



Rat Genome Database

rgd.mcw.edu

PhenoMiner: Integrating Phenotype Measurement Values for Multiple Strains

Mary Shimoyama

XVIIIth International Workshop on Genetic
Systems in the Rat – Kyoto, Japan



PhenoMiner Project

- **Integrates phenotype data from multiple sources: Physgen, NBRP, Literature, Direct Submission**
- **Standardized formats using ontologies for sample, measurement, method and experimental conditions**
- **Data mining and presentation tool**
- **Links to originating data sources**
- **Comprehensive phenotype profiles for strains, substrains, congenics, knockouts, mutants**
- **Public repository for researchers to post data – funding agency interest**
- **Development of the rat phenome – linking phenotype to genotype**



Accessing PhenoMiner



Keyword

[Home](#)

If you're heading to the upcoming 18th International Workshop on Genetic Systems in the Rat in Kyoto... Make sure you stop by our posters to see what's new at RGD and to pick up your copy of the 2011 Rat Calendar. [Click here](#) for more information about the meeting. We look forward to seeing you there!



Genes
Map positions, functions and more

Strains
Search Strains

QTL
Phenotypes & Traits linked to the genome

Function
Gene Ontology, Phenotype, Pathway info

Diseases
Genes, QTL & Strains related to Disease

Phenotypes & Models
Phenotype data, Assays, Husbandry and more

Rat Genome
Browse the Rat Genome

Genome Tools
Data mining, analysis and visualization

Pathways
Pathway reports and diagrams

[stop](#)

Featured RGD Video Tutorials

[Introduction to the RGD Phenotypes and Models Portal](#)



In addition to genomic and genetic data, RGD is an excellent source of information about rat strains and their associated physiology, phenotypes and diseases. Click this icon to learn how to navigate RGD's Phenotypes and Models Portal to find the information you need.

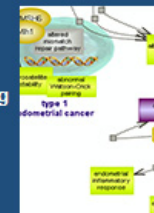
[An Introduction to the RatMine Database](#)



RatMine is RGD's newest data warehousing, mining and analysis tool. Click this icon to take a quick tour of RatMine's key features and begin learning how to use this valuable tool.

[Endometrial Cancer Pathway](#)

Endometrial cancer is ranked as the fourth most common malignancy and the eighth leading cause of cancer-related death for women in developed countries. It can be described as either type 1 or type 2, each implicating alterations in distinct sets of pathways. Click here to explore how these changes link to the development of this condition.

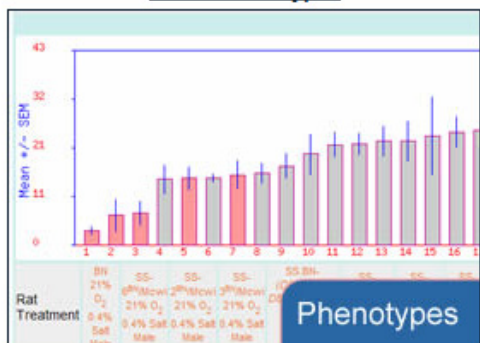


Phenotypes & Models at RGD

Welcome to the Phenotypes & Models Portal within RGD. This portal contains data related to rat strains and phenotypes, as well as essential information for conducting physiological research, identifying disease models, and community forums for gathering feedback from the scientific community.

Please feel free to [contact us](#) with suggestions for additional data or tools that would help advance your research.

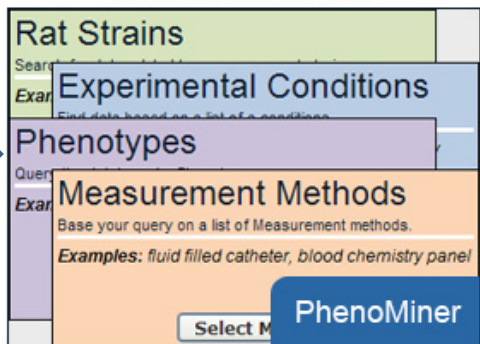
[Go to Phenotypes](#)



[Go to Strains & Models](#)



[Go to PhenoMiner Tool](#)



Rat Strains

Search

Experimental Conditions

Example: Find data based on a set of conditions

Phenotypes

Query

Measurement Methods

Base your query on a list of Measurement methods.

Examples: fluid filled catheter, blood chemistry panel

Select M

[Go to Strain Medical Records](#)





Creating a Query

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PhenoMiner Database

To begin, select a starting point

Rat Strains

Search for data related to one or more rat strains.

Examples: congenic strain, ACI, BN

Select Strains

Experimental Conditions

Find data based on a list of a conditions.

Examples: diet, atmosphere composition, activity level

Select Conditions

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

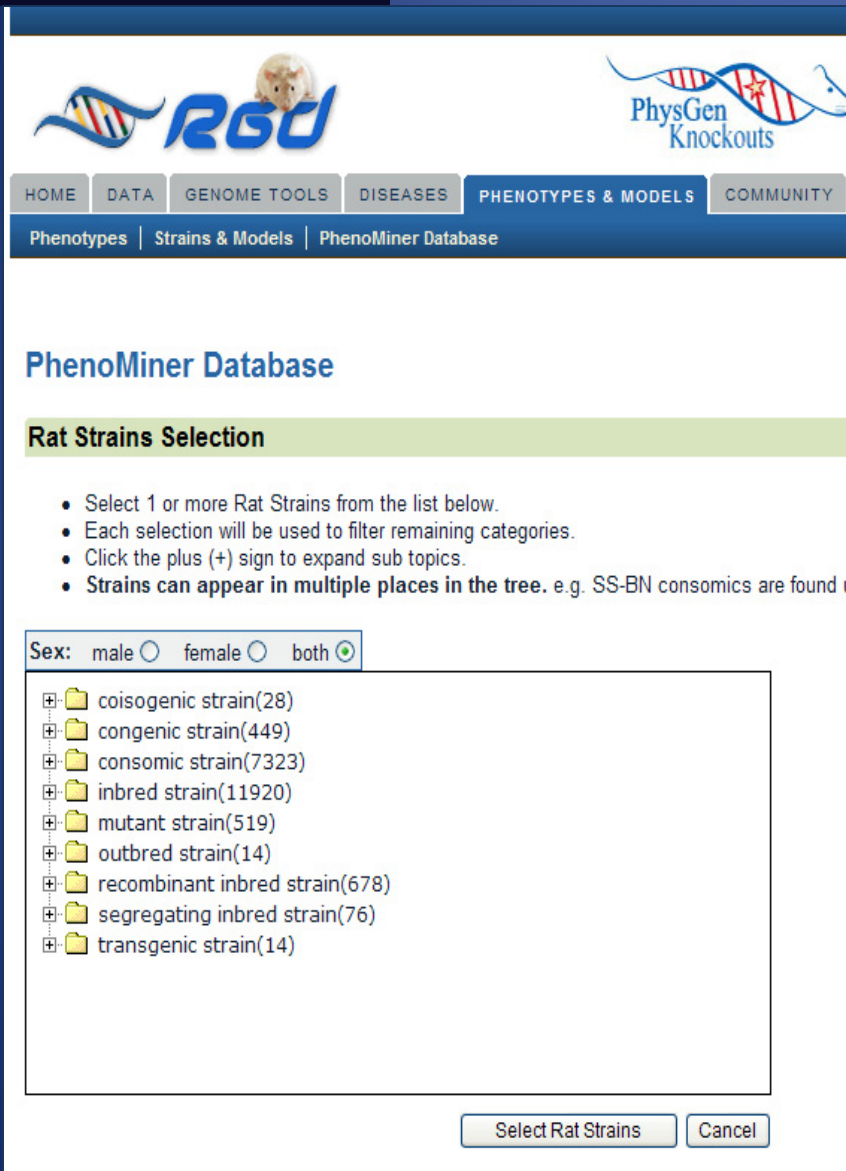
Select Phenotypes



Measurement Methods

Base your query on a list of Measurement methods.

