



BIOMICE



Innovative Models to Accelerate Drug Discovery



Product & Services Overview

- Gene Targeting Services
- Drug Target Humanized Models
- Preclinical Pharmacology Services

BioMice is a division of



BIOCYTOGEN

Gene Editing Service Platform

Our Technologies

	Overview	Insert Size	Timeline
CRISPR/EGE™	Proprietary “Extreme Genome Editing” increases the efficiency of knock-in by 10-20x compared to CRISPR/Cas9	<17Kb	4-7 months to F1 ^{+/-} 4-6 months for cell lines
ESC/HR	Homologous recombination using Biocytogen’s ES cell lines established on the C57/BL6 background	<30Kb	9-11 months to F1 ^{+/-}
EGE™ - ESC/HR	Combination of EGE and ESC/HR technologies to enable large site-specific insertions	<200Kb	10-12 months to F1 ^{+/-}
Tol2-Tg BAC-Tg	Random genetic insertion of large fragments	<30Kb; <300Kb	3-5 months to F0
SUPCE	Proprietary size-unlimited, precise chromosome engineering enables gene cluster-level insertions	Mb Scale	18-24 months

Add-on Services:

- **Expression analysis at mRNA level and/or protein level**
- **Copy number analysis, Transgene integration site mapping**
- **Custom breeding and colony expansion**



Biocytogen’s gene editing platform is compatible with multiple gene targeting strategies:

- Tol2 Transgene
- BAC Transgene
- Global Knockout
- Conditional Knockout
- Cre(ERT2) Knockin
- Reporter Gene Knockin
- Global Knockin
- Conditional Knockin
- Safe Harbor Locus Knockin (e.g. Rosa26, H11, Col1a1)
- Point Mutation Knockin
- Conditional Point Mutation Knockin
- Humanized Knockin

Strict Quality Control

**Rigorous
sgRNA Design**

**Pure RNA
Injection**

**4-Step QC in
Genotyping**
2 rounds of PCR, Southern,
Sequencing

**Predicted Off-target
Analysis**

Karyotyping
Cell line targeting and
ESC/HR targeting

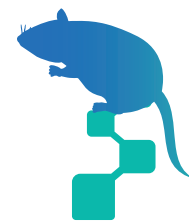
4,300+ gene editing projects delivered

500+ publications use our gene editing service/gene edited models



Immune Checkpoint Humanized Mice

4-1BB	CD112	CD24	CD4	CD79B	DLL1	GPC3	LILRB1	NKG2D	RAGE	TGFBR2	VSIG4
4-1BBL	CD155	CD248	CD40	CD80	DLL3	HVEM	LILRB2	NKP46	RANKL	TIGIT	VSIR
ADRB1	CD160	CD27	CD40L	CD89	DR4	ICAM1	LILRB3	NOTCH1	ROBO4	TIM1	
ALCAM	CD16A	CD28	CD43	CD93	EBI3	ICAM3	LILRB4	NRP1	RTN4R	TIM3	
AMHR2	CD16B	CD30	CD44	CD94	F11R	ICOS	LRRC33	OX40	SELE	TIM4	
ANTXR2	CD180	CD32A	CD45	CDCP1	FAP	ICOSL	LY6E	OX40L	SELL	TL1A	
AXL	CD19	CD32B	CD47	CEACAM1	FGL1	ITGB3	MADCAM1	PD-1	SELP	TLR2	
B2M	CD2	CD33	CD48	CLEC10A	FGL2	ITGB8	MERTK	PDGFB	SIGLEC10	TLR7	
B7-H3	CD20	CD36	CD5	CLEC14A	FOLR1	KAAG1	MICA	PDGFRA	SIGLEC15	TLR8	
B7-H4	CD200	CD37	CD52	CLEC9A	FOLR2	KLRG1	MRC1	PDGFRB	SIGLEC7	TLR9	
BAMBI	CD200R	CD38	CD6	CSPG4	FOLR4	LAG3	NCR2	PD-L1	SIGLEC9	TNFR1	
BCMA	CD22	CD39	CD69	CTLA4	GARP	LAIR1	NCR3	PDPN	SIRPA	TNFR2	
BST2	CD226	CD3E	CD70	CX3CL1	GAS6	LGALS9	NKG2A	PSGL-1	TF	TREM1	
BTLA	CD23	CD3EDG	CD73	DDR1	GITR	LIGHT	NKG2C	PVRIG	TGFB1	TREM2	



