



The following pages list the available TKO™ Knockout Rat Models and TGEM™ Rat Models by disease category

Table of Contents	
Featured TKO™ Knockout Rat Models	2
Immune and Inflammatory – TKO™ Knockout Rat Models	3
Immune and Inflammatory – TGEM™ Rat Models.....	5
Cancer Targets – TKO™ Knockout Rat Models.....	6
Cancer Targets – TGEM™ Rat Models	7
Metabolic and Cardiovascular – TKO™ Knockout Rat Models.....	8
Metabolic and Cardiovascular – TGEM™ Rat Models.....	10
Drug Metabolism and Chemoresistance - TKO™ Knockout Rat Models	11
Central Nervous System and Neurological - TKO™ Knockout Rat Models.....	12
Central Nervous System and Neurological - TGEM™ Rat Models..Error! Bookmark not defined.	
Other Exploratory Models - TKO™ Knockout Rat Models	15

Many TKO™ and TGEM™ rats have been recently created and in many cases phenotyping is still in progress. For up-to-date phenotype data on a specific rat line, please contact ordering@transposagenbio.com.

Featured TKO™ Knockout Rat Models	
Gene Name	Model / Disease Association
<i>Ada</i>- adenosine deaminase	<ul style="list-style-type: none"> • Severe combined immunodeficiency (SCID) • Transplantation
<i>Cyp7b1</i>	<ul style="list-style-type: none"> • dehydroepiandrosterone (DHEA) metabolism • Spastic Paraplegia 5A • Bile acid synthesis defects and Gallstone formation
<i>Dcc</i>- Deleted in colorectal carcinoma	<ul style="list-style-type: none"> • Tumor suppressor • Colorectal cancer, Esophageal carcinoma • Axon guidance
<i>Faslg</i>- fas ligand	<ul style="list-style-type: none"> • Autoimmune diseases • Arthritis • Inflammatory Bowel Disease • Autoimmune lymphoproliferative syndrome
<i>ErbB4</i>	<ul style="list-style-type: none"> • Peripheral neuropathy • Pain insensitivity
<i>Nrg1</i>- Neuregulin	<ul style="list-style-type: none"> • Schizophrenia • Expression improves muscle mechanical properties in models for Duchenne muscular dystrophy (DMD)
<i>Rapgef4 (Epac2)</i>	<ul style="list-style-type: none"> • Alzheimer's disease (AD)
<i>Robo1</i>	<ul style="list-style-type: none"> • Tumor suppressor • Lung, Breast, Kidney cancers
<i>Rtn4 (NogoA)</i>	<ul style="list-style-type: none"> • Neurodegeneration, enhanced corticospinal tract (CST) fiber regeneration following injury
<i>Slc7a11</i>	<ul style="list-style-type: none"> • Chemoresistance and a negative pharmacokinetic correlations with multiple drugs

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Immune and Inflammatory – TKO™ Knockout Rat Models	
Gene Name	Model / Disease Association
<i>Ada- adenosine deaminase</i>	<ul style="list-style-type: none">• Severe combined immunodeficiency (SCID)• Transplantation
<i>Bbx</i>	<ul style="list-style-type: none">• Multiple autoimmune diseases
<i>Cd226</i>	<ul style="list-style-type: none">• Systemic lupus erythematosus (SLE)• Leukocyte adhesion deficiency• Th1-mediated autoimmune disease
<i>Cenpp- Centromere Protein P</i>	<ul style="list-style-type: none">• Systemic sclerosis
<i>Cyp7b1</i>	<ul style="list-style-type: none">• Allergic pulmonary inflammation
<i>Dnah11</i>	<ul style="list-style-type: none">• Primary ciliary dyskinesia-7• Chronic respiratory infections, chronic sinusitis, recurrent bronchitis, and pneumonia.
<i>Faslg- fas ligand</i>	<ul style="list-style-type: none">• Autoimmune diseases• Arthritis• Inflammatory bowel disease (IBD)• Autoimmune lymphoproliferative syndrome
<i>Kcnh7</i>	<ul style="list-style-type: none">• Multiple sclerosis (MS)

