inotiv
analyze. answer. advance.

EFFECTIVE OCTOBER 1, 2024

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** today.

# Contents



* 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 (Including Transgenic Mouse) |
| **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 | + | | + | 10 |
| BALB/c | BALB/cAnNHsd | 047 | + | | | 11 |
| | BALB/cNHsd (IR) | 113 | + | + | | |
| | BALB/cOlaHsd | 162 | | + | + | * |
| C3H | C3H/HeNHsd | 040 | + | | + | 12 |
| C57BL/6 | C57BL/6JOlaHsd | 057 | | + | + | * |
| | C57BL/6JRccHsd | 043 | | | + | * |
| | C57BL/6NHsd | 044 | + | | + | 13 |
| | C57BL/6NHsd (IR) | 112 | + | + | | |
| C57BL/Ka | C57BL/KaLwRijHsd | 940 | | | + | * |
| CBA/Ca | CBA/CaOlaHsd | 209 | | | + | * |
| CBA | CBA/JCrHsd | 055 | + | | | 14 |
| DBA/1 | DBA/1OlaHsd | 105 | + | + | + | 15 |
| DBA/2 | DBA/2JRccHsd | 343 | | | + | * |
| | DBA/2NHsd | 042 | + | | | 15 |
| | DBA/2OlaHsd | 870 | | + | | * |
| FVB | FVB/NHan®Hsd | 862 | | + | + | * |
| | FVB/NHsd | 118 | + | | | 16 |
| NIH | NIH/OlaHsd | 059 | | + | | * |
| SAMP8 | SAMP8/TaHsd | 954 | + | | + | * |
| SAMR1 | SAMR1/TaHsd (control) | 956 | + | | + | * |
| SJL | SJL/JCrHsd | 052 | + | | | 16 |
| **OUTBRED MICE** | | | | | | |
| ICR (CD-1®) | Hsd:ICR (CD-1®) | 030 | + | + | + | 17 |
| ND4 Swiss Webster | Hsd:ND4 | 032 | + | | | 17 |
| NIH Swiss | Hsd:NIHS | 035 | + | + | | 18 |
| 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 | + | | | 18 |
| TO | HsdOla:TO | 876 | | + | | * |
| **MUTANT MICE (Spontaneous)** | | | | | | |
| ***Nudes*** | | | | | | |
| Athymic Nude | Hsd:Athymic Nude-*Foxn1*$^{nu}$ | 069 | + | + | + | 22 |
| | Hsd:Athymic Nude-*Foxn1*$^{nu}$/*Foxn1*$^{+}$ | 070 | + | + | + | 22 |
| BALB/c Nude | BALB/cOlaHsd-*Foxn1*$^{nu}$ | 165 | | | + | * |
| | BALB/cOlaHsd-*Foxn1*$^{nu}$/*Foxn1*$^{+}$ | 886 | | | + | * |
| NMRI Nude | HsdCpb:NMRI-*Foxn1*$^{nu}$ | 889 | | | + | * |
| | HsdCpb:NMRI-*Foxn1*$^{nu}$/*Foxn1*$^{+}$ | 890 | | | + | * |
| ***SCIDs*** | | | | | | |
| NOD.SCID | NOD.CB17-*Prkdc*$^{scid}$/NCrHsd | 170 | + | | + | 23 |
| SCID | C.B-17/IcrHan®Hsd-*Prkdc*$^{scid}$ | 883 | | + | + | * |
| | C.B-17/IcrHsd-*Prkdc*$^{scid}$ | 182 | + | | | 24 |
| SCID/Beige | C.B-17/IcrHsd-*Prkdc*$^{scid}$*Lyst*$^{bg-J}$ | 186 | + | | + | 24 |
| ***Diabetic/Obese*** | | | | | | |
| Diabetic *(db/db)* | BKS.Cg- + *Lepr*$^{db}$/+*Lepr*$^{db}$/OlaHsd | 173 | + | | + | 25 |
| | BKS.Cg-*Dock7*$^{m}$+/+ *Lepr*$^{db}$/OlaHsd | H174 | + | | + | 25 |
| | BKS.Cg-(Lean)/OlaHsd | 174 | + | | + | 25 |
| ***Other*** | | | | | | |
| Albino C57BL/6 | C57BL/6BrdCrHsd-*Tyr*$^{c}$ | 103 | + | + | + | 26 |
| **GEMS MICE** | | | | | | |
| R2G2® | B6;129-*Rag2*$^{tm1Fwa}$ *Il2rg*$^{tm1Rsky}$/DwlHsd | 021 | + | + | + | 27 |
| B-NDG | NOD.CB17-*Prkdc*$^{scid}$*Il2rg*$^{tm1}$/BcgenHsd | 126 | + | | + | 28 |
| B-NDG B2m | *NOD.CB17-Prkdc*$^{scid}$*Il2rg*$^{tm1}$*B2m*$^{tm1}$*Fcgrt*$^{tm1(B2m)}$*/BcgenHsd* | 405 | + | + | + | 29 |
| B-NDG hIL15 | *NOD.CB17-Prkdc*$^{scid}$*Il2rg*$^{tm1}$*Il15*$^{tm1(IL15)}$*/BcgenHsd* | 406 | + | | + | 30 |
| **COVID MICE** | | | | | | |
| hACE2 | C57BL/6Hsd-*Ace2*$^{em1(ACE2)Env}$ | 492 | + | | | 33 |
| hTmprss2 | C57BL/6Hsd-*Tmprss2*$^{em1(TMPRSS2)Env}$ | 494 | + | | | 34 |

# Worldwide stocks and strains
## Production locations

| COMMON NAME | NOMENCLATURE | CODE | US | UK | NED | PG# |
|---|---|---|---|---|---|---|
| **HYBRID MICE**** | | | | | | |
| B6C3F1 | B6C3F1/Hsd | 061 | + | | | 31 |
| | B6C3F1/OlaHsd | 946 | | | + | * |
| B6CBAF1 | B6CBAF1/OlaHsd | 045 | | | + | * |
| B6D2F1 | B6D2F1/Hsd | 063 | + | | | 31 |
| | B6D2F1/JRccHsd | 344 | | | + | * |
| CB6F1 | CB6F1/Hsd | 065 | + | | | 32 |
| | CB6F1/OlaHsd | 949 | | | + | * |
| CD2F1 | CD2F1/Hsd | 060 | + | | | 32 |
| CSJLF1 | CSJLF1/HliHsd | 969 | | | | * |
| **INBRED RATS** | | | | | | |
| Brown Norway | BN/RijHsd | 147 | + | | | 36 |
| DA (Dark Agouti) | DA/OlaHsd | 092 | + | + | | 37 |
| Fischer 344 | F344/NHsd | 010 | + | | | 38 |
| Lewis | LEW/SsNHsd | 017 | + | | | 38 |
| Spontaneously Hypertensive | SHR/NHsd | 022 | + | | | 39 |
| Wistar Kyoto | WKY/NHsd | 023 | + | | | 40 |
| **OUTBRED RATS** | | | | | | |
| Holtzman® | HsdHot:Holtzman® | 003 | + | | | 41 |
| Lister Hooded | HsdOla:LH | 119 | | + | + | * |
| Long Evans | HsdBlu:LE | 140 | + | | | 41 |
| Sprague Dawley® | Hsd:Sprague Dawley® SD® | 002 | + | + | + | 43 |
| Wistar | Hsd:WI | 001 | + | | | 42 |

* 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 | + | + | + | 44 |
| **MUTANT RATS** | | | | | | |
| ***Nudes*** | | | | | | |
| Athymic Nude | Hsd:RH-*Foxn1*$^{mu}$ | 005 | + | | + | 46 |
| | Hsd:RH-*Foxn1*$^{mu}$/*Foxn1*$^{+}$ | 006 | + | | + | 46 |
| *Spontaneous Mutants* | | | | | | |
| Zucker | HsdHlr:ZUCKER-*Lepr*$^{fa}$ | 194 | + | | | 47 |
| | HsdHlr:ZUCKER-*Lepr*$^{fa}$/*Lepr*$^{+}$ | H195 | + | | | 47 |
| | HsdHlr:ZUCKER-*Lepr*$^{+}$ | W195 | + | | | 47 |
| **GEMS RATS** | | | | | | |
| Pink1 | HsdSage: LE-*Pink1*$^{em1Sage}$ | 372 | + | | | 48 |
| Mdr1a | HsdSage: SD-*Mdr1a*$^{em1sage}$ | 364 | + | | | 49 |
| Mdr1a-Bcrp | HsdSage: SD-*Mdr1a*$^{em1sage}$ *Abcg2*$^{em1sage}$ | 363 | + | | | 50 |
| **COVID RATS** | | | | | | |
| hACE2 | Hsd:SD-*Ace2*$^{em1(ACE2)Env}$ | 493 | + | | | 51 |
| **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 | + | + | | 53 |
| **COTTON RATS** | | | | | | |
| Cotton Rat | Hsd:Cotton Rat | 201 | + | | | 54 |
| **RABBITS** | | | | | | |
| New Zealand White | HsdHra:(NZW) SPF | 221 | + | | | 55 |
| | Hsdlf:NZW | 444 | | + | | * |
| Dutch Belted | HsdHra:DB (SPF) | 222 | + | | | 56 |
| **NONHUMAN PRIMATES** | | | | | | |
| Cynomolgus macaques | *M. fascicularis* | 226/ 228 | + | | | 57 |
| Rhesus macaques | *M. mulatta* | 224 | + | | | 57 |

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

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

MODEL CODE
049

# A

NOMENCLATURE: A/JOlaHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $191.10 | $222.95 |
| 4-5 | $205.95 | $236.20 |
| 5-6 | $220.80 | $263.55 |
| 6-7 | $230.85 | $276.30 |
| 7-8 | $263.20 | $331.00 |
| 8-9 | $289.40 | $357.20 |
| 9-10 | $315.50 | $383.25 |
| Over 10 weeks, add per week | $26.05 | $26.05 |
| Proven breeder | $384.70 | $421.45 |
| Retired breeder | $361.60 | $361.60 |
| Untimed pregnant* | | $999.20 |
| Timed mated* | | $1,331.55 |
| Female with litter | | $1,387.30 |

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

**Albino.** From G.D. Searle to Harlan Olac, United Kingdom, in 1978; to Harlan, United States, in 1993. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

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 | $35.85 | $37.45 |
| 4-5 | 13-17g | 12-15g | $38.20 | $39.05 |
| 5-6 | 17-20g | 15-18g | $42.75 | $41.70 |
| 6-7 | 18-22g | 15-19g | $43.65 | $42.75 |
| 7-8 | 20-23g | 17-19g | $44.70 | $46.20 |
| 8-9 | | | $47.30 | $51.15 |
| 9-10 | | | $52.35 | $53.60 |
| Over 10 weeks, add per week | | | $5.70 | $5.40 |
| Untimed pregnant* | | | | $310.85 |
| Timed mated* | | | | $340.05 |
| Female with litter | | | | $383.90 |
| Proven breeder | | | $48.05 | $51.60 |
| Retired breeder | | | $34.25 | $37.20 |

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

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

## CHARACTERISTICS

- Litter average: 6.0
- Docile disposition
- Haplotype: *H-2* $^{d}$
- Experimental allergic encephalomyelitis resistant

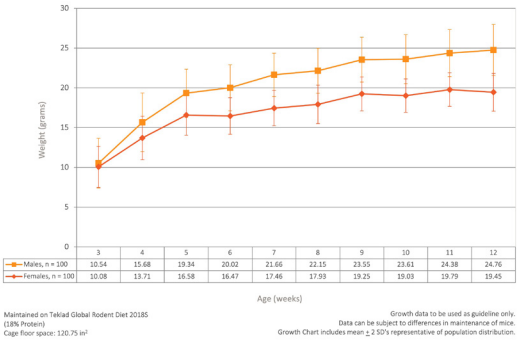
## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

## RESEARCH USE

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

## BALB/cAnNHsd




MODEL CODE
113

NEW

# BALB/c

## Biosecure Plus™ - Isolator raised, SOPF health status

NOMENCLATURE: BALB/cAnNHsd

| AGE (WEEKS) | APPROX. WEIGHT (G) | | PRICE PER ANIMAL | |
|---|---|---|---|---|
| | MALE | FEMALE | MALE | FEMALE |
| 3-4 | up to approx 13g | up to approx 12g | $55.05 | $57.55 |
| 4-5 | 14-19g | 12-16g | $58.75 | $60.05 |
| 5-6 | 18-22g | 15-18g | $65.70 | $64.05 |
| 6-7 | 20-23g | 16-19g | $67.05 | $65.70 |
| 7-8 | 21-25g | 17-20g | $68.65 | $71.05 |
| 8-9 | | | $72.65 | $78.60 |
| 9-10 | | | $80.50 | $82.35 |
| Over 10 weeks, add per week | Pricing available upon request | | | |
| Female with litter | Pricing available upon request | | | |
| Retired breeder | Pricing available upon request | | | |

**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

## RESEARCH USE

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

MODEL CODE
040

# C3H

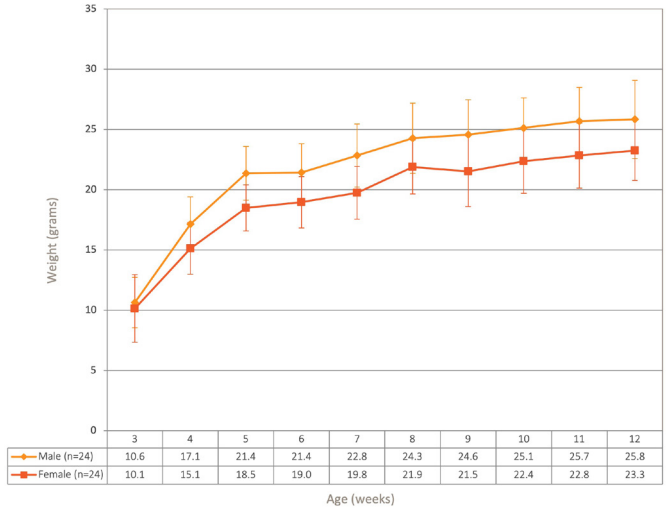
NOMENCLATURE: C3H/HeNHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $48.10 | $48.45 |
| 4-5 | $50.00 | $52.45 |
| 5-6 | $53.50 | $58.80 |
| 6-7 | $58.05 | $62.35 |
| 7-8 | $64.30 | $64.50 |
| 8-9 | $71.85 | $72.35 |
| 9-10 | $79.55 | $80.40 |
| Over 10 weeks, add per week | $7.65 | $7.90 |
| Proven breeder | $67.55 | $76.00 |
| Retired breeder | $42.50 | $48.45 |
| Untimed pregnant* | | $431.50 |
| Timed mated* | | $449.70 |
| Female with litter | | $482.50 |

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

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

## C3H/HeNHsd




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=24) | 10.6 | 17.1 | 21.4 | 21.4 | 22.8 | 24.3 | 24.6 | 25.1 | 25.7 | 25.8 |
| Female (n=24) | 10.1 | 15.1 | 18.5 | 19.0 | 19.8 | 21.9 | 21.5 | 22.4 | 22.8 | 23.3 |

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 ± 2 SD's representative of population distribution.

## CHARACTERISTICS

- Litter Average: 5.0
- Haplotype: *H-2* $^{k}$
- Carrier of the retinal degeneration (*Pde6br*$^{rd1}$) mutation
- Normal response to LPS
- Highly susceptible to Anthrax toxin

## RESEARCH USE

- General Purpose
- Ocular Disease
- Immunology

## ADDITIONAL AVAILABLE DATA

- Clinical chemistry
- Hematology

MODEL CODE
044

# C57BL/6

NOMENCLATURE: C57BL/6NHsd

| AGE (WEEKS) | APPROX. WEIGHT (G) | | PRICE PER ANIMAL | |
|---|---|---|---|---|
| | MALE | FEMALE | MALE | FEMALE |
| 3-4 | Up to 13g | Up to 12g | $35.50 | $38.80 |
| 4-5 | 14-19 | 12-16 | $38.70 | $40.55 |
| 5-6 | 18-22 | 15-18 | $42.50 | $43.15 |
| 6-7 | 20-23 | 16-19 | $47.45 | $43.60 |
| 7-8 | 21-25 | 17-20 | $48.10 | $44.25 |
| 8-9 | | | $53.65 | $49.00 |
| 9-10 | | | $59.35 | $54.65 |
| Over 10 weeks, add per week | | | $6.20 | $6.15 |
| Untimed pregnant* | | | | $336.60 |
| Timed mated* | | | | $390.55 |
| Female with litter | | | | $478.85 |
| Proven breeder | | | $56.90 | $58.70 |
| Retired breeder | | | $36.40 | $36.40 |

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

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

## CHARACTERISTICS

- Litter average: 6.0
- Haplotype: *H-2*$^{b}$
- Most widely-used inbred strain
- Low tumor incidence
- High preference for alcohol
- Microphthalmia
- Incidence of micropthalmia

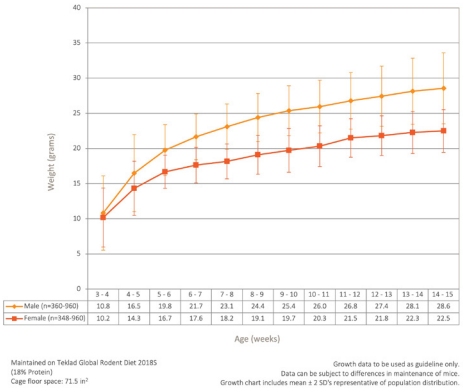
## RESEARCH USE

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

## ADDITIONAL AVAILABLE DATA

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

## C57BL/6NHsd




MODEL CODE
112

NEW

# C57BL/6

## Biosecure Plus™ - Isolator raised, SOPF health status

NOMENCLATURE: C57BL/6NHsd

| AGE (WEEKS) | APPROX. WEIGHT (G) | | PRICE PER ANIMAL | |
|---|---|---|---|---|
| | MALE | FEMALE | MALE | FEMALE |
| 3-4 | Up to 13g | Up to 12g | $55.05 | $57.55 |
| 4-5 | 14-19 | 12-16 | $58.75 | $60.05 |
| 5-6 | 18-22 | 15-18 | $65.70 | $64.05 |
| 6-7 | 20-23 | 16-19 | $67.05 | $65.70 |
| 7-8 | 21-25 | 17-20 | $68.65 | $71.05 |
| 8-9 | | | $72.65 | $78.60 |
| 9-10 | | | $80.50 | $82.35 |
| Over 10 weeks, add per week | Pricing available upon request | | | |
| Female with litter | Pricing available upon request | | | |
| Retired breeder | Pricing available upon request | | | |

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

## CHARACTERISTICS

- Litter average: 6.0
- Haplotype: *H-2*$^{b}$
- Most widely-used inbred strain
- Low tumor incidence
- High preference for alcohol
- Microphthalmia
- Incidence of micropthalmia

## RESEARCH USE

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

Aging available
See page 81

MODEL CODE
055

# CBA

NOMENCLATURE: CBA/JCrHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $58.90 | $63.30 |
| 4-5 | $63.30 | $68.90 |
| 5-6 | $68.90 | $74.55 |
| 6-7 | $74.55 | $80.40 |
| 7-8 | $80.40 | $85.85 |
| Over 8 weeks, add per week | $8.55 | $8.55 |
| Untimed pregnant* | | $430.85 |
| Timed mated* | | $599.25 |
| Female with litter | | $478.85 |
| Proven breeder | $84.65 | $99.85 |
| Retired breeder | $63.35 | $75.00 |

* 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 (*Pde6b*$^{rd1}$) mutation
- Susceptible to radiation
- High incidence of mammary tumors in females

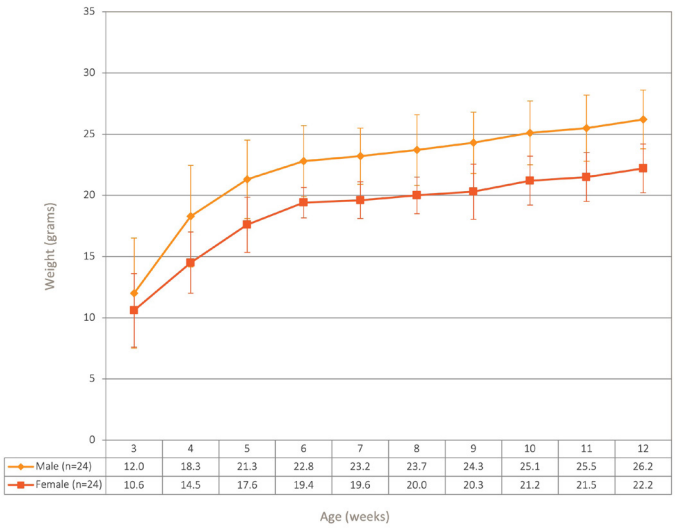
## RESEARCH USE

- 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




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=24) | 12.0 | 18.3 | 21.3 | 22.8 | 23.2 | 23.7 | 24.3 | 25.1 | 25.5 | 26.2 |
| Female (n=24) | 10.6 | 14.5 | 17.6 | 19.4 | 19.6 | 20.0 | 20.3 | 21.2 | 21.5 | 22.2 |

Maintained on Teklad Global Rodent Diet 2018S (18% Protein)
Cage floor space: 120.75 in$^2$

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
105

# DBA/1

**NOMENCLATURE:** DBA/1OlaHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $76.35 | $76.35 |
| 4-5 | $81.20 | $81.20 |
| 5-6 | $86.30 | $86.30 |
| 6-7 | $90.95 | $90.95 |
| 7-8 | $95.70 | $95.70 |
| 8-9 | $105.00 | $105.00 |
| 9-10 | $114.15 | $114.15 |
| Over 10 weeks, add per week | $9.25 | $9.25 |
| Proven breeder | $86.30 | $107.25 |
| Retired breeder | $52.85 | $65.95 |
| Untimed pregnant* | | $486.40 |
| Timed mated* | | $525.65 |
| Female with litter | | $557.55 |

* 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*$^{q}$

## RESEARCH USE

- Adjuvant-induced arthritis
- Immunology
- Inflamation

MODEL CODE
042

# DBA/2

**NOMENCLATURE:** DBA/2NHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $88.60 | $92.50 |
| 4-5 | $97.00 | $101.35 |
| 5-6 | $98.85 | $108.40 |
| 6-7 | $106.75 | $113.55 |
| 7-8 | $119.45 | $118.25 |
| 8-9 | $130.55 | $129.35 |
| 9-10 | $141.70 | $140.20 |
| Over 10 weeks, add per week | $11.25 | $11.00 |
| Proven breeder | $109.35 | $124.85 |
| Retired breeder | $74.50 | $74.85 |
| Untimed pregnant* | | $556.00 |
| Timed mated* | | $568.10 |
| Female with litter | | $637.35 |

* 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.

