# Exploring Rat Quantitative Phenotype Data with the Rat Genome Database (RGD)

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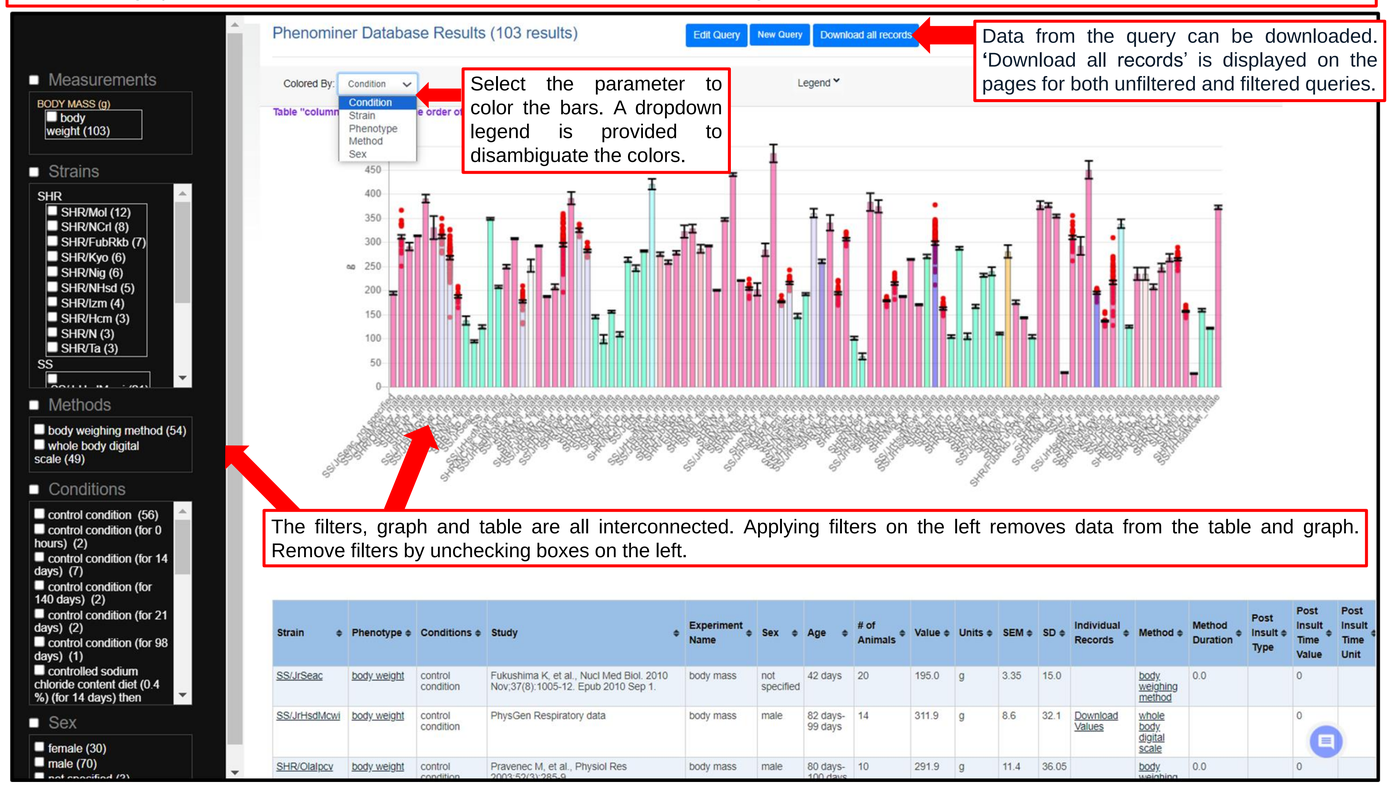
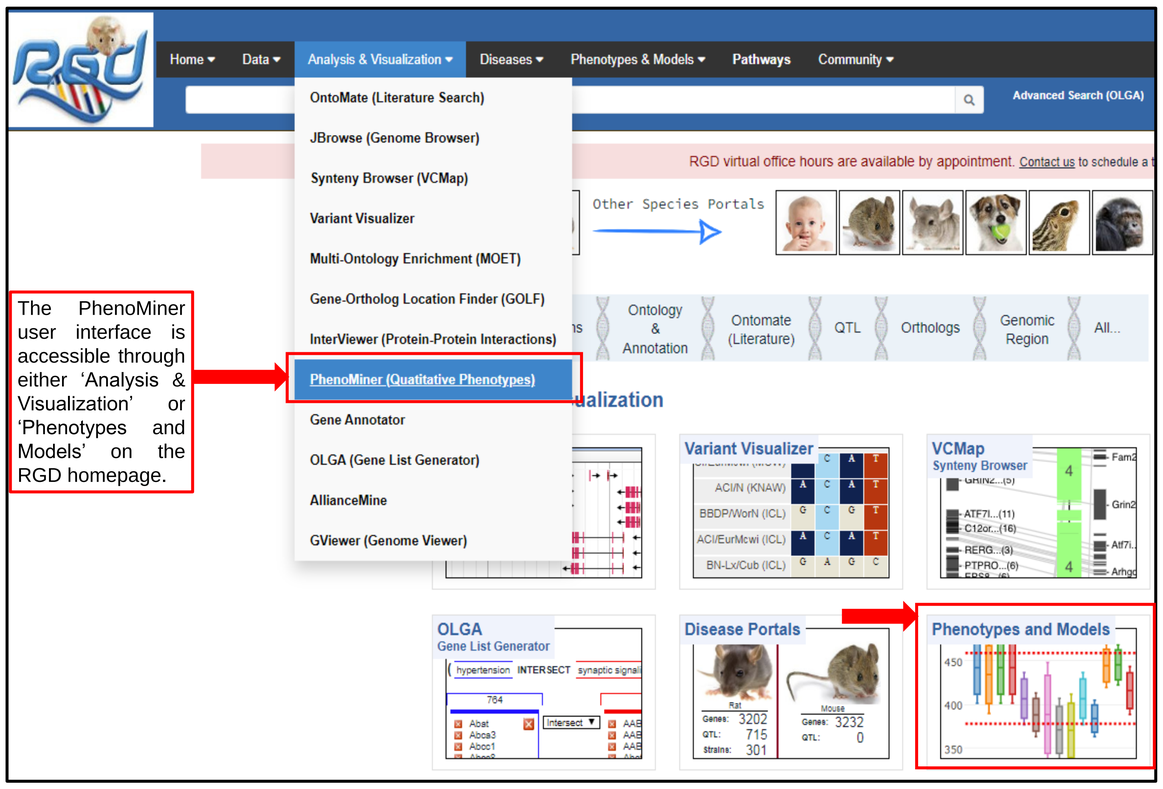
https://rgd.mcw.edu