Examples: fluid filled catheter, blood chemistry panel

Select Methods



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[Phenotypes](#) | [Strains & Models](#) | [PhenoMiner Database](#)

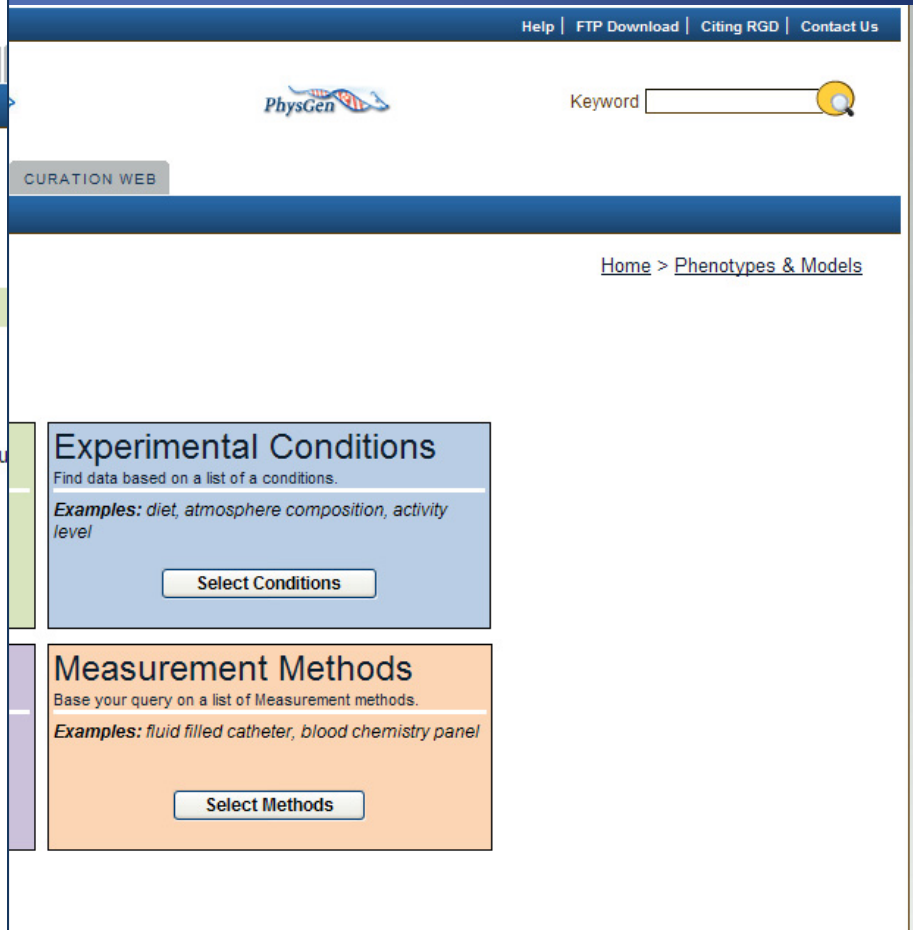
PhenoMiner Database

Rat Strains Selection



- Select 1 or more Rat Strains from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.
- Strains can appear in multiple places in the tree. e.g. SS-BN consomics are found u

Sex: male female both

- coisogenic strain(28)
- congenic strain(449)
- consomic strain(7323)
- inbred strain(11920)
- mutant strain(519)
- outbred strain(14)
- recombinant inbred strain(678)
- segregating inbred strain(76)
- transgenic strain(14)



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Experimental Conditions

Find data based on a list of a conditions.

Examples: diet, atmosphere composition, activity level

Measurement Methods

Base your query on a list of Measurement methods.

Examples: fluid filled catheter, blood chemistry panel



Creating a Query

RGD PhysGen Knockouts

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PhenoMiner Database

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- Strains can appear in multiple places in the tree. e.g. SS-BN consomics are

Sex: male female both

- inbred strain(11920)
 - ACI(148)
 - ACI/Eur(4)
 - ACI/N(123)
 - ACI/NHok(18)
 - ACI/NJcl(20)
 - ACI/NKyo(47)
 - ACI/NKyo(33)
 - ACI-Lystbg-Kyo/Kyo(14)
 - ACI/NMna(18)
 - ACI/NSlc(20)
 - ACI/SegHsd(21)
 - ACI/SegHsd(9)

Select Rat Strains Cancel

Select Rat Strains Cancel

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PhysGen

Keyword

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Experimental Conditions

Find data based on a list of a conditions.

Examples: diet, atmosphere composition, activity level

Select Conditions

Measurement Methods

Base your query on a list of Measurement methods.

Examples: fluid filled catheter, blood chemistry panel

Select Methods



Creating a Query

The screenshot shows the RGD website home page. At the top, there is a navigation bar with the RGD logo and 'PhysGen Knockouts' text. Below this is a secondary navigation bar with tabs for HOME, DATA, GENOME TOOLS, DISEASES, PHENOTYPES & MODELS, and COMMUNITY. A search bar is located below the navigation. The main content area features a 'PhenoMiner Database' section with the instruction 'To begin, select a starting point'. There are two main selection boxes: 'Rat Strains' (green background) and 'Phenotypes' (purple background). The 'Rat Strains' box contains the text 'Search for data related to one or more rat strains.' and 'Examples: congenic strain, ACI, BN', with a 'Select Strains' button. The 'Phenotypes' box contains the text 'Query the database by Phenotype.' and 'Examples: heart rate, blood cell count', with a 'Select Phenotypes' button.

PhenoMiner Database

To begin, select a starting point

Rat Strains

Search for data related to one or more rat strains.

Examples: congenic strain, ACI, BN

Select Strains

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

Select Phenotypes

The screenshot shows the 'PhenoMiner Database' interface. At the top, there is a navigation bar with the RGD logo and 'PhysGen Knockouts' text. Below this is a secondary navigation bar with tabs for HOME, DATA, GENOME TOOLS, DISEASES, PHENOTYPES & MODELS, and COMMUNITY. A search bar is located below the navigation. The main content area features a 'PhenoMiner Database' section with the instruction 'To begin, select a starting point'. There are two main selection boxes: 'Rat Strains' (green background) and 'Phenotypes' (purple background). The 'Rat Strains' box contains the text 'Search for data related to one or more rat strains.' and 'Examples: congenic strain, ACI, BN', with a 'Select Strains' button. The 'Phenotypes' box contains the text 'Query the database by Phenotype.' and 'Examples: heart rate, blood cell count', with a 'Select Phenotypes' button. The 'Phenotypes Selection' section is highlighted in purple and contains a list of phenotypes with checkboxes and plus signs for expansion. The list includes: blood measurement(5455), body morphological measurement(4257), body temperature(512), cardiovascular measurement(2407), liver/biliary measurement(400), renal/urinary measurement(220), respiratory measurement(400), and tumor measurement(68). At the bottom of the list, there are 'Select Phenotypes' and 'Cancel' buttons.

PhenoMiner Database

Phenotypes Selection

- Select 1 or more Phenotypes from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.

blood measurement(5455)
 body morphological measurement(4257)
 body temperature(512)
 cardiovascular measurement(2407)
 liver/biliary measurement(400)
 renal/urinary measurement(220)
 respiratory measurement(400)
 tumor measurement(68)

Select Phenotypes Cancel

Contact



Creating a Query

PhenoMiner Database

To begin, select a starting point

Rat Strains

Search for data related to one or more rat strains.
Examples: congenic strain, ACI, BN

Select Strains

Phenotypes

Query the database by Phenotype.
Examples: heart rate, blood cell count

Select Phenotypes

PhenoMiner Database

Phenotypes | Strains & Models | PhenoMiner Database

Phenotypes Selection

- Select 1 or more Phenotypes from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.