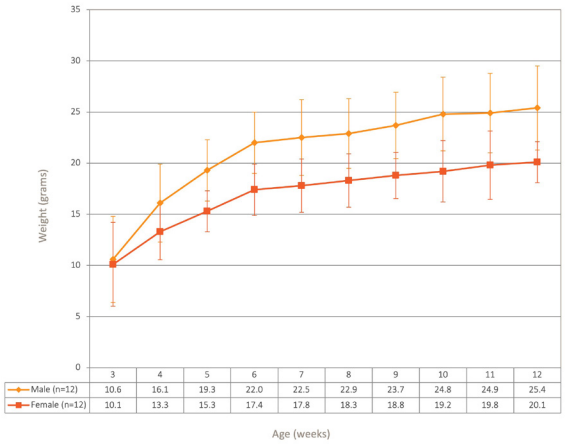
## CHARACTERISTICS

- 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 ± 2 SD's representative of population distribution.

MODEL CODE
118

# FVB

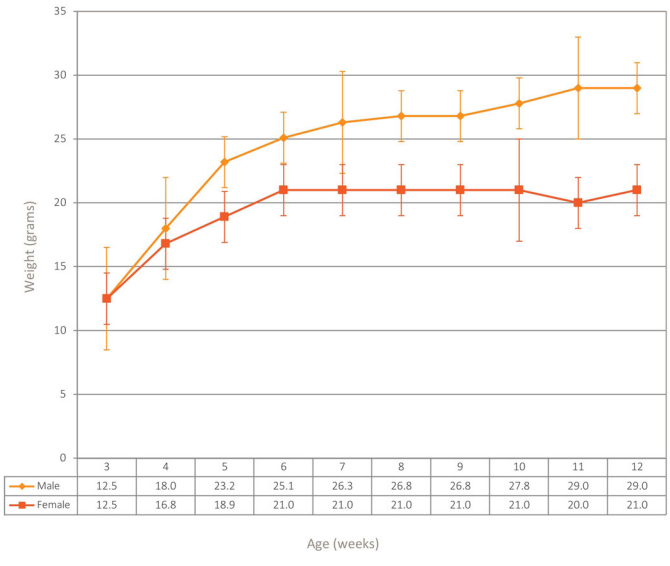
NOMENCLATURE: FVB/NHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $44.25 | $48.35 |
| 4-5 | $50.85 | $54.10 |
| 5-6 | $59.00 | $63.30 |
| 6-7 | $72.00 | $72.75 |
| 7-8 | $80.45 | $81.40 |
| 8-9 | $80.85 | $85.45 |
| 9-10 | $81.20 | $90.50 |
| Over 10 weeks, add per week | $4.75 | $5.30 |
| Proven breeder | $64.05 | $75.75 |
| Retired breeder | $49.75 | $58.90 |
| Untimed pregnant* | | $508.35 |
| Timed mated* | | $508.35 |
| Female with litter | | $388.55 |

* 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 ± 2 SD's representative of population distribution.

MODEL CODE
052

# SJL

NOMENCLATURE: SJL/JCrHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $89.90 | $96.05 |
| 4-5 | $95.35 | $101.45 |
| 5-6 | $100.80 | $114.60 |
| 6-7 | $108.30 | $117.90 |
| 7-8 | $115.40 | $124.30 |
| 8-9 | $140.90 | $150.15 |
| 9-10 | $149.70 | $165.15 |
| 10-11 | $159.55 | $168.60 |
| 11-12 | $169.45 | $178.40 |
| 12-13 | $178.75 | $189.60 |
| Untimed pregnant* | | $852.10 |
| Female with litter | | $1,002.45 |

* 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.

MODEL CODE
030

# ICR (CD-1®)

NOMENCLATURE: Hsd:ICR (CD-1®)

| WEIGHT (G) | PRICE PER ANIMAL |
|---|---|
| Up to 11 | $11.45 |
| 12-14 | $12.65 |
| 15-17 | $12.70 |
| 18-20 | $12.90 |
| 21-24 | $13.10 |
| 25-30 | $13.85 |
| 31-34 | $14.95 |
| 35+ | $16.30 |
| Untimed pregnant* | $71.25 |
| Timed mated* | $111.50 |
| Female with litter | $157.95 |
| Proven breeder | $70.90 |
| Retired breeder | $13.10 |

* 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 (*Pde6b*$^{rd1}$)

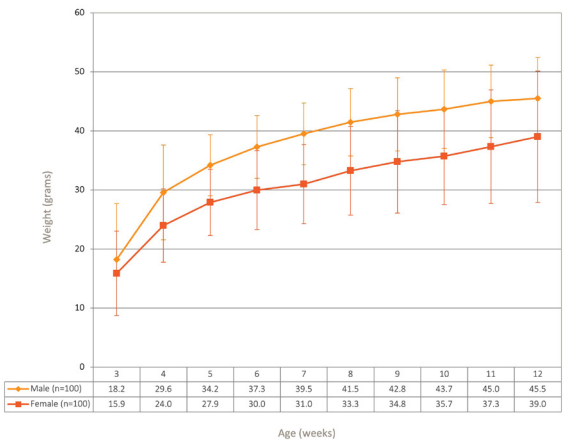
## RESEARCH USE

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

## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

## Hsd:ICR (CD-1®)




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=100) | 18.2 | 29.6 | 34.2 | 37.3 | 39.5 | 41.5 | 42.8 | 43.7 | 45.0 | 45.5 |
| Female (n=100) | 15.9 | 24.0 | 27.9 | 30.0 | 31.0 | 33.3 | 34.8 | 35.7 | 37.3 | 39.0 |

MODEL CODE
032

# ND4 Swiss Webster

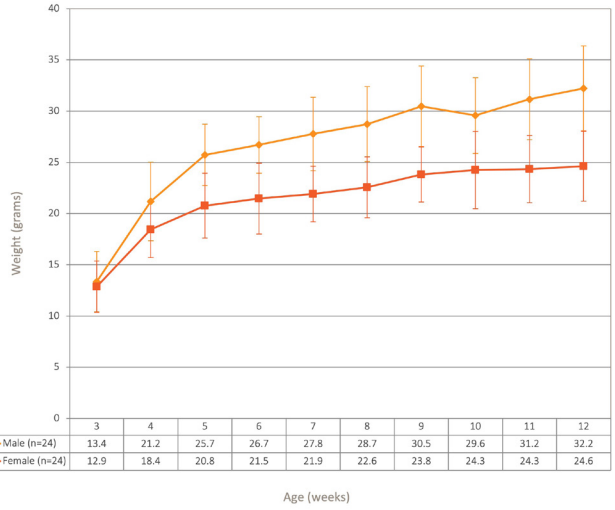
NOMENCLATURE: Hsd:ND4

| WEIGHT (G) | PRICE PER ANIMAL |
|---|---|
| Up to 11 | $14.20 |
| 12-14 | $15.50 |
| 15-17 | $15.60 |
| 18-20 | $15.80 |
| 21-24 | $16.10 |
| 25-30 | $16.60 |
| 31-34 | $18.10 |
| 35+ | $19.45 |
| 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




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=24) | 13.4 | 21.2 | 25.7 | 26.7 | 27.8 | 28.7 | 30.5 | 29.6 | 31.2 | 32.2 |
| Female (n=24) | 12.9 | 18.4 | 20.8 | 21.5 | 21.9 | 22.6 | 23.8 | 24.3 | 24.3 | 24.6 |

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 ± 2 SD's representative of population distribution.

MODEL CODE
035

# NIH Swiss

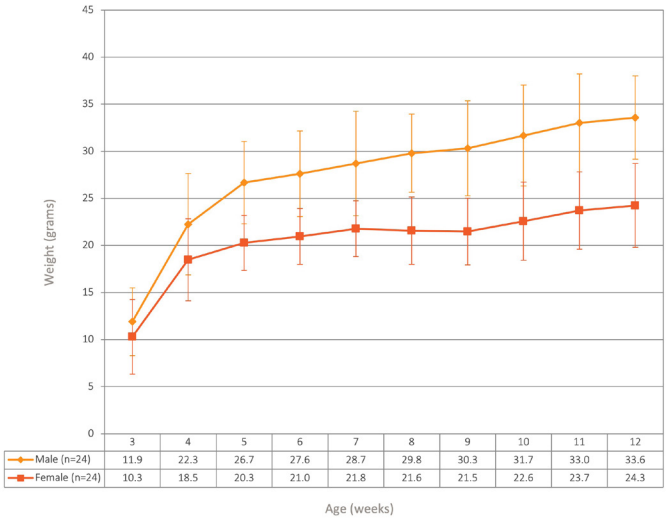
**NOMENCLATURE:** Hsd:NIHS

| WEIGHT (G) | PRICE PER ANIMAL |
|---|---|
| Up to 11 | $31.50 |
| 12-14 | $32.55 |
| 15-17 | $33.15 |
| 18-20 | $33.60 |
| 21-24 | $34.20 |
| 25-30 | $35.15 |
| 31-34 | $35.70 |
| 35+ | $36.65 |
| Untimed pregnant* | $139.10 |
| Timed mated* | $256.35 |
| Female with litter | $329.10 |
| Proven breeder | $133.40 |
| Retired breeder | $24.55 |

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

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

## Hsd:NIHS




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=24) | 11.9 | 22.3 | 26.7 | 27.6 | 28.7 | 29.8 | 30.3 | 31.7 | 33.0 | 33.6 |
| Female (n=24) | 10.3 | 18.5 | 20.3 | 21.0 | 21.8 | 21.6 | 21.5 | 22.6 | 23.7 | 24.3 |

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 ± 2 SD's representative of population distribution.

MODEL CODE
033

# NSA (Non-Swiss Albino)

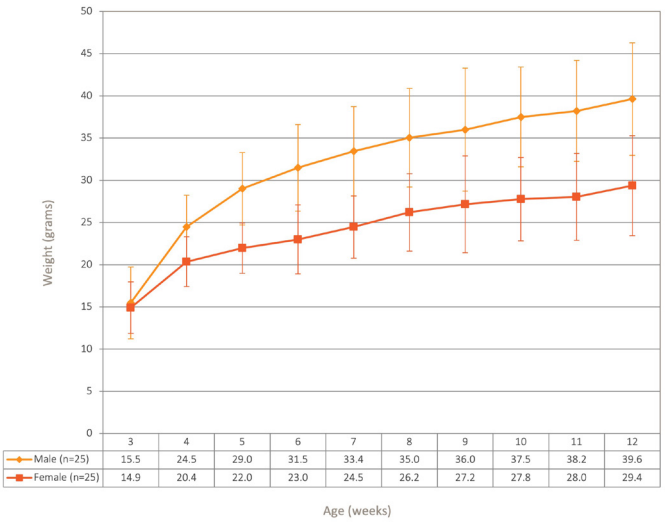
**NOMENCLATURE:** Hsd:NSA (CF-1®)

| WEIGHT (G) | PRICE PER ANIMAL |
|---|---|
| Up to 11 | $12.20 |
| 12-14 | $13.35 |
| 15-17 | $13.40 |
| 18-20 | $13.45 |
| 21-24 | $13.75 |
| 25-30 | $14.35 |
| 31-34 | $15.25 |
| 35+ | $16.90 |
| Untimed pregnant* | $73.85 |
| Timed mated* | $118.00 |
| Female with litter | $165.60 |
| Proven breeder | $67.60 |
| Retired breeder | $13.30 |

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

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

## Hsd:NSA (CF-1®)




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=25) | 15.5 | 24.5 | 29.0 | 31.5 | 33.4 | 35.0 | 36.0 | 37.5 | 38.2 | 39.6 |
| Female (n=25) | 14.9 | 20.4 | 22.0 | 23.0 | 24.5 | 26.2 | 27.2 | 27.8 | 28.0 | 29.4 |

Maintained on Teklad Global Rodent Diet 2018S (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 ± 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 |
| B-NDG B2m Mouse | 29 | Yes | Nonfunctional | Nonfunctional | Nonfunctional |
| B-NDG hIL15 | 30 | Yes | Nonfunctional | Nonfunctional | Nonfunctional |

## Models

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

*Pages 10-57*

## Diets

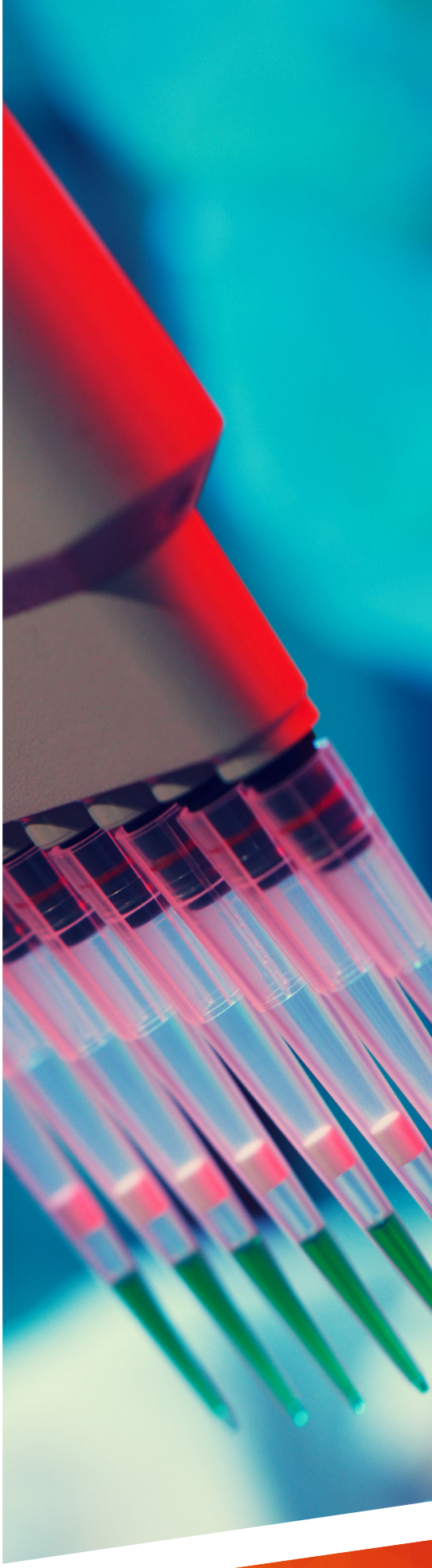
Largest global provider of lab animal diets designed to minimize research variables.

*Pages 58-67*

## Services

Tumor models and 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] | | + | |
| | BMC-2147 [274] | | + | |
| Liver | AKH23 [307] | | + | |
| | KFJ18 [307] | | + | |
| Lung | (NSCLC PDX) [272] | | + | |
| Pancreatic | JH033 [272] | + | | |

| 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] | | + | |

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

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

# Tumor models and services.

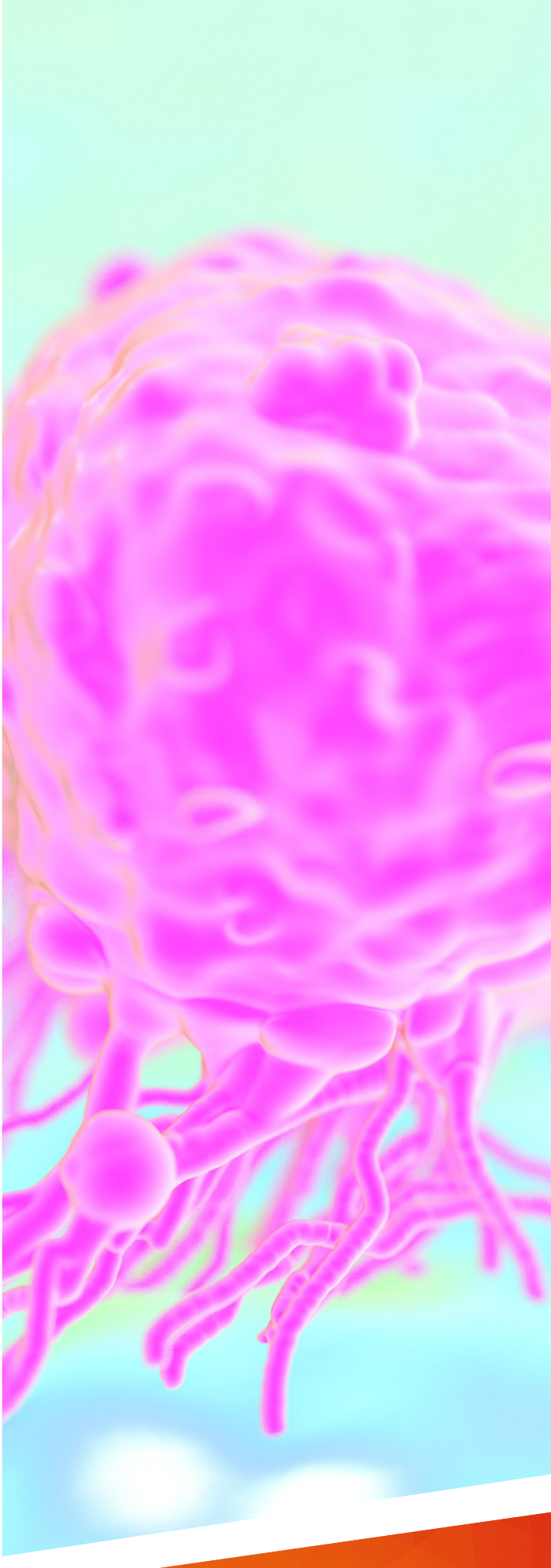
As personalized medicine takes center stage in cancer treatment, the need for reliable preclinical models has never been greater. Inotiv empowers researchers with industry-leading Patient-Derived Xenograft (PDX) models to bridge the gap between patient tumors and effective therapies.

## We provide services to establish and propagate PDX lines

| | |
|---|---|
| **EFFICACY TESTING** | • *In vivo* efficacy testing of PDX tumors<br>• Downstream support of PK and PD analysis |
| **UNGRAFTED PDX CELLS** | • Viable, frozen PDX cells (5-10 M/vial) for propagation in mice or *ex-vivo* analysis |
| **NON-VIABLE ANALYSIS MATERIALS** | • FFPE blocks/FFPE slides |

Inotiv is the exclusive provider of Washington University Human in Mouse (WHIM) from Washington University in St. Louis, and Wistar Melanoma (WM) cells from the Wistar Institute. These highly regarded cells are well characterized, frequently published, and come with the technical support of Inotiv's experienced scientists. Utilize these tumors in-house or design a study for our scientists to execute at Inotiv. Additionally, we are able to provide tumor model services for cell-line derived xenograft (CDX) and syngeneic models.

