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

Mahima Vedi[1], Jennifer R Smith[1], Stanley JF Laulederkind[1], G Thomas Hayman[1], Shur-Jen Wang[1], Monika Tutaj[1], Mary L Kaldunski[1], Wendy M Demos[1], Marek A Tutaj[1], Jyothi Thota[1], Logan Lamers[1], Adam C Gibson[1], Akhilanand Kundurthi[1], Varun Reddy Gollapally[1], Kent C Brodie[2], Stacy Zacher[3], Jeffrey L De Pons[1], Melinda R Dwinell[1], Anne E Kwitek[1]

[1]Rat Genome Database, Department of Physiology. [2]Clinical and Translational Science Institute. [3]Finance and Administration, Medical College of Wisconsin, Milwaukee, WI, USA.

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.