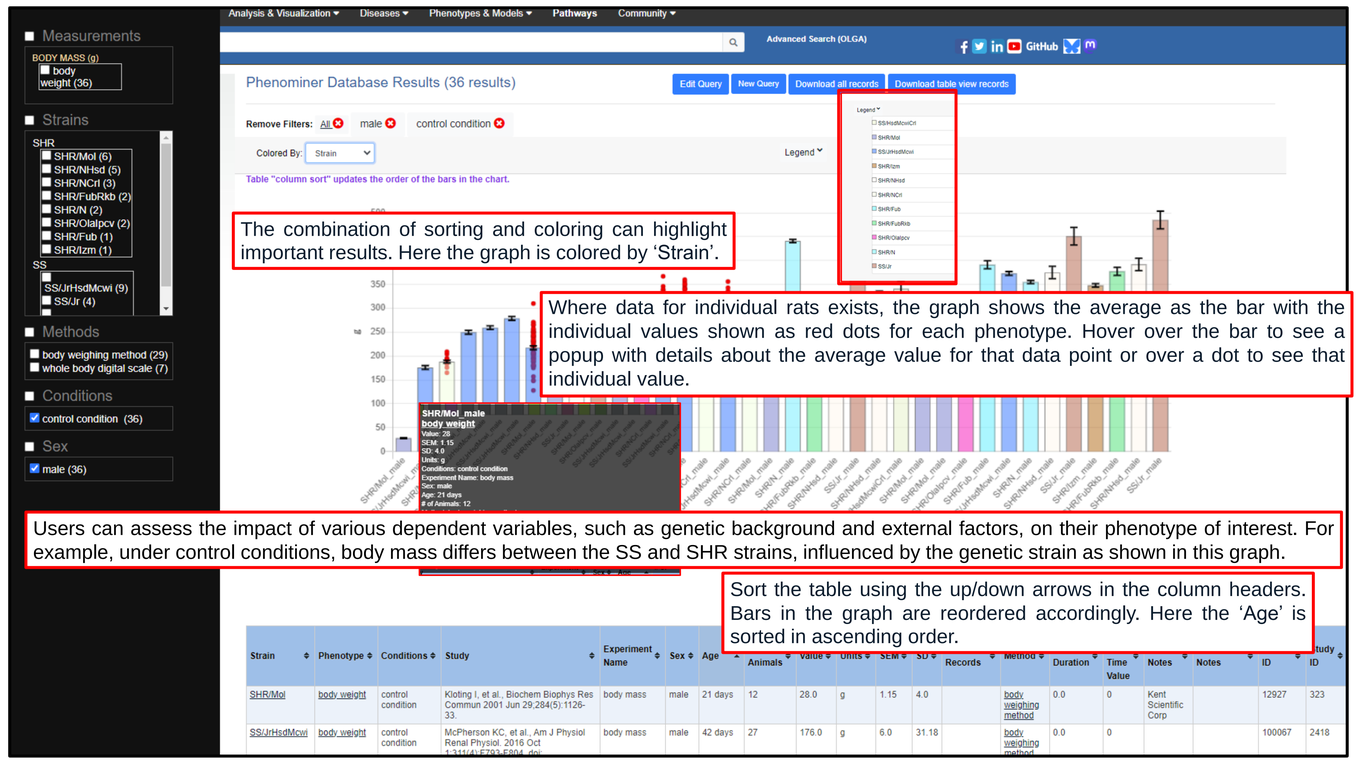
**Abstract**

The Rat Genome Database (RGD) is the premier site for rat genetic and physiologic data as well as complementary data for human and eight other model organisms. Among its innovative suite of tools that allows users to search, analyze and visualize research data, PhenoMiner is used for querying and visualizing quantitative phenotype data across various rat strains. This data is meticulously curated by literature curation by RGD biocurators and through automated imports from other databases, ensuring a robust dataset. Each datapoint in PhenoMiner carries comprehensive information annotated using terms from the Clinical Measurement Ontology (CMO), Measurement Methods Ontology (MMO), and Experimental Condition Ontology (XCO) ontologies. Users can access PhenoMiner (https://rgd.mcw.edu/rgdweb/phenominer/ontChoices.html) through the Phenotypes & Models drop-down menu on the RGD home page and then select specific vertebrate traits and strains, followed by selection of desired clinical measurements. Choosing from a list of measurement methods and limiting search parameters by experimental conditions, users can generate reports that provide quantitative phenotype data for analysis, with links to the source information. Users can identify and highlight the importance of independent variables, such as genetic background and external factors, in influencing their phenotype of interest, thus facilitating novel hypotheses for complex disease research. New features in PhenoMiner are continually being developed and added to improve the ability to view and download data at multiple levels from different rat strains.

The result from 'Generate Report' consists of a graph, a list of filters, and a table of results. If measurements that use more than one unit have been selected, the graph is hidden until the user filters the measurement selection to a single unit.




PhenoMiner is a tool for ontology-based standardization, storage and mining of quantitative phenotype data for the laboratory rat. The ontologies used to organize the data in the database include:

- **Rat Strain Ontology** (RSO) for animals measured (e.g., SHR, SS, WKY).
- **Vertebrate Trait Ontology** (VTO) for organizing related phenotypes within a study (e.g., body mass, arterial blood pressure trait).
- **Clinical Measurement Ontology** (CMO) for what specific phenotype was measured (e.g., body weight, systolic blood pressure).
- **Measurement Method Ontology** (MMO) for how the phenotype was measured (e.g., whole body digital scale, body weighing method, indwelling catheter, tail-cuff).
- **Experimental Condition Ontology** (XCO) for recording the experimental conditions (e.g., control condition, salt diet).







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