For more information on our tumor models and services, please visit **inotiv.com** or contact us at **RMSinfo@inotiv.com**



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 | $100.00 | $116.20 | $77.50 | $89.35 | $61.05 | $75.40 |
| 4-5 | $100.30 | $116.35 | $77.60 | $90.00 | $63.55 | $76.10 |
| 5-6 | $100.60 | $116.40 | $78.25 | $90.60 | $64.25 | $76.30 |
| 6-7 | $111.15 | $129.20 | $88.75 | $104.90 | $74.60 | $90.65 |
| 7-8 | $111.85 | $129.90 | $90.15 | $105.40 | $76.75 | $90.80 |
| 8-9 | $121.40 | $139.55 | $100.10 | $115.25 | $90.50 | $100.70 |
| | | | | | MALE | FEMALE |
| Over 9 weeks, add per week | | | | | $9.70 | $9.95 |
| Proven breeder | | | | | $268.10 | |
| Retired breeder | | | | | $85.40 | |
| 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

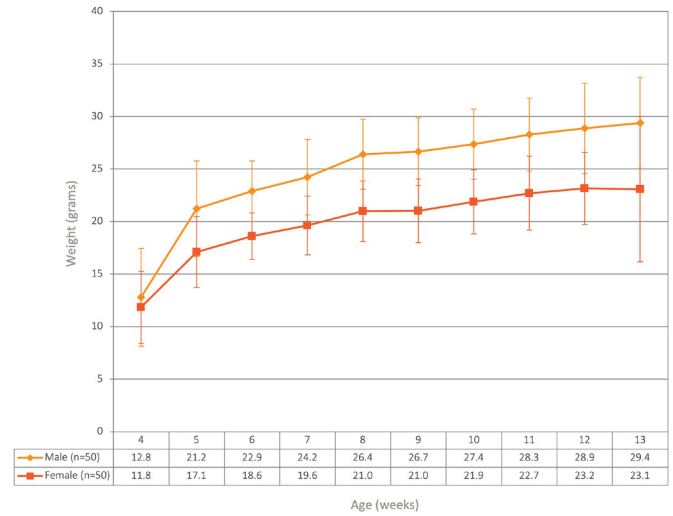
## RESEARCH USE

- 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 in$^2$

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 | $37.90 |
| 4-5 | $45.50 |
| 5-6 | $54.45 |
| 6-7 | $61.65 |
| 7-8 | $69.45 |
| Over 8 weeks, add per week | $12.00 |
| Proven breeder | $226.55 |
| Retired breeder | $45.10 |

* 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.*

MODEL CODE
170

# NOD.SCID

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

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $176.05 | $186.50 |
| 4-5 | $176.05 | $186.50 |
| 5-6 | $176.05 | $186.50 |
| 6-7 | $189.95 | $206.05 |
| 7-8 | $190.60 | $206.35 |
| Over 8 weeks, add per week | $20.55 | $18.95 |

**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

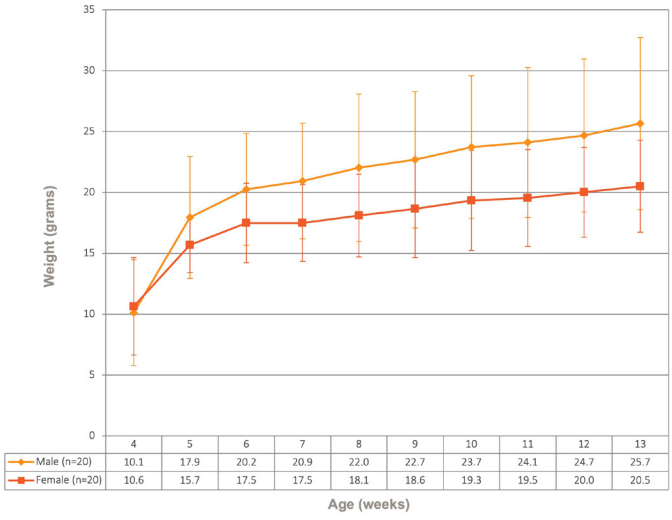
## RESEARCH USE

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

## ADDITIONAL AVAILABLE DATA

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

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




| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=20) | 10.1 | 17.9 | 20.2 | 20.9 | 22.0 | 22.7 | 23.7 | 24.1 | 24.7 | 25.7 |
| Female (n=20) | 10.6 | 15.7 | 17.5 | 17.5 | 18.1 | 18.6 | 19.3 | 19.5 | 20.0 | 20.5 |

Maintained on Teklad Global Rodent Diet 2919
(19% Protein)
Cage floor space: 71.5 in$^2$

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
182

# SCID

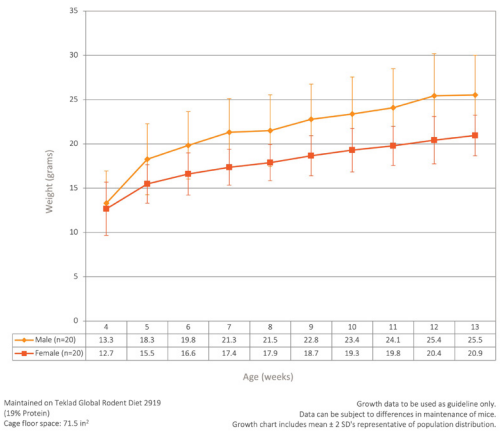
NOMENCLATURE: C.B-17/IcrHsd-*Prkdc*$^{scid}$

| AGE (WEEKS) | PRICE PER ANIMAL |
|---|---|
| 3-4 | $133.00 |
| 4-5 | $133.00 |
| 5-6 | $142.45 |
| 6-7 | $150.05 |
| 7-8 | $158.95 |
| Over 8 weeks, add per week | $13.30 |

**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/IcrHsd-*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)

MODEL CODE
186

# SCID/Beige

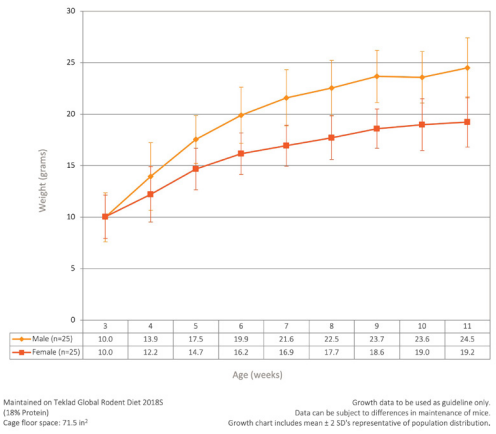
NOMENCLATURE: C.B-17/IcrHsd-*Prkdc*$^{scid}$ *Lyst*$^{bg-J}$

| AGE (WEEKS) | PRICE PER ANIMAL |
|---|---|
| 3-4 | $135.30 |
| 4-5 | $135.30 |
| 5-6 | $143.55 |
| 6-7 | $151.45 |
| 7-8 | $158.75 |
| Over 8 weeks, add per week | $13.55 |

**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/IcrHsd-*Prkdc*$^{scid}$*Lyst*$^{bg-J}$




### CHARACTERISTICS

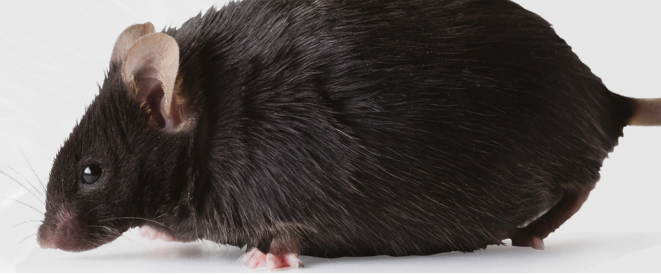
- Autosomal-recessive, single-nucleotide polymorphism within *Prkdc* gene on chromosome 16
- Autosomal-recessive beige *(bg-J)* mutation on chromosome 13
- Severe combined immunodeficiency affecting T- and B-cell development
- Severe lymphopenia
- Diminished Natural Killer (NK) cell activity relative 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)



**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 | $257.20 | $172.30 |
| 4-5 | $257.20 | $172.30 |
| 5-6 | $260.25 | $176.10 |
| 6-7 | $263.30 | $180.60 |
| 7-8 | $266.35 | $184.75 |
| Over 8 weeks, add per week | $9.35 | $6.65 |
| Retired Breeder | $278.60 | $146.95 |

**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

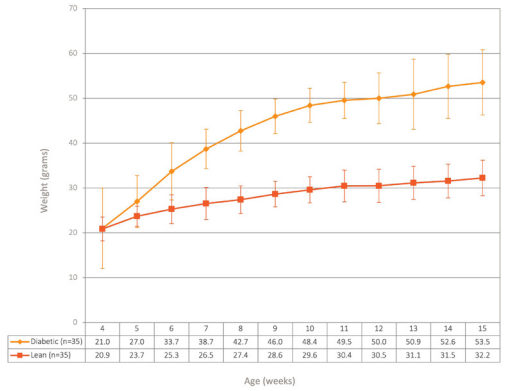
## RESEARCH USE

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

## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry
- Glucose tolerance test

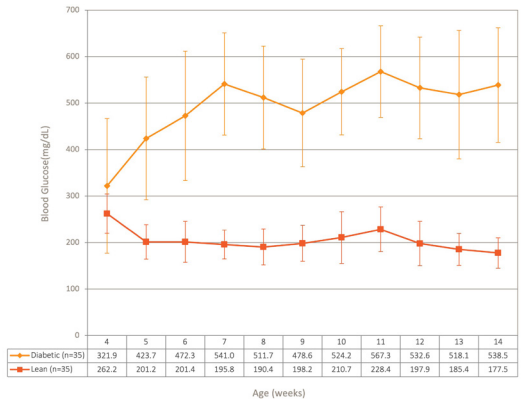
## BKS.Cg- + *Lepr$^{db}$*/+ *Lepr$^{db}$*/OlaHsd (male)




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.

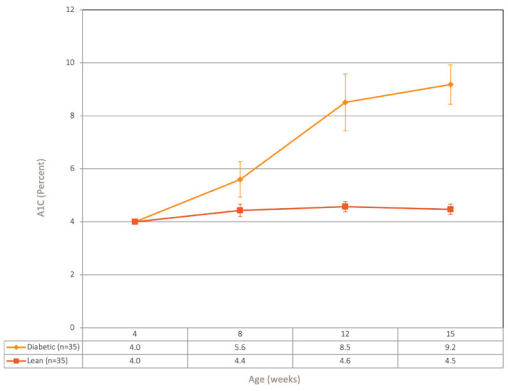
## BKS.Cg- + *Lepr$^{db}$*/+ *Lepr$^{db}$*/OlaHsd Blood Glucose (male)




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 SD 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 SD 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 |
| 3-4 | $60.50 | $57.80 |
| 4-5 | $61.00 | $64.20 |
| 5-6 | $62.85 | $68.55 |
| 6-7 | $73.45 | $80.50 |
| 7-8 | $83.30 | $84.25 |
| Over 8 weeks, add per week | $9.90 | $9.90 |
| Proven breeder | $87.80 | $87.80 |
| Retired breeder | $56.10 | $54.40 |
| Untimed pregnant* | | $482.70 |
| Timed mated* | | $571.15 |
| Female with litter | | $713.85 |

* 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

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

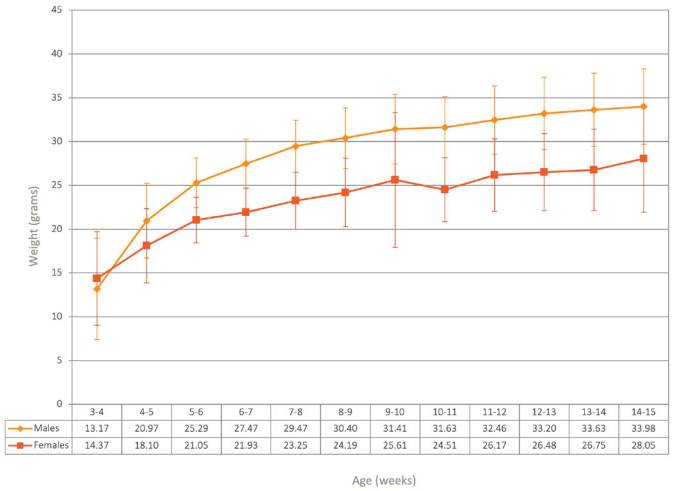
AGE (WEEKS) — FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $187.75 | $198.25 |
| 4-5 | $187.75 | $198.25 |
| 5-6 | $191.95 | $202.35 |
| 6-7 | $196.10 | $206.55 |
| 7-8 | $200.25 | $210.75 |
| Over 8 weeks, add per week | $6.30 | $6.30 |

AGE (WEEKS) — NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $125.85 | $133.30 |
| 4-5 | $125.85 | $133.30 |
| 5-6 | $133.80 | $137.50 |
| 6-7 | $138.20 | $141.75 |
| 7-8 | $142.60 | $146.00 |
| Over 8 weeks, add per week | $6.70 | $6.70 |

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




| | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Males | 13.17 | 20.97 | 25.29 | 27.47 | 29.47 | 30.40 | 31.41 | 31.63 | 32.46 | 33.20 | 33.63 | 33.98 |
| Females | 14.37 | 18.10 | 21.05 | 21.93 | 23.25 | 24.19 | 25.61 | 24.51 | 26.17 | 26.48 | 26.75 | 28.05 |

Maintained on Teklad Global Rodent Diet 2918 (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
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.

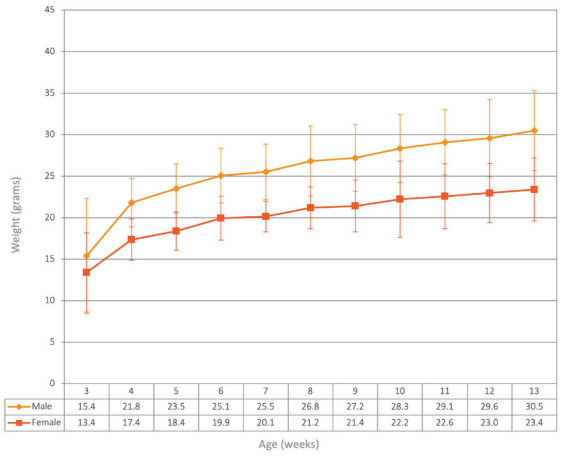
**AGE (WEEKS)** — FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $198.65 | $245.45 |
| 4-5 | $198.65 | $245.45 |
| 5-6 | $198.65 | $245.45 |
| 6-7 | $199.80 | $246.60 |
| 7-8 | $201.00 | $247.75 |
| 8-9 | $203.35 | $250.10 |
| 9-10 | $204.55 | $251.25 |
| Over 10 weeks, add per week | $5.85 | $5.85 |

**AGE (WEEKS)** — NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $91.15 | $116.85 |
| 4-5 | $91.15 | $116.85 |
| 5-6 | $91.15 | $116.85 |
| 6-7 | $91.15 | $116.85 |
| 7-8 | $91.15 | $116.85 |
| 8-9 | $97.00 | $122.70 |
| 9-10 | $102.85 | $127.35 |
| Over 10 weeks, add per week | $5.85 | $5.85 |

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




Maintained on Teklad Global Rodent Diet 2919 (18% Protein)
Cage floor space (MB3): 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.

MODEL CODE
405

# B-NDG B2m knockout plus mouse

NOMENCLATURE: *Prkdc$^{scid}$Il2rg$^{tm1}$B2m$^{tm1}$Fcgrt$^{tm1(B2m)}$/BcgenHsd*

**Albino.** The B-NDG B2m model is a 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. The B2m gene is fused in the FcRn gene while the endogenous murine B2m gene is knocked out. This mouse combines the B-NDG mouse background with the absence of the MHC class I molecule β2m and shows no difference in the metabolism of IgG drugs in mice compared with wild-type mice. This model is effective against GVHD effects. Envigo licensed the mouse model from Biocytogen in 2021, 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
- MHC class I deficiency
- Deficiency in cytokine signaling
- High humanization capability

## RESEARCH USE

- Oncology research
- Cancer cell transplantation
- Immunology
- Infectious disease
- Graft vs. host disease research
- 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
- **Increased survival and decreased GvHD** → Significant extension of survival & remarked delay of onset and reduction of severity of GvHD in human PBMC engrafted B2M/FcRn mice
- **Antibody half-life** → Improved antibody half-life compared with B2m KO mice

## ADDITIONAL AVAILABLE DATA

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

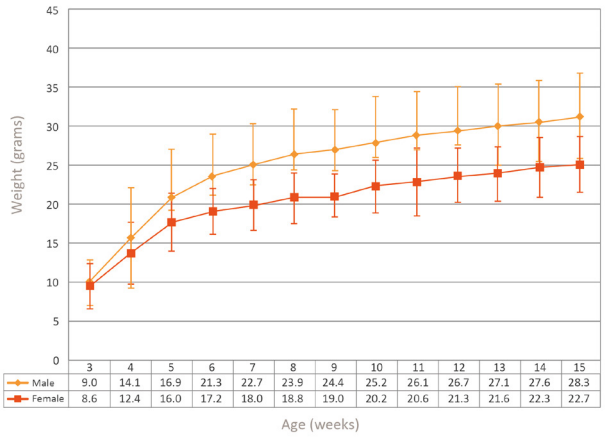
AGE (WEEKS) — FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $283.80 | $328.35 |
| 4-5 | $283.80 | $328.35 |
| 5-6 | $283.80 | $328.35 |
| 6-7 | $289.40 | $333.90 |
| 7-8 | $294.95 | $339.45 |
| 8-9 | $300.50 | $345.05 |
| 9-10 | $306.05 | $350.60 |
| Over 10 weeks, add per week | $5.55 | $5.55 |

AGE (WEEKS) — NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $144.70 | $161.40 |
| 4-5 | $144.70 | $161.40 |
| 5-6 | $144.70 | $161.40 |
| 6-7 | $150.25 | $166.95 |
| 7-8 | $155.80 | $172.50 |
| 8-9 | $161.40 | $178.10 |
| 9-10 | $166.95 | $183.65 |
| Over 10 weeks, add per week | $5.55 | $5.55 |

## *Prkdc$^{scid}$Il2rg$^{tm1}$B2m$^{tm1}$Fcgrt$^{tm1(B2m)}$/BcgenHsd*




Maintained on Labdiet 56JL
(19.3% protein, 6.2% fat, 20 ppm Vitamin K)

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.

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

MODEL CODE
406

# B-NDG hIL15 mouse

NOMENCLATURE: *Prkdc*$^{scid}$*Il2rg*$^{tm1}$*Il15*$^{tm1(IL15)}$/BcgenHsd

**Albino.** The B-NDG hIL15 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. The human IL15 gene was inserted after the 5'UTR of the mouse IL15, so that this mouse expresses the human IL15 cytokine. This mouse combines a B-NDG mouse background and expresses human IL15 cytokine. It will become a suitable animal model to investigate development and function of human NK cells. Envigo licensed the mouse model from Biocytogen in 2021, 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
- NK cell role in tumorigenesis
- Antibody drug efficacy evaluation
- Humanization applications

## FEATURES AND ADVANTAGES

- **Severe Immunodeficiency** -> Ultra immunodeficient phenotype enhances tumor cell acceptance
- **Reduced leakiness** -> Decreased leakiness as compared to SCID models
- **High humanization capability** -> Minimal rejection of human-derived cells and tissue
- **Expresses human IL15 cytokine** -> Ability to investigate the development and function of human NK cells

## ADDITIONAL AVAILABLE DATA

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

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

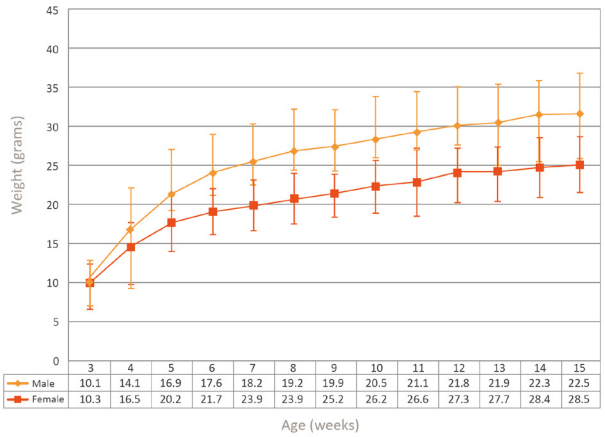
AGE (WEEKS) — FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $283.80 | $328.35 |
| 4-5 | $283.80 | $328.35 |
| 5-6 | $283.80 | $328.35 |
| 6-7 | $289.40 | $333.90 |
| 7-8 | $294.95 | $339.45 |
| 8-9 | $300.50 | $345.05 |
| 9-10 | $306.05 | $350.60 |
| Over 10 weeks, add per week | $5.55 | $5.55 |

AGE (WEEKS) — NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 3-4 | $144.70 | $161.40 |
| 4-5 | $144.70 | $161.40 |
| 5-6 | $144.70 | $161.40 |
| 6-7 | $150.25 | $166.95 |
| 7-8 | $155.80 | $172.50 |
| 8-9 | $161.40 | $178.10 |
| 9-10 | $166.95 | $183.65 |
| Over 10 weeks, add per week | $5.55 | $5.55 |

## *Prkdc*$^{scid}$*Il2rg*$^{tm1}$*Il15*$^{tm1(IL15)}$/BcgenHsd




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | 10.1 | 14.1 | 16.9 | 17.6 | 18.2 | 19.2 | 19.9 | 20.5 | 21.1 | 21.8 | 21.9 | 22.3 | 22.5 |
| Female | 10.3 | 16.5 | 20.2 | 21.7 | 23.9 | 23.9 | 25.2 | 26.2 | 26.6 | 27.3 | 27.7 | 28.4 | 28.5 |

Maintained on Labdiet 5KJL
(19.3% protein, 6.2% fat, 20 ppm Vitamin K)

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
061

# B6C3F1

NOMENCLATURE: B6C3F1/Hsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $46.05 | $50.10 |
| 4-5 | $48.70 | $51.00 |
| 5-6 | $58.85 | $56.20 |
| 6-7 | $61.90 | $56.50 |
| 7-8 | $67.70 | $60.15 |
| Over 8 weeks, add per week | $8.00 | $8.15 |
| Proven breeder | $63.05 | $61.20 |
| Retired breeder | $39.75 | $38.50 |
| Untimed pregnant* | | $265.90 |
| Timed mated* | | $299.10 |
| Female with litter | | $299.10 |

* 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.

MODEL CODE
063

# B6D2F1

NOMENCLATURE: B6D2F1/Hsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $41.90 | $46.20 |
| 4-5 | $46.10 | $48.05 |
| 5-6 | $54.10 | $51.50 |
| 6-7 | $65.30 | $56.80 |
| 7-8 | $69.95 | $61.55 |
| Over 8 weeks, add per week | $9.30 | $7.85 |
| Proven breeder | $79.90 | $69.00 |
| Retired breeder | $54.45 | $43.50 |
| Untimed pregnant* | | $281.60 |
| Timed mated* | | $309.00 |
| Female with litter | | $309.00 |

* 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.