Link to our models page and full catalog

Cytokine & Cytokine Receptor Humanized Mice

ADIPOQ	CCL4	CSF3	GDF8	IGFBP2	IL15RA	IL21R	IL33	INHBE	MIF	TFPI
ADM	CCL5	CXCL1	GEP	IGFBP7	IL17A	IL22	IL36A	KIT	OSM	TNFA
AFP	CCN1	CXCL10	GFRAL	IL10	IL17B	IL22RA1	IL36R	KITLG	OSMR	TSLP
ANG2	CCN2	CXCL13	GHRL	IL10RA	IL17F	IL23A	IL4	KLK2	PAI1	TSLPR
ANGPTL3	CCN4	CXCL16	GRP	IL10RB	IL17RA	IL25	IL4RA	KLK3	PCSK9	TWEAK
ANGPTL4	CD14	CXCL3	IFNAR1	IL11	IL17RB	IL26	IL5	LAIR1	PTHrP	VEGFA
ANGPTL8	CD59	CXCL4	IFNAR2	IL11RA	IL17RC	IL27	IL5RA	LIF	RNASE4	VEGFR1
APRIL	CD5L	CXCL7	IFNB1	IL12A	IL18	IL27RA	IL6	LPA	RSPO1	VEGFR2
BAFF	CETP	DKK1	IFNG	IL12B	IL18BP	IL2RA	IL6R	LTA	RSPO3	VWF
BAFFR	CFB	EPO	IFNGR1	IL12RB1	IL19	IL2RB	IL6ST	LTB	S100A8	WNT3A
C3	CFD	FCER1A	IFNGR2	IL12RB2	IL1B	IL2RG	IL7R	LTBR	S100A9	
CCL11	CSF1	FGF21	IgE	IL13	IL1RACP	IL3	IL8	LYPD3	SOST	
CCL24	CSF1R	FGFR3	IGF1R	IL13RA1	IL2	IL31	IL9	MAG	SPP1	
CCL3	CSF2RB	GDF15	IGF2R	IL15	IL20	IL31RA	IL9R	MASP2	TEK	

30+

Immunodeficient Mice

- B-NDG series of immunodeficient mice
- Other immunodeficient mice & rats

GPCR Humanized Mice

A2AR	C5AR1	CCL1	CCR2	CCR7	CX3CR1	CXCR6	FZD7	GPR40	LGR4
ADGRG2	C5AR2	CCL2	CCR3	CCR8	CXCR2	ETAR	GCGR	GPR55	MC4R
ADORA2E	CALCRL	CCL20	CCR4	CCR9	CXCR3	F2RL1	GLP1R	GPR75	S1PR1
BDKRB2	CB1	CCL22	CCR5	CGRP	CXCR4	FSHR	GPR20	GPRC5D	SUCNR1
C5	CB2	CCR1	CCR6	CRTH2	CXCR5	FZD5	GPR35	HCAR1	VPAC1