- [-] [] blood measurement(5455)
 - [-] [] blood cell measurement(1488)
 - [+] [] blood cell count(1116)
 - [] hematocrit(186)
 - [] mean corpuscular volume (MCV)(186)
 - [+] [] blood chemistry measurement(3967)
 - [+] [] body morphological measurement(4257)
 - [] body temperature(512)
 - [-] [] cardiovascular measurement(2407)
 - [+] [] blood pressure measurement(933)
 - [-] [] heart measurement(797)
 - [+] [] heart weight(797)
 - [] heart rate(677)

Select Phenotypes Cancel



Creating a Query

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Keyword 

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PhenoMiner Database

To begin, select a starting point

Rat Strains

Search for data related to one or more rat strains.

Examples: congenic strain, ACI, BN

Select Strains

Experimental Conditions

Find data based on a list of a conditions.

Examples: diet, atmosphere composition, activity level

Select Conditions

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

Select Phenotypes

Measurement Methods

Base your query on a list of Measurement methods.

Examples: fluid filled catheter, blood chemistry panel

Select Methods



Creating a Query

Phenotypes
Query the database by Phenotype.

Examples: heart rate, blood cell count

Select Phenotypes



PhenoMiner Database

Phenotypes Selection

- Select 1 or more Phenotypes from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.

- blood measurement(5290)
- body morphological measurement(4266)
- body temperature(512)
- cardiovascular measurement(2407)
- liver/biliary measurement(400)
- renal/urinary measurement(220)
- respiratory measurement(400)
- tumor measurement(68)
 - mammary tumor measurement(68)
 - mammary tumor growth rate(12)
 - mammary tumor number(46)
 - time to mammary tumor formation, post insult(10)

Select Phenotypes Cancel

PhenoMiner Database New Query

Select values from categories of interest and select "Generate Report" to build report

Matching Records 68

Phenotypes
Query the database by Phenotype.

Examples: heart rate, blood cell count

Edit Phenotypes

- mammary tumor growth rate (12)
- mammary tumor number (46)
- time to mammary tumor formation, post insult (10)

Additional Options...

Limit By Rat Strains

Limit By Experimental Conditions

Limit By Measurement Methods

I'm Done..

Generate Report

You are limiting by: **Phenotypes** (68 records)



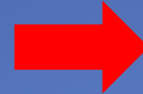
Creating a Query

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

Select Phenotypes



PhenoMiner Database

Phenotypes Selection

- Select 1 or more Phenotypes from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub-topics.

- blood measurement(5290)
- body morphological measurement(512)
- body temperature(512)
- cardiovascular measurement(40)
- liver/biliary measurement(40)
- renal/urinary measurement(40)
- respiratory measurement(40)
- tumor measurement(68)
 - mammary tumor measurement(12)
 - mammary tumor growth rate(12)
 - mammary tumor number(46)
 - time to mammary tumor formation(10)

PhenoMiner Database

Rat Strains Selection

- Select 1 or more Rat Strains from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub-topics.
- Strains can appear in multiple places in the tree. e.g. SS-BN consomics are

Sex: male female both

- congenic strain(29)
 - ACI.COP(12)
 - SPRD.WKY(17)
- consomic strain(20)
 - SS-Chr BN/Mcwi Consomics(20)
- inbred strain(68)
 - ACI(21)
 - BN(21)
 - COP(14)
 - SPRD(23)
 - SS(21)
 - WKY(17)
 - WKY/HanZtm(17)

Matching Phenotypes

Select Rat Strains **Cancel**

PhenoMiner Database

Select values from categories of interest and select **"Generate Report"** to build report

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

Edit Phenotypes

- mammary tumor growth rate (12)
- mammary tumor number (46)
- time to mammary tumor formation, post insult (10)

Additional Options...

Limit By Rat Strains

Limit By Experimental Conditions

Limit By Measurement Methods

I'm Done..

Generate Report

You are limiting by: **Phenotypes** (68 records)



Creating a Query

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

Select Phenotypes



PhenoMiner Database

Phenotypes Selection

- Select 1 or more Phenotypes from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.

- blood measurement(5290)
- body morphological measurement(4266)
- body temperature(512)
- cardiovascular measurement(2407)
- liver/biliary measurement(400)
- renal/urinary measurement(220)
- respiratory measurement(400)
- tumor measurement(68)
 - mammary tumor measurement(68)
 - mammary tumor growth rate(12)
 - mammary tumor number(46)
 - time to mammary tumor forma



PhenoMiner Database

Experimental Conditions Selection

- Select 1 or more Experimental Conditions from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.

- control condition(7)
 - naive control condition(7)
- drug/chemical(61)
 - neoplasm inducing agent(61)
 - polycyclic arene(44)
 - steroid(17)
 - 17 beta-estradiol(17)
 - polycyclic arene(44)
 - 7,12-dimethyltetraphene (DMBA)(44)
 - steroid(17)
 - 17 beta-estradiol(17)
- surgical removal(1)
- ovariectomy(1)

Select Experimental Conditions **Cancel**

PhenoMiner Database

Select values from categories of interest and select **"Generate Report"** to build report

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

Edit Phenotypes

- mammary tumor growth rate (12)
- mammary tumor number (46)
- time to mammary tumor formation, post insult (10)

Additional Options...

Limit By Rat Strains

Limit By Experimental Conditions

Limit By Measurement Methods

I'm Done..

Generate Report

Matching Records

You are limiting by: **Phenotypes** (68 records)



Creating a Query

PhenoMiner Database

Phenotypes Selection

- Select 1 or more Phenotypes from the list below.
- Each selection will be used to filter remaining categories.
- Click the plus (+) sign to expand sub topics.

[Home](#) > [Phenotypes & Models](#)

[New Query](#)

PhenoMiner Database

Select values from categories of interest and select "Generate Report" to build report

Phenotypes

Query the database by Phenotype.

Examples: heart rate, blood cell count

[Edit Phenotypes](#)

- mammary tumor growth rate (0)
- mammary tumor number (10)
- time to mammary tumor formation, post insult (7)

Experimental Conditions

Find data based on a list of a conditions.

Examples: diet, atmosphere composition

[Edit Conditions](#)

- 17 beta-estradiol (17)

Additional Options...

[Limit By Rat Strains](#)

[Limit By Measurement Methods](#)

I'm Done..