More Immune and Inflammatory TKO™ Models on the following page

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Immune and Inflammatory – TKO™ Knockout Rat Models	
<i>Klra2</i>	<ul style="list-style-type: none">• Non-specific Immune Disorders
<i>Mov10</i>	<ul style="list-style-type: none">• Human hepatitis delta virus (HDV)
<i>Mylk4</i>	<ul style="list-style-type: none">• Lung inflammation• Diarrheal disease
<i>Pde4d</i>	<ul style="list-style-type: none">• Asthma• Chronic obstructive pulmonary disease (COPD)• Brain ischemia• Cerebrovascular accident• Ischemia• Stroke
<i>Ptpa</i>	<ul style="list-style-type: none">• Rheumatoid arthritis (RA)
<i>Slc7a11</i>	<ul style="list-style-type: none">• Pulmonary fibrosis

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Immune and Inflammatory – TGEM™ Rat Models	
Gene Name	Model / Disease Association
<i>Ccr2</i>	<ul style="list-style-type: none">• Rheumatoid arthritis (RA)
<i>N117S</i>	<ul style="list-style-type: none">• Alveolitis• Systemic lupus erythematosus (SLE)• HIV resistance
<i>Tlr4</i>	<ul style="list-style-type: none">• Endotoxin hyporesponsiveness• Innate immunity
<i>V489A</i>	
<i>Sod3</i>	<ul style="list-style-type: none">• Enhanced collagen induced arthritis (CIA)
<i>E124D</i>	
<i>Cpt2</i>	<ul style="list-style-type: none">• Hypoglycemic encephalopathy• Hepatomegaly
<i>F475L</i>	

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Cancer Targets – TKO™ Knockout Rat Models	
Gene Name	Model / Disease Association
<i>Cdc91ll1 (Pigu)</i>	<ul style="list-style-type: none"> • Bladder Cancer
<i>Cenpp</i>	<ul style="list-style-type: none"> • Intestinal adenoma
<i>Cyrr1-cysteine/tyrosine-rich 1</i>	<ul style="list-style-type: none"> • Neuroendocrine (NE) tumors
<i>Dcc- Deleted in colorectal carcinoma</i>	<ul style="list-style-type: none"> • Colon cancer • Esophageal carcinoma • Tumor suppressor
<i>ErbB4</i>	<ul style="list-style-type: none"> • Breast cancer • Prostate cancer • Leukemia
<i>Fam5c</i>	<ul style="list-style-type: none"> • Pituitary tumorigenesis
<i>Lims1</i>	<ul style="list-style-type: none"> • Esophageal squamous cell carcinoma
<i>Mgat4c</i>	<ul style="list-style-type: none"> • Increased expression in malignancies • Liver cancer
<i>Palld</i>	<ul style="list-style-type: none"> • Pancreatic cancer
<i>Pebp4</i>	<ul style="list-style-type: none"> • Prostate cancer • Ovarian cancer • Breast cancer • Anti-apoptotic oncogene
<i>Ptptra</i>	<ul style="list-style-type: none"> • Prostate cancer • Apoptosis resistance • Metastasis suppression
<i>Rbed1</i>	<ul style="list-style-type: none"> • Tumor suppression
<i>Robo1</i>	<ul style="list-style-type: none"> • Tumor suppressor • Lung cancer • Breast cancer • Kidney cancers
<i>Spata13</i>	<ul style="list-style-type: none"> • Sporadic and familial colorectal tumors
<i>Stxbp5l</i>	<ul style="list-style-type: none"> • Melanoma
<i>Tmem22</i>	<ul style="list-style-type: none"> • Lung cancer • Renal Cell Carcinoma • Tumor suppression

