- PK-PD efflux assay
- Neurotoxicology
- Formulation drug-drug interactions
- Drug resistance
- Blood-brain barrier efflux
- Efficacy

HsdSage: SD-Mdr1a^{em1Sage}



** When packing males, all animals will need to be packed as cage mates only. Otherwise, males will be packed separately.



Mdr1a - Bcrp knockout rat

NOMENCLATURE: HsdSage: SD-*Mdr1a*^{em1Sage} *Abcg2*^{em1Sage}

P-glycoprotein and Bcrp both play a critical role in efflux for brain. Double homozygous null *Mdr1a*-*Bcrp* rats display increased exposure to CNS drugs in the brain, as well as increased bioavailability in the plasma for P-glycoprotein and *Bcrp* specific substrates.

MDR1 and BCRP are membrane-bound drug transporters expressed in the brain. Each effectively blocks specific drugs from crossing the blood-brain barrier. P-glycoprotein and *Bcrp* can confer multiple drug resistance to tumor cells. Absence of P-glycoprotein and *Bcrp* creates a functional deficiency in the blood-brain barrier and results in elevated drug levels in many tissues, making this a useful model for efflux assay, efficacy, formulation, tissue distribution, studying neurotoxicology and chemotherapeutic agents.

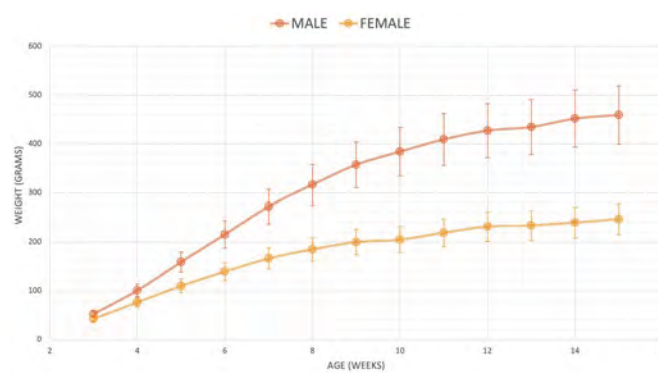
CHARACTERISTICS

- Biallelic 20 bp deletion within *Abcb1a* gene and 588 bp deletion within the *Abcg2* gene
- Increased oral bioavailability of P-glycoprotein and *Bcrp* specific substrates
- Homozygous knockout rats display total loss of both proteins via Western blot
- Background strain: Sprague-Dawley

RESEARCH USE

- DMPK Assay
- PK/PD Efflux Assay
- Neurotoxicology; Formulation
- Drug-drug interactions
- Drug resistance
- Blood-brain barrier efflux
- Efficacy

HsdSage: SD-*Mdr1a*^{em1Sage} *Abcg2*^{em1Sage}



** When packing males, all animals will need to be packed as cage mates only. Otherwise, males will be packed separately.

Transgenic rodent models

Pre-developed genetically engineered rodent models

Advance your drug discovery research with predictive and translational models.

Our pre-developed models cover various therapeutic areas, such as neuroscience, ADMET, cardiovascular, respiratory, and oncology. Our breadth of pre-developed knockout and knockin models are available to provide the scientific community access to popular models for use in basic and preclinical research applications.

Our portfolio of pre-developed transgenic models includes over 80 rat and mouse models. The table below details our available portfolio of both off-the-shelf and cryopreserved models for the research community.

NEUROSCIENCE									
	Alzheimer's Disease	Autism	Pain	Hereditary Neuropathy	Parkinson's Disease*	Schizophrenia	Cre Models		
	ApoE KO rat	CHD8 KO rat	Faah KO rat	SORD KO rat	Lrrk1 KO rat	BDNF KO rat	5Ht3a-Cre KI rat		
	hApoE2 KI rat	Cntnap2 KO rat	Oprm1 KO rat		Lrrk2 KO rat	Cacna1c KO rat	CamKIIa-Cre KI rat		
	hApoE3 KI rat	Fmr1 KO rat	p75 ^{NTR} KO rat		Lrrk1-Lrrk2 KO rat	Chrna7 KO rat	DAT-Cre KI rat		
	hApoE4 KI rat	Gabrb3 KO rat	Trpv1 KO rat		Park2 (Parkin) KO rat	Disc1 KO rat	Parvalbumin-Cre KI rat		
	App KO rat	MeCP2 KO rat			Park7 (DJ-1) KO rat	Pde4b KO rat	Sst-Cre KI rat		
	BDNF KO rat	Met KO rat			Pink1 (Park6) KO rat		tdTomato KI rat		
		mGluR5 KO rat			Pink1/Parkin KO rat		TH-Cre KI rat		
		Nrxn1 KO rat					Tph2-Cre KI rat		
		Nlgn3 KO rat					Vgat-Cre KI rat		
	Rbfox1 KO rat					VIP-Cre KI rat			
ADMET			ONCOLOGY						
	Transporters	Xenobiotic		Cell Proliferation	DNA Repair	Immunotherapy			
	Bcrp KO rat	AHR KO rat		p53 KO rat	Prkdc KO rat	B-NDG KO mouse			
	BSEP KO rat	CAR KO rat		Pten KO rat					
	Mdr1a KO rat	Ppara KO rat		Rag2-Il2rg (R2G2®) KO mouse					
	Mdr1a-1b KO rat	PXR KO rat		IMMUNOLOGY					
	Mdr1a-Bcrp KO rat	PXR/CAR KO rat		Inflammation					
	Mrp1 KO rat	PXR/CAR/AHR KO rat		Cox1 KO rat	Rag1 KO rat (Sprague Dawley)				
	Mrp2 KO rat			Cox2 KO rat	Rag2 KO rat (Fischer 344)				
	Oat1 KO rat			Lgals1 (Gal1) KO rat	Rag2 KO rat (Sprague Dawley)				
	Oat3 KO rat			Prkdc KO rat	Rag2-Il2rg (R2G2®) KO mouse				
Oct1 KO rat		Rag1 KO rat (Fischer 344)	Tbx21 (T-beta) KO rat						
Oct2 KO rat									
RESPIRATORY		INFECTIOUS DISEASE		CARDIOVASCULAR					
	Cystic Fibrosis		COVID-19		Atherosclerosis				
	CFTR KO rat		hACE2 KI rat		ApoE KO rat				
			hACE2 KI mouse		hApoE2 KI rat				
			hTmprss2 KI mouse		hApoE3 KI rat				
			hACE2/hTmprss2 KI mouse		hApoE4 KI rat				
					Ldlr KO rat				
				Leptin KO rat					

For more information on our pre-developed transgenic models, please visit [inotiv.com](https://www.inotiv.com) or contact us at GEMSorders@inotiv.com

Hamsters



MODEL CODE
089

Golden Syrian Hamster

NOMENCLATURE: HsdHan®:AURA

AGE (WEEKS)	APPROX WEIGHT (G)		PRICE PER ANIMAL	
	MALE	FEMALE	MALE	FEMALE
3-4	40 - 75	40 - 75	\$67.00	\$67.00
4-5	65 - 90	65 - 90	\$73.45	\$73.45
5-6	75 - 100	75 - 100	\$84.15	\$84.15
6-7	85 - 105	85 - 105	\$94.45	\$94.45
7-8	90 - 110	85 - 110	\$106.95	\$106.95
8-9	90 - 115	90 - 115	\$115.65	\$115.65
9-10	95 - 120	90 - 120	\$128.15	\$128.15
10-11	100 - 130	95 - 130	\$162.80	\$162.80
Proven breeder			\$137.20	\$146.55
Pregnant female*				\$326.25
Female with litter				\$292.50
Timed mated*				\$326.25

* For our pregnant animal policy, refer to page 91.

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.

CHARACTERISTICS

- Litter average: 9.0
- Excellent reproductive performance

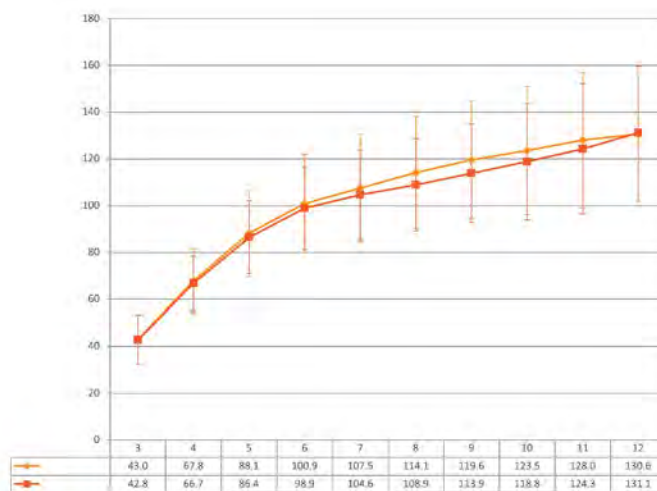
RESEARCH USE

- Behavior
- Carcinogenesis
- Hibernation
- Hypercholesterolemia
- Infectious disease (Clostridium difficile, SARS-CoV-2)
- Metabolism
- Oncology
- Syrian Hamster Embryo (SHE) Cell Transformation Assay
- Toxicology

ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry
- 12-week growth

HsdHan®:AURA



Sia, S. F., Yan, L. M., Chin, A. W., Fung, K., Choy, K. T., Wong, A. Y., ... & Peiris, M. (2020). Pathogenesis and transmission of SARS-CoV-2 in golden hamsters. Nature, 1-7. https://www.researchgate.net/profile/Limeng_Yan/publication/341378309_Pathogenesis_and_transmission_of_SARS-CoV-2_in_golden_hamsters/links/5ebd9dd4458515626ca8376c/Pathogenesis-and-transmission-of-SARS-CoV-2-in-golden-hamsters.pdf

Cotton rats



MODEL CODE
201

Cotton Rat

NOMENCLATURE: Hsd:Cotton Rat

AGE (WEEKS)	PRICE PER ANIMAL
3-4	\$501.90
4-5	\$557.45
5-6	\$606.65
6-7	\$667.20
7-8	\$708.60
8-9	\$778.55
9-10	\$810.50
Over 10 weeks, add per week	\$46.05

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, then Envigo was acquired by Inotiv in 2021.