MODEL CODES
065

# CB6F1

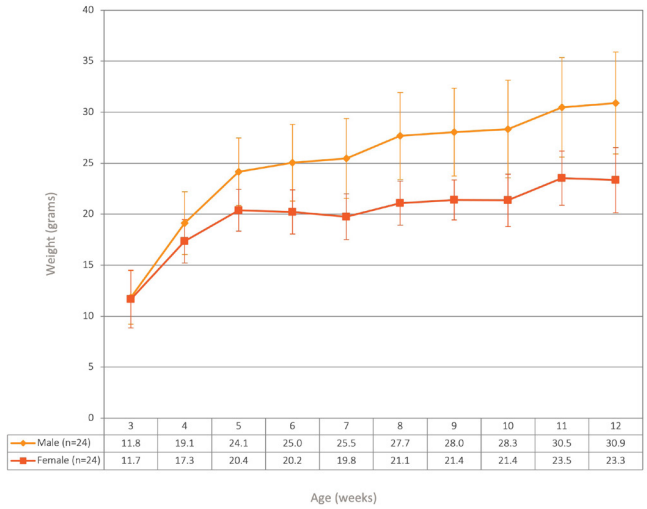
NOMENCLATURE: CB6F1/Hsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $67.75 | $76.40 |
| 4-5 | $72.75 | $81.10 |
| 5-6 | $77.10 | $85.20 |
| 6-7 | $84.50 | $90.25 |
| 7-8 | $87.60 | $93.70 |
| Over 8 weeks, add per week | $10.40 | $10.40 |
| Proven breeder | $81.75 | $81.75 |
| Retired breeder | $67.75 | $67.75 |
| Untimed pregnant* | | $362.60 |
| Timed mated* | | $407.75 |
| Female with litter | | $407.75 |

* 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




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=24) | 11.8 | 19.1 | 24.1 | 25.0 | 25.5 | 27.7 | 28.0 | 28.3 | 30.5 | 30.9 |
| Female (n=24) | 11.7 | 17.3 | 20.4 | 20.2 | 19.8 | 21.1 | 21.4 | 21.4 | 23.5 | 23.3 |

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 CODES
060

# CD2F1

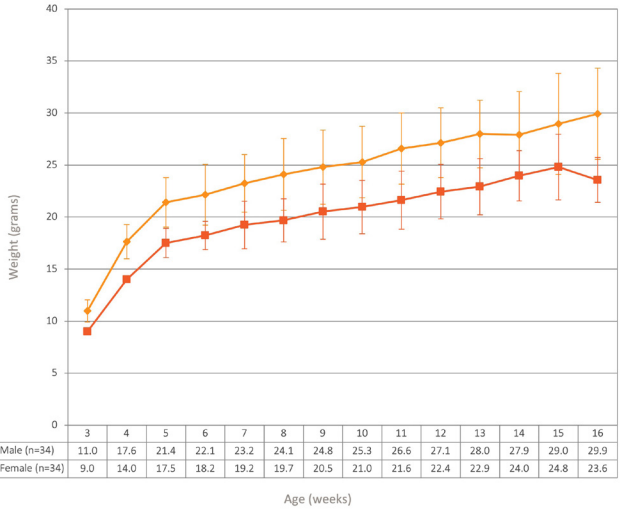
NOMENCLATURE: CD2F1/Hsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $45.75 | $49.10 |
| 4-5 | $50.45 | $51.75 |
| 5-6 | $53.95 | $56.80 |
| 6-7 | $60.90 | $62.35 |
| 7-8 | $63.00 | $63.20 |
| Over 8 weeks, add per week | $8.15 | $7.65 |
| Proven breeder | $60.30 | $48.10 |
| Retired breeder | | $42.35 |
| Untimed pregnant* | | $231.70 |
| Timed mated* | | $282.60 |
| Female with litter | | $254.40 |

* 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




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=34) | 11.0 | 17.6 | 21.4 | 22.1 | 23.2 | 24.1 | 24.8 | 25.3 | 26.6 | 27.1 | 28.0 | 27.9 | 29.0 | 29.9 |
| Female (n=34) | 9.0 | 14.0 | 17.5 | 18.2 | 19.2 | 19.7 | 20.5 | 21.0 | 21.6 | 22.4 | 22.9 | 24.0 | 24.8 | 23.6 |

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 ± 2 SD's representative of population distribution.

MODEL CODE
492

# Humanized ACE2 (hACE2) knockin mouse

NOMENCLATURE: C57BL/6Hsd-*Ace2*$^{em1(ACE2)Env}$

Angiotensin-converting enzyme 2 (ACE2) is a key enzyme in the renin-angiotensin system (RAS). RAS regulates blood volume and arterial tone, as such, ACE2 is a common target for the treatment of hypertension. ACE2 is highly expressed in several human tissues including the gastrointestinal tract, liver, gallbladder, kidney, urinary bladder, testes, placenta and fallopian tube, with lower expression levels in the lungs and pancreas. It also serves as the primary receptor for cell entry for the SARS-CoV and SARS-CoV-2 viruses. Binding of the coronavirus spike (S) protein to ACE2 initiates fusion of the cell and viral membranes for cell entry. ACE2-S protein binding is the critical initial step for coronavirus infection and is being investigated as a potential coronavirus drug target.

This hACE2 knockin mouse model was generated by integrating a codon optimized human *ACE2* cDNA expression cassette into the mouse *Ace2* gene through CRISPR-based technology. As a result, the mouse *Ace2* gene promoter and other regulatory elements drive expression of the human ACE2 protein while terminating mouse *Ace2* gene expression, making this a useful rodent model for studying SARS-CoV-2 and COVID-19.

## CHARACTERISTICS

- Human *ACE2* expression was confirmed by measuring mRNA levels in heterozygous and homozygous females and hemizygous males.
- Background strain: C57BL/6

## RESEARCH USE

- Infectious disease
- COVID-19
- SARS

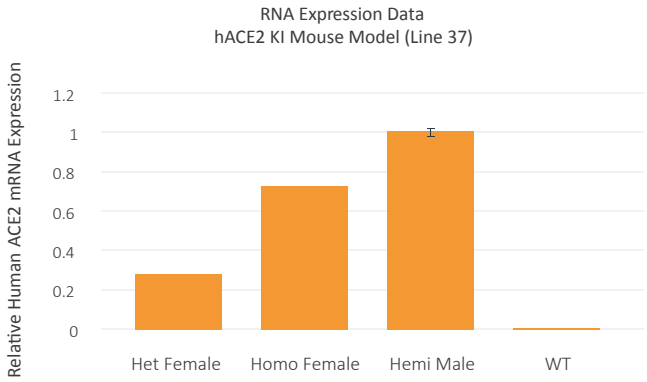
**AGE (WEEKS)** FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $259.00 | $259.00 |
| Over 12 weeks, add per week | $5.50 | $5.50 |

**AGE (WEEKS)** NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $113.00 | $113.00 |
| Over 12 weeks, add per week | $5.50 | $5.50 |

## C57BL/6Hsd-*Ace2*$^{em1(ACE2)Env}$




Relative human *ACE2* expression in a heterozygous (Het) female, homozygous (Homo) female, and hemizygous (Hemi) male hACE2 knockin mouse, or a C57BL/6 wild type (WT) animal.

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

MODEL CODE
494

# Humanized Tmprss2 (hTmprss2) knockin mouse

NOMENCLATURE: C57BL/6Hsd-*Tmprss2*$^{em1(TMPRSS2)Env}$

Tmprss2 is a transmembrane serine protease that is involved in viral infection. Both influenza viruses and human coronaviruses, including HCoV-229E, MERS-CoV, SARS-CoV, and SARS-CoV-2, depend on Tmprss2 proteolytically cleaving (i.e., priming) the viral spike glycoprotein, which triggers fusion of the viral envelope and host cell membrane, allowing the virus to enter the cell. Tmprss2 also has a pivotal role in the development and progression of prostate cancer. The fusion of the *TMPRSS2* gene with the *ERG* oncogene is the most frequent genomic alteration in prostate cancer.

The hTmprss2 KI mouse model was generated using CRISPR-based technology to mediate the integration of a codon optimized human *TMPRSS2* cDNA expression cassette into the mouse *Tmprss2* gene locus. As a result, the mouse *Tmprss2* gene promoter and other regulatory elements will drive the human Tmprss2 protein expression whereas the mouse *Tmprss2* gene expression will be terminated.

## CHARACTERISTICS

- Background strain: C57BL/6

## RESEARCH USE

- Infectious disease
- COVID-19
- SARS & MERS

**AGE (WEEKS)** FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $259.00 | $259.00 |
| Over 12 weeks, add per week | $5.50 | $5.50 |

**AGE (WEEKS)** NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $113.00 | $113.00 |
| Over 12 weeks, add per week | $5.50 | $5.50 |

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

MODEL CODE
495

# Humanized ACE2/Tmprss2 (hACE2/hTmprss2) double knockin mouse

NOMENCLATURE: C57BL/6Hsd-*Ace2*$^{em1(ACE2)Env}$*Tmprss2*$^{em1(TMPRSS2)Env}$ CRYOPRESERVED

Cellular infection by coronaviruses, including SARS-CoV and SARS-CoV-2, is a two-step process that utilizes the host proteins ACE2 and Tmprss2. Angiotensin-converting enzyme 2 (ACE2), a key enzyme in the renin-angiotensin system that regulates blood volume and arterial tone, is the entry receptor for SARS-CoV and SARS-CoV-2. The S1 subunit of the coronavirus spike (S) protein contains a receptor binding domain (RBD) that recognizes and binds to ACE2. Upon receptor binding, Tmprss2, a transmembrane serine protease, cleaves the S protein at the junction of the S1 and S2 subunits, allowing fusion of the cellular and viral membranes and the subsequent entry of the coronavirus into the cell. As such, ACE2 and Tmprss2 are being investigated as potential targets for anti-viral drugs.

The hACE2 and hTmprss2 single knockin models were generated by integrating a codon optimized human *ACE2* or *TMPRSS2* cDNA expression cassette into the respective mouse gene through CRISPR-based technology. This results in the mouse gene promoter and other regulatory elements driving the expression of the human ACE2 or Tmprss2 protein while terminating expression of the respective mouse gene. The hACE2/hTmprss2 double knockin mouse was created through the crossing of the hACE2 and hTmprss2 single knockin mouse models.

## CHARACTERISTICS

- Background strain: C57BL/6

## RESEARCH USE

- Infectious disease
- COVID-19
- SARS

**AGE (WEEKS)** FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $372.00 | $372.00 |
| Over 12 weeks, add per week | $5.50 | $5.50 |

**AGE (WEEKS)** NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $221.00 | $221.00 |
| Over 12 weeks, add per week | $5.50 | $5.50 |

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

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 | $210.60 | $221.25 |
| 50-74 | 23 - 30 | 23 - 35 | $226.90 | $242.20 |
| 75-99 | 31 - 37 | 36 - 43 | $242.20 | $268.90 |
| 100-124 | 38 - 43 | 44 - 55 | $259.45 | $322.45 |
| 125-149 | 44 - 50 | 56 - 72 | $290.20 | $378.30 |
| 150-174 | 51 - 54 | 73 - 84 | $331.80 | $486.55 |
| 175-199 | 55 - 63 | 85+ | $356.20 | $536.70 |
| 200-224 | 64 - 71 | | $382.20 | $573.10 |
| 225-249 | 72 - 82 | | $406.40 | $595.55 |
| 250-299 | 83+ | | $449.65 | |
| Proven breeder | | | $486.60 | $645.20 |
| Retired breeder | | | $195.35 | $258.15 |
| Untimed pregnant* | | | | $1,115.25 |
| Timed mated* | | | | $1,218.30 |
| Female with litter | | | | $1,437.25 |

* 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.

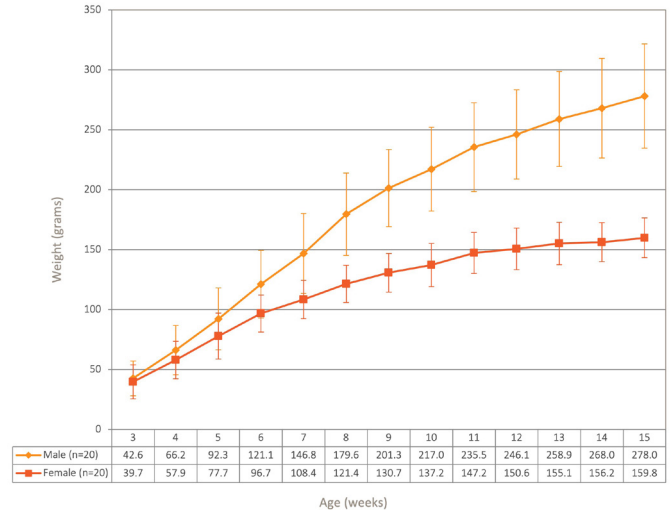
## CHARACTERISTICS

- Litter average: 4.5
- Haplotype: *RT1$^{n}$*
- Hyper-responsive lungs
- High incidence of bladder tumors in males

## RESEARCH USE

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

## BN/RijHsd




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=20) | 42.6 | 66.2 | 92.3 | 121.1 | 146.8 | 179.6 | 201.3 | 217.0 | 235.5 | 246.1 | 258.9 | 268.0 | 278.0 |
| Female (n=20) | 39.7 | 57.9 | 77.7 | 96.7 | 108.4 | 121.4 | 130.7 | 137.2 | 147.2 | 150.6 | 155.1 | 156.2 | 159.8 |

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.

MODEL CODE
092

# DA (Dark Agouti)

**NOMENCLATURE:** DA/OlaHsd

| AGE (WEEKS) | PRICE PER ANIMAL | |
|---|---|---|
| | MALE | FEMALE |
| 3-4 | $228.95 | $228.95 |
| 4-5 | $228.95 | $228.95 |
| 5-6 | $228.95 | $228.95 |
| 6-7 | $290.20 | $290.20 |
| 7-8 | $290.20 | $290.20 |
| 8-9 | $290.20 | $290.20 |
| 9-10 | $366.45 | $366.45 |
| 10-11 | $366.45 | $366.45 |
| 11-12 | $366.45 | $366.45 |
| 12-13 | $458.10 | $458.10 |
| 13-14 | $458.10 | $458.10 |
| 14-15 | $458.10 | $458.10 |
| 15-16 | $458.10 | $458.10 |

**Agouti.** From A.R.C. Cambridge, United Kingdom; to Olac, United Kingdom, in 1979; to Harlan, United States, in 1992. Harlan became Envigo in 2015, then Envigo was acquired by Inotiv in 2021.

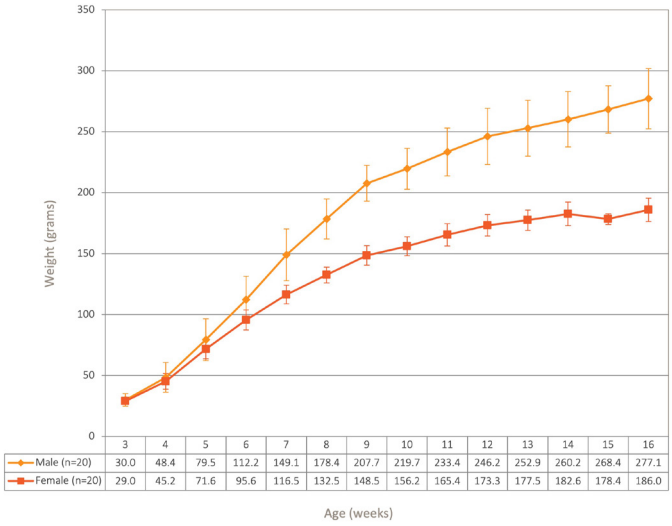
## CHARACTERISTICS

- Litter average: 6.0
- Haplotype: *RT1*$^{av1}$
- Females have a defective bile acid transport

## RESEARCH USE

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

## DA/OlaHsd




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=20) | 30.0 | 48.4 | 79.5 | 112.2 | 149.1 | 178.4 | 207.7 | 219.7 | 233.4 | 246.2 | 252.9 | 260.2 | 268.4 | 277.1 |
| Female (n=20) | 29.0 | 45.2 | 71.6 | 95.6 | 116.5 | 132.5 | 148.5 | 156.2 | 165.4 | 173.3 | 177.5 | 182.6 | 178.4 | 186.0 |

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.

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 | | $58.60 |
| 50-74 | 32-38 | 34-43 | $58.80 | $64.40 |
| 75-99 | 39-44 | 44-54 | $68.05 | $79.15 |
| 100-124 | 45-51 | 55-72 | $81.40 | $88.60 |
| 125-149 | 52-58 | 73-84 | $89.30 | $107.50 |
| 150-174 | 59-64 | 85+ | $100.45 | $139.05 |
| 175-199 | 65-72 | | $106.95 | $175.50 |
| 200-224 | 73-81 | | $125.15 | $187.75 |
| 225-249 | 82-84 | | $134.55 | |
| 250-299 | 85+ | | $143.95 | |
| 300+ | | | $153.05 | |
| Untimed pregnant* | | | | Upon request |
| Timed mated* | | | | Upon request |
| Female with litter | | | | Upon request |
| Proven breeder | | | Upon request | Upon request |
| Retired breeder | | | Upon request | 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*$^{lv1}$
- Hydrocephalic resistant

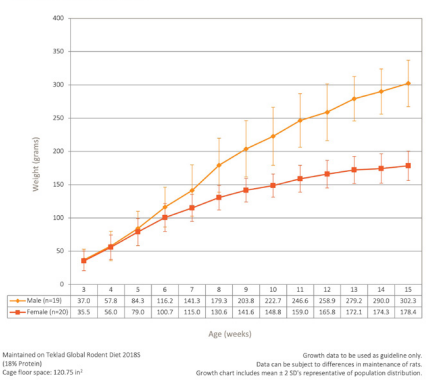
## RESEARCH USE

- 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 | $57.45 | $56.65 |
| 50-74 | 21 - 28 | 23 - 28 | $65.30 | $64.20 |
| 75-99 | 29 - 33 | 29 - 32 | $72.00 | $72.35 |
| 100-124 | 34 - 36 | 33 - 40 | $77.20 | $80.15 |
| 125-149 | 37 - 39 | 41 - 49 | $94.55 | $92.75 |
| 150-174 | 40 - 43 | 50 - 69 | $108.30 | $104.05 |
| 175-199 | 44 - 48 | 70+ | $116.55 | $115.30 |
| 200-224 | 49 - 54 | | $122.45 | $120.45 |
| 225-249 | 55 - 58 | | $132.90 | Upon request |
| 250-299 | 59 - 70 | | $141.90 | |
| 300+ | 71+ | | $155.75 | |
| Untimed pregnant* | | | | $326.65 |
| Timed mated* | | | | $420.65 |
| Female with litter | | | | $485.80 |
| Proven breeder | | | $114.35 | $257.15 |
| Retired breeder | | | $76.45 | $84.55 |

* 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

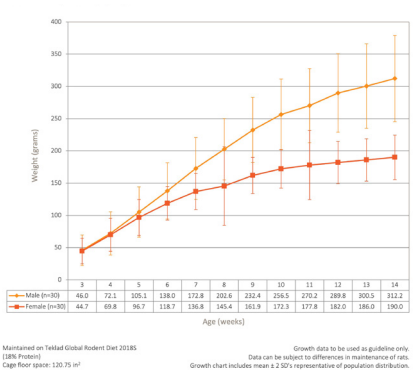
## RESEARCH USE

- Adjuvant-induced arthritis
- Experimental allergic encephalomyelitis
- Transplantation

## ADDITIONAL AVAILABLE DATA

- Clinical chemistry

## LEW/SsNHsd



MODEL CODE
022

# Spontaneously Hypertensive

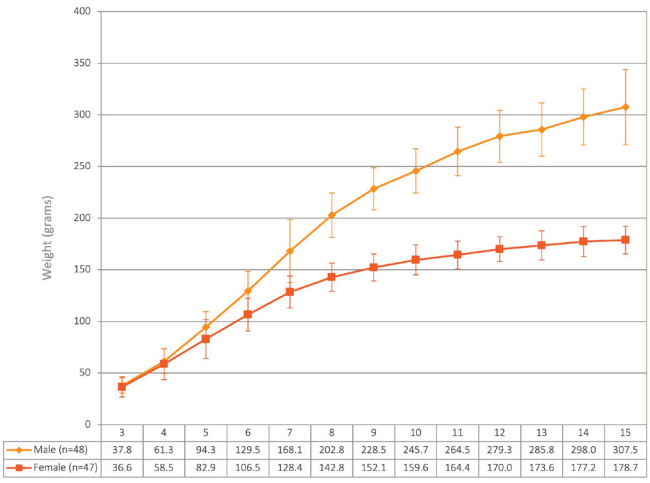
NOMENCLATURE: SHR/NHsd

| AGE (WEEKS) | PRICE PER ANIMAL |
|---|---|
| 3-4 | $231.40 |
| 4-5 | $250.20 |
| 5-6 | $271.15 |
| 6-7 | $305.40 |
| 7-8 | $334.70 |
| 8-9 | $363.75 |
| 9-10 | $392.15 |
| 10-11 | $419.55 |
| 11-12 | $456.10 |
| 12-13 | $498.05 |
| 13-14 | $531.65 |
| 14-15 | $579.30 |
| Untimed pregnant* | $1,528.00 |
| Timed mated* | $1,616.60 |
| Female with litter | $2,077.05 |
| Proven breeder | $658.00 |
| Retired breeder | $381.40 |

* 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/NHsd




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=48) | 37.8 | 61.3 | 94.3 | 129.5 | 168.1 | 202.8 | 228.5 | 245.7 | 264.5 | 279.3 | 285.8 | 298.0 | 307.5 |
| Female (n=47) | 36.6 | 58.5 | 82.9 | 106.5 | 128.4 | 142.8 | 152.1 | 159.6 | 164.4 | 170.0 | 173.6 | 177.2 | 178.7 |

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.