800+

Other Genetically Modified Models

- Cre mice
- Target knock-out mice (700+)
- Other gene edited mice
- Aged mice

Other Targets Humanized Mice

ADA	C1Q	CD9	DPP3	FXII	ITGA5	HLA-G	MET	ORAI1	SEMA7A	TGM2	XDH
ADAM15	CAIX	CD95	EGFL7	GFRA1	ITGA6	LAT1	MFGE8	P2RX3	SERPINF2	TIMP1	α4β7
ADAM17	CD105	CD98HC	EGFR	GFRA3	ITGA9	LGALS3BF	MMP9	PGLYRP1	SHH	TLR3	
ADAM9	CD133	CDH1	EMP2	GPC1	ITGAL	LRP10	MSLN	PLAUR	SIGLEC8	TLR4	
ADAMTS5	CD147	CDH17	EPCAM	HAMP	ITGAV	LRP5	MST1R	PLXNB2	SLAMF7	TLT1	
ALB	CD151	CDH3	EPHB3	HBEGF	ITGB1	LRP6	MUC1	POSTN	SLC16A3	TLT2	
AMIGO2	CD163	CFP	EREG	HER2	ITGB7	LRRC15	MUC17	PSCA	SLC43A2	TNC	
AOC3	CD1D	CLDN2	EVA-1	HER3	JAG1	LSR	NECTIN4	PSMA	SLPI	TPBG	
APOC3	CD209	CLEC5A	FcRn	HMMR	JAG2	LUCA2	NGAL	PTH	SRB1	TROP2	
APOE2	CD300A	CLU	FGF	IBSP	JAM3	MARCO	NGF	PTK7	SSTR2	TTR*V30M	
APOE4	CD55	CSPG5	FGFRL1	ILT7	L1CAM	MCAM	NPR1	RETN	TCIRG1	TYRO3	
AREG	CD63	CTSG	FLT3LG	ITGA1	HLA-A11	MDK	NTRK1	RGMA	TDGF1	UPA	
BDCA2	CD68	DLK1	FSHB	ITGA2	HLA-A24	MDR1	NTRK2	ROR1	TEM7R	UPAR	
BPIFA1	CD79A	DLL4	FSTL3	ITGA4	HLA-A3.1	MELTF	NTRK3	SEMA4D	TFR1	VLDLR	

210+

Cell Lines

- Humanized cell lines
- Reporter cell lines

1,800+

Off-the-shelf animal and cell models developed

800,000+

animal models annual supply capacity

150,000+

cages in AAALAC-accredited animal centers

Pharmacology & Translational Research Services

Therapeutic Areas

We assess the efficacy of a wide range of therapeutics:

- **Antibodies**
- **Vaccines**
- **CAR-T cell therapy**
- **Allergens**
- **Somatic cells & tissues**
- **Gene therapy**
- **Recombinant therapeutic proteins**



2,500+
drug evaluation
projects completed

Pharmacology Service Capabilities



In vivo Efficacy Evaluation

Tumor Models (Allograft & Xenograft)

Drug Target Humanized Models

- Syngeneic model (subcutaneous/orthotopic)
- Spontaneous tumor model

Immune System Humanized Models

- PBMC reconstitution model
- CD34+ HSC reconstitution model
- NK reconstitution model



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Policy & Restrictions:



RISK-FREE SERVICES

Our experts are committed to your project's success.

We offer the following policies to earn the trust of your partnership and guarantee your satisfaction with our pharmacology services:

- **Risk-free Trial for New Clients:** Validate our service quality risk-free with a complimentary pilot study/model build; no charges until you're satisfied.
- **Complimentary Overage Policy:** No charges for any overages of Biocytogen mice supplied, ensuring statistical power necessary for project success.
- **100% Money-back Guarantee:** In the event our services are not satisfactory, we offer a free project repeat or a full refund. No questions asked.

In Vivo Efficacy Disease Modeling Capabilities

Nervous System Diseases

Multiple sclerosis: EAE
Ischemic stroke: MCAO model
Acute epilepsy: PTZ

Respiratory Diseases

Asthma: ALT, OVA, HDM
Pulmonary fibrosis: BLM
Acute Lung Injury: ALT, IL33 Papain, LPS
COPD: LPS+PPE

Digestive Diseases

Ulcerative enteritis: DSS, TNBS
Crohn's disease: T cell transfer model
Chronic enteritis: DSS

Skeletal Diseases

Rheumatoid arthritis: CII, CAIA
Osteoporosis model: OVX
Osteoarthritis model: ACLT

Integumentary Diseases

Psoriasis: IMQ
Atopic dermatitis: OXA, MC903
Delayed type hypersensitivity: OXA, KLH
Pruritus: Wound healing
Alopecia Areata: IMQ