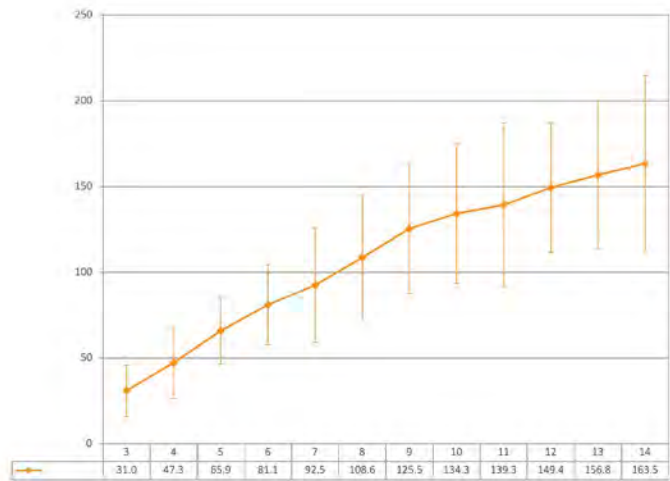
CHARACTERISTICS

- 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
- Infectious disease immune response
 - SARS-CoV-2

Hsd:Cotton Rat



Rabbits



New Zealand White

NOMENCLATURE: HsdHra:(NZW)

PRICE PER ANIMAL - AVAILABLE ON REQUEST

CHARACTERISTICS

- **Body temperature**
100°–103° F
- **Respiration rate**
35–65 BPM
- **Weight: newborn**
50–60 gm
- **Gestation period**
31 days
- **Average litter size**
7–10
- **Age at weaning**
5 weeks
- **Photo period (light/dark)**
14/10
- **Water consumption**
(automated watering system)
150 mL per day
- **Food consumption**
60 gm 5-8 weeks
125 gm over 8 weeks
- **Sexual maturity Male:**
6–9 months
- **Sexual maturity Female:**
5–8 months
- **Breeding life Male:**
24–30 months
- **Breeding life Female:**
24–30 months
- **Identification methods**
Ear tags, tattoos, microchips

ADDITIONAL SERVICE OFFERINGS

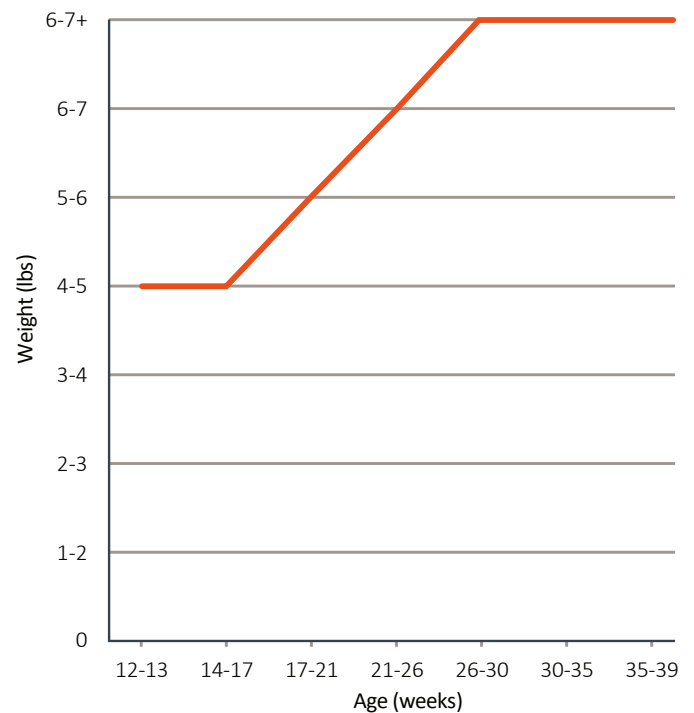
- Ocular screening solutions – Pre-shipment eye screening solutions identify optimal models for your ocular studies
- Social housing solutions – Social housing capabilities promote the compatibility and sociability of your rabbits (up to 2 kg)
- We're able to offer single or double vascular catheterizations in our rabbit models to enable efficient and fast study start
- Pre-implanted telemetry solutions – Partnered with Data Sciences International, Inc. (DSI), we're able to offer large models that are pre-implanted with telemetry devices to enable efficient and fast study start

RABBIT ENRICHMENT

Our commitment to animal welfare including enrichment is a daily commitment. Our rabbit enrichment program includes:

- Music in each room for 24 hours daily
- Group housing up to 4-1/2 - 5 months of age
- Dumbbells, chains, bells and other 'toys' are supplied for continuous enrichment
- Resting pads are provided in each cage as needed
- Flat, perforated cage bottoms

WEIGHT CHART



- We do not recommend shipping rabbits under the age of 12 weeks. If you require a rabbit under 12 weeks of age, please contact our customer service team for more details.
- Weights may fluctuate slightly from the growth chart depending on the time of year.

Rabbits



Dutch Belted

NOMENCLATURE: HsdHra:DB

PRICE PER ANIMAL - AVAILABLE ON REQUEST

CHARACTERISTICS

- **Body temperature**
100°–103° F
- **Respiration rate**
35–65 BPM
- **Weight: newborn**
50–60 gm
- **Gestation period**
31 days
- **Average litter size**
6–8
- **Age at weaning**
5 weeks
- **Photo period (light/dark)**
14/10
- **Water consumption**
(automated watering system)
150 mL per day
- **Food consumption**
55 gm 5–9 weeks
85–90 gm over 9 weeks
- **Sexual maturity Male:**
6–9 months
- **Sexual maturity Female:**
5–8 months
- **Breeding life Male:**
24–30 months
- **Breeding life Female:**
24–30 months
- **Identification methods**
Ear tags, tattoos, microchips

ADDITIONAL SERVICE OFFERINGS

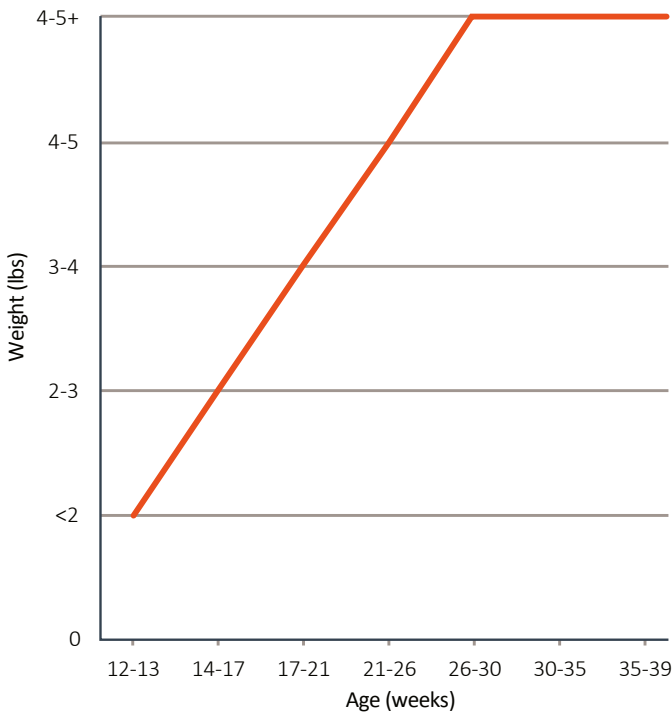
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- Weights may fluctuate slightly from the growth chart depending on the time of year.

Nonhuman primates



Cynomolgus macaques

NOMENCLATURE: *M. fascicularis*

PRICE PER ANIMAL - AVAILABLE ON REQUEST

CHARACTERISTICS

- Ability to source domestic bred animals of Asian origin.
- Sexually mature models available.
- Global primate holding facilities in North America and Europe.



Rhesus macaques

NOMENCLATURE: *M. mulatta*

PRICE PER ANIMAL - AVAILABLE ON REQUEST

CHARACTERISTICS

- Model origin: Chinese or Indian (pending availability)

Quality breeding farms

We work with only high-quality breeding farm partners and our global veterinary group routinely conducts extensive audits of each farm to ensure supplier facilities are well maintained, the animals are well-cared for and healthy, and the export facilities are of high quality. Inotiv's veterinarians are often on site at farms to assist in the pre-export screening.

PRE-SHIPMENT AND TESTING SOLUTIONS

Our large inventory and comprehensive pre-shipment testing protocol support a wide range of pre-testing specifications.

- **Documentation:**
We maintain electronic medical records on the health of each animal, including sexual maturity, behavioral assessments, and social housing history
- **Enrichment:**
Our training and socialization programs include cage-to-transfer box training, pole and collar training, social housing and environmental enrichment providing NHPs better prepared to meet your needs
- **Screening:**
We offer a wide range of available pre-shipment screening, including, EKG, ocular, pathogen, and viral, to meet your study specifications, enhance your study success rate and potentially reduce the number of models to meet your 3Rs goals

ADDITIONAL SERVICE OFFERINGS

- Uniquely positioned to provide industry leading ground transportation services.
- Ocular screening solutions – Pre-shipment eye screening solutions identify optimal models for your ocular studies
- Social housing solutions – Social housing capabilities promote the compatibility and sociability of your nonhuman primates
- Pre-implanted telemetry solutions – Partnered with Data Sciences International, Inc. (DSI), we are able to offer nonhuman primates that are pre-implanted with telemetry devices to enable efficient and fast study start
- Surgery services – Offer pre-implanted Vascular Access Ports for quick dosing of fluids, medications, and test compounds as well as blood withdrawal
- Buy and board – readily available NHP models and top-level care to give you peace of mind while you focus on other phases of your study.
- Microbiology laboratory – on-site microbiology laboratory produces results faster than if samples were sent to a reference lab – recovering pathogens more readily by reducing the potential for loss or degradation
- Pole and collar acclimation solutions – The proven pole and collar acclimation solution can remove critical days from your animal receipt to study initiation window



Teklad

Bedding, Diets
and Enrichment



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

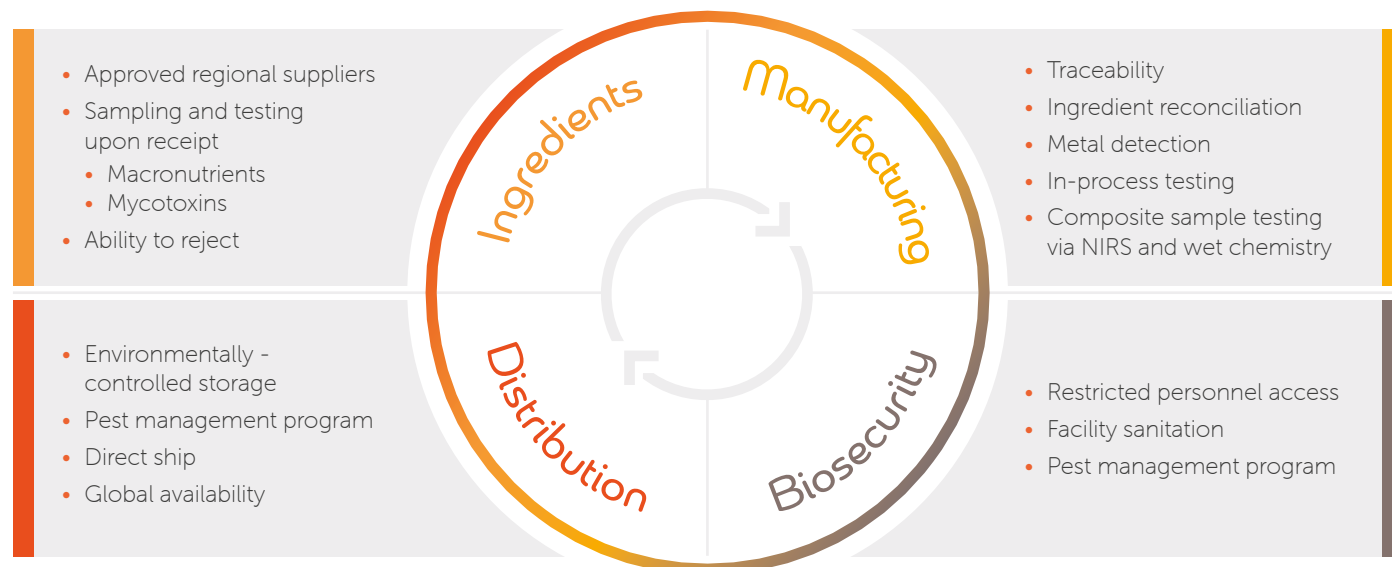
TEKLAD DIETS: A FIXED FORMULATION APPROACH