MODEL CODE
023

# Wistar Kyoto

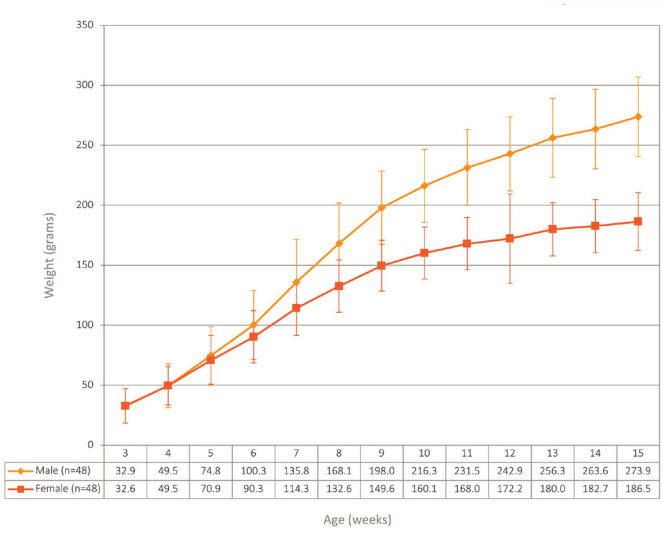
NOMENCLATURE: WKY/NHsd

| AGE (WEEKS) | PRICE PER ANIMAL |
|---|---|
| 3-4 | $202.25 |
| 4-5 | $218.45 |
| 5-6 | $234.30 |
| 6-7 | $268.15 |
| 7-8 | $311.95 |
| 8-9 | $336.55 |
| 9-10 | $375.90 |
| 10-11 | $392.40 |
| 11-12 | $441.50 |
| 12-13 | $484.50 |
| 13-14 | $523.35 |
| 14-15 | $572.55 |
| Untimed pregnant* | $1,430.80 |
| Timed mated* | $1,533.60 |
| Female with litter | $1,964.00 |
| Proven breeder | $561.10 |
| Retired breeder | $369.90 |

* 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




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=48) | 32.9 | 49.5 | 74.8 | 100.3 | 135.8 | 168.1 | 198.0 | 216.3 | 231.5 | 242.9 | 256.3 | 263.6 | 273.9 |
| Female (n=48) | 32.6 | 49.5 | 70.9 | 90.3 | 114.3 | 132.6 | 149.6 | 160.1 | 168.0 | 172.2 | 180.0 | 182.7 | 186.5 |

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.

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 | $146.30 | $148.75 |
| 50-74 | 21 - 24 | 21 - 24 | $177.65 | $180.30 |
| 75-99 | 25 - 28 | 25 - 30 | $192.95 | $196.65 |
| 100-124 | 29 - 33 | 31 - 34 | $211.50 | $214.45 |
| 125-149 | 34 - 37 | 35 - 40 | $234.40 | $242.55 |
| 150-174 | 38 - 41 | 41 - 46 | $251.10 | $261.10 |
| 175-199 | 42 - 45 | 47 - 52 | $272.25 | $283.45 |
| 200-224 | 46 - 48 | 53 - 58 | $289.70 | $302.40 |
| 225-249 | 49 - 51 | 59 - 63 | $308.90 | $330.75 |
| 250-274 | 52 - 54 | 64 - 70 | $333.90 | $349.50 |
| 275-299 | 55 - 59 | 71 - 90 | $369.25 | $379.15 |
| 300-324 | 60 - 64 | 91+ | $391.25 | |
| 325-349 | 65 - 70 | | $410.25 | |
| 350-374 | 71 - 74 | | $433.35 | |
| 375-399 | 75 - 80 | | $448.80 | |
| Untimed pregnant* | | | | Upon request |
| Timed mated* | | | | Upon request |
| Female with litter | | | | Upon request |
| Proven breeder | | | Upon request | Upon request |
| Retired breeder | | | Upon request | 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)

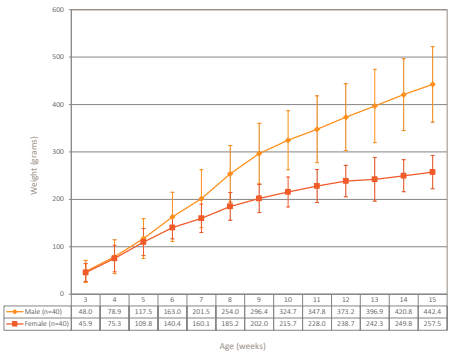
NOMENCLATURE: HsdBlu:LE

| WEIGHT (G) | APPROX AGE (DAYS) | | PRICE PER ANIMAL | |
|---|---|---|---|---|
| | MALE | FEMALE | MALE | FEMALE |
| 35-49 | 20 - 23 | 20 - 24 | $35.30 | $36.20 |
| 50-74 | 24 - 29 | 25 - 30 | $41.20 | $45.00 |
| 75-99 | 30 - 33 | 31 - 35 | $49.95 | $52.70 |
| 100-124 | 34 - 37 | 36 - 41 | $56.00 | $58.70 |
| 125-149 | 38 - 41 | 42 - 49 | $61.05 | $64.05 |
| 150-174 | 42 - 45 | 50 - 56 | $66.25 | $74.05 |
| 175-199 | 46 - 49 | 57 - 69 | $72.10 | $79.05 |
| 200-224 | 50 - 57 | 70 - 89 | $78.25 | $87.05 |
| 225-249 | 58 - 64 | 90 - 110 | $88.55 | $94.45 |
| 250-274 | 65 - 70 | 111+ | $95.65 | $107.05 |
| 275-299 | 71 - 79 | | $101.30 | $114.45 |
| 300-324 | 80 - 90 | | $107.20 | |
| 325-349 | 91 - 100 | | $119.20 | |
| 350-374 | 101 - 110 | | $127.40 | |
| Untimed pregnant* | | | | $405.45 |
| Timed mated* | | | | $495.20 |
| Female with litter | | | | $533.85 |
| Proven breeder | | | $189.15 | $211.20 |
| Retired breeder | | | $125.35 | $119.90 |

* 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

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 | $34.35 | $37.35 |
| 75-99 | 26 - 28 | 27 - 30 | $41.70 | $44.15 |
| 100-124 | 29 - 32 | 31 - 34 | $48.60 | $51.20 |
| 125-149 | 33 - 35 | 35 - 38 | $54.15 | $57.65 |
| 150-174 | 36 - 40 | 39 - 41 | $57.60 | $64.30 |
| 175-199 | 41 - 42 | 42 - 49 | $66.75 | $69.10 |
| 200-224 | 43 - 44 | 50 - 56 | $72.00 | $73.85 |
| 225-249 | 45 - 48 | 57 - 63 | $77.90 | $79.70 |
| 250-274 | 49 - 52 | 64 - 76 | $83.75 | $89.10 |
| 275-299 | 53 - 55 | 77+ | $87.50 | $101.40 |
| 300-324 | 56 - 58 | | $91.30 | |
| 325-349 | 59 - 63 | | $102.70 | |
| 350-374 | 64 - 69 | | $114.90 | |
| 375-399 | 70 - 75 | | $116.60 | |
| 400+ | 76+ | | Upon request | |
| Untimed pregnant* | | | | $266.25 |
| Timed mated* | | | | $318.65 |
| Female with litter | | | | $336.20 |
| Proven breeder | | | $125.30 | $141.20 |
| Retired breeder | | | $78.95 | $80.70 |

* 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

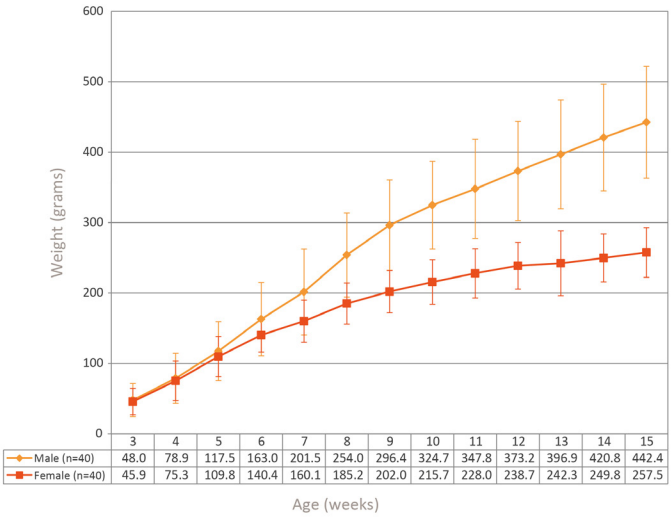
## RESEARCH USE

- Teratology
- Nutrition
- Aging
- Oncology
- General purpose

## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

## Hsd:WI




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=40) | 48.0 | 78.9 | 117.5 | 163.0 | 201.5 | 254.0 | 296.4 | 324.7 | 347.8 | 373.2 | 396.9 | 420.8 | 442.4 |
| Female (n=40) | 45.9 | 75.3 | 109.8 | 140.4 | 160.1 | 185.2 | 202.0 | 215.7 | 228.0 | 238.7 | 242.3 | 249.8 | 257.5 |

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.

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 | $24.80 | $25.05 |
| 50-74 | 22 - 26 | 22 - 29 | $31.55 | $33.10 |
| 75-99 | 27 - 31 | 30 - 34 | $39.40 | $40.95 |
| 100-124 | 32 - 35 | 35 - 39 | $44.60 | $46.75 |
| 125-149 | 36 - 40 | 40 - 44 | $52.10 | $57.90 |
| 150-174 | 41 - 43 | 45 - 53 | $54.90 | $63.40 |
| 175-199 | 44 - 48 | 54 - 64 | $64.30 | $67.60 |
| 200-224 | 49 - 52 | 65 - 75 | $69.10 | $72.65 |
| 225-249 | 53 - 58 | 76+ | $75.10 | $79.00 |
| 250-274 | 59 - 63 | | $81.15 | $88.80 |
| 275-299 | 64 - 69 | | $84.85 | $95.85 |
| 300-324 | 70 - 75 | | $89.85 | |
| 325-349 | 76 - 85 | | $98.70 | |
| 350-374 | 86 - 95 | | $105.20 | |
| 375-399 | 96 - 115 | | $109.40 | |
| 400+ | 116+ | | Upon request | |
| Untimed pregnant* | | | | $230.50 |
| Timed mated* | | | | $271.75 |
| Female with litter | | | | $291.55 |
| Proven breeder | | | $124.55 | $129.35 |
| Retired breeder | | | $77.70 | $74.30 |

* 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.

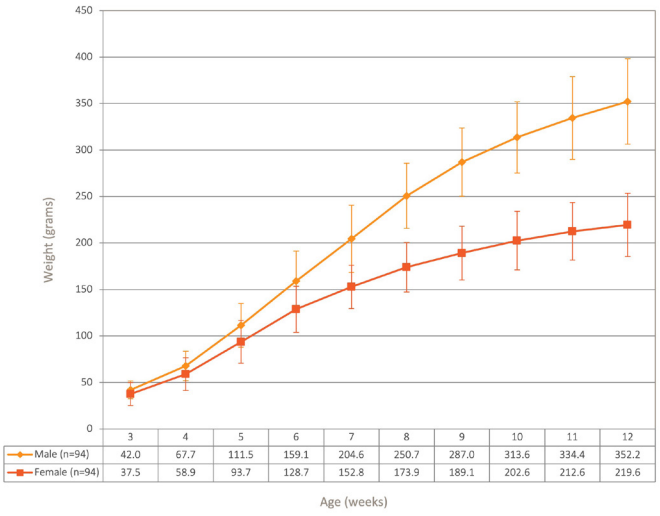
## CHARACTERISTICS

- 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®




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=94) | 42.0 | 67.7 | 111.5 | 159.1 | 204.6 | 250.7 | 287.0 | 313.6 | 334.4 | 352.2 |
| Female (n=94) | 37.5 | 58.9 | 93.7 | 128.7 | 152.8 | 173.9 | 189.1 | 202.6 | 212.6 | 219.6 |

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.

Aging available for Sprague Dawley rats
See page 81

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 | $28.45 | $30.50 |
| 50-74 | 25 - 30 | 25 - 31 | $36.90 | $40.05 |
| 75-99 | 31 - 36 | 32 - 43 | $43.45 | $47.35 |
| 100-124 | 37 - 42 | 44 - 54 | $49.50 | $53.70 |
| 125-149 | 43 - 47 | 55 - 65 | $54.75 | $62.65 |
| 150-174 | 48 - 54 | 66 - 76 | $57.60 | $66.65 |
| 175-199 | 55 - 60 | 77 - 85 | $65.55 | $75.50 |
| 200-224 | 61 - 66 | 86+ | $74.10 | $79.80 |
| 225-249 | 67 - 73 | | $80.20 | $92.45 |
| 250-274 | 74 - 79 | | $86.55 | Upon request |
| 275-299 | 80 - 85 | | $89.95 | Upon request |
| 300-324 | 86+ | | $97.60 | |
| 325-349 | | | $106.55 | |
| 350-374 | | | $110.30 | |
| 375-399 | | | $115.50 | |
| Untimed pregnant* | | | | $217.10 |
| Timed mated* | | | | $243.20 |
| Female with litter | | | | $261.20 |
| Proven breeder | | | $111.75 | $130.75 |
| Retired breeder | | | $72.10 | $71.20 |

* 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 Zentralinstitute 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

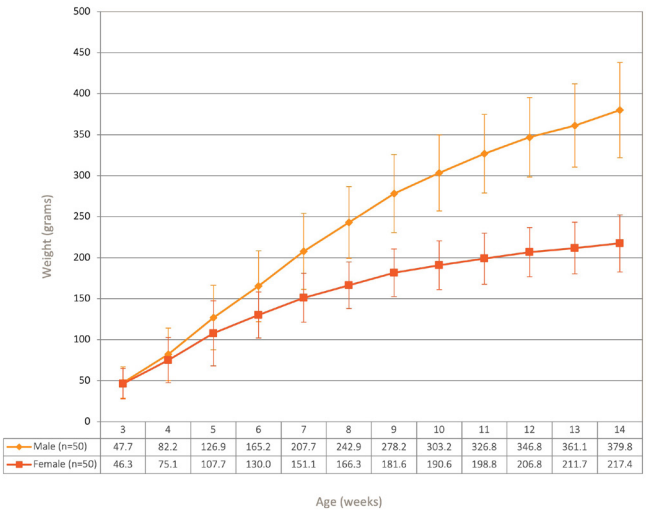
## RESEARCH USE

- Toxicology
- Oncology
- Teratology
- Aging
- General purpose

## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

## RccHan®:WIST




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=50) | 47.7 | 82.2 | 126.9 | 165.2 | 207.7 | 242.9 | 278.2 | 303.2 | 326.8 | 346.8 | 361.1 | 379.8 |
| Female (n=50) | 46.3 | 75.1 | 107.7 | 130.0 | 151.1 | 166.3 | 181.6 | 190.6 | 198.8 | 206.8 | 211.7 | 217.4 |

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.

# 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

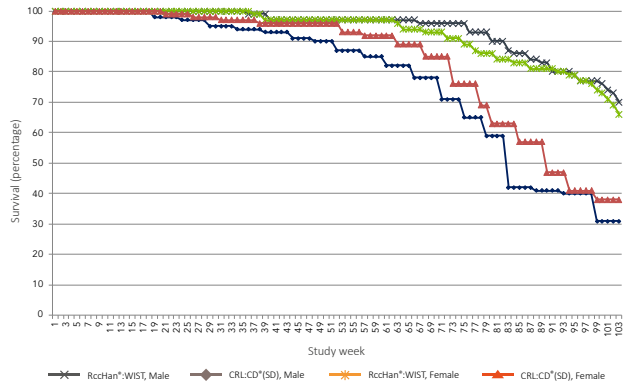
- Fewer background tumors

## LATEST 103-WEEK DATA AVAILABLE

- Growth and survival
- Food consumption
- Clinical observations

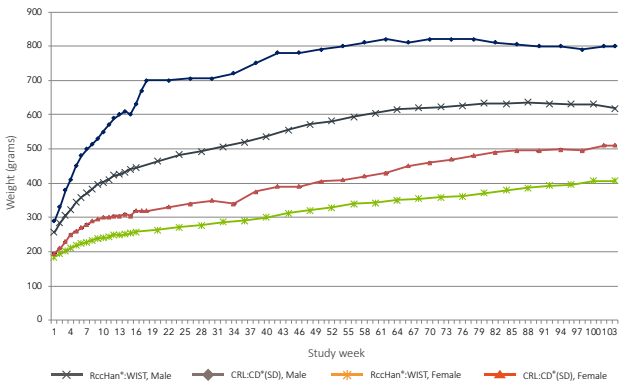
**RccHan®:WIST 103-week growth curve**

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

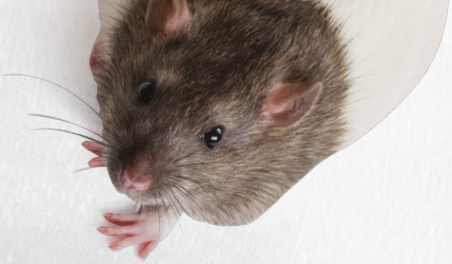



**RccHan®:WIST 103-week survival curve**

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

| AGE (WEEKS) | | PRICE PER ANIMAL |
|---|---|---|
| | *rnu/rnu* | *rnu/+* |
| 3-4 | $241.65 | $171.05 |
| 4-5 | $297.60 | $231.05 |
| 5-6 | $357.95 | $297.50 |
| 6-7 | $413.90 | $351.15 |
| 7-8 | $474.35 | $408.50 |
| 8-9 | $529.45 | $465.45 |
| 9-10 | $591.60 | $521.90 |
| Over 10 weeks, add per week | $67.75 | $68.35 |

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

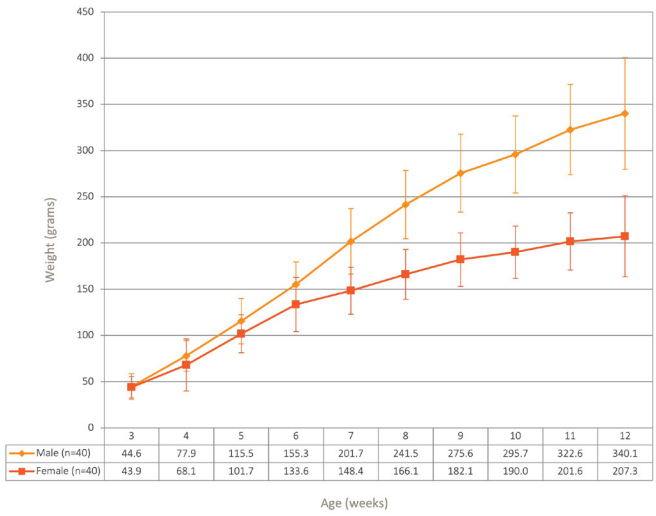
## RESEARCH USE

- Oncology
- Immunology
- Xenograft and allograft transplantation

## ADDITIONAL AVAILABLE DATA

- Proven model with extensive references (see page 20)

## Hsd:RH-*Foxn1*$^{rnu}$




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=40) | 44.6 | 77.9 | 115.5 | 155.3 | 201.7 | 241.5 | 275.6 | 295.7 | 322.6 | 340.1 |
| Female (n=40) | 43.9 | 68.1 | 101.7 | 133.6 | 148.4 | 166.1 | 182.1 | 190.0 | 201.6 | 207.3 |

Maintained on Teklad Global Rodent Diet 2018S (18% Protein)
Cage floor space: 141.75 in$^2$

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.

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

# Zucker

**NOMENCLATURE:**

HsdHlr:ZUCKER-*Lepr$^{fa}$* - fat, homozygous (Code 194)
HsdHlr:ZUCKER-*Lepr$^{fa}$/Lepr$^{+}$* - lean, heterozygous (Code H195*)
HsdHlr:ZUCKER-*Lepr$^{+}$* - lean, homozygous wildtype (Code W195*)
HsdHlr:ZUCKER-(Lean) - lean, not genotyped (Code 195)

**AGE (WEEKS)** PRICE PER ANIMAL

| | *fa/fa* | *Lean** |
|---|---|---|
| 3-4 | $425.45 | $113.25 |
| 4-5 | $444.65 | $117.05 |
| 5-6 | $466.35 | $123.15 |
| 6-7 | $491.65 | $137.05 |
| 7-8 | $528.05 | $152.85 |
| 8-9 | $556.90 | $168.50 |
| 9-10 | $584.80 | $176.30 |
| Over 10 weeks, add per week | $40.75 | $22.80 |

**Black, brown, brown/white, black/white.** Derived from a colony obtained in 1992 from Hoffmann-La Roche, Nutley, New Jersey.

* Genetic testing is required to determine *Lep$^{fa}$/Lepr$^{+}$* or *Lepr$^{+}$/Lepr$^{+}$* genotype. See page 69 for genotyping services available from Inotiv.