[Generate Report](#)

Matching Records **17**

You are limiting by: **Phenotypes** (68 records) -> then by -> **Experimental Conditions** (17 records)

- mammary tumor growth rate (12)
- mammary tumor number (46)
- time to mammary tumor formation, post insult (10)

You are limiting by: **Phenotypes** (68 records)

[Generate Report](#)

Experiments by Phenotype Refresh Chart Customize chart help


Phenotypes: mammary tumor
 Min: 0.0
 Male Female
 How To

Strains: Conditions Measurement Methods Age

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Keyword

152-162 days
 196 days
 185 days
 not specified
 201-203 days


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Phenotypes | Strains & Models | PhenoMiner Database

Home > Phenotypes & Models

PhenoMiner Database (68 experiments) [View data table](#) | [Download data table](#) | [View expanded data table](#) New Query

Experiments by Phenotype Refresh Chart Customize chart help

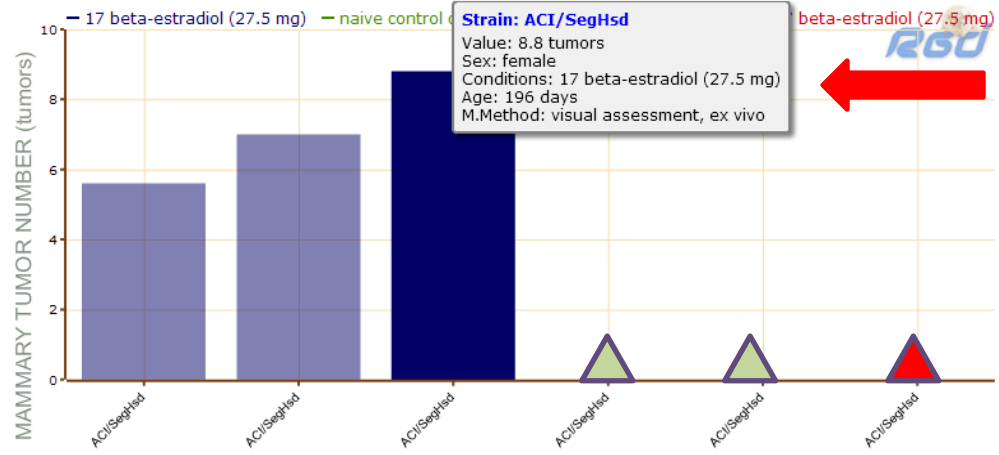
Phenotypes: mammary tumor number
 Min: 0.0 Max: 11.2
 Male Female
 How To

Strains: Conditions Measurement Methods Age

7,12-dimethyltetraphene (DMBA) (65 mg/kg body mass)
 17 beta-estradiol (27.5 mg)
 ovariectomy, bilateral then 17 beta-estradiol (27.5 mg)
 naive control condition

visual assessment, ex vivo
 manual palpitation method
 calliper method

152-162 days
 196 days
 185 days
 not specified
 201-203 days



Results

Experiments by Phenotype [Customize chart](#) [help](#)

Phenotypes: mammary tumor
 Min: 0.0
 Male Female
 How To

Strains: Conditions: Measurement Methods: Age: 152-162 days, 196 days, 185 days, not specified, 201-203 days

PhenoMiner Database (68 experiments) [View data table](#) | [Download data](#)

Experiments by Phenotype [Customize chart](#)

Phenotypes: mammary tumor number, mammary tumor number, time to mammary tumor formation, post insult, mammary tumor growth rate
 How To

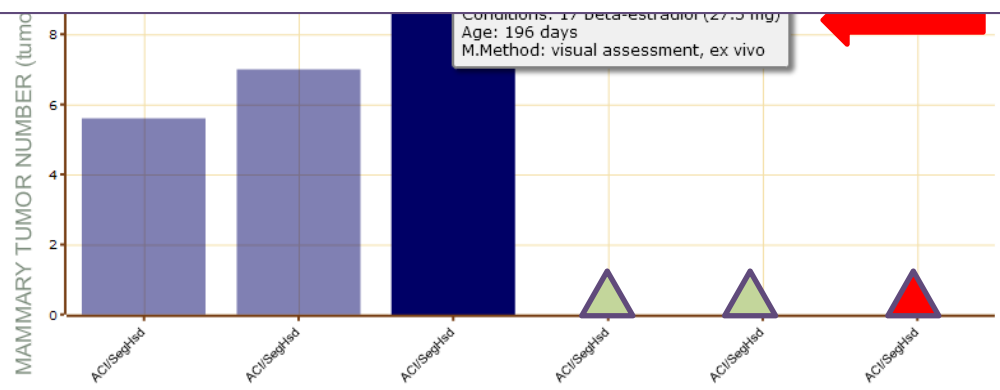
Strains:

- SPRD.WKY-(D10Rat91-D10Rat135)/Ibmm - 30
- SPRD.WKY-(D18Wox8-D18Rat44)/Ibmm - 31
- SPRD.WKY-(D5Rat190-D5Rat114)/Ibmm - 32
- SPRD/HanZtm - 33

Conditions:

- 7,12-dimethyltetraphene (DMB)
- 17 beta-estradiol (27.5 mg)
- ovariectomy, bilateral then 17
- naive control condition

MAMMARY TUMOR NUMBER (tumor)



Strain	Mammary Tumor Number (tumor)
ACI/SegHsd	~5.5
ACI/SegHsd	~7.0
ACI/SegHsd	> 8.0
ACI/SegHsd	~1.0
ACI/SegHsd	~1.0
ACI/SegHsd	~1.0

Conditions: 17 beta-estradiol (27.5 mg)
 Age: 196 days
 M.Method: visual assessment, ex vivo

Results

Experiments by Phenotype Refresh Chart Customize chart help

Phenotypes: mammary tumor
 Min: 0.0
 Male Female
 How To

Strains: Help FTP Download Citing RGD Contact Us

Conditions: 152-162 days 196 days 185 days not specified

Measurement Methods: View data table Download data table View expanded data table New Query

Experiments by Phenotype Refresh Chart Customize chart help

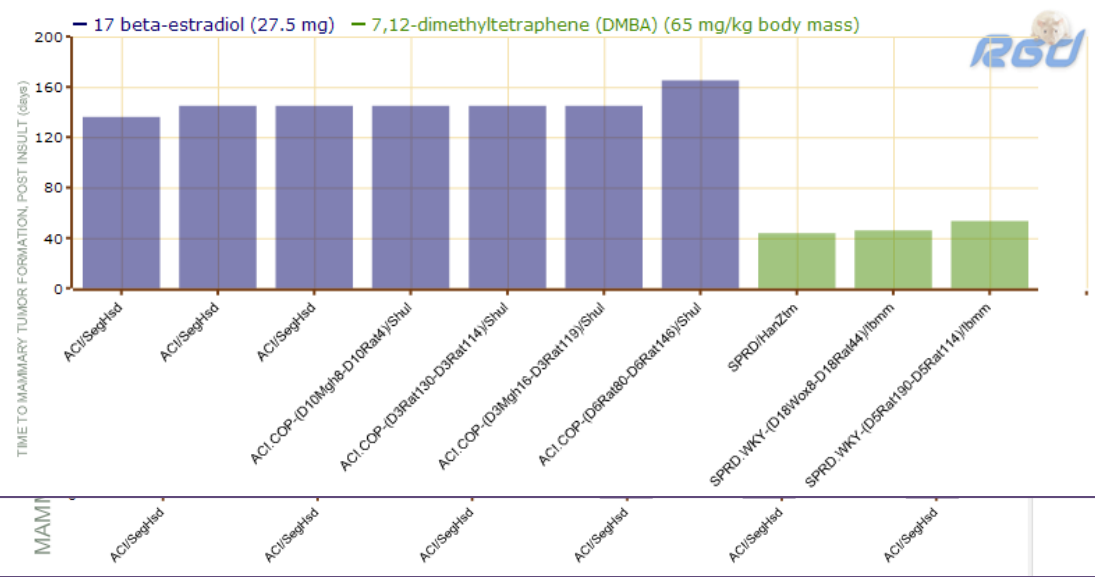
Phenotypes: **time to mammary tumor formation, post insult**
 Min: 145.0 Max: 165
 Male Female
 How To

Strains: SPRD.WKY-(D10Rat91-D10Rat135)/lbmm - 30
 SPRD.WKY-(D18Wox8-D18Rat44)/lbmm - 31
 SPRD.WKY-(D5Rat190-D5Rat114)/lbmm - 32
 SPRD/HanZtm - 33

Conditions: 7,12-dimethyltetraphene (DMBA) (65 mg/kg body mass)
 17 beta-estradiol (27.5 mg)
 ovariectomy, bilateral then 17 beta-estradiol (27.5 mg)
 naive control condition

Measurement Methods: visual assessment, ex vivo
 manual palpitation method
 caliper method