Method	Ingredients from approved suppliers are tested prior to acceptance and use.
Rationale	Both nutrients and non-nutrients can have important effects.
Result	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 Diets sites in Madison, WI, are certified to the 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
Primary ingredients (Order of inclusion)	Wheat midds Wheat Corn Corn gluten meal Soy oil	Wheat Corn Wheat midds Corn gluten meal Soy oil	Wheat Corn Wheat midds Soybean meal 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)					
Protein %	14.3	16.4	18.4	19.2	19.4
Fat %	3.7	3.7	6.0	9.0	6.5
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
Isoflavone content*	<20 mg/kg	<20 mg/kg	225-340 mg/kg	<20 mg/kg	<20 mg/kg
USE AND FEATURES					
Life stage	Long-term maintenance	Growth, maintenance	Breeding, growth	Breeding, higher energy	Breeding, growth
Purpose and benefits	<ul style="list-style-type: none"> • Prolonged maintenance • Aging • Toxicology • Oncology 	<ul style="list-style-type: none"> • Growth • Maintenance • Toxicology • Oncology 	<ul style="list-style-type: none"> • Breeding • Growth • Maintenance • General purpose 	<ul style="list-style-type: none"> • Breeding • Genetically - engineered mice • Poorly performing strains • Oncology 	<ul style="list-style-type: none"> • 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

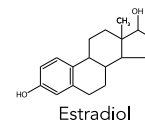
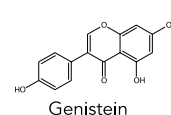
Not all product combinations are produced regularly or stocked locally.



Ingredient selection

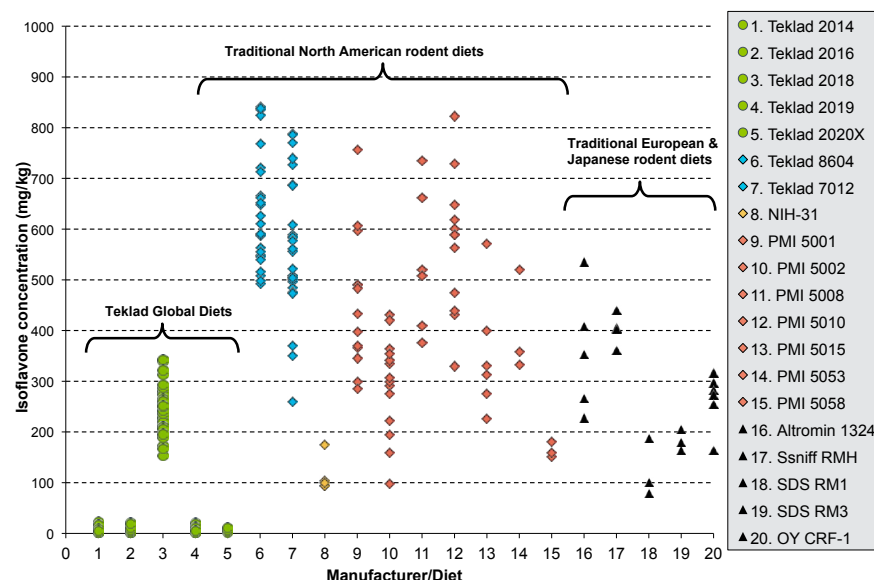
THE KEY TO REDUCING RATHER THAN INTRODUCING VARIATION

INGREDIENT	COMPONENT	SIGNIFICANCE
Soybean meal	Isoflavones: Genistein, Daidzein	Selective Estrogen Receptor Modulator
Alfalfa meal	Coumestrol	Selective Estrogen Receptor Modulator
	Chlorophyll	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.



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: inotiv.com/phytoestrogen-references

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

ADDITIONAL RESOURCES:

- Dietary phytoestrogens, a source of research variation, Volume 1
- Phytoestrogens limit translation of preclinical results to clinical outcomes - Volume 2

WAYS IN WHICH ISOFLAVONES IMPACT RESEARCH

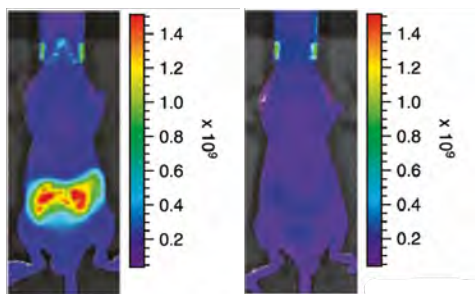
RESEARCH AREA	EFFECTS DESCRIBED IN THE LITERATURE
Oncology	Modulate tumor growth, latency, multiplicity, metastasis; diminish action of drugs such as tamoxifen and letrozole.
Reproductive	Increase uterine weight; accelerate vaginal opening; affect response to exogenous estrogens/xenobiotics.
Endocrine	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.

Solution: Inotiv'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

Model

Hsd:Sprague Dawley®
SD® males (n=200)

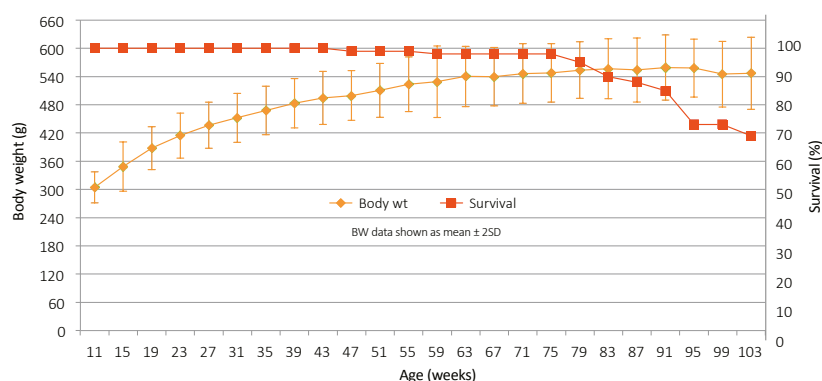
Diet

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%

GROWTH AND SURVIVAL CURVES





Teklad Global Diets® at a glance

SPECIES	RODENT					CANINE		
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)			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 <i>Moderate phytoestrogen</i>	19% Protein 9% Fat	19% Protein 6% Fat	21% Protein 6% Fat	25% Protein 9% Fat	27% Protein 16% Fat
<ul style="list-style-type: none"> • 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 					<ul style="list-style-type: none"> • High-quality poultry by-products • Smooth transition between diets • Options for all life stages • All options stocked as certified 		

PURPOSE AND BENEFITS

<ul style="list-style-type: none"> • Prolonged maintenance • Aging • Toxicology • Oncology 	<ul style="list-style-type: none"> • Growth • Maintenance • Toxicology • Oncology 	<ul style="list-style-type: none"> • Breeding • Growth • Maintenance • General purpose 	<ul style="list-style-type: none"> • Breeding • Genetically engineered mice • Poorly performing strains • Oncology 	<ul style="list-style-type: none"> • Breeding • General purpose • Estrogen-sensitive breeding studies • Reproductive toxicology • Oncology 	<ul style="list-style-type: none"> • Maintenance 	<ul style="list-style-type: none"> • Gestation • Lactation • Growth • Maintenance 	<ul style="list-style-type: none"> • Gestation • Lactation • Growth
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CALCULATED AVERAGE NUTRIENT PROFILE

Protein %	14.3	16.4	18.4	19.2	19.4	21.0	26.3	28.6
Fat %	3.7	3.7	6.0	9.0	6.5	6.7	10.5	16.8
Crude Fiber %	4.1	3.3	3.8	2.6	2.7	4.0	3.0	2.7
NDF % ¹	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

✓	✓	✓	✓	✓	✓	✓	✓	✓
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¹ 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		Feline	Ferret	
Product	2030	2031	2040	2041	2050, 2050A	2055	2060	2072	
Irradiated (29xx)	2930	2931	2940	2941					
Certified (C)	2030C	2031C	2040C	2041C	2050C	2055C	2060C	2072C	
Autoclavable (S)									
Extruded (X)					Standard	Standard	Standard	Standard	
Key Features									
	<ul style="list-style-type: none">• 16% Protein• 3% Fat <i>Vegetarian</i>	<ul style="list-style-type: none">• 14% Protein• 2% Fat <i>Vegetarian</i> <i>Higher fiber</i>	<ul style="list-style-type: none">• 18% Protein• 3% Fat	<ul style="list-style-type: none">• 17% Protein• 4% Fat <i>Higher fiber</i>	<ul style="list-style-type: none">• 20% Protein• 4% Fat <i>Higher fiber</i>	<ul style="list-style-type: none">• 25% Protein• 5% Fat	<ul style="list-style-type: none">• 32% Protein• 12% Fat <i>Includes a urinary acidifier</i>	<ul style="list-style-type: none">• 36% Protein• 18% Fat <i>Highly digestible</i> <i>Low ash poultry by-products</i>	
		Global Guinea Pig Diets are fortified with stabilized vitamin C				Global Primate Diets are fortified with stabilized vitamin C			
	Purpose and Benefits								
	<ul style="list-style-type: none">• Gestation• Lactation• Growth	<ul style="list-style-type: none">• Maintenance• Long term studies	<ul style="list-style-type: none">• Gestation• Lactation• Growth	<ul style="list-style-type: none">• Maintenance	<ul style="list-style-type: none">• Gestation• Lactation• Growth• Maintenance	<ul style="list-style-type: none">• Gestation• Lactation• Growth• Maintenance	<ul style="list-style-type: none">• Gestation• Lactation• Growth• Maintenance	<ul style="list-style-type: none">• Gestation• Lactation• Growth• Maintenance	
Calculated Average Nutrient Profile									
Protein %	17.2	14.5	19.2	17.6	20.0	25.6	34.0	39.0	
Fat %	3.0	2.5	3.0	4.5	5.4	5.9	13.2	20.0	
Crude Fiber %	13.7	22.8	12.2	15.8	8.8	3.5	1.8	1.2	
NDF % ¹	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 fortification 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

Teklad

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, Inotiv 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
- Fiber adjusted

Induce disease

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

Dose animals

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

Ask a nutritionist!

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

inotiv.com/laboratory-animal-diets
askanutritionist@inotiv.com

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.