## CHARACTERISTICS

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

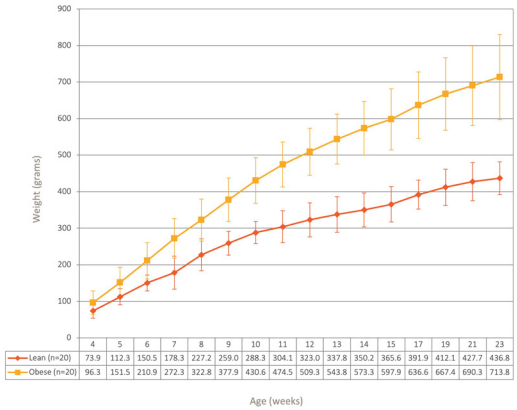
## RESEARCH USE

- Genetic obesity
- Type 2 Diabetes

## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry

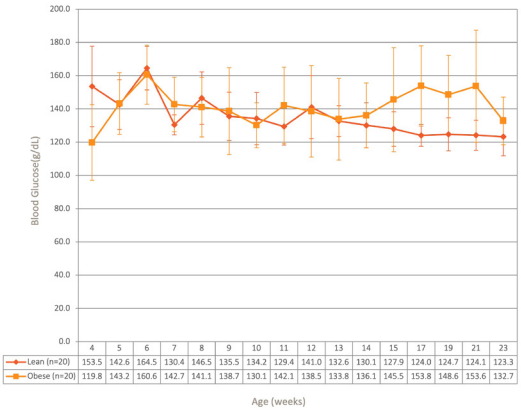
## ZUCKER-*Lepr$^{fa}$* (male)




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.
Phenotypic discrimination only. Rats were not genotyped.

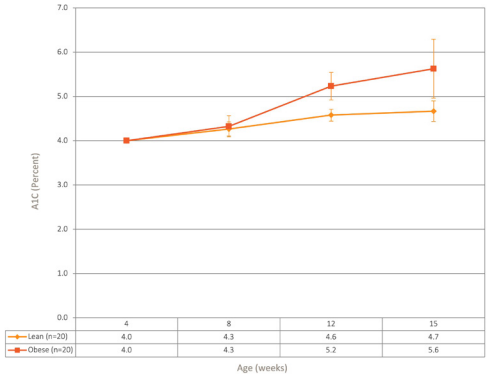
## ZUCKER-*Lepr$^{fa}$* Blood Glucose (male)




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

Glucose data to be used as guideline only.
Data can be subject to differences in maintenance of rats.
Glucose chart includes mean ± 1 SD representative of population distribution.
Phenotypic discrimination only. Rats were not genotyped.

## ZUCKER-*Lepr$^{fa}$* A1c (male)




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

A1C data to be used as guideline only.
Data can be subject to differences in maintenance of rats.
A1C chart includes mean ± 1 SD representative of population distribution.
Phenotypic discrimination only. Rats were not genotyped.

# 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.

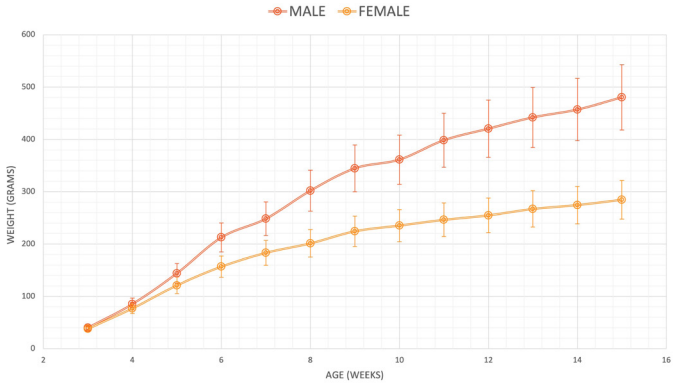
## CHARACTERISTICS

- 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.

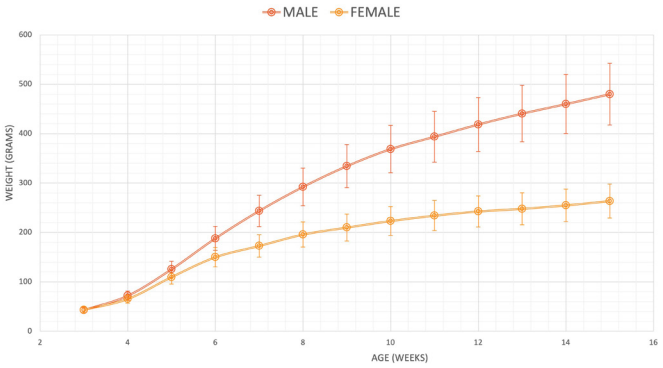
## CHARACTERISTICS

- 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.

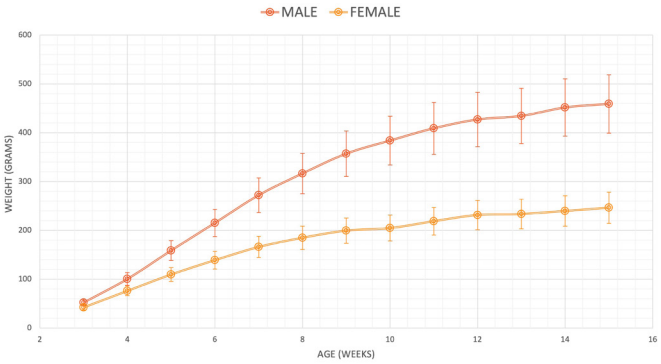
## CHARACTERISTICS

- 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.

MODEL CODE
493

# Humanized ACE2 (hACE2) knockin rat

NOMENCLATURE: Hsd:SD-*Ace2*$^{em1(ACE2)Env}$

Angiotensin-converting enzyme 2 (ACE2) is an integral membrane zinc metalloprotease that is highly expressed in several human tissues including the gastrointestinal tract, liver, gallbladder, kidney, urinary bladder, testes, placenta and fallopian tube. It is also expressed at more moderate levels in the lungs and pancreas. ACE2 serves as the primary receptor for cell entry for the SARS-CoV and SARS-CoV-2 viruses. Binding of the coronavirus spike (S) protein to ACE2 initiates fusion of the cell and viral membranes for cell entry. ACE2-S protein binding is the critical initial step for coronavirus infection and is being investigated as a potential target for anti-viral therapeutics.

ACE2 is also a key enzyme in the renin-angiotensin system (RAS). Activation of the RAS pathway results in increased sodium and water retention, which leads to elevated blood volume and arterial pressure. ACE2 regulates RAS activity by cleaving angiotensin I and II into angiotensin 1-9 and angiotensin 1-7, respectively. As such, ACE2 is a common target for the treatment of hypertension.

The hACE2 knockin rat model was generated through CRISPR-based technology. A codon optimized human *ACE2* cDNA expression cassette was integrated into the rat *Ace2* gene, causing the rat *Ace2* gene promoter and other regulatory elements to drive expression of the human ACE2 protein while terminating rat *Ace2* gene expression, making this a useful rodent model for studying SARS-CoV-2 and COVID-19.

## CHARACTERISTICS

- Genotyping of lung tissue from heterozygous and homozygous females and hemizygous males confirmed expression of the human *ACE2* gene and a lack (or reduction) of rat *Ace2* gene expression.
- Background strain: Sprague Dawley

## RESEARCH USE

- Infectious disease
- COVID-19
- SARS

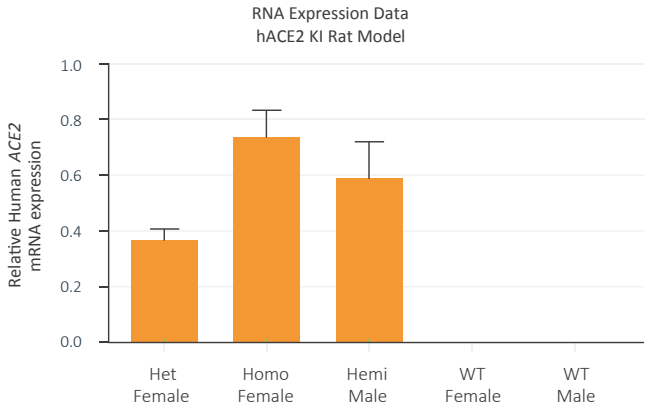
**AGE (WEEKS)** FOR-PROFIT (COMMERCIAL) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $588.00 | $588.00 |
| Over 12 weeks, add per week | $11.00 | $11.00 |

**AGE (WEEKS)** NOT-FOR-PROFIT (ACADEMIC) / PRICE PER ANIMAL

| | MALE | FEMALE |
|---|---|---|
| 4-12 | $280.00 | $280.00 |
| Over 12 weeks, add per week | $11.00 | $11.00 |

## Hsd:SD-*Ace2*$^{em1(ACE2)Env}$




Relative human *ACE2* expression in a heterozygous (Het) female, homozygous (Homo) female, and hemizygous (Hemi) male hACE2 knockin rat, or a wild type (WT) female and male.

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

# 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 | Parkinson's Disease* | Schizophrenia | Cre Models |
|---|---|---|---|---|---|
| ApoE KO rat | CHD8 KO rat | Faah 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

| Transporters | Xenobiotic |
|---|---|
| Bcrp KO rat | AHR KO rat |
| BSEP KO rat | CAR KO rat |
| Mdr1a KO rat | Ppara KO rat |
| Mdr1a-1b KO rat | PXR KO rat |
| Mdr1a-Bcrp KO rat | PXR/CAR KO rat |
| Mrp1 KO rat | PXR/CAR/AHR KO rat |
| Mrp2 KO rat | |
| Oat1 KO rat | |
| Oat3 KO rat | |
| Oct1 KO rat | |
| Oct2 KO rat | |

### ONCOLOGY

| Cell Proliferation | DNA Repair | Immunotherapy |
|---|---|---|
| p53 KO rat | Prkdc KO rat | B-NDG B2m KO mouse |
| Pten KO rat | | B-NDG KO mouse |
| Rag2-Il2rg (R2G2®) KO mouse | | B-NDG hIL15 KI mouse |

### IMMUNOLOGY

| Inflammation | |
|---|---|
| Cox1 KO rat | Rag1 KO rat (Sprague Dawley) |
| Cox2 KO rat | Rag2 KO rat (Fischer 344) |
| Lgals1 (Gal1) KO rat | Rag2 KO rat (Sprague Dawley) |
| Prkdc KO rat | Rag2-Il2rg (R2G2®) KO mouse |
| Rag1 KO rat (Fischer 344) | Tbx21 (T-beta) KO rat |

### RESPIRATORY

| Cystic Fibrosis |
|---|
| CFTR KO rat |

### INFECTIOUS DISEASE

| COVID-19 |
|---|
| hACE2 KI rat |
| hACE2 KI mouse |
| hTmprss2 KI mouse |
| hACE2/hTmprss2 KI mouse |

### CARDIOVASCULAR

| Atherosclerosis |
|---|
| ApoE KO rat |
| hApoE2 KI rat |
| hApoE3 KI rat |
| hApoE4 KI rat |
| Ldlr KO rat |
| Leptin KO rat |

For more information on our pre-developed transgenic models, please visit **inotiv.com** or contact us at **GEMSorders@inotiv.com**

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 | $61.45 | $61.45 |
| 4-5 | 65 - 90 | 65 - 90 | $67.40 | $67.40 |
| 5-6 | 75 - 100 | 75 - 100 | $77.20 | $77.20 |
| 6-7 | 85 - 105 | 85 - 105 | $86.65 | $86.65 |
| 7-8 | 90 - 110 | 85 - 110 | $98.10 | $98.10 |
| 8-9 | 90 - 115 | 90 - 115 | $106.10 | $106.10 |
| 9-10 | 95 - 120 | 90 - 120 | $117.55 | $117.55 |
| 10-11 | 100 - 130 | 95 - 130 | $149.35 | $149.35 |
| Pregnant female* | | | | $299.30 |
| Female with litter | | | | $268.35 |
| Timed mated* | | | | $299.30 |
| Proven breeder | | | $125.85 | $134.45 |

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

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

## CHARACTERISTICS

- Litter average: 9.0
- Excellent reproductive performance

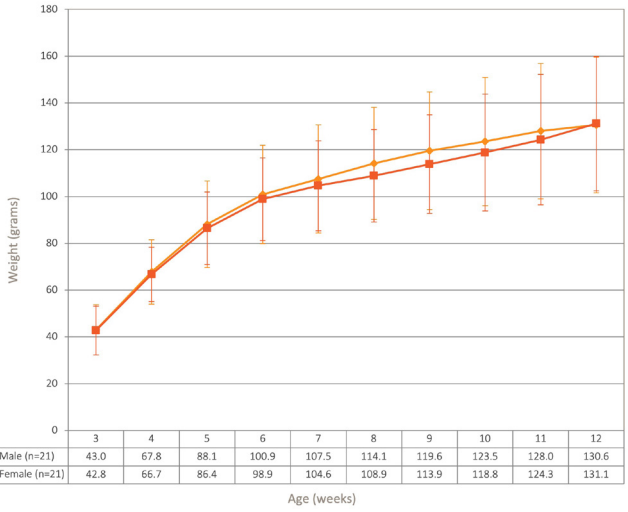
## RESEARCH USE

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

## ADDITIONAL AVAILABLE DATA

- Hematology
- Clinical chemistry
- 12-week growth

## HsdHan®:AURA




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=21) | 43.0 | 67.8 | 88.1 | 100.9 | 107.5 | 114.1 | 119.6 | 123.5 | 128.0 | 130.6 |
| Female (n=21) | 42.8 | 66.7 | 86.4 | 98.9 | 104.6 | 108.9 | 113.9 | 118.8 | 124.3 | 131.1 |

Maintained on Teklad Global Rodent Diet 2018S (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 hamsters.
Growth chart includes mean ± 2 SD's representative of population distribution.

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

MODEL CODE
201

# Cotton Rat

NOMENCLATURE: Hsd:Cotton Rat

| AGE (WEEKS) | PRICE PER ANIMAL |
|---|---|
| 3-4 | $460.45 |
| 4-5 | $511.45 |
| 5-6 | $556.60 |
| 6-7 | $612.10 |
| 7-8 | $650.10 |
| 8-9 | $714.25 |
| 9-10 | $743.60 |
| Over 10 weeks, add per week | $42.25 |

**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.

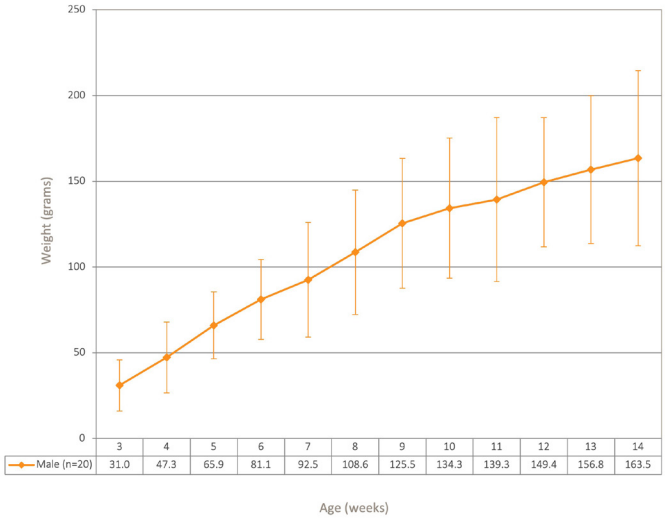
## CHARACTERISTICS

- 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




| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (n=20) | 31.0 | 47.3 | 65.9 | 81.1 | 92.5 | 108.6 | 125.5 | 134.3 | 139.3 | 149.4 | 156.8 | 163.5 |

Maintained on Teklad Global Rodent Diet 2019S (19% 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.

# New Zealand White

**NOMENCLATURE:** HsdHra:(NZW) SPF

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

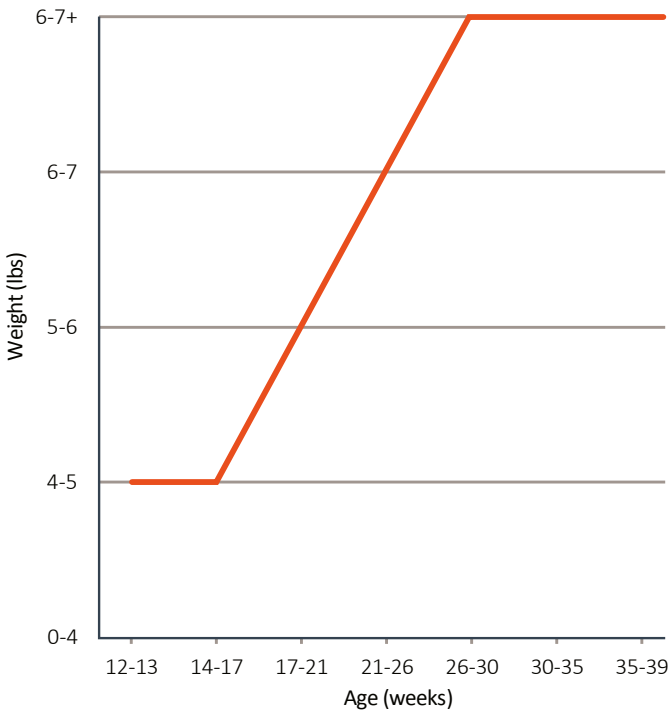
- Ocular screening solutions – Pre-shipment eye screening solutions identify optimal models for your ocular studies
- Social housing solutions – Social housing capabilities promote the compatibility and sociability of your rabbits (up to 2 kg)
- We're able to offer single or double vascular catheterizations 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
- Health monitoring program – At least once per month, a minimum of four representative rabbits from each production building are sent to a third-party laboratory for a complete health assessment

## RABBIT ENRICHMENT

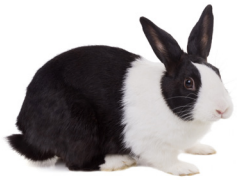
Our commitment to animal welfare including enrichment is a daily commitment. Our rabbit enrichment program includes:

- Music in each room for 24 hours daily
- Each animal is handled twice per week, beginning at 4 days of age
- 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.



# Dutch Belted

NOMENCLATURE: HsdHra:DB (SPF)

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

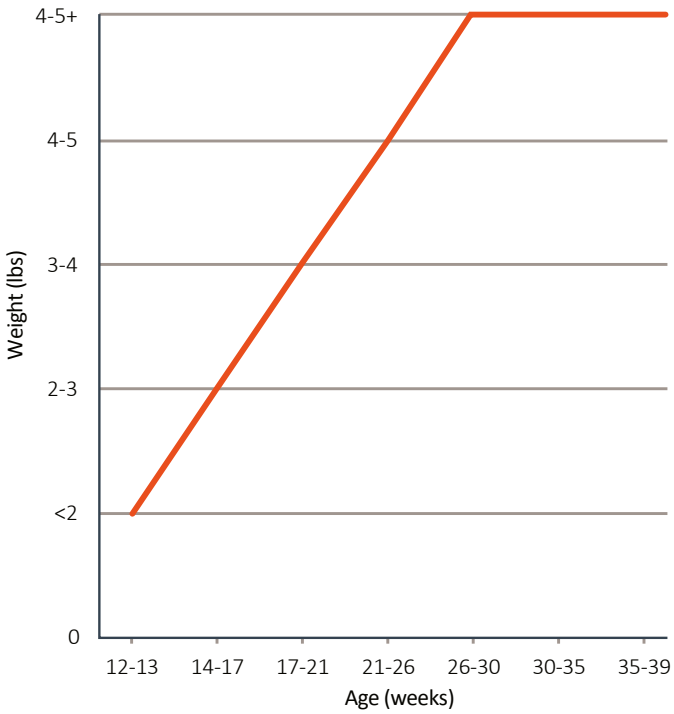
- Ocular screening solutions – Pre-shipment eye screening solutions identify optimal models for your ocular studies
- Social housing solutions – Social housing capabilities promote the compatibility and sociability of your rabbits (up to 2 kg)
- We're able to offer single or double vascular catheterizations in our rabbit models to enable efficient and fast study start
- Health monitoring program – At least once per month, a minimum of four representative rabbits from each production building are sent to a third-party laboratory for a complete health assessment

## 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
- Each animal is handled twice per week, beginning at 4 days of age
- 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.

# Cynomolgus macaques

NOMENCLATURE: M. fascicularis

PRICE PER ANIMAL - AVAILABLE ON REQUEST

## CHARACTERISTICS

- Ability to source both Asian (Vietnamese and Cambodia) and Mauritian origin animal models.
- Sexually mature models available
- Global primate holding facilities in North American (Alice, Texas and Denver, Pennsylvania) and Europe (Camarny, Spain and Strasburg, France).

# Rhesus macaques

NOMENCLATURE: M. mulatta

PRICE PER ANIMAL - AVAILABLE ON REQUEST

## CHARACTERISTICS

- Model origin: Chinese (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.

## 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
- **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 exams:**
  We offer a wide range of available pre-shipment screening exams, including EKG, ocular and pathogen, 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

- 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
- 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

inotiv

analyze. answer. advance.

# 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

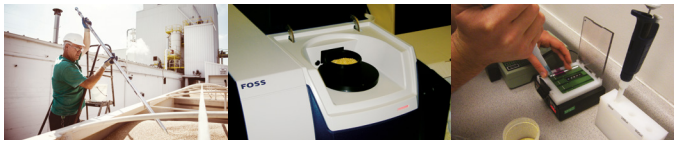
By combining **fixed formulation** with rigorous **ingredient control**, the variation in nutrient and non-nutrient levels is minimized, meaning **consistent results** for you.