Age: 185-196 days
 206-208 days
 208 days
 202 days
 228 days





Results

Options: [View chart](#) | [Download data table](#) | [View expanded data table](#) | [Which do I want](#)

Phenotype (Click to Sort)	Strain (Click to Sort) ▼	Sex (Click to Sort)	Value (Click to Sort)	Units (Click to Sort)	Condition 1 (Click to Sort)	Condition 2 (Click to Sort)
mammary tumor number	ACI.COP-(D10Mgh8-D10Rat4)/Shul	female	4.8	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D10Mgh8-D10Rat4)/Shul	female	0.0	tumors	naive control condition	-
time to mammary tumor formation, post insult	ACI.COP-(D10Mgh8-D10Rat4)/Shul	female	145.0	days	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D3Mgh16-D3Rat119)/Shul	female	4.3	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D3Mgh16-D3Rat119)/Shul	female	0.0	tumors	naive control condition	-
time to mammary tumor formation, post insult	ACI.COP-(D3Mgh16-D3Rat119)/Shul	female	145.0	days	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D3Rat130-D3Rat114)/Shul	female	4.5	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D3Rat130-D3Rat114)/Shul	female	0.0	tumors	naive control condition	-
time to mammary tumor formation, post insult	ACI.COP-(D3Rat130-D3Rat114)/Shul	female	145.0	days	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D6Rat80-D6Rat146)/Shul	female	2.4	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI.COP-(D6Rat80-D6Rat146)/Shul	female	0.0	tumors	naive control condition	-
time to mammary tumor formation, post insult	ACI.COP-(D6Rat80-D6Rat146)/Shul	female	165.0	days	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI/SegHsd	female	8.8	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI/SegHsd	female	0.0	tumors	ovariectomy, bilateral	then 17 beta-estradiol (27.5 mg)
mammary tumor number	ACI/SegHsd	female	0.0	tumors	naive control condition	-
mammary tumor number	ACI/SegHsd	female	5.6	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI/SegHsd	female	7.0	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	ACI/SegHsd	female	0.0	tumors	naive control condition	-
time to mammary tumor formation, post insult	ACI/SegHsd	female	136.0	days	17 beta-estradiol (27.5 mg)	-
time to mammary tumor formation, post insult	ACI/SegHsd	female	145.0	days	17 beta-estradiol (27.5 mg)	-
time to mammary tumor formation, post insult	ACI/SegHsd	female	145.0	days	17 beta-estradiol (27.5 mg)	-
mammary tumor number	BN/SsNHsd	female	0.0	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	COP/CrCrI	female	0.1	tumors	17 beta-estradiol (27.5 mg)	-
mammary tumor number	COP/CrCrI	female	0.0	tumors	naive control condition	-
mammary tumor number	SPRD.WKY-(D10Rat91-D10Rat135)/lbmm	female	9.2	tumors	7,12-dimethyltetraphene (DMBA) (65 mg/kg body mass)	-
mammary tumor growth rate	SPRD.WKY-(D10Rat91-D10Rat135)/lbmm	female	0.5	cm/week	7,12-dimethyltetraphene (DMBA) (65 mg/kg body mass)	-
mammary tumor growth rate	SPRD.WKY-(D10Rat91-D10Rat135)/lbmm	female	0.5	cm/week	7,12-dimethyltetraphene (DMBA) (65 mg/kg body mass)	-

Sample Data

Search Parameter Summary

Phenotypes:

- mammary tumor growth rate (12)
- mammary tumor number (46)
- time to mammary tumor formation, post insult (10)

Rat Strains: **Experimental Conditions:** **Measurement Methods:**

- All
- All
- All

Number of records returned by search: 68

Options: [Download Expanded Data Table](#) | [View condensed data table](#)

This data view is intended for external processing. To work with it please download it by clicking the above link.

Study Id	Study Name	Study URL	Experiment Name	Experiment Notes	Strain out id	Strain	Sex	Age	# of animals	Sample notes
81	Schaffer BS, et al., Cancer Res. 2006 Aug 1;66(15):7793-800	/tools/references/references_view.cgi?id=1642522	mammary cancer	-	RS:32	ACI/SegHsd	female	196 days	22	-
81	Schaffer BS, et al., Cancer Res. 2006 Aug 1;66(15):7793-800	/tools/references/references_view.cgi?id=1642522	mammary cancer	-	RS:155	BN/SsNHsd	female	196 days	13	-
76	Shull JD, et al., Carcinogenesis. 1997 Aug;18(8):1595-601	/tools/references/references_view.cgi?id=4145282	mammary cancer	-	RS:32	ACI/SegHsd	female	185 days	11	-
76	Shull JD, et al., Carcinogenesis. 1997 Aug;18(8):1595-601	/tools/references/references_view.cgi?id=4145282	mammary cancer	-	RS:32	ACI/SegHsd	female	not specified	3	-
76	Shull JD, et al., Carcinogenesis. 1997 Aug;18(8):1595-601	/tools/references/references_view.cgi?id=4145282	mammary cancer	-	RS:32	ACI/SegHsd	female	201-203 days	20	-
75	Kurz SG, et al., Endocrinology. 2008 Apr 17	/tools/references/references_view.cgi?id=2292503	mammary cancer	-	RS:185	COP/CrCrI	female	259 days	7	-
75	Kurz SG, et al., Endocrinology. 2008 Apr 17	/tools/references/references_view.cgi?id=2292503	mammary cancer	-	RS:185	COP/CrCrI	female	259 days	5	-

Keyword [HOME](#) | [DATA](#) | [GENOME TOOLS](#) | [DISEASES](#) | [PHENOTYPES & MODELS](#) | [KNOCKOUTS](#) | [COMMUNITY](#)[Genes](#) | [QTLs](#) | [Strains](#) | [Markers](#) | [ESTs](#) | [Maps](#) | [Ontologies](#) | [Sequences](#) | [References](#) | [FTP Download](#) | [Submit Data](#)**Related Tools:**
[PubMed](#)
[MGD](#)

Reference Report

Ovary-intact, but not ovariectomized female ACI rats treated with 17beta-estradiol rapidly develop mammary carcinoma.

[Shull JD](#), [Spady TJ](#), [Snyder MC](#), [Johansson SL](#), [Pennington KL](#),

Citation: Shull JD, et al., *Carcinogenesis*. 1997 Aug;18(8):1595-601.

Status: NON-CURATED REFERENCE

Abstract (?)

We have examined the ability of 17beta-estradiol (E2) to induce development of mammary cancers in the female ACI rat. Continuous treatment with E2, delivered through release from s.c. Silastic tubing implants containing 27.5 mg crystalline hormone, resulted in rapid development of palpable mammary tumors in ovary-intact ACI rats. In a population of 21 E2-treated rats, palpable tumors were first observed following 99 days treatment and 100% of the treated population developed tumors within 197 days. The median and mean times to appearance of first palpable tumor were 143 and 145 days respectively. All mammary tumors were classified as carcinomas and invasive features were observed. Circulating E2 levels in the treated animals at the time of sacrifice averaged 185 pg/ml serum. Mammary tumors were not observed in ovary-intact female ACI rats that were not treated with E2. This is the first report indicating that this naturally occurring estrogen is capable of inducing mammary cancers in the ACI rat strain. Mammary carcinoma did not develop in a population of 11 ovariectomized female ACI rats treated with E2 for a period of 140 days. Circulating E2 levels in the treated ovariectomized animals averaged 207 pg/ml. These data indicate that the ovary modulates estrogen-mediated mammary carcinogenesis in this rat strain. Both ovary-intact and ovariectomized female ACI rats displayed similar susceptibilities to E2-induced pituitary tumors and hyperprolactinemia. Pituitary weight was increased 6.0-fold in ovary-intact ACI rats and 5.3-fold in ovariectomized female rats. Circulating prolactin levels averaged 2318 ng/ml in E2-treated, ovary-intact rats and 2285 ng/ml in E2-treated, ovariectomized ACI rats. These data indicate that estrogen-induced hyperprolactinemia is not the sole factor leading to development of mammary cancers in the E2-treated ACI rat.