Bedding



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

Inotiv 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 and 7099W White TEK-Fresh™ Bedding
- 7094 Ultrasoft Bedding
- 7177C Diamond Sort Twist - NEW Enriched Bedding

BEDDING – WOOD ⚠️

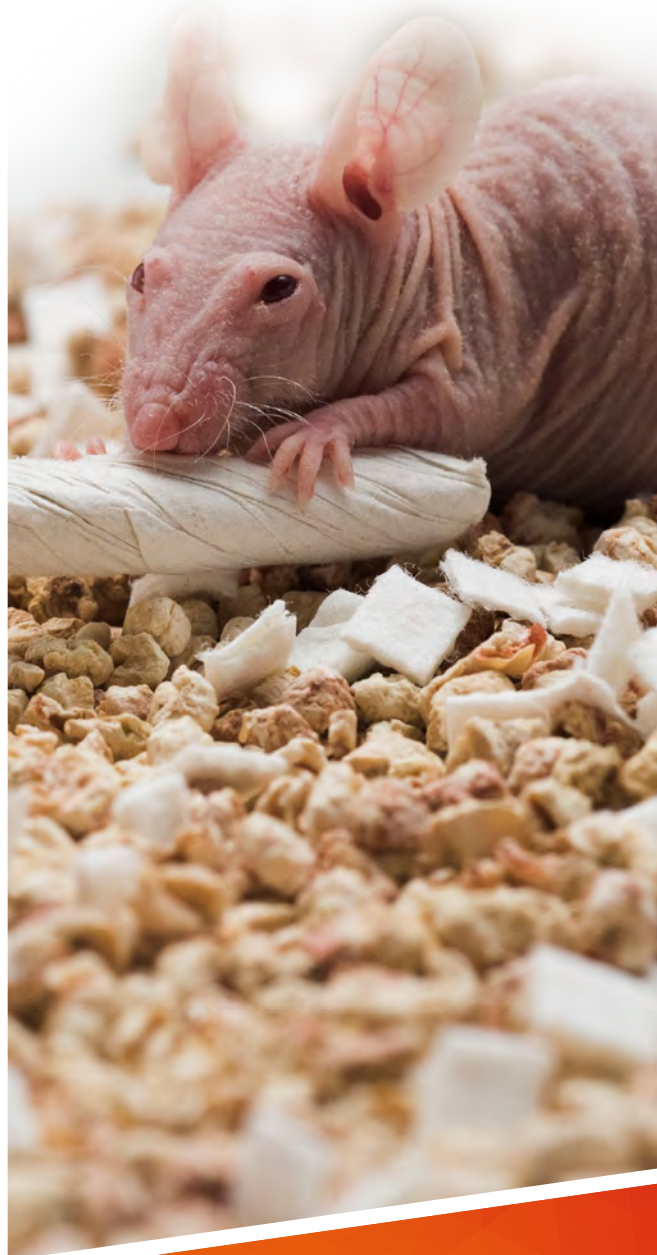
- 7090A Sani-Chips® Bedding - Aspen
- 7090M Sani-Chips® Bedding - Maple
- 7090C Certified Sani-Chips® Bedding
- 7093 Shredded Aspen Bedding

BEDDING – CORNCOB

- 7092 1/8" Corncob Bedding
- 7097 1/4" Corncob Bedding
- 7087C Certified Soft Cob Enrichment Bedding
- 7076 Corncob Twist - NEW Enriched Bedding

CUSTOM CUT LINERS

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



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.

welfareplus+[®]

Rodent Enrichment Solutions

Welfare focused enrichment for laboratory animals provides sensory and motor stimulation to promote natural behaviors and improve overall animal well-being.

Benefits include:

Enhanced animal welfare / Promotes natural behaviors
Promotes animal welfare by reducing stress / Promotes more reliable and translatable data

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

- 7087C Certified Soft Cob Enrichment Bedding
- 7978C Certified Irradiated Diamond Twist Minis
- 7979C.CS Certified Irradiated Diamond Twists
- 6105.CS iso-PADST[™] Environmental Enrichment Pads (6" x 10")
- 6060.CS iso-BLOX[™] Environmental Enrichment Squares (2" x 2")

Certificates of analysis are available upon request for products listed below:

- TE.5010, 5910 Cocoon Nesting
- TE.5020, 5920 Sizzle-Nest
- TE. 5030, 5930 Paperwool Nesting
- TE.5040, 5940, 5065, 5965, 5090 Play Tunnels in a variety of sizes
- TE.5050, 5950, 5955 Aspen Bricks
- TE.5060, 5960 Smart Homes
- TE.5070, 5075, 5970 Aspen Graw Balls
- TE.5096 Rabbit Shelters



Custom genetically engineered
rodent models

Genetically Engineered Models by CRISPR

RAT AND MOUSE MODELS TO YOUR SPECIFICATION IN AS FEW AS 4 MONTHS

Looking for an animal model to fit your specific research needs?

First, we reimagined the possibilities of genetic engineering in rats. Now we offer the world's fastest custom *in vivo* model generation service, powered by CRISPR-Cas9 genome editing technology. Go from idea to rat or mouse model in under half the time of traditional ES-cell based methods.

HOW IT WORKS

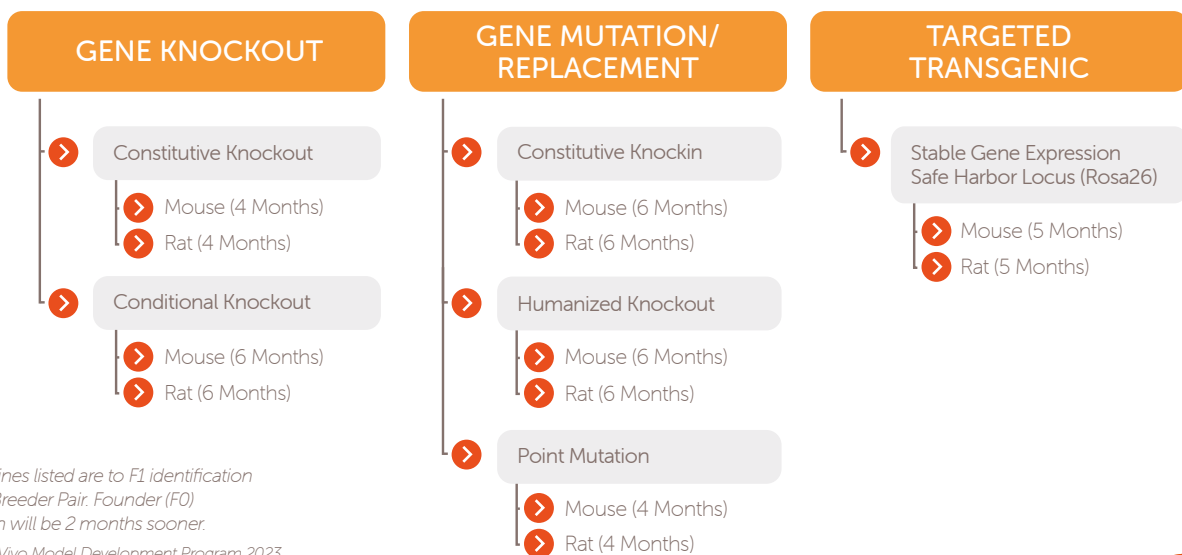
Looking for a knockout rat or mouse not included in our standard model portfolio?

Your Inotiv *in vivo* model development specialist will work with you to design a custom model to your exact specifications, using our CRISPR/Cas9 (licensed by The Broad Institute and ERS Genomics) or Zinc Finger Nuclease technologies licensed by MilliporeSigma, in as few as 4 months.

Using our Custom Model Builder, simply select your species, strain, gene of interest and we will generate a model specific to your downstream research applications.

ADVANTAGES OF OUR ANIMAL MODEL CREATION

- Exclusive options—mice and rats, any strain
- Longest nuclease based expertise in the industry
- F1 breeding pair delivered in as few as 4 months
- Guaranteed germline transmission
- Reagent design, construction, and validation
- Comprehensive project management
- Detailed, formal project reports



Contract breeding services

With decades of experience in the breeding world, Inotiv is a trusted partner in delivering high-quality, end-to-end breeding programs that support scientific progress.

Our expertise has been shaped through long-standing collaboration with researchers, enabling us to provide precise, dependable, and tailored support at every stage. Today, we apply that deep technical knowledge and operational discipline to help research organizations worldwide maintain high standards, meet timelines, and achieve their study goals - on time and on budget.

We approach each project with a scientist's perspective and a clear understanding of the importance of data integrity, timelines, and responsible breeding practices. We recognize that high standards of animal welfare are essential - not only for ethical reasons, but also for generating reliable, reproducible results. These considerations are built into every breeding strategy we design. This is why researchers trust Inotiv not just as a provider, but as a partner in delivering successful outcomes.



Contract breeding cohort supply

Ensure planned, regular supply batches of models bred, pre-conditioned and delivered to your facilities. Add-on from our integrated service spectrum to improve welfare and research efficiency.



Quarantine

Prevent the risk of introducing pathogens to your facility by utilizing Inotiv's isolators to quarantine, test, revitalize or rederive the models you need from other facilities with an unknown health status.



Health status verification

Verify and maintain the health of your colonies with our in-house full spectrum health monitoring program. All of our standard and contract bred models are guaranteed to be specific pathogen free.



Surgical Services

Access to highly skilled surgical teams combined with expert solutions and a first-in-class surgical model tracking system.



Cryopreservation

Reduce the risk of losing a valuable cohort through genetic or pathogen contamination or catastrophe, and eliminate needless breeding through cryopreservation.



Genotyping, preconditioning, and aging

Leverage Inotiv's expertise in breeding to deliver pre-determined cohorts of known-sex, confirmed phenotype or genotype models at the right age to suit your specific research needs.



Rederivation and revitalization

Bring cohorts back to their ideal state in the shortest time possible or completely refresh colonies from cryopreserved material.



Custom model generation

Partner with our experienced scientists to design and genetically engineer a rodent model to meet your specific needs using CRISPR and ZFN technologies.

CRYOPRESERVATION – RAT AND MOUSE

Inotiv offers embryo and sperm cryopreservation services as a reliable way to preserve the genetic integrity of valuable strains. This approach helps safeguard against colony loss and, by limiting continuous breeding, supports the principles of the 3Rs. Sperm cryopreservation requires fewer donor animals, making it more efficient in some cases, but it preserves only a haploid genome and may not be suitable for all models - particularly those on a mixed genetic background.

Cryopreservation - embryo or sperm

SERVICE	REQUIREMENTS	PROJECT OUTCOME
Embryo cryopreservation using homozygous, heterozygous or wild type females - Mouse and Rat	<ul style="list-style-type: none"> • 6-8 donor males (6-27 wk) • 35 wild-type donor females (3-4 wk) • Genotype and background of donors • Copy of the latest health report 	<ul style="list-style-type: none"> • Approximately 200-300 embryos • <i>In vitro</i> QC • Free storage for the first year
Mouse Sperm cryopreservation	<ul style="list-style-type: none"> • 2-4 donor males (6-27 wk) • Genotype and background of donors • Copy of the latest health report 	<ul style="list-style-type: none"> • Approximately 20-22 straws • <i>In vitro</i> fertilization QC (2 cell embryo stage) • Free storage for the first year.
Site Storage Fees		<ul style="list-style-type: none"> • Dual site storage, first year is free • Up to 500 embryos in total • Up to 50 straws of sperm in total
Live Birth Quality Control for Mouse or Rat Cryopreserved Embryos	<ul style="list-style-type: none"> • 40 embryos, minimum 	<ul style="list-style-type: none"> • <i>In vivo</i> QC to generate live offspring • Viable embryos transferred into recipient animals to generate live offspring • Confirmation of embryo viability
Live Birth Quality Control for Mouse Cryopreserved Sperm	<ul style="list-style-type: none"> • 2-3 straws of sperm 	<ul style="list-style-type: none"> • <i>In vivo</i> QC to generate live offspring • Viable embryos transferred into recipient animals to generate live offspring • Confirmation of sperm viability

The above tables are guidelines to achieve the projected outcome. Your project manager will work with you to customize a plan that best suits your needs.