# 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

**Ingredients**
- Approved regional suppliers
- Sampling and testing upon receipt
  - Macronutrients
  - Mycotoxins
- Ability to reject

**Manufacturing**
- Traceability
- Ingredient reconciliation
- Metal detection
- In-process testing
- Composite sample testing via NIRS and wet chemistry

**Distribution**
- Environmentally - controlled storage
- Pest management program
- Direct ship
- Global availability

**Biosecurity**
- Restricted personnel access
- Facility sanitation
- Pest management program

# 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<br>Wheat<br>Corn<br>Corn gluten meal<br>Soy oil | Wheat<br>Corn<br>Wheat midds<br>Corn gluten meal<br>Soy oil | Wheat<br>Corn<br>Wheat midds<br>**Soybean meal**<br>Corn gluten meal<br>Soy oil | Wheat<br>Corn<br>Corn gluten meal<br>Wheat midds<br>Soy oil | Wheat<br>Corn<br>Corn gluten meal<br>Wheat midds<br>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<br>12.1 kJ/g | 3.0 kcal/g<br>12.6 kJ/g | 3.1 kcal/g<br>13.0 kJ/g | 3.3 kcal/g<br>13.8 kJ/g | 3.1 kcal/g<br>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** | • Prolonged maintenance<br>• Aging<br>• Toxicology<br>• Oncology | • Growth<br>• Maintenance<br>• Toxicology<br>• Oncology | • Breeding<br>• Growth<br>• Maintenance<br>• General purpose | • Breeding<br>• Genetically - engineered mice<br>• Poorly performing strains<br>• Oncology | • Breeding<br>• General purpose<br>• Estrogen-sensitive breeding studies<br>• Reproductive toxicology<br>• 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

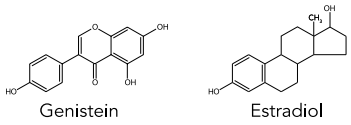
- '9' in the second digit - the diet has been irradiated
- 'S' - the autoclavable version, supplemented with vitamins to account for presumed losses
- 'X' - extruded form; exception is 2019 which is extruded
- 'C' - certified; a representative sample is tested for a panel of contaminants
- 'M' - meal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

Not all product combinations are produced regularly or stocked locally.

# Ingredient selection

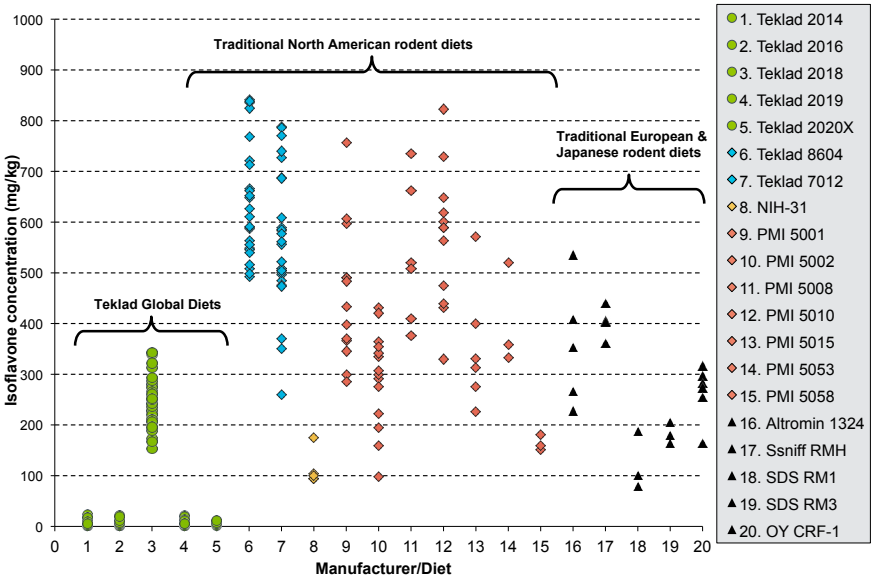
## THE KEY TO REDUCING RATHER THAN INTRODUCING VARIATION

| 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

## 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 homeostatsis, 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. |

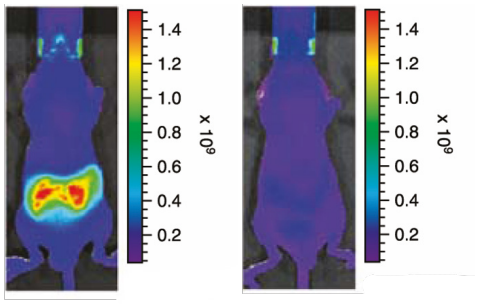
**Solution:** Inotiv's minimal isoflavone Teklad diets lead to reliable, repeatable research results.

## ADDITIONAL RESOURCES:

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

# Teklad Global Rodent Diets

## FOR FLUORESCENT IMAGING



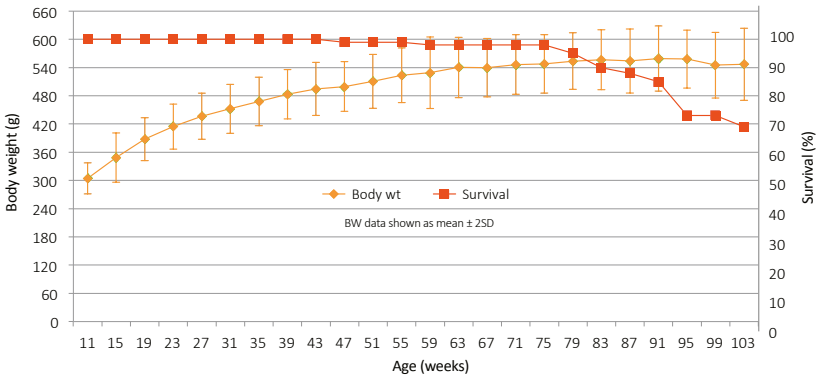

- Exclusion of alfalfa meal practically eliminates chlorophyll, the source of autofluorescence in the gut region
- Teklad Global Rodent Diets significantly reduce background autofluorescence and are suitable for many imaging applications

# Teklad Global Rodent Diets

## DESIGNED TO IMPROVE ANIMAL WELFARE

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

### GROWTH AND SURVIVAL CURVES




### Model

Hsd:Sprague Dawley® SD® males (n=200)

### Diet

Teklad 2014 (14% protein) starting at 8 weeks of age

### Results

- Body weight plateaus at ~550 grams without diet restriction; compare to CD® IGS rat which are 100-200 grams heavier when fed more typical standard diets
- Survival at 2 years ~68%; compare to typical 2 year survival in CD® IGS rat of ~35-40%

# Teklad Global Diets® at a glance

| SPECIES | RODENT | | | | | 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<br>4% Fat | 16% Protein<br>4% Fat | 18% Protein<br>6% Fat<br>*Moderate phytoestrogen* | 19% Protein<br>9% Fat | 19% Protein<br>6% Fat | 21% Protein<br>6% Fat | 25% Protein<br>9% Fat | 27% Protein<br>16% Fat |
| | • Vegetarian (no nitrosamines)<br>• Minimal phytoestrogens (2014, 2016, 2019, 2020X)<br>• Suitable for imaging studies (no alfalfa meal)<br>• Extruded versions dramatically reduce clumping and hardening after autoclaving and reduce waste | | | | | • High-quality poultry by-products<br>• Smooth transition between diets<br>• Options for all life stages<br>• All options stocked as certified | | |
| PURPOSE AND BENEFITS | | | | | | | | |
| | • Prolonged maintenance<br>• Aging<br>• Toxicology<br>• Oncology | • Growth<br>• Maintenance<br>• Toxicology<br>• Oncology | • Breeding<br>• Growth<br>• Maintenance<br>• General purpose | • Breeding<br>• Genetically engineered mice<br>• Poorly performing strains<br>• Oncology | • Breeding<br>• General purpose<br>• Estrogen-sensitive breeding studies<br>• Reproductive toxicology<br>• Oncology | • Maintenence | • Gestation<br>• Lactation<br>• Growth<br>• Maintenance | • Gestation<br>• Lactation<br>• Growth |
| 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<br>12.1 kJ/g | 3.0 kcal/g<br>12.6 kJ/g | 3.1 kcal/g<br>13.0 kJ/g | 3.3 kcal/g<br>13.8 kJ/g | 3.1 kcal/g<br>13.0 kJ/g | 3.2 kcal/g<br>13.4 kJ/g | 3.5 kcal/g<br>14.6 kJ/g | 3.8 kcal/g<br>15.9 kJ/g |
| FIXED FORMULA - ACHIEVING HIGH CONSISTENCY OF NUTRIENTS COUPLED WITH THE SAME INGREDIENT INCLUSIONS IN EVERY BATCH | | | | | | | | |
| | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

[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 | | | | | | | | |
| | • 16% Protein<br>• 3% Fat<br>*Vegetarian* | • 14% Protein<br>• 2% Fat<br>*Vegetarian*<br>*Higher fiber* | • 18% Protein<br>• 3% Fat | • 17% Protein<br>• 4% Fat<br>*Higher fiber* | • 20% Protein<br>• 4% Fat<br>*Higher fiber* | • 25% Protein<br>• 5% Fat | • 32% Protein<br>• 12% Fat<br>*Includes a urinary acidfier* | • 36% Protein<br>• 18% Fat<br>*Highly digestible*<br>*Low ash poultry by-products* |
| | | | Global Guinea Pig Diets are fortified with stabilized vitamin C | | Global Primate Diets are fortified with stabilized vitamin C | | | |
| PURPOSE AND BENEFITS | | | | | | | | |
| | • Gestation<br>• Lactation<br>• Growth | • Maintenance<br>• Long term studies | • Gestation<br>• Lactation<br>• Growth | • Maintenance | • Gestation<br>• Lactation<br>• Growth<br>• Maintenance | • Gestation<br>• Lactation<br>• Growth<br>• Maintenance | • Gestation<br>• Lactation<br>• Growth<br>• Maintenance | • Gestation<br>• Lactation<br>• Growth<br>• 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<br>10.0 kJ/g | 2.0 kcal/g<br>8.4 kJ/g | 2.5 kcal/g<br>10.5 kJ/g | 2.4 kcal/g<br>10.0 kJ/g | 2.8 kcal/g<br>11.7 kJ/g | 3.2 kcal/g<br>13.4 kJ/g | 3.5 kcal/g<br>14.6 kJ/g | 3.8 kcal/g<br>15.9 kJ/g |
| FIXED FORMULA - ACHIEVING HIGH CONSISTENCY OF NUTRIENTS COUPLED WITH THE SAME INGREDIENT INCLUSIONS IN EVERY BATCH | | | | | | | | |
| | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## Extruded

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

## Certified

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

# Custom research diets, medicated diets

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

### Induce disease

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

### Dose animals

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

**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

Teklad 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
- 7099W White TEK-Fresh™ 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

### CUSTOM CUT LINERS

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

### ENRICHMENT

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

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

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

# 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 hold 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 Institue 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

**GENE KNOCKOUT**

- Constitutive Knockout
  - Mouse (4 Months)
  - Rat (4 Months)
- Conditional Knockout
  - Mouse (6 Months)
  - Rat (6 Months)

**GENE MUTATION/ REPLACEMENT**

- Constitutive Knockin
  - Mouse (6 Months)
  - Rat (6 Months)
- Humanized Knockout
  - Mouse (6 Months)
  - Rat (6 Months)
- Point Mutation
  - Mouse (4 Months)
  - Rat (4 Months)

**TARGETED TRANSGENIC**

- Stable Gene Expression Safe Harbor Locus (Rosa26)
  - Mouse (5 Months)
  - Rat (5 Months)

***Note:*** *Timelines listed are to F1 identification of a F1 Het Breeder Pair. Founder (F0) identification will be 2 months sooner.*

# Contract breeding services

## Inotiv has performed contract breeding services – rederivation, cryopreservation, revitalization, colony management, contract breeding, and quarantine services – for many years.

Originally developed to support our internal breeding operations, we began providing these services to customers. Experience gained through these customer engagements and our continuous investment in capabilities, facilities, and personnel, have enabled us to refine and formalize a comprehensive set of contract breeding service offerings.

Because these capabilities are core to supporting our own breeding operations, we fully understand the importance of high quality breeding services to colony management and to the integrity of the research process. We bring both a provider and customer perspective to the table when working with our customers to develop a plan of action.

Our contract breeding services employees are dedicated to providing high quality, reliable, and consistent results. By continuously striving to achieve this level of performance, we deliver not only what matters to our customers, but we aim to be the most dependable supplier of contract breeding services in the industry. All contract breeding services are managed by a dedicated group of project managers who will work closely with you to develop a customized program to address your needs and requirements. You will always have a knowledgeable team to support your projects with 24/7 online colony management system, LabTracks™.

### CRYOPRESERVATION – RAT AND MOUSE

Inotiv provides both embryo and sperm cryopreservation services. Embryo and sperm cryopreservation provides a means to permanently preserve the genetic integrity of an animal colony. It also provides a cost effective means to safeguard your valuable model lines in the event of a catastrophic colony disaster. Sperm cryopreservation also provides a cost effective way to preserve a mouse line that generally requires fewer donor animals. Although sperm cryopreservation requires fewer animals to complete a project, it only preserves a haploid genome. Our team is trained in state of the art IVF and freezing technologies and conduct permanent development and quality control to guarantee you the highest cryopreservation safety.

# Contract breeding services

## Cryopreservation - embryo or sperm

| SERVICE | REQUIREMENTS | PROJECT OUTCOME |
|---|---|---|
| Embryo cryopreservation using homozygous, heterozygous or wild type females - Mouse and Rat | • 6-8 donor males (6-27 wk)<br>• 35 wild-type donor females (3-4 wk)<br>• Genotype and background of donors | • Approximatively 200-300 embryos<br>• *In vitro* QC<br>• Free storage for the first year |
| Mouse Sperm cryopreservation | • 2-4 donor males (6-27 wk)<br>• Genotype and background of donors | • Approximately 20-22 straws<br>• *In vitro* fertilization QC (2 cell embryo stage)<br>• Free storage for the first year. |
| Site Storage Fees | | • Dual site storage, first year is free<br>• Up to 500 embryos in total<br>• Up to 50 straws of sperm in total |
| Live Birth Quality Control for Mouse or Rat Cryopreserved Embryos | • 40 embryos, minimum | • *In vivo* QC to generate live offspring<br>• Viable embryos transferred into recipient animals to generate live offspring<br>• Confirmation of embryo viability |
| Live Birth Quality Control for Mouse Cryopreserved Sperm | • 2-3 straws of sperm | • *In vitro* QC to generate live offspring<br>• Viable embryos transferred into reciepient animals to generate ive offspring<br>• 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.

# Contract breeding services

## REDERIVATIONS AND SPEED REDERIVATIONS – RAT AND MOUSE

Rederivation is a procedure used to establish specific pathogen free animals and to improve the overall animal health status of a colony. Inotiv uses embryo transfer to generate small cohorts of pups. Once completed, you have the option of sustaining your line at Inotiv for continued colony maintenance and breeding.

### Rederivations and speed rederivations

| SERVICE | REQUIREMENTS | PROJECT OUTCOME |
|---|---|---|
| Rederivation with health screening | • 5 donor males (6-27 wk)<br>• 10 donor females (3-4 wk) or<br>• 15 wild-type donor females (3-4 wk)<br>• Genotype and background of donors | • Small cohort with a specified health status<br>• Shipping and container fees are additional<br>• 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 | • 100 cryopreserved embryos<br>• Freezing and thawing protocol<br>• QC report | • Small cohort with a specified health status<br>• Includes rederivation services, recipient and offspring housing and health monitoring |
| Revitalization of sperm with health screening – Mouse only | • 3-5 straws of cryopreserved sperm<br>• Freezing and thawing protocol<br>• QC report | • Small cohort with a specified health status<br>• Includes rederivation services, recipient and offspring housing and health monitoring |
| Revitalization of embryos with health screening (embryos from a discontinued line, either mouse or rat) | | • Small cohort offspring with a specified health status<br>• Includes rederivation services, recipient and offspring housing and health monitoring |

Once completed, you have the option of maintaining your line at Inotiv for continued colony maintenance and breeding.

## CRYO/REDERIVATION COMBO – RAT AND MOUSE

In some situations it is practical to combine the rederivation or revitalization effort with cryopreservation (embryos or sperm) of the same line. Inotiv offers the following cost effective options. Once completed, you have the option of maintaining your line at Inotiv for continued colony maintenance and breeding.

### Cryo/rederivation combo

| SERVICE | REQUIREMENTS | PROJECT OUTCOME |
|---|---|---|
| Mouse Embryo | • Wildtype or customer females | • Rederivation or revitalization to generate a small cohort of offspring at a specified health status.<br>• Cryopreservation of 150 embryos<br>• Includes<br>  • Donor animal housing<br>  • Recipient and offspring housing<br>  • Health monitoring<br>  • *In vitro* culture QC<br>  • Dual storage site, free for the first year |
| Rat Embryo | • Wildtype or customer females | • Rederivation or revitalization to generate a small cohort of offspring at a specified health status.<br>• Cryopreservation of 100 embryos<br>• Includes<br>  • Donor animal housing<br>  • Recipient and offspring housing<br>  • Health monitoring<br>  • *In vitro* culture QC<br>  • Dual storage site, free for the first year |
| Mouse Sperm | • Wildtype or customer females | • Rederivation or revitalization to generate a small cohort of offspring at a specified health status.<br>• Cryopreservation of 10-12 straws of sperm<br>• Includes<br>  • Donor animal housing<br>  • Recipient and offspring housing<br>  • Health monitoring<br>  • *In vitro* culture QC<br>  • Dual storage site, free for the first year |

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

## CONTRACT BREEDING ISOLATOR 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. These services allow you to concentrate on your research and save space in your animal facility.

| 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 |
| Quarantine Isolator | Routine Husbandry / isolator or IVC / week - extended housing for donor animals after completed rederivation |
| 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 service solutions
- Predict cohort requirements to avoid over production
- 24/7 online access to your animal colony through LabTracks™
- Flexible solutions
- Active project management and personalized communication
- Customized breeding schemes, health monitoring and genetic monitoring programs
- Easy access to surgical services, custom model, cryopreservation, rederivation, preconditioning, aging and dosing using Teklad custom diets
- Expertise in breeding
- Multiple site locations across the globe
- Easy access to Inotiv animals for cross-breeding or rederivation

LabTracks™ colony management portal to provide you with regular reports on your project's progress.
**servicesPMG.US@inotiv.com**

labtracks

Inotiv utilizes LabTracks(TM) 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

**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**

# 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 from third-party or Inotiv-bred 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
- Innovative software system to track and monitor surgical model development

## Development

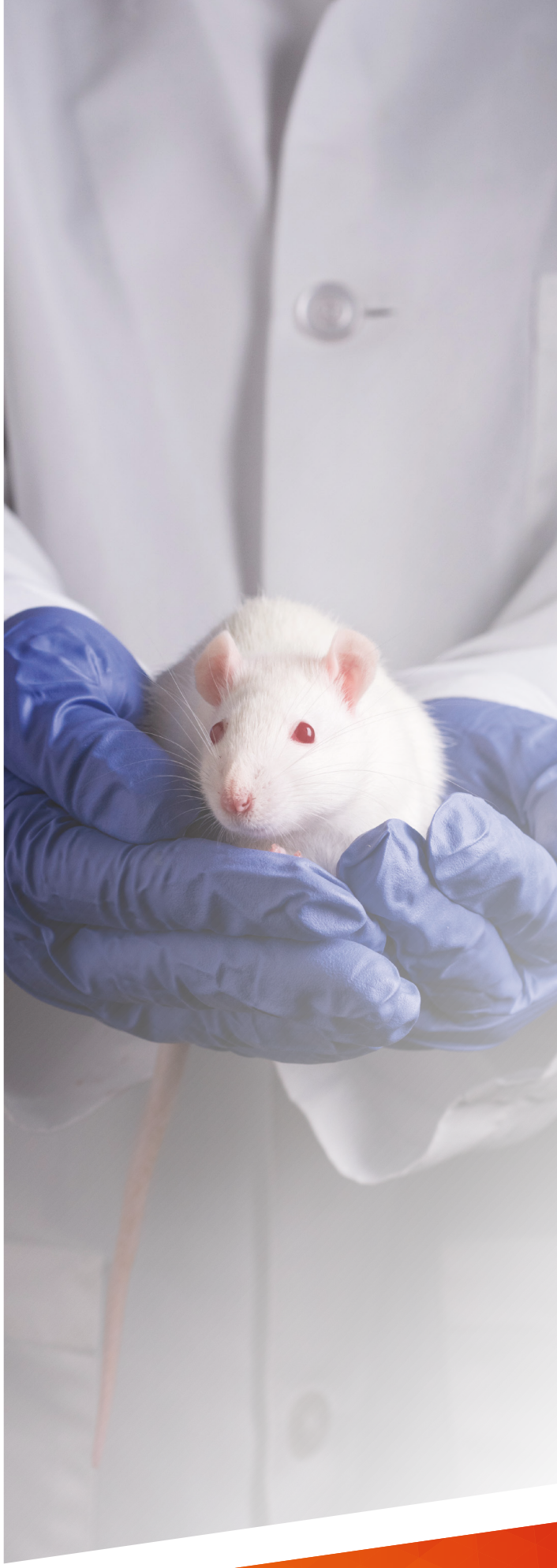
- Working with researchers to develop new surgical models and improve current models
- Commitment to continuing education opportunities for Inotiv surgical staff
- Continuous investment in Inotiv surgical facilities
- Flexibility to conduct surgery on both third-party and Inotiv bred rodent models