[Show data curated from this reference](#)

External Database Links

PubMed

[Shull JD, et al., *Carcinogenesis*. 1997 Aug;18\(8\):1595-601. \(9276635\)](#)

Measurement and Methods

Phenotype ont id	Phenotype	Formula	Phenotype Notes	Value	Units	SEM	SD	Method ont id	Method	Method Site	Method duration (secs)	Method Notes
CMO:343	mammary tumor number	-	-	8.8	tumors	1.4	-	MMO:162	visual assessment, ex vivo	-	-	-
CMO:343	mammary tumor number	-	-	0.0	tumors	-	-	MMO:162	visual assessment, ex vivo	-	-	-
CMO:343	mammary tumor number	-	-	0.0	tumors	-	-	MMO:162	visual assessment, ex vivo	-	-	-
CMO:343	mammary tumor number	-	-	0.0	tumors	-	-	MMO:162	visual assessment, ex vivo	-	-	-
CMO:343	mammary tumor number	-	-	5.6	tumors	-	-	MMO:162	visual assessment, ex vivo	-	-	-
CMO:343	mammary tumor number	-	-	0.1	tumors	-	0.4	MMO:162	visual assessment, ex vivo	-	-	-
CMO:343	mammary tumor number	-	-	0.0	tumors	-	-	MMO:162	visual assessment, ex vivo	-	-	-

Experimental Conditions

Phenotype	Condition	Condition 1							Condition 2							Method Notes		
		ont id	term	ordinality	duration	value	units	notes	applicationMethod	ont id	term	ordinality	duration	value	units		notes	applicationMethod
CMO:34	XCO:92	17 beta-estradiol	1	-	27.5	mg	-	crystalline implant	-	-	-	-	-	-	-	-	-	-
CMO:34	XCO:92	17 beta-estradiol	1	-	27.5	mg	-	crystalline implant	-	-	-	-	-	-	-	-	-	-
CMO:34	XCO:95	ovariectomy, bilateral	1	-	-	-	-	-	XCO:92	17 beta-estradiol	2	-	27.5	mg	-	crystalline implant	-	-
CMO:34	XCO:56	naive control condition	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CMO:34	XCO:92	17 beta-estradiol	1	-	27.5	mg	-	crystalline implant	-	-	-	-	-	-	-	-	-	-
CMO:34	XCO:92	17 beta-estradiol	1	-	27.5	mg	-	crystalline implant	-	-	-	-	-	-	-	-	-	-
CMO:34	XCO:56	naive control condition	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



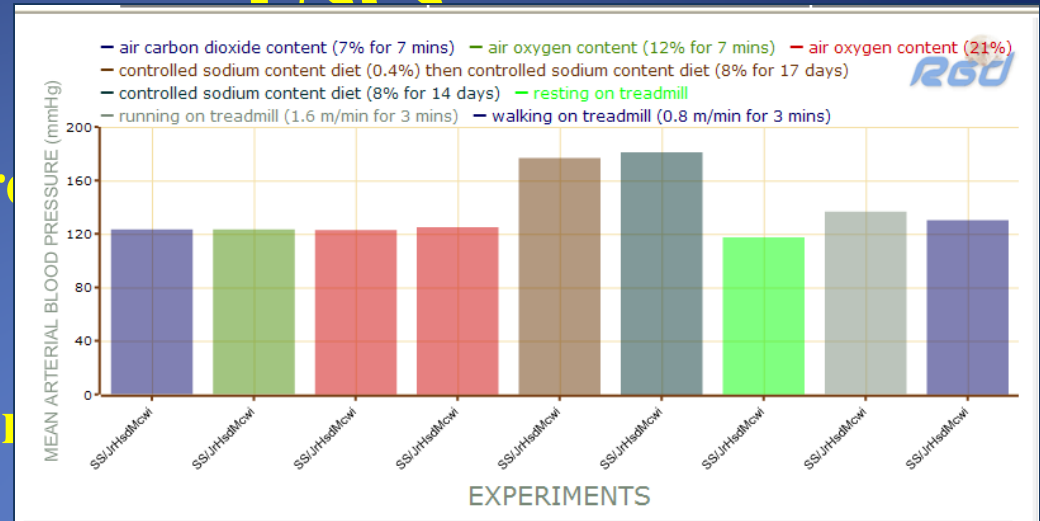
Uses

- **Compare phenotypes across experiments for one or more strains**
- **Compare a phenotype across ages for one or more strains**
- **Compare phenotype values for a set of substrains**
- **Comprehensive phenotype values for a single or multiple strains**
- **Compare results from multiple methods**



Uses

- Compare phenotypes across strains
- Compare a phenotype across strains
- Compare phenotype values for a set of substrains
- Comprehensive phenotype values for a single or multiple strains
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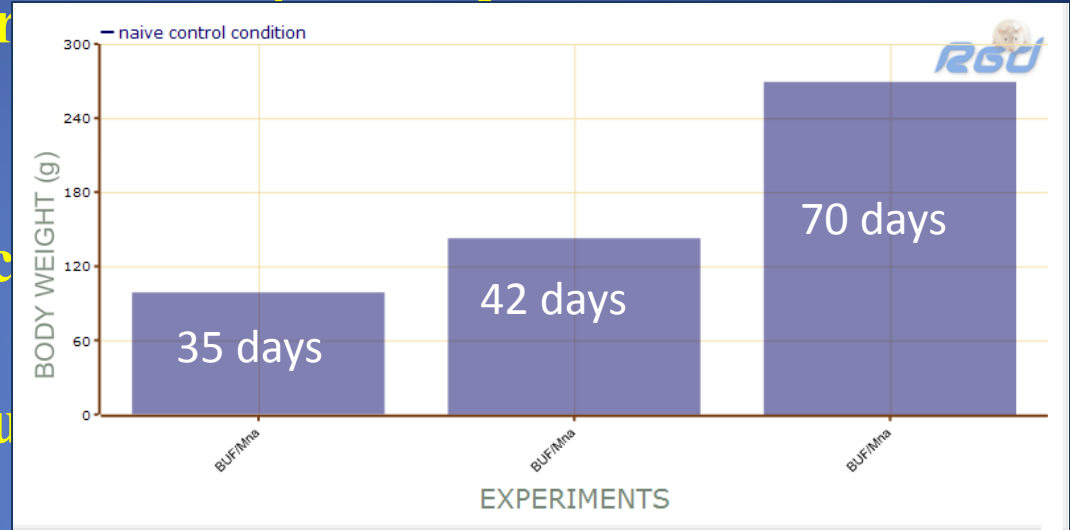
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Uses