REDERIVATIONS AND SPEED REDERIVATIONS – RAT AND MOUSE

Inotiv uses embryo transfer to generate small cohorts of clean animals suitable for re-establishing valuable lines. Speed rederivation options are also available and can be tailored to meet individual project needs. Once rederivation is complete, you have the option to sustain your line at Inotiv for continued colony maintenance and breeding.

Rederivations

SERVICE	REQUIREMENTS	PROJECT OUTCOME
Rederivation with health screening	<ul style="list-style-type: none"> • 5 donor males (6-27 wk) • 10 donor females (3-4 wk) or • 15 wild-type donor females (3-4 wk) • Genotype and background of donors 	<ul style="list-style-type: none"> • Small cohort with a specified health status • Shipping and container fees are additional • Alternatively, maintain and breed colony through Contract Breeding Services

REVITALIZATION OF EMBRYO OR SPERM – RAT AND MOUSE

Revitalization is a procedure used to establish a small cohort of specific pathogen free animals from cryopreserved material (embryos or sperm). Inotiv offers several revitalization options:

Revitalization - cryopreserved embryo or sperm

SERVICE	REQUIREMENTS	PROJECT OUTCOME
Revitalization of embryos with health screening – Mouse and Rat	<ul style="list-style-type: none"> • 100 cryopreserved embryos • Freezing and thawing protocol • QC report 	<ul style="list-style-type: none"> • Small cohort with a specified health status • Includes rederivation services, recipient and offspring housing and health monitoring
Revitalization of sperm with health screening – Mouse only	<ul style="list-style-type: none"> • 3-5 straws of cryopreserved sperm • Freezing and thawing protocol • QC report 	<ul style="list-style-type: none"> • Small cohort with a specified health status • Includes rederivation services, recipient and offspring housing and health monitoring

The above tables are guidelines to achieve the projected outcome. Your project manager will work with you to customize a plan that best suits your needs. Once completed, you have the option of maintaining your line at Inotiv for continued colony maintenance and breeding.

Contract breeding services

CRYO/REDERIVATION COMBO – RAT AND MOUSE

In some situations, it can be efficient to combine rederivation or revitalization with simultaneous cryopreservation of embryos or sperm. This approach supports the generation of specific pathogen-free animals while preserving the line for future use - all in a single, streamlined process. Inotiv offers flexible, cost-effective options to support this combined strategy. Once complete, you also have the option to maintain your line at Inotiv for continued colony management and breeding.

Cryo/rederivation combo

SERVICE	REQUIREMENTS	PROJECT OUTCOME
Mouse Embryo	<ul style="list-style-type: none"> • Wildtype or customer females • Donor males and/or females (strategy dependent) • Genotype and background of donors • Copy of the latest health report 	<ul style="list-style-type: none"> • Rederivation or revitalization to generate a small cohort of offspring at a specified health status. • Cryopreservation of 150 embryos • Includes <ul style="list-style-type: none"> • Donor animal housing • Recipient and offspring housing • Health monitoring • <i>In vitro</i> culture QC • Dual storage site, free for the first year • Recipient and offspring housing is available until 6 weeks of age
Rat Embryo	<ul style="list-style-type: none"> • Wildtype or customer females • Donor males and/or females (strategy dependent) • Genotype and background of donors • Copy of the latest health report 	<ul style="list-style-type: none"> • Rederivation or revitalization to generate a small cohort of offspring at a specified health status. • Cryopreservation of 100 embryos • Includes <ul style="list-style-type: none"> • Donor animal housing • Recipient and offspring housing • Health monitoring • <i>In vitro</i> culture QC • Dual storage site, free for the first year • Recipient and offspring housing is available until 6 weeks of age
Mouse Sperm	<ul style="list-style-type: none"> • Wildtype or customer females • Donor males and/or females (strategy dependent) • Genotype and background of donors • Copy of the latest health report 	<ul style="list-style-type: none"> • Rederivation or revitalization to generate a small cohort of offspring at a specified health status. • Cryopreservation of 10-12 straws of sperm • Includes <ul style="list-style-type: none"> • Donor animal housing • Recipient and offspring housing • Health monitoring • <i>In vitro</i> culture QC • Dual storage site, free for the first year • Recipient and offspring housing is available until 6 weeks of age

The above tables are guidelines to achieve the projected outcome. Your dedicated project manager will work with you to customize a plan that best suits your needs.

CONTRACT BREEDING SERVICES – RAT AND MOUSE

For situations in which it is not practical for you to breed and maintain your colonies within your own facility, Inotiv provides colony breeding and maintenance services. Our team of experts will work closely with you to understand your needs and develop a customized colony management plan and a genetic and health surveillance program. This service allows you to conserve facility space, reduce operational burden, and stay focused on your research.

SERVICE	DESCRIPTION
Isolator breeding for mice	Routine Husbandry + breeding / reporting / HM / Fixed fee per isolator, additional fees per cage per week
Isolator breeding for rats	Routine Husbandry + breeding / reporting / HM / Fixed fee per isolator, additional fees per cage per week
Implantable Transponder ID Chip - Animal Identification	ISO Transponder Chip for animal identification - per individual chip
IVC or Open top caging	Routine husbandry + breeding / reporting / HM / fee per cage per week

Housing is subject to availability. Rederivation may be required depending on caging and location.

BENEFITS TO OUTSOURCING YOUR BREEDING PROJECT

- Fully integrated, end-to-end service model
- Cohort planning support to reduce waste and avoid overproduction
- Active project management with responsive, personalized communication
- Tailored breeding strategies and flexible housing options
- Genetic integrity and health assurance through robust monitoring programs and controlled breeding strategies
- 24/7 online access to colony data via LabTracks™
- Extensive breeding expertise across a wide range of species and model types
- Easy access to Inotiv animals for cross-breeding or rederivation
- Access to a global network of breeding sites in North America, the UK, and mainland Europe
- Integrated pipeline from colony management to preclinical testing including surgical services, model development and characterisation.

For more information on our services and to request a quote on your next project, please contact us in North America at servicesPMG.US@inotiv.com or in Europe at servicesPMG.EU@inotiv.com.



Inotiv utilizes LabTracks™ software system, by Locus Technology, Inc., which provides a fully integrated on-line colony management system that supports daily inventory data, cryopreserved materials, animal husbandry and information on cage capacity for each project via a secured web portal. Our customers have secured access to only their project information at their own convenience, 24/7.

Inotiv genetic testing services

The Inotiv genetic services operations in North America provide global DNA and RNA analysis services. Inotiv has partnered with Transnetyx to offer a range of quality genetic testing services.

FEATURES

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

- Genotyping
- Zygosity Testing
- SNP profiling for Speed Congenics and background identification

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

- Quantitative PCR (qPCR)

ADVANTAGES

- 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 Inotiv representative
or visit [inotiv.com](https://www.inotiv.com)

Surgical services

Inotiv's state of the art surgical facilities are dedicated to providing the highest quality surgical models to our customers from our advanced surgery center and 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.

Inotiv offers many standard surgical models and has the flexibility to collaborate with customers to create custom surgical models.

Contact us to discuss your
surgical model needs.



Surgical services

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

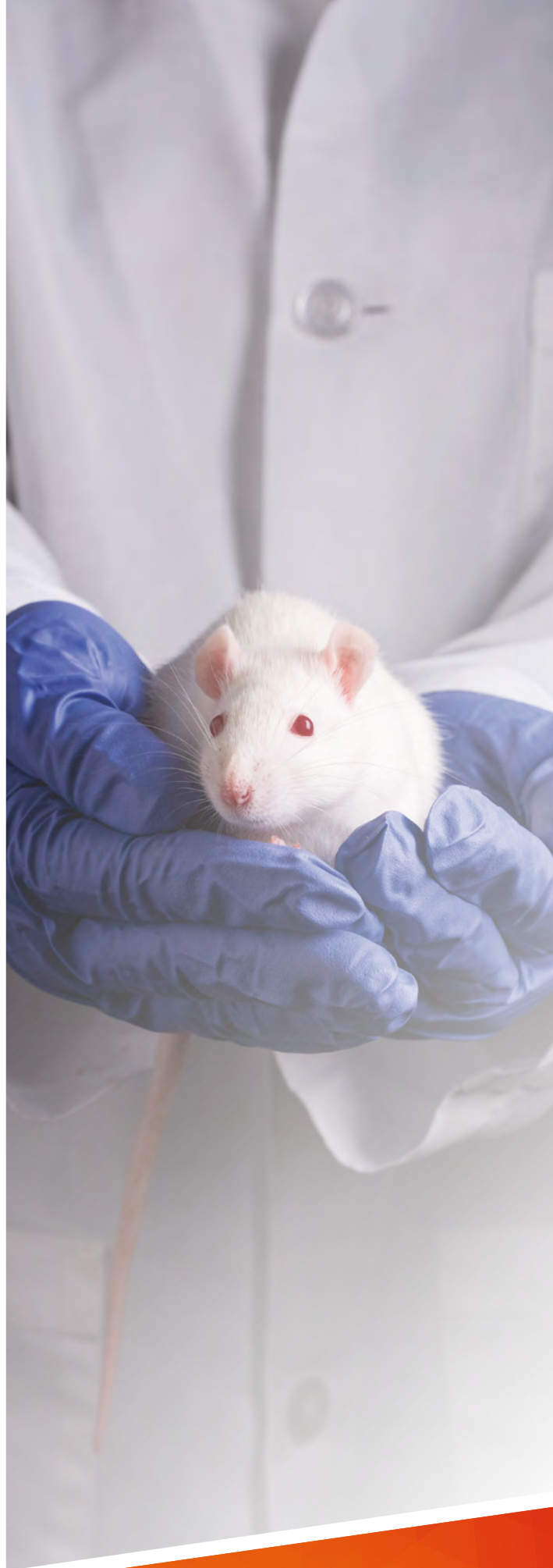
- Working with researchers to develop new surgical models and improve current models
- Commitment to continuing education opportunities for Inotiv surgical staff
- Continuous investment in Inotiv surgical facilities

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 Inotiv surgical personnel

Animal Welfare

- Dedicated to the humane and ethical care of research animals
- All surgical modifications are reviewed and approved by the Inotiv IACUC
- Inotiv veterinarians provide oversight and technical and professional support to all surgical personnel
- Utilizing Inotiv's experience and expertise adds consistency to your cohorts and may decrease animal usage





RODENT CATHETERIZATIONS

Inotiv 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 inotiv.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

		UP TO 5 ANIMALS (PER ANIMAL)	6 OR MORE ANIMALS (PER ANIMAL)
VASCULAR CATHETERIZATIONS			
Carotid Artery	CAC	\$209.70	\$203.65
Femoral Artery*	FAC	\$334.25	\$233.95
Femoral Vein	FVC	\$315.95	\$200.65
Jugular Vein	JVC	\$258.35	\$164.15
Portal Vein	PVC	\$442.05	\$319.10
NON-VASCULAR CATHETERIZATIONS			
Urinary Bladder		\$340.20	\$340.20
Bile Duct - Closed Loop	BDCL	\$493.45	\$350.20
Intestinal-Duodenal	IDC	\$402.60	\$290.25
Intestinal-Jejunal	IJC	\$493.75	\$357.00
Gastric	IGC	\$366.10	\$255.20
Intra-Colonic		\$448.25	\$332.80
Ileum*	ILC	\$343.40	\$337.20
Intra-Cecum Catheterization	ICC	\$370.70	\$275.00
Intra-Thecal - For dose administration		\$407.15	\$351.00

* On certain animal models only

For inquiries on our large model surgical services, please contact us at RMSsurgical@inotiv.com

Mouse catheterizations

		UP TO 5 ANIMALS (PER ANIMAL)	6 OR MORE ANIMALS (PER ANIMAL)
VASCULAR CATHETERIZATIONS			
Carotid Artery*	CAC	\$297.85	\$287.10
Jugular Vein	JVC	\$224.90	\$215.70

Surgical enrichment program

- All singly-housed surgically-modified rodents receive enrichment postoperatively and during transit
- All surgically-modified rodents are acclimated to ClearH₂O gel prior to shipment

Catheterizations may be exteriorized using Inotech's Pinport™, Inotech Vascular Access Buttons™ and Harnesses™. Additional charges apply.