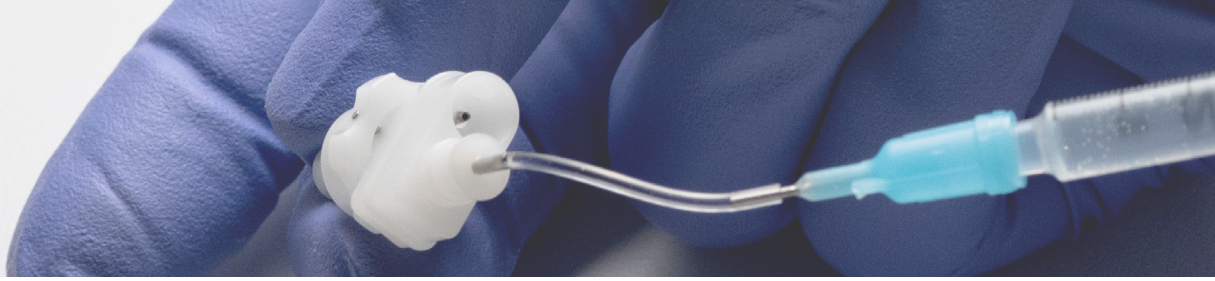
## Collaboration

- 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 | $186.40 | $181.00 |
| Femoral Artery* | FAC | $297.10 | $207.95 |
| Femoral Vein | FVC | $280.85 | $178.35 |
| Jugular Vein | JVC | $229.65 | $145.90 |
| Portal Vein | PVC | $392.95 | $283.65 |
| NON-VASCULAR CATHETERIZATIONS | | | |
| Urinary Bladder | | $302.40 | $302.40 |
| Bile Duct - Closed Loop | BDCCL | $438.60 | $311.30 |
| Intestinal-Duodenal | IDC | $357.85 | $258.00 |
| Intestinal-Jejunal | IJC | $438.90 | $317.35 |
| Gastric | IGC | $325.40 | $226.85 |
| Intra-Colonic | ICC | $398.45 | $295.80 |
| Ileum* | ILC | $305.25 | $299.75 |
| Intra-Thecal | | $361.90 | $312.00 |

* On certain animal models only

For inquires 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 | $264.75 | $255.20 |
| Jugular Vein | JVC | $199.90 | $191.75 |
| NON-VASCULAR CATHETERIZATIONS | | | |
| Intestinal-Duodenal* | IDC | $424.10 | $402.40 |
| Gastric | IGC | $253.90 | $244.45 |
| Intra-colonic | ICC | $299.75 | $290.40 |
| Ileum | ILC | $418.60 | $405.80 |

### Surgical enrichment program

- All singly-housed surgically-modified rodents receive enrichment postoperatively and during transit
- All surgically-modified rodents are acclimated to Clear$H_2O$ gel prior to shipment

**All catheterizations can be performed using Instech's PinPort™ for an additional charge of $12.00 (to include the PinPort™ for use during surgery and shipping). See page 56 for pricing on injectors for flushing maintenance.**

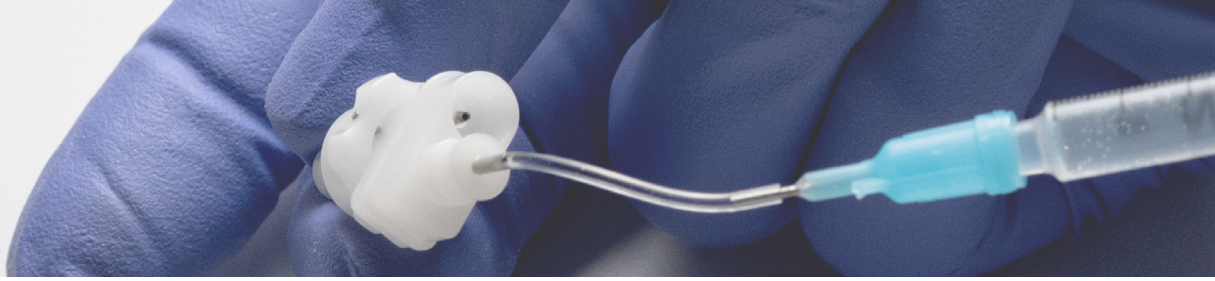
### Multiple procedures – single animal rat

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 | $421.30 | $293.10 |
| Double Jugular Vein | JVC/JVC | $360.55 | $259.30 |
| Femoral Artery/Femoral Vein | FVC/FAC | $465.85 | $348.40 |
| Jugular Vein/Femoral Vein | JVC/FVC | $398.45 | $291.70 |
| Jugular Vein/Femoral Artery | JVC/FAC | $436.20 | $317.35 |

**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 #VAH95AB* | $93.20 |
| Harness, dual port | $137.65 |
| Harness, quad port | $177.55 |
| Harness Dual Port w/ Connector *Part #s VAHD115AB & VAHD115L* | $210.05 |
| Harness Quad Port w/ Connector | $255.90 |
| Connector, Dual/Quad Harness | $78.50 |
| Harness, Quik Connect Single Port *Part# QCH-21* | $90.30 |
| Harness, Custom Dual Port *Part# QCDH-21-22LIVCV* | $115.35 |
| **CULEX CATHETERS** | |
| Culex CAC | $59.25 |
| Culex FVC short Catheter | $63.65 |
| Culex FAC Catheter | $59.25 |
| Culex JVC short Catheter | $63.65 |
| Culex Bile Duct-GI Closed Loop | $221.95 |
| Culex PVC Catheter | $63.65 |
| Culex Catheter SS Plug, 19g | $13.30 |
| Stainless Steel U Connector | $88.80 |
| **CATHETER BUTTONS** | |
| Vascular Access Button - Mice/Rats/Hamsters/Guinea Pigs | $76.85 |
| Instech Double Button - Mice/Rats/Hamsters/Guinea Pigs | $105.70 |
| Instech Triple Button - Mice/Rats/Hamsters/Guinea Pigs | $131.00 |

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.

For inquires 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.

## Soft tissue surgical procedures

| | | UP TO 5 ANIMALS (PER ANIMAL) | 6 OR MORE ANIMALS (PER ANIMAL) |
|---|---|---|---|
| **REPRODUCTIVE** | | | |
| Castration - rat | CAST-scrotal | $74.30 | $40.60 |
| Castration - mouse | CAST-scrotal | $78.40 | $44.65 |
| Ovariectomy - rat | OVX | $83.75 | $43.25 |
| Ovariectomy - mouse | OVX | $79.75 | $44.65 |
| Vasectomy - rat | VAS | $98.65 | $56.80 |
| Vasectomy - mouse | VAS | $101.35 | $56.80 |
| **ENDOCRINE** | | | |
| Adrenalectomy - rat | | $59.50 | $47.35 |
| Adrenalectomy - mouse | | $59.50 | $47.35 |
| **ADDITIONAL** | | | |
| Nephrectomy-Unilateral - rat | NEPHREX | $133.10 | $75.00 |
| Nephrectomy-Unilateral - mouse | NEPHREX-mouse | $140.10 | $80.75 |
| 5/6 Nephrectomy - rat | | Pricing available upon request | |
| 5/6 Nephrectomy - mouse | | Pricing available upon request | |
| **CARDIOVASCULAR** | | | |
| Telemetry - rat | | Pricing available upon request | |
| Telemetry - mouse | | Pricing available upon request | |
| Myocardial infarction - rat | | Pricing available upon request | |
| Myocardial infarction - mouse | | Pricing available upon request | |
| Transverse aortic constriction - rat | | Pricing available upon request | |
| Transverse aortic constriction - mouse | | Pricing available upon request | |

## Immunodeficient models

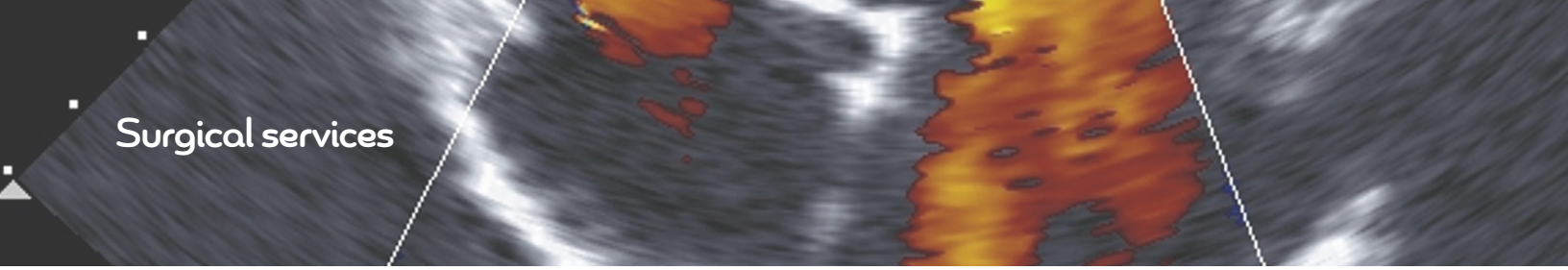
Surgical modification of immunodeficient rodents that are maintained in flexible-film isolators is also available. These surgical procedures are performed within surgical isolators.

| | | UP TO 5 ANIMALS (PER ANIMAL) | 6 OR MORE ANIMALS (PER ANIMAL) |
|---|---|---|---|
| **REPRODUCTIVE** | | | |
| Castration - rat | CAST-Isolator rat | $99.95 | $70.30 |
| Castration - mouse | CAST-Isolator mice | $97.25 | $73.00 |
| Ovariectomy - rat | | $96.00 | $71.60 |
| Ovariectomy - mouse | OVX-Isolator mice | $89.10 | $73.00 |
| Vasectomy - rat | | $113.50 | $83.75 |
| Vasectomy - mouse | | $109.40 | $86.45 |

## Additional charges

| | EACH |
|---|---|
| Custom surgeries not listed | Pricing available upon request |

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



# Myocardial infarction model

In the mid 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

# Commerically-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

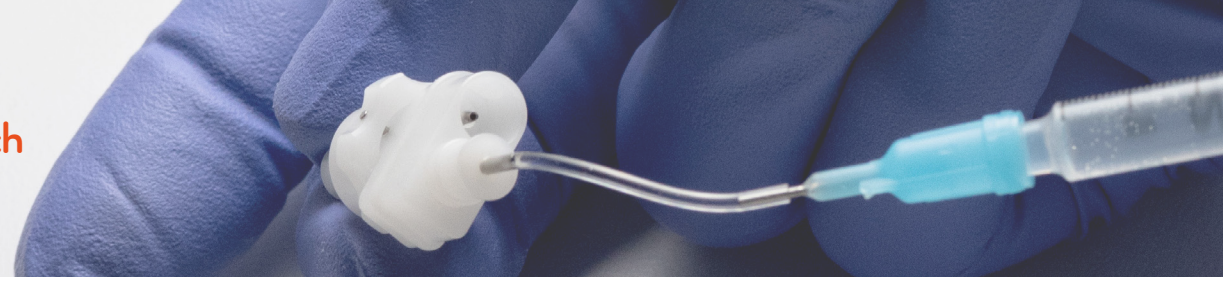
- Hair loss
- Loss of motor skills and sensory perception
- Presence of spontaneous tumors
- Reduced immunologic and physiologic function
- Loss of vision, e.g. retinal degeneration, development of cataracts

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
- 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

Answering the right questions on time and with high-quality data is the key to achieving your objectives. At Inotiv, drug discovery and development innovation is our focus. We deliver the comprehensive and integrated range of right-sized *in vivo*, *in vitro* and *in silico* services, analytical, bioanalysis, DMPK, and consulting solutions essential to your success. Take advantage of our long and impeccable regulatory history, world-class team of scientists, and track record of providing attentive, decisive service.

### *IN VITRO* AND *IN VIVO* SERVICES

#### Discovery

- Pharmacology and toxicology assessment
- Drug metabolism and pharmacokinetics
- Pharmacology/pharmacodynamic model co-development
- Toxicogenomics
- Computational toxicology
- Proteomic analysis

#### 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

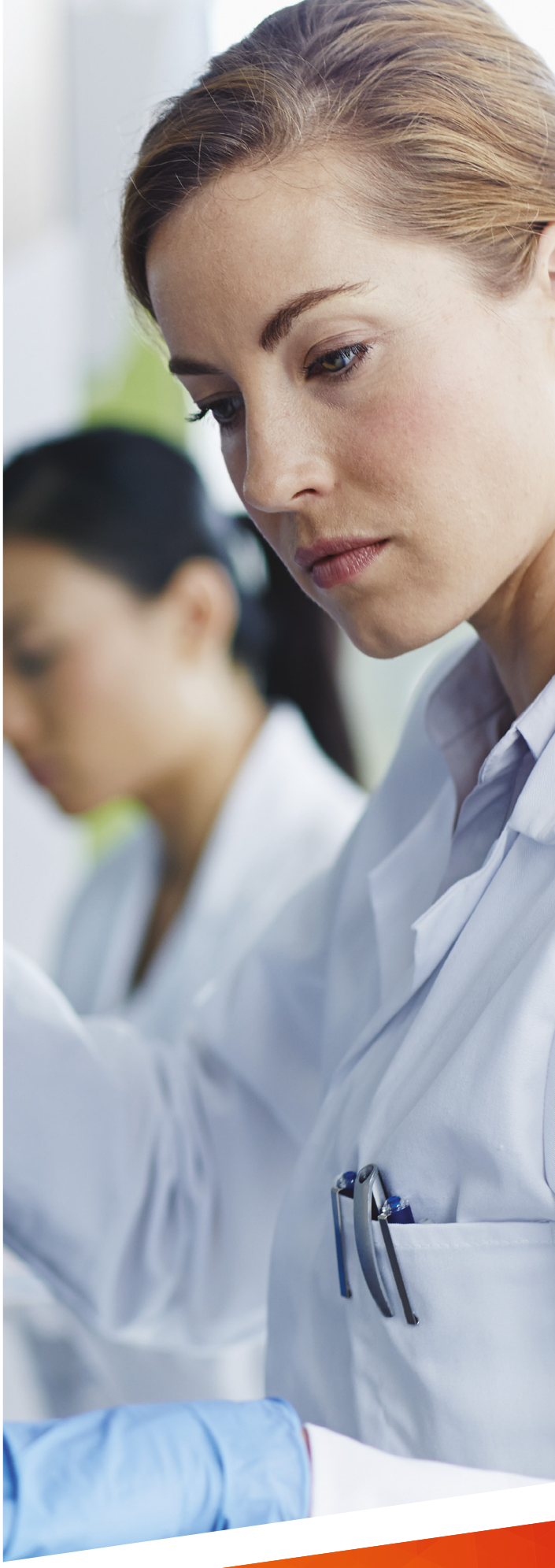
# Production locations
## WORLDWIDE RESEARCH SERVICES

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

# Custom antibody production
# BIOPRODUCTS

## *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** | • Cost effective for smaller research runs<br>• 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 | • Reduced cost<br>• Yield ~20-150mg per 1 L bag<br>• Quick turn-around<br>• Excellent oxygen transport |
| **Large Scale Production** | • Flexible and easy scale up<br>• Larger scale research<br>• and cGMP runs | Hybridomas (CHO's, 293's, PerC.6 and secreted proteins) | Hollow Fiber Bioreactor, Wave Bag Rocker | 10mg-300g per project | • Max environmental control<br>• Reproducible manufacturing process<br>• Reduces extraneous proteins<br>• 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** | • Immunize mice with antigen<br>• Boost/Test by ELISA or alternate method<br>• Additional boost(s) if needed<br>• Pre-fusion boost | • Move mice with best titers as fusion candidates<br>• Immunizing multiple mice increases success |
| **Stage II: Fusion/Screen and Select** | • Fusion with myeloma cell line<br>• Grow cells in HAT medium<br>• Initial screen/selection | • Screen all initial plates<br>• Expand positive wells and test by ELISA<br>• Set up to 30 positives for cloning<br>• Keep frozen back-up for future testing |
| **Stage III: Cloning/Frozen Stock** | • First cloning<br>• Final cloning<br>• Selection for non-HT requirement<br>• Frozen stock and small antibody scale-up | • Clone by limiting dilution method<br>• Test clones by ELISA<br>• Several cloning cycles<br>• 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<br>USDA Licensed<br>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<br>IEF, SEC, MW Testing<br>Fab and F(ab')2 Fragmentation<br>FITC, Biotin, Alk Phos, and HRP Conjugation** | Monoclonals<br>Polyclonals<br>Secreted Proteins<br>IgM<br>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 | • Variety of Methods<br>• Low endotoxin for *in vivo* use cGMP compliant for diagnostic use<br>• Purify customer's in-house antibody<br>• 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<br>Rats, Guinea Pigs | Small to large scale (all size runs available) | Vaccine, Research Discovery | Variety of Species<br>USDA Licensed<br>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/bioproducts, for our full program, or contact us at 800.972.4362 or by e-mail at bioproducts.NA@inotiv.com to place an order.

# Quality programs

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

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

Custom antibody production **inotiv.com/bioproducts**

Custom antibody production facilities in North America are cGMP compliant (21CFR Parts, 210, 211, and 820).

For any questions, please contact BPS at **Bioproducts.NA@inotiv.com**, or **800.972.4362**.

## 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 V irus (RMV) | 1 | - | - | M | Q | - | M[a] | ELISA or PCR |
| Rat Parvovirus (RPV) | 1 | - | - | M | Q | - | M[a] | ELISA or PCR |
| Rat Theiler V irus (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
F 317.806.6090
E CSDorders@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/CSDorders
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 hierachy. 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 | $28.50 |
| Zip Top Double Wire Container w/ Viewing Windows & Gel | $50.50 |
| Plastic Shipping Container with Hydrogels | $50.50 |
| Zip Top MicroShipper with Two Innocages and Gel | $85.50 |
| Tattoo (rodents) | $15.10 |
| Ear Tag (rodents) | $9.20 |
| Import or export charges | $1,200.00 |
| Fish and Wildlife Declaration Fee | $600.00 |
| Veterinary Certificate | $500.00 |

# Shipping guidelines

## SHIPPING

- Viewing windows, plus mylar lid liner for easy, convenient viewing of animal models
- Woven-edge screen for smooth handling
- Clear$H_2O$® gel hydration source
- Dimensions are 24.5"x16.25"x8"

Clear$H_2O$® gel is recognized by the research industry as an innovative hydration source. Our veterinary staff recommends Clear$H_2O$® 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.

## 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

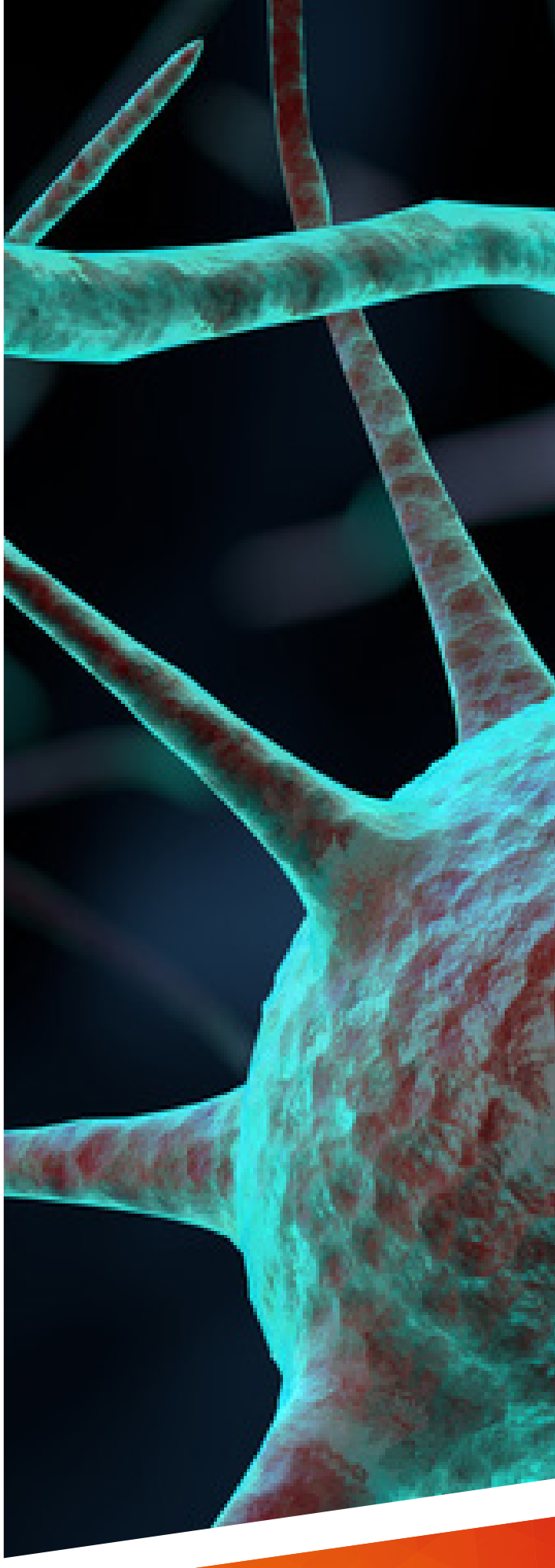
We are proud of our customer-centric culture which makes us responsive to every customer, no matter their size, as we continually optimize their product delivery and research programs to help ensure consistently clear results.

### 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**



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