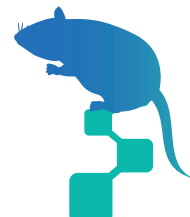
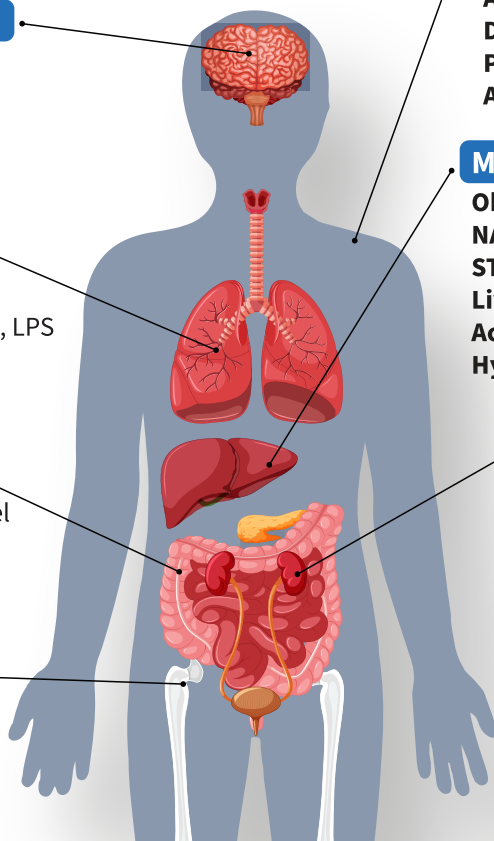
Metabolism Diseases

Obesity and diabetes: HFD, Spontaneous, STZ
NAFLD/NASH: GAN-induced, HFMC-induced
STAM-NASH: STZ and HFD
Liver fibrosis: CCL4, Bleomycin, Bile duct ligation, TAA
Acute liver injury: APAP, Concanavalin A
Hyperlipidemia: ApoE-/-

Urinary Diseases

Systemic Lupus Erythematosus: Pristane, MRL spontaneous model
Nephritis: POP model
Chronic kidney disease: 5/6 Nephrectomy, Oxalate diet

T-cell-dependent antibody response (TDAR)



Ex Vivo, In Vitro, Toxicology Platforms

> PD/PK Platform

Receptor occupancy (RO) analysis	Blood concentration analysis
Immune cell analysis	Immunogenicity analysis
Tumor infiltrating lymphocytes analysis	Tissue distribution analysis
Multiple cytokine analysis	
Tumor microenvironment analysis	

> Non-GLP Toxicology Platform

Histopathology toxicology tests	Clinical observation(Score)	Blood toxicology tests
Toxicokinetic (TK)	Cytokine release syndrome (CRS)	

> In vitro Pharmacology Platform

Model Validation	Screen	MOA	Toxicology
Binding assay	Killing assay	ADCC/ADCP/CDC	Inflammation/ Cytokines assay
Blocking assay	Internalization	MLR/Polarization	
Bioactivation assay			

> Large animal (canine) translational research platform

In vivo efficacy	PK/PD	Non-GLP toxicology
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BioMice Facilities & Capabilities



- Breeding & Maintenance
- Embryology & Surgery

- Quarantine & Rederivation
- Genetic Analysis & Phenotypic Evaluations

55,500m²

SPF Animal Facility

**800K
mice/year**

Gene-edited Mouse
Inventory

150K

Cages

30K/120K

Isolator Cages/IVC
Cages

Haimen Animal Center: AAALAC Certified Since 2016
Beijing Animal Center: AAALAC Certified Since 2021
Boston Animal Facility Operates Under AAALAC Guidelines

Integrated Services from Target to IND



Biocytogen's preclinical service division, **BioMice**, encompasses the generation and provision of off-the-shelf humanized and/or immunodeficient animal and cell model products, a variety of preclinical pharmacology services, and custom gene-editing services to clients in academia and industry. Biocytogen's pharmacology team has significant expertise in testing novel therapeutics for immuno-oncology, oncology, and autoimmune/ inflammatory disease applications. This array of innovative products and services is designed to streamline the evaluation process for novel anti-human therapeutics, with a particular emphasis on biologics.

Disease Target Selection

Preclinical Tumor/Disease Models

Preclinical Validation Studies

IND

Gene Editing Services

- CRISPR/Cas9-based Extreme Genome Editing (EGETM)
- ESC-based homologous recombination (large fragments)

4,500+

Custom Models Delivered

Animal & Cell Models

- Humanized Immune-Checkpoint Mice
- Humanized Cytokine/GPCR Mice
- Immunodeficient (B-NDG) Mice
- Humanized Tumor Cell Lines
- KO & Tool Models

1,700+

Off-the-shelf Models

Pharmacology Services

- Efficacy, PK/PD Evaluation of PCCs
- In vitro/In vivo/Toxicity Assays
- Syngeneic/Xenogeneic Models
- Inflammatory Disease Models

2,500+

Projects Delivered

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