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Cancer Targets – TGEM™ Rat Models	
Gene Name	Model / Disease Association
<i>Tgfbr2</i>	<ul style="list-style-type: none">• Colon cancer• Esophageal cancer
<i>E311K</i>	<ul style="list-style-type: none">• Loeys-Dietz syndrome
<i>Nr4a1</i>	<ul style="list-style-type: none">• Acute myeloid leukemia
<i>nonsense</i>	

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Metabolic and Cardiovascular – TKO™ Knockout Rat Models	
Gene Name	Model / Disease Association
<i>Abat</i>	<ul style="list-style-type: none"> • Transaminase deficiency
<i>Cyp7b1</i>	<ul style="list-style-type: none"> • Bile acid synthesis defect • Gallstones formation • Dehydroepiandrosterone (DHEA) metabolism
<i>Exoc4</i>	<ul style="list-style-type: none"> • Insulin stimulated glucose transport • Type 2 diabetes
<i>Fam5c (Brinp3)</i>	<ul style="list-style-type: none"> • Myocardial infarction
<i>Grk1</i>	<ul style="list-style-type: none"> • Hypotension
<i>Inpp4b</i>	<ul style="list-style-type: none"> • Type 2 diabetes
<i>Lrrc7</i>	<ul style="list-style-type: none"> • Diabetic nephropathy • Kimmelstiel-Wilson syndrome • Intercapillary glomerulonephritis
<i>Mmell</i>	<ul style="list-style-type: none"> • Arterial pressure regulation • Phosphate metabolism • Homeostasis
<i>Mov10</i>	<ul style="list-style-type: none"> • Hemophilia • Gene therapy
<i>Palld</i>	<ul style="list-style-type: none"> • Coronary disease • Myocardial infarction
<i>Plce1</i>	<ul style="list-style-type: none"> • Nephrotic syndrome
	<ul style="list-style-type: none"> •

More Metabolic and Cardiovascular TKO™ Models on the following page

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Metabolic and Cardiovascular – TKO™ Knockout Rat Models	
<i>Rap1gds1</i>	<ul style="list-style-type: none">• Cholesterol metabolism• Bile acid synthesis defect• Gallstone formation• Type 2 diabetes• Insulin resistance
<i>Rapgef4</i>	<ul style="list-style-type: none">• Diabetes
<i>Rph3a</i>	<ul style="list-style-type: none">• Glomerular diseases• Glomerulonephritis• Glomerulosclerosis• Nephrotic syndrome
<i>Slc16a12</i>	<ul style="list-style-type: none">• Renal glucosuria
<i>Slc7a11</i>	<ul style="list-style-type: none">• Glomerulonephritis
<i>Spta1</i>	<ul style="list-style-type: none">• Sickle cell anemia,• Red blood cell disorders• Elliptocytosis• Pyropoikilocytosis• Spherocytosis
<i>Trpc4</i>	<ul style="list-style-type: none">• Pulmonary vascular medial hypertrophy• Thrombosis

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Metabolic and Cardiovascular – TGEM™ Rat Models	
Gene Name	Model / Disease Association
<i>Adipoq</i>	<ul style="list-style-type: none"> • Diabetes, • Non-alcoholic fatty liver disease
<i>L119P, I164N, Y162C</i>	
<i>Adra1a</i>	<ul style="list-style-type: none"> • Arterial blood pressure regulation
<i>G393V</i>	
<i>Agtr1</i>	<ul style="list-style-type: none"> • Hypertension • Myocardial infarction
<i>del251F</i>	<ul style="list-style-type: none"> • Tubular dysgenesis
<i>F10</i>	<ul style="list-style-type: none"> • Factor X deficiency
<i>nonsense</i>	
<i>Ghsr</i>	<ul style="list-style-type: none"> • Hypertension • Diet induced obesity
<i>Nonsense</i>	
<i>N26K</i>	
<i>Kcna5</i>	<ul style="list-style-type: none"> • Atrial fibrillation
<i>N152K</i>	
<i>Lcat</i>	<ul style="list-style-type: none"> • LCAT deficiency • Coronary arteriosclerosis
<i>nonsense</i>	<ul style="list-style-type: none"> • Fish-eye disease
<i>Nr0b2</i>	<ul style="list-style-type: none"> • Obesity
<i>G96R</i>	
<i>Proc</i>	<ul style="list-style-type: none"> • Thrombophilia
<i>L312P</i>	
<i>Cpt2</i>	<ul style="list-style-type: none"> • Infantile carnitine palmitoyltransferase II deficiency • Variable myopathy
<i>F475L</i>	