Multiple procedures – single animal rat

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.

		UP TO 5 ANIMALS (PER ANIMAL)	6 OR MORE ANIMALS (PER ANIMAL)
DOUBLE VASCULAR CATHETERIZATIONS			
Jugular Vein/Carotid Artery	JVC/CAC	\$473.95	\$329.75
Double Jugular Vein	JVC/JVC	\$405.60	\$291.70
Femoral Artery/Femoral Vein*	FVC/FAC	\$524.10	\$391.95
Jugular Vein/Femoral Vein	JVC/FVC	\$448.25	\$328.15
Jugular Vein/Femoral Artery	JVC/FAC	\$490.75	\$357.00

Inotiv 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 is assessed and includes the provision of surgically-modified animals for evaluation.

Surgical services



Catheterizations options*

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

	PRICE PER ITEM
RAT HARNESSES	
Harness, Single Port Part #VAHR1H/22	\$104.85
Harness, dual port Part# VAHR1H/22-1P	\$154.85
<i>Other harnesses available upon request</i>	
CULEX CATHETERS	
Culex CAC	\$71.60
Culex FVC short Catheter	\$71.60
Culex FAC Catheter	\$71.60
Culex JVC short Catheter	\$71.60
CATHETER BUTTONS	
Vascular Access Button	\$86.45
Instech Double Button	\$118.90
Instech Triple Button	\$147.40
<i>Other buttons and accessories available upon request</i>	

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

		UP TO 5 ANIMALS (PER ANIMAL)	6 OR MORE ANIMALS (PER ANIMAL)
REPRODUCTIVE			
Castration - rat	CAST	\$83.60	\$45.70
Castration - mouse	CAST	\$88.20	\$50.25
Ovariectomy - rat	OVX	\$94.20	\$48.65
Ovariectomy - mouse	OVX	\$89.70	\$50.25
Vasectomy - rat	VAS	\$111.00	\$63.90
Vasectomy - mouse	VAS	\$114.00	\$63.90
ENDOCRINE			
Adrenalectomy - mouse		\$66.95	\$53.25
ADDITIONAL			
Nephrectomy-Unilateral - rat NEPHREX		\$149.75	\$84.40
Nephrectomy-Unilateral - mouse NEPHREX-mouse		\$157.60	\$90.85
5/6 Nephrectomy - mouse		Pricing available upon request	
CARDIOVASCULAR			
Myocardial infarction - rat		Pricing available upon request	
Myocardial infarction - mouse		Pricing available upon request	
Transverse aortic constriction - mouse		Pricing available upon request	

Immunodeficient models

Surgical modification of immunodeficient rodents is also available.

		UP TO 5 ANIMALS (PER ANIMAL)	6 OR MORE ANIMALS (PER ANIMAL)
REPRODUCTIVE			
Castration - rat	CAST-Rat	\$112.45	\$79.10
Castration - mouse	CAST-Mice	\$109.40	\$82.15
Ovariectomy - rat		\$108.00	\$80.55
Ovariectomy - mouse	OVX-Mice	\$100.25	\$82.15
Vasectomy - rat		\$127.70	\$94.20
Vasectomy - mouse		\$123.10	\$97.25

Additional charges

	EACH
Custom surgeries not listed	Pricing available upon request

Cancellations must be received five 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 five business days 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.

For inquiries on our large model surgical services, please contact us at **800.793.7287** or by e-mail at **RMSsurgical@inotiv.com** to place an order.

Myocardial infarction model

In the mid 1990s, research concluded the rat model has many pathophysiological and clinical similarities as the human heart. Progression to heart failure is similar to human progression. Inotiv 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)

INOTIV MI SURGICAL PERFORMANCE

Measurable success

- 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



The Inotiv difference

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

Preconditioned models and services

CUSTOM RESEARCH DIET ANIMAL MAINTENANCE

Inotiv rodents can be maintained on Teklad custom research diet 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 environmentally-controlled vehicles.

Benefits of Inotiv custom diet animal maintenance

- Inotiv 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 Inotiv'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 examples

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

Diet-Induced Obesity (DIO) rodent models

- Randomly-selected rats and mice are fed Inotiv 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 either three, six, or nine weeks of age, available upon request

Commercially-aged rats and mice

Inotiv maintains a commercial colony of aged Sprague Dawley male rats available for purchase. Pricing for aged animals is available upon request. If the desired quantity, sex, or strain is not readily available, Inotiv can reserve cohorts of animals to be aged to the customer's specifications within our maximum security barriers with consideration to 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, Inotiv will confirm customer expectations, the project work scope, and animal pricing with a written agreement of understanding.

Research use examples

- 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®*
- C57BL/6 - C57BL/6JRccHsd* and C57BL/6NHsd
- Other rat or mice strains

*Available from Europe



Discovery and Safety Assessment Portfolio

EXPECT MORE FROM YOUR DISCOVERY AND DEVELOPMENT CRO

Gain the insights you deserve to get the answers you need

Getting high-quality data and timely answers to critical questions is essential for reaching your goals. At Inotiv, we specialize in accelerating drug discovery and development. We offer a comprehensive suite of integrated services all tailored to your specific needs. Partner with us and benefit from our extensive regulatory experience, world-class scientists, and a history of providing responsive, impactful service to drive your product forward.

IN VITRO AND IN VIVO SERVICES

Discovery

- Pharmacology and toxicology assessment
- Drug metabolism and pharmacokinetics
- Pharmacology/pharmacodynamic model co-development
- Toxicogenomics
- Computational toxicology
- Drug target and pathway analysis via proteomics

Regulatory-enabling safety assessment

- Acute through chronic GLP toxicology with toxicokinetics
- Safety pharmacology
- Genetic toxicology
- Carcinogenicity studies including transgenic mice
- Developmental and reproductive toxicology including Juvenile animal studies
- Program management for overall program oversight and seamless communication

DMPK

- *In vitro* metabolism and PK screening
- Metabolite ID, soft spot analysis
- *In vitro* drug-drug interactions (CYP and transporters)
- PK/TK analysis

HISTOLOGY AND PATHOLOGY

- Standalone or fully integrated with *in vivo* services
- Discovery through regulated toxicologic pathology
- Primary evaluations and peer reviews
- Board-certified pathologists (ACVP)
- Pharmacologic, clinical, medical device, and digital pathology
- Immunohistochemistry and immunofluorescence, *in situ* hybridization, quantitative microscopy, image analysis, stereology, histomorphometry, and specialty stains

SURGICAL SUPPORT AND MEDICAL DEVICE SOLUTIONS

- GLP and non-GLP *in vivo* testing
- Broad portfolio of techniques
- Trained veterinary surgeons
- Multiple surgical suites
- State-of-the-art imaging

BIOANALYSIS

- Phase-appropriate discovery method validation
- Regulatory enabling (GLP, GCP) method development, validation, and transfer
- Clinical/nonclinical studies supporting safety and efficacy
- Nonclinical and clinical fluids and tissues
- Dose formulation analysis

Small molecule

- AB SCIEX™ LC-MS/MS platform (small molecule, peptides, oligonucleotides)
- High-resolution mass spectrometry (HRMS)
- Liquid handling and assay automation

Biotherapeutics

- Peptide/protein therapeutics, monoclonal antibodies, cell, and gene therapies, and ADCs (PK and immunogenicity)
- Molecular biology (DNA/RNA/proteins)
- Cytokine panels (inflammatory markers)
- Flow cytometry (immunophenotyping)
- Pharmacokinetic (PK), toxicokinetic, and immunogenicity (ADA and Nab) assessments
- Ligand binding assay (ELISA, ELISpot, MSD, BioPlex™, and Luminex®)
- Biomarkers for single and multiplex assay

Contact us for more details at DDinfo@inotiv.com

Production locations

WORLDWIDE RESEARCH SERVICES

	US	UK	NED	ITA	ESP
TEKLAD GLOBAL DIETS® AND BEDDING					
Standard Diets (pelleted, extruded, meal)	✓		✓	✓	
Autoclavable Diets	✓			✓	
Irradiated Diets	✓			✓	
Certified Diets	✓		✓	✓	
Medicated Diets	✓		✓		
Custom Research Diets	✓			✓	
Bedding	✓			✓	✓
Cage Enrichment	✓			✓	✓
Cage Liners	✓				
PRECONDITIONED MODELS					
Aging Research Models	✓	✓	✓		
Animal Model Development	✓				
Animal Identification (tattooing, implantation etc.)	✓	✓	✓		
Diabetic Induced Models (STZ induced)					
Diet-Induced Obesity Models	✓	✓	✓		
Diet Maintenance Studies	✓	✓	✓		
Custom genetically engineered rodent models	✓				
Tumor Models and Services	✓				
GENETIC TESTING SERVICES					
PCR Zygosity Testing	✓				
Inbred Strain Verification	✓				
Gene Expression	✓				
Speed Congenics	✓				
Prevalidated SNP Zygosity Testing	✓				
Prevalidated Reporter and Conditional Model Testing	✓				
SURGICAL SERVICES					
Surgical services	✓	✓			
HEALTH MONITORING					
Serology				✓	
Bacteriology				✓	
Parasitology		✓		✓	
Pathology		✓		✓	
Molecular Biology				✓	
BIOSPECIMEN SERVICES					
Serum	✓	✓	✓		
Plasma	✓	✓	✓		
Complement	✓	✓	✓		
Tissues, Organs, Glands	✓	✓	✓		
Whole Embryo Culture Serum	✓	✓			
EGF, 2.5S and 7.0S Nerve Growth Factor	✓				
Cytokines	✓				

	US	UK	NED	ITA	ESP
PROCESSING AND CELL LINE SERVICES					
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	✓				
CUSTOM ANTIBODY PRODUCTION					
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	✓				
COLONY MANAGEMENT SERVICES					
Maintenance Research Models		✓	✓		
Contract Breeding	✓	✓	✓		
Import/Export Services	✓	✓	✓	✓	✓
Quarantine		✓		✓	
FACILITY SERVICES					
Facility Management	✓	✓	✓	✓	✓
TRANSGENIC SERVICES					
Embryo Transfer	✓	✓		✓	✓
Cryopreservation	✓	✓		✓	✓
Revitalization	✓	✓		✓	✓
Sperm Cell Freezing	✓	✓		✓	✓
Biospecimen Collection	✓	✓	✓		

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

At Inotiv 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, Inotiv 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 ISO 9001-2015 and AAALAC accredited facility 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, Inotiv Bioproducts helps you focus on your research, rather than on unwanted distractions.