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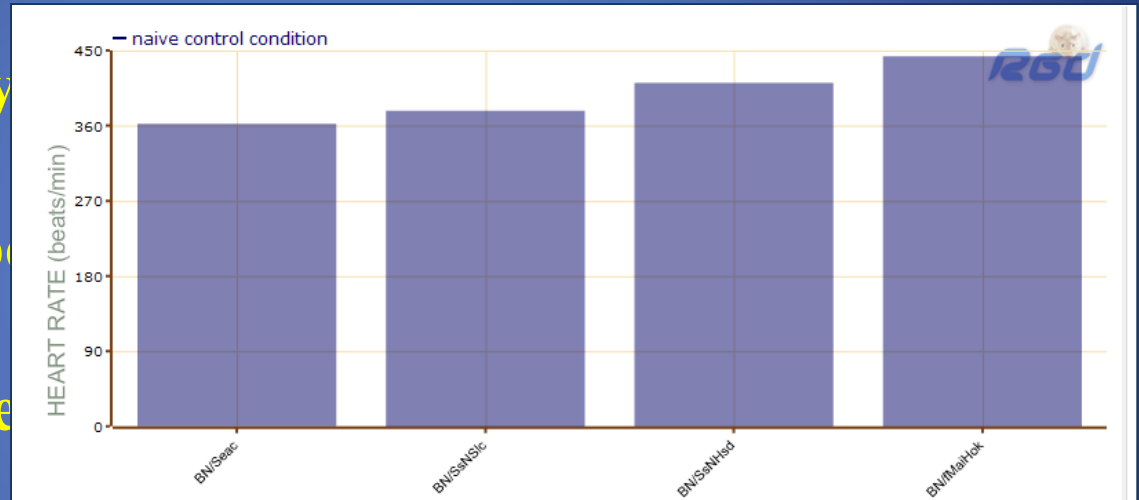
Uses

- **Compare phenotypes across experiments for one or more strains**
- **Compare a phenotype across ages for one or more strains**
- **Compare phenotype values for a set of substrains**
- **Comprehensive phenotype values for a single or multiple strains**
- **Compare results from multiple methods**



Uses

- Compare phenotypes across experiments for one or more strains
- Compare a phenotype across different conditions
- Compare phenotypes across different methods
- Comprehensive phenotyping of multiple strains
- Compare results from multiple methods





Uses

- **Compare phenotypes across experiments for one or more strains**
- **Compare a phenotype across ages for one or more strains**
- **Compare phenotype values for a set of substrains**
- **Comprehensive phenotype values for a single or multiple strains**
- **Compare results from multiple methods**



Uses

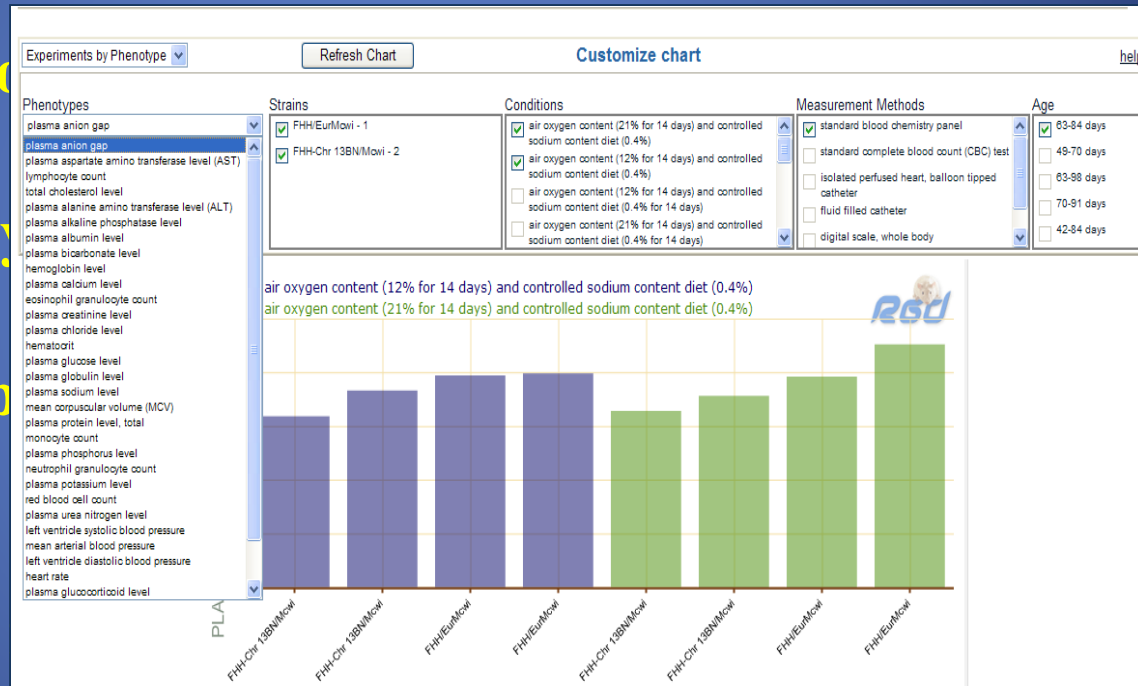
- Compare phenotypes across experiments for one or more strains

- Compare a phenotype

- Compare phenotypes

- Comprehensive phenotype

- Compare results





Uses

- **Compare phenotypes across experiments for one or more strains**
- **Compare a phenotype across ages for one or more strains**
- **Compare phenotype values for a set of substrains**
- **Comprehensive phenotype values for a single or multiple strains**
- **Compare results from multiple methods**



Uses

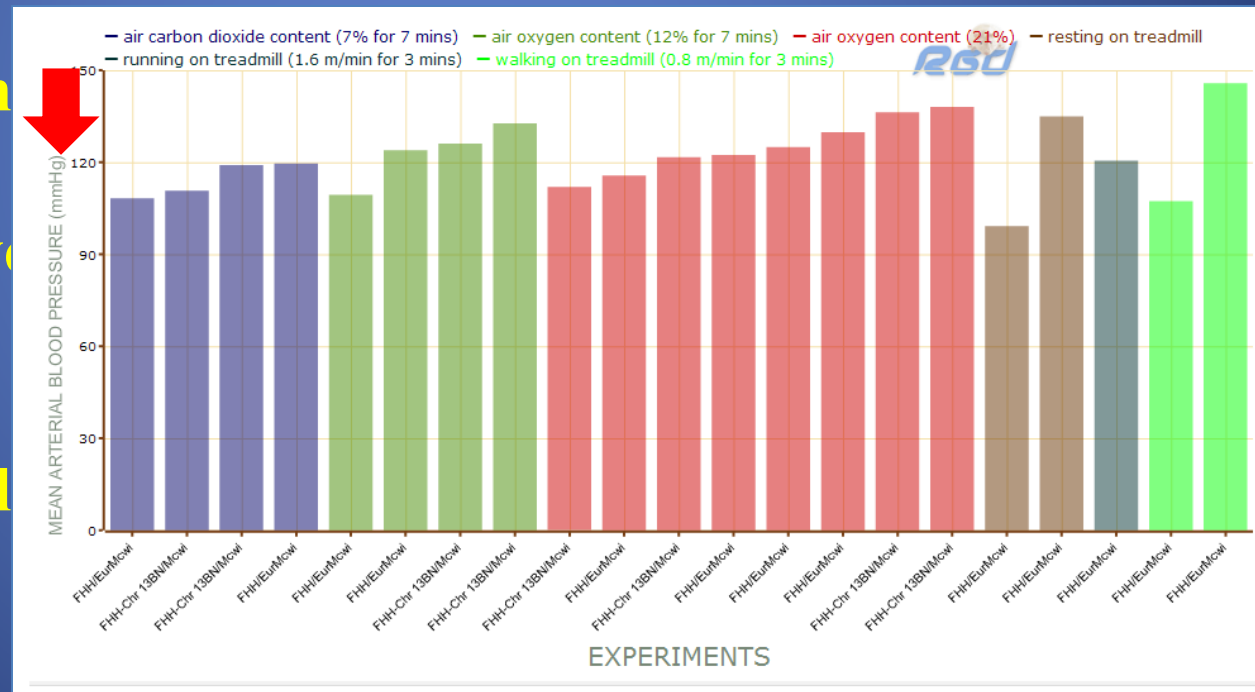
- Compare phenotypes across experiments for one or more strains