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Drug Metabolism and Chemoresistance TKO™ Knockout Rat Models

Gene Name	Model / Disease Association
<i>Cyp7b1</i>	<ul style="list-style-type: none">Dehydroepiandrosterone (DHEA) metabolism
<i>Enox1</i>	<ul style="list-style-type: none">Resistant to multiple anti-cancer drugs
<i>Slc16a12</i>	<ul style="list-style-type: none">Multiple xenobiotic and carcinogen chemoresistance
<i>Slc7a11</i>	<ul style="list-style-type: none">Chemoresistance and a negative pharmacokinetic correlations with multiple drugs

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Central Nervous System and Neurological TKO™ Knockout Rat Models	
Gene Name	Model / Disease Association
<i>Abat (GABAT)</i>	<ul style="list-style-type: none"> • Mental retardation, hypotonia, and ataxia • Autism susceptibility • Psychomotor retardation • Lethargy • Refractory seizures • EEG abnormalities error of neurotransmitter metabolism
<i>Auts2</i>	<ul style="list-style-type: none"> • Autistic disorder
<i>Chsy1</i>	<ul style="list-style-type: none"> • Mental retardation • Intellectual disability
<i>Csmd3</i>	<ul style="list-style-type: none"> • Adult familial myoclonic epilepsy • Autism
<i>Cyp7b1</i>	<ul style="list-style-type: none"> • Spastic paraplegia 5A • Alzheimer's disease (AD) • Aging related cognitive defects
<i>ErbB4</i>	<ul style="list-style-type: none"> • Peripheral neuropathy • Pain insensitivity • Schizophrenia • Axon guidance defects
<i>GALNTL6</i>	<ul style="list-style-type: none"> • Neuronal fitness
<i>Grk1</i>	<ul style="list-style-type: none"> • Oguchi disease or night blindness • Abnormal photoresponses and light-induced apoptosis in rods • Dependency & Addiction
<i>IMMP1L</i>	<ul style="list-style-type: none"> • Neurodegeneration

More Central Nervous System and Neurological TKO™ Models on the following page

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Central Nervous System and Neurological TKO™ Knockout Rat Models	
<i>Imp2l</i>	<ul style="list-style-type: none"> • Spinal cord injury remodeling
<i>Kcnab1</i>	<ul style="list-style-type: none"> • Learning and memory
<i>Kcnh7</i>	<ul style="list-style-type: none"> • Multiple sclerosis (MS)
<i>Kcnip4</i>	<ul style="list-style-type: none"> • Regulation of neuronal excitability • Alzheimer's disease (AD) • Parkinson's disease (PD)
<i>Lama2</i>	<ul style="list-style-type: none"> • Congenital merosin-deficient muscular dystrophy type 1A • Dysmyelination of peripheral nerve
<i>Large</i>	<ul style="list-style-type: none"> • Congenital Muscular Dystrophy • Severe mental retardation • Ocular abnormalities
<i>Lims1</i>	<ul style="list-style-type: none"> • HIV-associated neurodegeneration
<i>Lphn3</i>	<ul style="list-style-type: none"> • Attention-deficit/hyperactivity disorder (ADHD)
<i>Mmel1</i>	<ul style="list-style-type: none"> • Pain perception
<i>Myo9a</i>	<ul style="list-style-type: none"> • Human retinal disease • Retinitis pigmentosa (RP) • Bardet-Biedl(Laurence Moon) syndrome-4
<i>Myo1d</i>	<ul style="list-style-type: none"> • Autistic disorder
<i>Nrg1- Neuregulin</i>	<ul style="list-style-type: none"> • Schizophrenia • Expression improves muscle mechanical properties in models for Duchenne muscular dystrophy (DMD)
<i>Orc3l</i>	<ul style="list-style-type: none"> • Schizophrenia
<i>Plcb3</i>	<ul style="list-style-type: none"> • Bardet-Biedl syndrome type 1 • Best's vitelliform macular dystrophy • Vitreo-retinopathy
<i>Plce1</i>	<ul style="list-style-type: none"> • Alzheimer's disease (AD)
<i>Pvr1l</i>	<ul style="list-style-type: none"> • Alzheimer's disease (AD) • Continuous seizure • Epilepsy • Traumatic injury