IN VIVO PRODUCTION

For an economical approach, Inotiv 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 ensures a rapid turn-around time at a competitive price. We can also help maximize your yield time through our innovative Optimization Program.



Inotiv Bioproducts is a global market leader with **more than 40 years of experience** in developing, scaling up and purifying 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, immunology, 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:

- ISO 9001-2015 and AAALAC accredited, cGMP-compliant facility
- OLAW Assurance
- USDA registered
- Expertise > 40 years
- Rapid turnaround time
- Scientific expertise
- Superior quality management system
- Vendor qualification expertise

IN VIVO (ASCITES) PRODUCTION

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

SERVICE	DESCRIPTION	CELL LINE	PRODUCTION TYPE	CAPACITY	ADVANTAGES
Optimization Program	<ul style="list-style-type: none">• 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)	<ul style="list-style-type: none">• Determine optimal cell dose• Allows maximal yield• Verifies specifications• Saves time
Research <i>in vivo</i> Production (non-cGMP)	<ul style="list-style-type: none">• 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)	<ul style="list-style-type: none">• No MAP Testing requirement• Quicker turn-around time• Custom protocols• Reduced cost
cGMP Production	<ul style="list-style-type: none">• 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)	<ul style="list-style-type: none">• AAALAC accredited,• cGMP compliant• Optimized production• Large animal inventory• Complete documentation

IN VITRO MONOCLONAL ANTIBODY PRODUCTION

Inotiv Bioproducts has the expertise to produce your monoclonal or secreted protein *in vitro*. We have the capacity to produce 10mg-300g of research or cGMP antibody, or other secreted proteins, in our innovative tissue culture bag and hollow fiber production units. We offer a variety of media options such as RPMI, DMEM, IMDM, serum free, protein free, or other custom media formulations.

SERVICE	DESCRIPTION	CELL LINE	PRODUCTION TYPE	CAPACITY	ADVANTAGES
Small Scale Production	<ul style="list-style-type: none"> Cost effective for smaller research runs Good for early feasibility, clonal selection, and media optimization 	Hybridomas (CHO's, 293's, PerC.6 and secreted proteins)	Tissue, Culture, Bag, Hollow Fiber Bioreactor, Spinner Flasks	Up to 1 gram per project	<ul style="list-style-type: none"> Reduced cost Yield ~20-150mg per 1 L bag Quick turn-around Excellent oxygen transport
Large Scale Production	<ul style="list-style-type: none"> Flexible and easy scale up Larger scale research and cGMP runs 	Hybridomas (CHO's, 293's, PerC.6 and secreted proteins)	Hollow Fiber Bioreactor, Wave Bag Rocker	10mg-300g per project	<ul style="list-style-type: none"> Max environmental control Reproducible manufacturing process Reduces extraneous proteins Highly concentrated product

HYBRIDOMA DEVELOPMENT

Our hybridoma development program is a flexible, interactive, and cost-effective multi-phased service. We will work closely with you to design a program that will meet your requirements. Our custom development options include providing up to three, five, or 10 clones, or as many as you require. As our customer, you retain all rights to any clones that are produced. Once the clones are developed, we can scale them up via *in vivo* or tissue culture supernatant.

SERVICE	REQUIREMENTS	PROJECT OUTCOMES
Stage I: Immunization	<ul style="list-style-type: none"> Immunize mice with antigen Boost/Test by ELISA or alternate method Additional boost(s) if needed Pre-fusion boost 	<ul style="list-style-type: none"> Move mice with best titers as fusion candidates Immunizing multiple mice increases success
Stage II: Fusion/Screen and Select	<ul style="list-style-type: none"> Fusion with myeloma cell line Grow cells in HAT medium Initial screen/selection 	<ul style="list-style-type: none"> Screen all initial plates Expand positive wells and test by ELISA Set up to 30 positives for cloning Keep frozen back-up for future testing
Stage III: Cloning/Frozen Stock	<ul style="list-style-type: none"> First cloning Final cloning Selection for non-HT requirement Frozen stock and small antibody scale-up 	<ul style="list-style-type: none"> Clone by limiting dilution method Test clones by ELISA Several cloning cycles Final clones expanded and small amount of antibody produced

POLYCLONAL ANTIBODY PRODUCTION

Our comprehensive polyclonal antibody production service is offered in a variety of species. These include rabbits, goats, chickens, guinea pigs, rats, and mice. We can make your polyclonal using a wide range of antigens, bacteria, viruses, fungi, fusion proteins, synthetic peptides, plasmids, DNA, and other proteins. Peptide synthesis, carrier and labeling conjugations, and purification can easily be added to your productions. Standard protocols are available for each species, or we can follow your specific protocol. All our procedures are fully documented, allowing complete traceability.

SERVICE	ANTIGEN	PRODUCTION TYPE	PRODUCTION CAPACITY	AREA OF USE	ADVANTAGES
Polyclonal	Proteins, Peptides, variety of antigens	Rabbits, Goats, Chickens, Mice, Rats, Guinea Pigs, Sheep and Horses	Small to Large Scale (all size runs available)	Diagnostics, Research	Variety of Species USDA Licensed Standard/Custom Protocols

Custom antibody production

BIOPRODUCTS

ANTIBODY PURIFICATION

Inotiv 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	DESCRIPTION	CELL LINE	PRODUCTION TYPE	CAPACITY	ADVANTAGES
Antibody Purification IEF, SEC, MW Testing Fab and F(ab') ₂ Fragmentation FITC, Biotin, Alk Phos, and HRP Conjugation	Monoclonals Polyclonals Secreted Proteins IgM IgY	Protein A and G, Antigen affinity, Hydrophobic interaction, Size exclusion, Ammonium sulphate, Ion exchange	Small to large scale (20mg - 20g scale available)	Diagnostics, cGMP Research	<ul style="list-style-type: none"> Variety of Methods Low endotoxin for <i>in vivo</i> use cGMP compliant for diagnostic use Purify customer's in-house antibody Standard/Custom Protocols

IMMUNOGENICITY IMMUNIZATION

Inotiv 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 Immunization	Proteins, viruses, variety of antigens	Rabbits, Mice Rats, Guinea Pigs	Small to large scale (all size runs available)	Vaccine, Research Discovery	Variety of Species USDA Licensed 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

- Inotiv 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
- Rabbit and nonhuman primate tissues and sera available as well
- 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,
inotiv.com/custom-antibody-production,
for our full program, or contact us at
800.972.4362 or by e-mail
bioproducts.NA@inotiv.com
to place an order.

Quality programs

Inotiv stands out for our wide range of high-quality research models and services designed to minimize variables and enhance the quality of your research.

Diet manufacturing and small animal production facilities are ISO 9001 certified. North American large animal production facilities follow standard operating procedures aligned with the ISO 9001 standard but are not ISO certified. All Inotiv animal facilities are fully accredited to AAALAC International. Our animal operations in the Netherlands and UK are both ISO 9001 certified and AAALAC accredited.

Please visit inotiv.com to view a list of all certifications and accreditations for all Inotiv diet manufacturing and animal production sites globally.

ANIMAL WELFARE inotiv.com/animalwelfare

Inotiv is dedicated to the humane care and use of research animals. In North America, 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 Policy/OLAW, and USDA Animal Care licensing and registration. In Europe, the Animal Welfare Body ensures animal care and use meets the requirements of the national animal welfare legislation.

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

Our nonhuman primate facilities in Texas and Pennsylvania are registered as importers with the CDC.

DIET AND BEDDING MONITORING inotiv.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 inotiv.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 small animal production facilities is conducted by our own internal laboratory, Inotiv Health Monitoring Services. Our large model facilities undergo monthly health monitoring within our laboratories or through an external laboratory.

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 inotiv.com/GIAP

Inotiv's global genetic monitoring program consists of routine testing in all mouse and rat colonies in North America and Europe. Barrier reared inbred colonies are tested continuously as new cages are added. Outbred and isolator-reared colonies are tested annually. Tests are conducted on all pedigreed Foundation Colony breeding cages in newly-populated isolator bred colonies, annually thereafter. Routine genetic monitoring is also performed on 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 tested using proprietary 48 marker SNP panels for both inbred rats and mice. Outbred rats are tested at 95 SNP markers and outbred mice are tested using miniMUGA arrays. Routine genetic monitoring is performed at TransnetYX in Memphis, TN.

For any questions or reports, please contact our Veterinary Sciences, Research and Support team at RMSTechnicalServices.NA@inotiv.com or 800.793.7287.

MICROBIOLOGICAL MONITORING

The Inotiv 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: inotiv.com/healthreports

Organism List and Testing Frequency

Legend: A = annually, Semi = semi-annually, Q = quarterly, M = monthly, - = not tested. ELISA = Enzyme-Linked Immunosorbent Assay, IFA = Immunofluorescence Assay, PCR = Real Time Polymerase Chain Reaction

VIRUSES	BIOEXCLUSION LEVEL	MICE		RATS		HAMSTERS	COTTON RATS	TEST METHODS
		BARRIER	ISOLATOR	BARRIER	ISOLATOR	BARRIER	BARRIER	
Kilham's Rat Virus (KRV)	1	-	-	M	Q	-	M ^a	ELISA or PCR
Mouse Hepatitis Virus (MHV)	1	M	Q	-	-	-	M ^a	Bead or PCR
Mouse Minute Virus (MMV)	1	M	Q	-	-	-	M ^a	Bead or PCR
Mouse Parvovirus (MPV)	1	M	Q	-	-	-	M ^a	Bead or PCR
Parvovirus NS-1	1	M	Q	M	Q	-	M ^a	ELISA (R), Bead (M) or PCR
Pneumonia Virus of Mice (PVM)	1	M	Q	M	Q	M	M ^a	ELISA (R), Bead (M) or PCR
Rotavirus (EDIM)	1	M	Q	-	-	-	M ^a	Bead or PCR
Rat Minute Virus (RMV)	1	-	-	M	Q	-	M ^a	ELISA or PCR
Rat Parvovirus (RPV)	1	-	-	M	Q	-	M ^a	ELISA or PCR
Rat Theiler Virus (RTV)	1	-	-	M	Q	-	M ^a	ELISA or PCR
Reovirus 3 (REO 3)	1	Q	Q	Q	Q	M	Q ^a	ELISA (R), Bead (M) or PCR
Sialodacryoadenitis Virus (SDAV/RCV)	1	-	-	M	Q	-	M ^a	ELISA or PCR
Sendai virus	1	M	Q	M	Q	M	M ^a	ELISA (R), Bead (M) or PCR
Theiler's Mouse Encephalomyelitis Virus (TMEV/GDVII)	1	M	Q	-	-	-	M ^a	ELISA (R), Bead (M) or PCR
Toolan's H-1 Parvovirus	1	-	-	M	Q	-	M ^a	ELISA or PCR
Mouse Norovirus (MNV)	1	Q	Q	-	-	-	Q ^a	Bead or PCR
Simian Virus 5 (SV-5)	1	-	-	-	-	M	-	ELISA or PCR
Ectromelia (Mousepox)	1	Semi	A	-	-	-	Semi ^a	Bead or PCR
Hantaan virus	1	Semi	A	Semi	A	-	Semi ^a	ELISA (R), Bead (M) or PCR
Lymphocytic Choriomeningitis Virus (LCMV)	1	Semi	A	Semi	A	M	Q ^a	ELISA (R), Bead (M) or PCR
Mouse Adenovirus-1 (MAD-1)	1	Semi	A	Semi	A	-	Semi ^a	ELISA (R), Bead (M) or PCR
Mouse Adenovirus-2 (MAD-2)	1	Semi	A	Semi	A	-	Semi ^a	ELISA (R), Bead (M) or PCR
Mouse Cytomegalovirus (MCMV)	1	Semi	A	-	-	-	Semi ^a	Bead or PCR
Polyoma Virus	1	Semi	A	-	-	-	Semi ^a	ELISA or PCR
K virus	1	Semi	A	-	-	-	Semi ^a	ELISA or PCR
Lactic Dehydrogenase-Elevating Virus (LDEV)	1	Semi	A	-	-	-	Semi ^a	ELISA or PCR
Mouse Thymic Virus (MTV)	1	Semi	A	-	-	-	Semi ^a	IFA or PCR

^a Cotton rats are not tested serologically; therefore, mouse or rat sentinels are utilized.