- Compare a phenotype across ages for one or more strains

- Compare phenotypes across conditions

- Comprehensive analysis of multiple strains

- Compare results across different experimental setups



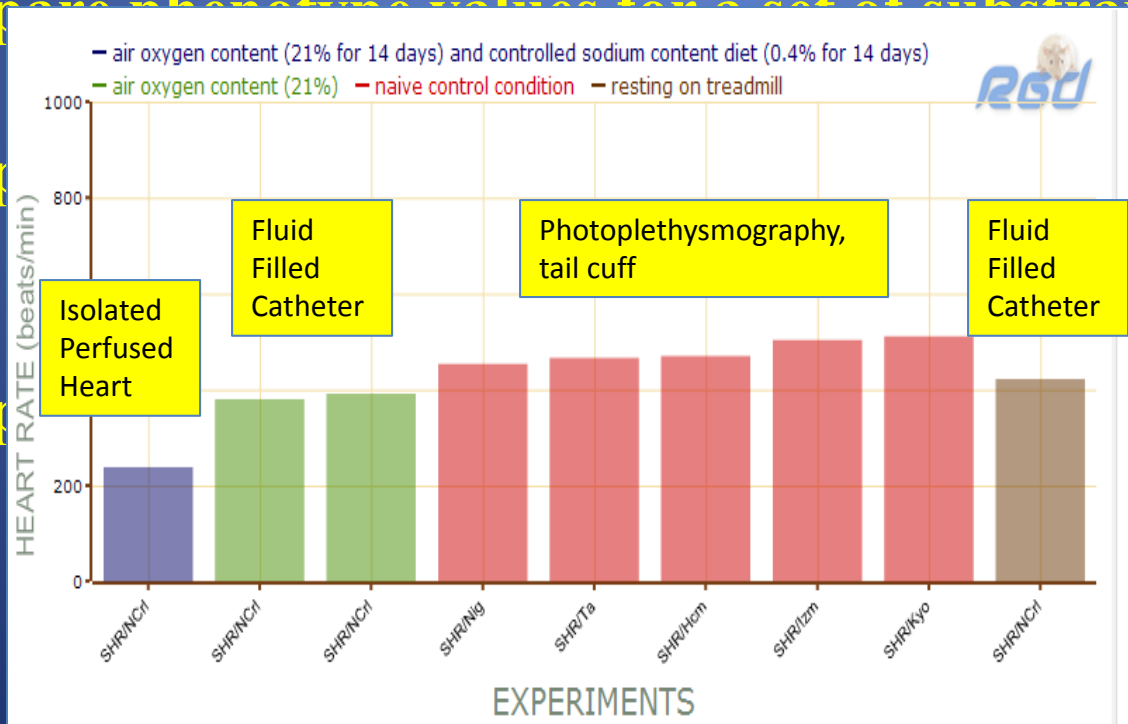


Uses

- **Compare phenotypes across experiments for one or more strains**
- **Compare a phenotype across ages for one or more strains**
- **Compare phenotype values for a set of substrains**
- **Comprehensive phenotype values for a single or multiple strains**
- **Compare results from multiple methods**

- Compare phenotypes across experiments for one or more strains
- Compare a phenotype across ages for one or more strains
- Compare phenotype values for a set of substrains

- Compare multiple strains
- Compare multiple





Future Developments

Data

- **Physgen data – complete integration**
- **NBRP data – complete integration of existing data, continued updates**
- **Literature**
 - **integration of data from all QTL papers**
 - **integration of data from papers characterizing inbred, mutant, congenic and knockout strains**
- **Researcher submissions – completion of online software for data submission**



Future Developments

Data Mining and Visualization

- Improved searching and query building
- Customization of bar charts
- Side by side chart viewing
- Dot plots for multiple phenotypes
- Statistical analysis tools
- Uploading and visualization of own data

Links with Other Tools

- Direct links from strain reports, strain medical records
- Direct links from QTL reports for parental, congenic strains
- Links from strain variation tracks on Gbrowse
- Links from SNPlotyper



Future Developments

Strain: ACI/SegHsd
 Value: 7.0 tumors
 SD: 5.3
 Sex: female
 Conditions: 17 beta-estradiol (27.5 mg)
 Age: 259 days
 M.Method: visual assessment, ex vivo

Strain: SPRD/HanZtm
 Value: 11.2 tumors
 SD: 0.5
 Sex: female
 Conditions: 7,12-dimethyltetraphene (DMBA) (65 mg/kg body mass)
 Age: 186-191 days
 M.Method: visual assessment, ex vivo

Strain: COP/CrCr
 Value: 0.1 tumors
 SD: 0.4
 Sex: female
 Conditions: 17 beta-estradiol (27.5 mg)
 Age: 259 days
 M.Method: visual assessment, ex vivo

Strain: BN/SsNHsd
 Value: 0.0 tumors
 Sex: female
 Conditions: 17 beta-estradiol (27.5 mg)
 Age: 196 days
 M.Method: visual assessment, ex vivo

Position	Allele	Sequence	Polymorphic	ACI/Seg.	WKY/NCh	SPRD/HanZtm	COP/CrCr	BN/SsNHsd	SS/JrHsdMcwi
Chr 5:12990423	G/A	TCAGCACAAAATCAAACAACCCCACTGCGATATCAAAA [G/A] TTCTGGGAGATTCACTATTTGTGTAGTCTCTCTGCTTCT		AA	GC	AA	AA	GG	AA
Chr 5:13271842	G/A	TTCATGAAAATCCCATTATTGATTGTTTGTAGTACCTGTG [G/A] TAACCAATGTTCTATTTAGGCAATCTCTTTTGGTTCCAAAAG		GG	GG	AA	NN	NN	AA
Chr 5:13327089	T/C	AGAAAAGGAAGGGAGAAAACACTGTAATTAATAATAATCT [T/C] AAAACAAAAATTATTAACACATATTAAGCTTACACCAGA		CC	CC	CC	CC	TT	CC
Chr 5:13437823	T/C	TCAAAAAGCTTTTGTCAAAGCAGCAAGACAAGTAACCTAACA [T/C] ATTCAAGTGGCATCTCTTTAGTGAAATCACACCAATCTCT		CC	CC	TT	CC	TT	TT
Chr 5:13500275	A/G	ACTGTATTTTTATTG [A/G] GAAAAGAGTGTTATG		GG	GG	GG	GG	AA	GG
Chr 5:13739291	G/A	TATATACAAGAAGTCT [G/A] TAACCATATTAATAA		AA	AA	GG	AA	GG	GG
Chr 5:13917908	C/A	ATCTCTCAACCTCTT [C/A] CTCATCAACCAATG		CC	AA	AA	CC	CC	AA
Chr 5:14088518	T/C	GCTGAGCCATCTTTCCAAACCTCCTTTCTTCAGTCTCTTAA [T/C] GACTCATTCTGCCCTGCCCTTGAATCCCTCAGGAGAGAG		TT	CC	TT	TT	TT	CC
Chr 5:14090305	G/T	TTAATTTTACTCATACAACAACCCCAATTTTTCATTTAAAAG [G/T] AAACATTTTTCATGCAACAGACAGCTTACAGACTCATGGAAT		GG	TT	GG	GG	GG	TT
Chr 5:14181884	C/T	TACTTTAAGTATATACATTGTAGTGATATTTGCTATGTAT [C/T] CAATTTATTTAAAAATGATTGCTCTTCGATGACGAATTA		TT	TT	TT	NN	NN	CC
Chr 5:14285551	A/G	ATATGTTCTGGCCCTTTTTCATGGTTTGTCTCATAGTGAG		AA	AA	AA	AA	AA	AA

Mamtr1 region

• Links from SNPlotyper



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NBRP

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