More Central Nervous System and Neurological TKO™ Models on the following page

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Central Nervous System and Neurological TKO™ Knockout Rat Models	
<i>Rap1gds1</i>	<ul style="list-style-type: none"> Alzheimer's disease (AD)
<i>Rapgef4 (Epac2)</i>	<ul style="list-style-type: none"> Alzheimer's disease (AD)
<i>Rph3a</i>	<ul style="list-style-type: none"> Huntington disease (HD) Lewy body disease (LBD)
<i>Rtn4</i>	<ul style="list-style-type: none"> Neurodegeneration Enhanced corticospinal tract (CST) fiber regeneration following injury Stroke Brain injury Spinal cord injury ALS Multiple sclerosis (MS)
<i>Sf4</i>	<ul style="list-style-type: none"> Axonal regeneration Stroke Brain injury Spinal cord injury
<i>Slc16a12</i>	<ul style="list-style-type: none"> Juvenile cataract Microcornea
<i>Syne1</i>	<ul style="list-style-type: none"> Spinocerebellar Ataxia
<i>Trpc4</i>	<ul style="list-style-type: none"> Neurotransmitter release from thalamic interneurons Schizophrenia
<i>Ubqln4</i>	<ul style="list-style-type: none"> Spinocerebellar Ataxia

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Central Nervous System Neurological TGEM™ Rat Models

Gene Name	Model / Disease Association
<i>Slc8a2</i>	<ul style="list-style-type: none">• Enhanced learning and memory• Aging associated cognitive disorders
<i>nonsense</i>	
<i>Htr1a</i>	<ul style="list-style-type: none">• Depression disorder
C266Y	

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Other Exploratory Models TKO™ Knockout Rat Models	
Gene Name	Model / Disease Association
<i>Acox1</i>	•
<i>Agbl4</i>	•
<i>AW915325</i>	•
<i>2600010E01Rik</i>	•
<i>Diaph3</i>	•
<i>EST BE329202</i>	•
<i>EST BF522453</i>	•
<i>EST BI284934</i>	•
<i>Gng12</i>	•
<i>Gramd1b</i>	•
<i>Inadl</i>	•
<i>Intu</i>	•
<i>Leprel2</i>	•
<i>Lmln</i>	•
<i>LOC290071</i>	•
<i>LOC499903</i>	•
<i>LOC680647</i>	•
<i>LOC685444</i>	•
<i>Lphn3</i>	•
<i>Lzic</i>	•
<i>Myo1d</i>	•
<i>Nsun4</i>	•
<i>Ppapdc1a</i>	•
<i>Ppfia2</i>	•
<i>Pld5</i>	•
<i>RGD1309969</i>	•
<i>RGD1310753</i>	•
<i>RGD1563503</i>	•
<i>RGD1565323</i>	•
<i>Tmtc2</i>	•

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