BACTERIA AND FUNGI	BIOEXCLUSION LEVEL	MICE		RATS		HAMSTERS	COTTON RATS	TEST METHODS
		BARRIER	ISOLATOR	BARRIER	ISOLATOR	BARRIER	BARRIER	
Bordetella bronchiseptica	3	Semi	A	Q	Q	Q	Q	Culture
Campylobacter jejuni	1	-	-	-	-	Q	-	Culture
CAR bacillus	1	Semi	A	Q	Q	-	Q ^a	ELISA or PCR
Citrobacter rodentium	1	Q	Q	-	-	-	Q ^a	Culture
Clostridium piliforme (Tyzzer's disease)	1	Q	Q	Q	Q	M	Q ^a	ELISA (R), Bead (M) or PCR
Corynebacterium bovis	1	-	Q	-	-	-	-	PCR
Corynebacterium kutscheri	1	Q	Q	Q	Q	Q	Q	Culture
Dermatophytes	1	Semi	Q	Semi	Q	-	Semi ^a	Culture
Encephalitozoon cuniculi	1	Semi	A	Semi	A	Q	Semi ^a	ELISA or PCR
Helicobacter spp.	1	Q	Q	Q	Q	Q	Q	PCR
Klebsiella oxytoca	3	Q	Q	Q	Q	Q	Q	Culture
Klebsiella pneumoniae	3	Q	Q	Q	Q	Q	Q	Culture
Lawsonia intracellularis	1	-	-	-	-	Q	-	ELISA or PCR
Mycoplasma pulmonis	1	Q	Q	Q	Q	Q	Q ^a	ELISA (R, H), Bead (M) or PCR
Pasteurella multocida	1	Semi	A	Semi	A	-	-	PCR
Pasteurella pneumotropica	1	M	Q	M	Q	Q	M	Culture
Pneumocystis spp.	1	Q	Q	Q	Q	Q	Q	IFA or PCR
Proteus mirabilis	3	-	Q	-	Q	-	-	Culture
Pseudomonas aeruginosa	2	Q	Q	Q	Q	Q	Q	Culture
Salmonella spp.	1	Q	Q	Q	Q	M	Q	Culture
Staphylococcus aureus	2	Q	Q	Q	Q	Q	Q	Culture
Streptococcus spp. Group B beta	3	Q	Q	Q	Q	Q	Q	Culture
Streptobacillus moniliformis	1	Semi	A	Q	Q	-	Q	PCR
Streptococcus pneumoniae	1	Q	Q	Q	Q	Q	Q	PCR

PARASITES	BIOEXCLUSION LEVEL	MICE		RATS		HAMSTERS	COTTON RATS	TEST METHODS
		BARRIER	ISOLATOR	BARRIER	ISOLATOR	BARRIER	BARRIER	
Endoparasites	1 / 2 ^b	M	Q	M	Q	M	M	Microscopy and PCR
Ectoparasites	1 / 2 ^c	M	Q	M	Q	M	M	Microscopy and PCR

^b Endoparasites in Bioexclusion Level 2 include Chilomastix sp., flagellates, Entamoeba muris, and trichomonads.

^c Ectoparasites in Bioexclusion Level 2 include Demodex spp. in hamsters.

All other endoparasites and all ectoparasites are Bioexclusion Level 1

Ordering information

For questions regarding our ordering and shipping guidelines, please contact us.

Inotiv
8520 Allison Pointe Blvd.,
Suite 400
Indianapolis, IN 46250
Attn: Customer Service Department

SMALL MODELS:

T 800.793.7287

E AIIICSDRMS@inotiv.com

LARGE MODELS:

T 800.793.7287

E DL-Customer-Services@inotiv.com

SMALL MODEL ORDERING INFORMATION

Orders may also be initiated via our website at inotiv.com/AIIICSDRMS. List prices are subject to change without notice. Current pricing will be listed on inotiv.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. Transportation will be made either by Inotiv owned vehicles or by third-party transport companies. 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, Inotiv 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 INOTIV'S ANIMALS

Animals purchased from Inotiv 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 Inotiv are for research use only.

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

Teklad Diets, Bedding and Enrichment Products purchased from Inotiv 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

Inotiv uses well-established techniques to successfully produce time mated rats, mice, hamsters, and rabbits. We use an impedance 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 for rodents 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, Inotiv cannot guarantee the minimum number of offspring per litter.

Inotiv will not ship animals which are in the last stage of gestation, as they 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 Inotiv's customer service department and provide detailed information regarding the animals involved.

Expected pregnancy rate

STOCK OR STRAIN	TIMED MATED ≤13 DAYS GESTATION (AT SHIPPING)	TIMED MATED ≥13 DAYS GESTATION (AT SHIPPING)	UNTIMED PREGNANT ≥13 DAYS GESTATION (AT SHIPPING)
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. Inotiv is not responsible for actual gestation and/or exact day of littering for untimed pregnant rodents.

Through and including February 28, 2023, in order to avoid charges, cancellations for timed mated animals must be received one week prior to mating date.

Effective March 1, 2023, and thereafter, to avoid charges, cancellations for time mated rats, mice and hamsters must still be received one week prior to mating date, however, cancelled orders for time mated rabbits will be charged at full price regardless of the amount of notice supplied.

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
Zip-Top Shipping Container w/ Viewing Windows & Gel Kits	\$30.00
Zip Top Double Wire Container w/ Viewing Windows & Gel	\$53.00
Plastic Shipping Container with Hydrogels	\$53.00
Zip Top MicroShipper with Two Innocages and Gel	\$90.00
Tattoo (rodents)	\$15.80
Ear Tag (rodents)	\$9.60
Import or export charges	\$1,250.00
Fish and Wildlife Declaration Fee	\$615.00
Veterinary Certificate	\$515.00

Shipping guidelines

SHIPPING

- Viewing windows, plus mylar lid liner for easy, convenient viewing of animal models
- Woven-edge screen for smooth handling
- ClearH₂O® gel hydration source
- Dimensions are 24.5"x16.25"x8"

ClearH₂O® gel is recognized by the research industry as an innovative hydration source. Our veterinary staff recommends ClearH₂O® 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).

** C57BL/6, BALB/c and Long Evans males are required to ship as cage mates.

*** Females may be possibly pregnant

HAMSTERS

WEIGHT (G)	MAXIMUM QUANTITY
25-60	16
61-74	14
74+	12
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

Inotiv

Who we are

Inotiv provides the broadest range of research models and related services to the pharmaceutical and biotechnology industries, government, academia, and other life science organizations.

Our business is founded on a dedication to exceptional customer service and the experience and expertise of our people. With locations worldwide, we are committed to helping customers realize the full potential of their research and products to bring life-changing therapies to people around the 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 at Inotiv we are dedicated to understanding your challenges, appreciating your perspectives and helping you achieve your goals.

EXCELLENT CUSTOMER EXPERIENCES

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.

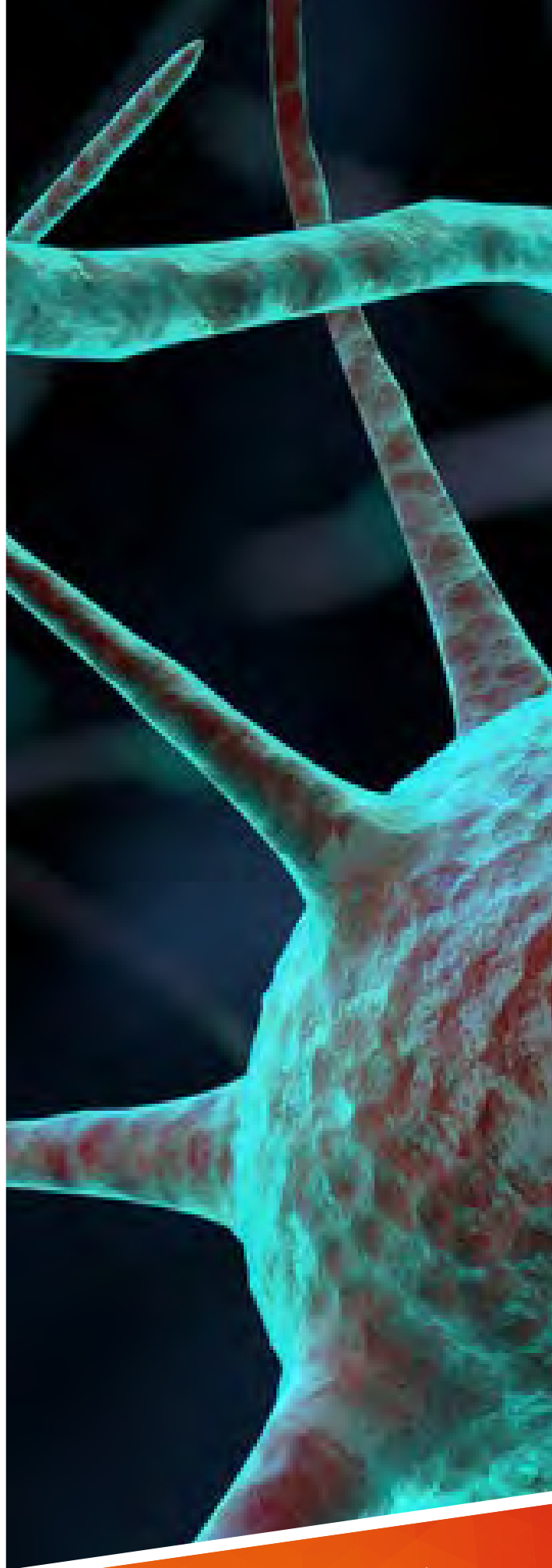
FOSTERING AND DEVELOPING SCIENTIFIC EXCELLENCE

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

Beyond our responsibility to customers, at Inotiv we 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 Inotiv, we exist to help our customers secure the potential of their research and products that enhance and enrich life.

Read more at [inotiv.com](https://www.inotiv.com)





Visit us at [inotiv.com](https://www.inotiv.com)