Updated Hybrid Rat Diversity Panel Portal at RGD

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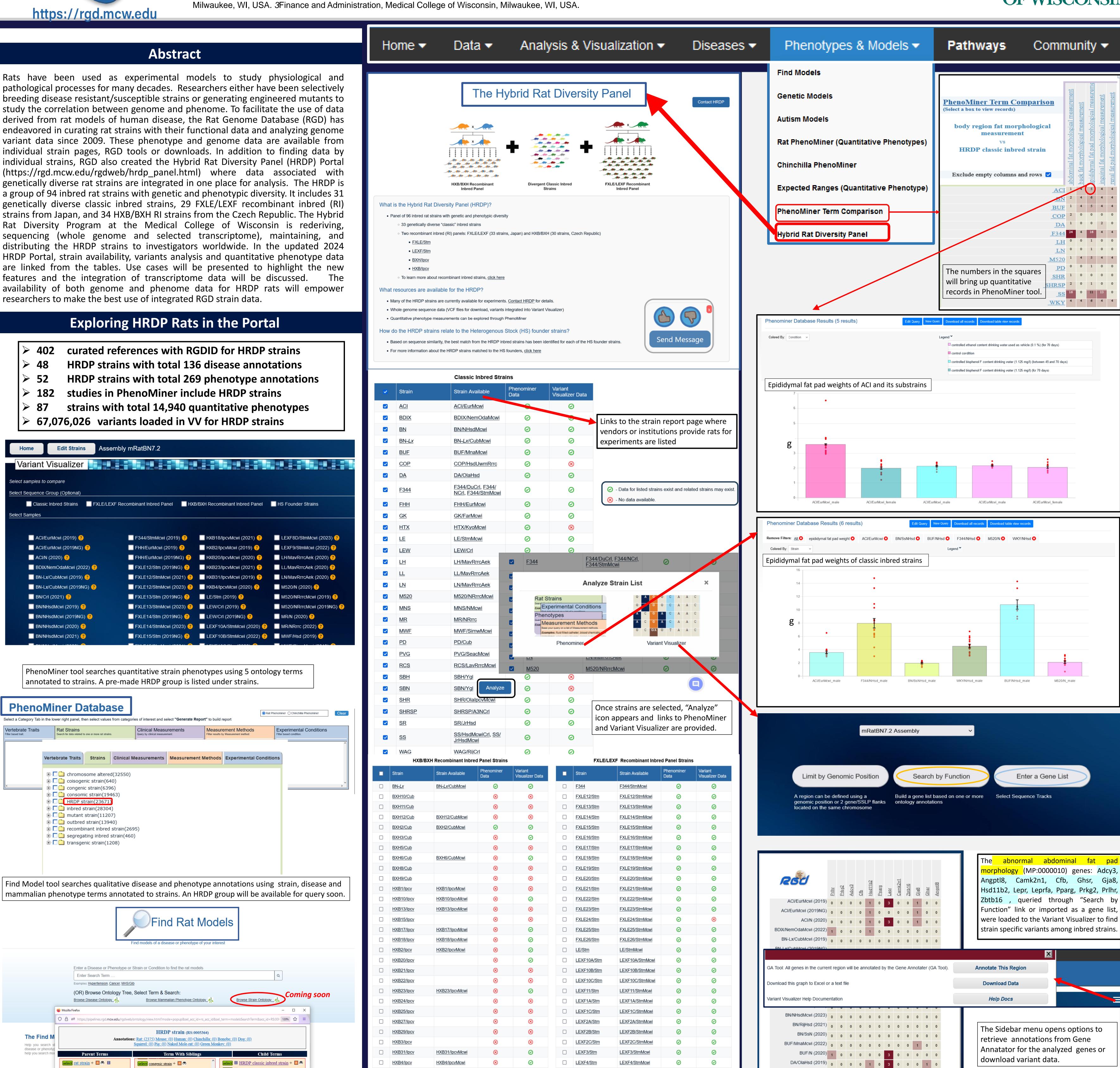
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https://rgd.mcw.edu

Abstract

Rats have been used as experimental models to study physiological and pathological processes for many decades. Researchers either have been selectively breeding disease resistant/susceptible strains or generating engineered mutants to study the correlation between genome and phenome. To facilitate the use of data derived from rat models of human disease, the Rat Genome Database (RGD) has endeavored in curating rat strains with their functional data and analyzing genome variant data since 2009. These phenotype and genome data are available from individual strain pages, RGD tools or downloads. In addition to finding data by individual strains, RGD also created the Hybrid Rat Diversity Panel (HRDP) Portal (https://rgd.mcw.edu/rgdweb/hrdp_panel.html) where data associated with genetically diverse rat strains are integrated in one place for analysis. The HRDP is a group of 94 inbred rat strains with genetic and phenotypic diversity. It includes 31 genetically diverse classic inbred strains, 29 FXLE/LEXF recombinant inbred (RI) strains from Japan, and 34 HXB/BXH RI strains from the Czech Republic. The Hybrid Rat Diversity Program at the Medical College of Wisconsin is rederiving, sequencing (whole genome and selected transcriptome), maintaining, and distributing the HRDP strains to investigators worldwide. In the updated 2024 HRDP Portal, strain availability, variants analysis and quantitative phenotype data are linked from the tables. Use cases will be presented to highlight the new features and the integration of transcriptome data will be discussed. The availability of both genome and phenome data for HRDP rats will empower researchers to make the best use of integrated RGD strain data.

Exploring HRDP Rats in the Portal

- 402 curated references with RGDID for HRDP strains
- 48 HRDP strains with total 136 disease annotations
- 52 HRDP strains with total 269 phenotype annotations
- 182 studies in PhenoMiner include HRDP strains
- 87 strains with total 14,940 quantitative phenotypes
- 67,076,026 variants loaded in VV for HRDP strains

PhenoMiner tool searches quantitative strain phenotypes using 5 ontology terms annotated to strains. A pre-made HRDP group is listed under strains.

PhenoMiner Database

Find Model tool searches qualitative disease and phenotype annotations using strain, disease and mammalian phenotype terms annotated to strains. An HRDP group will be available for query soon.

Find Rat Models

The Hybrid Rat Diversity Panel

Links to the strain report page where vendors or institutions provide rats for experiments are listed

- Data for listed strains exist and related strains may exist.
- No data available.

Once strains are selected, "Analyze" icon appears and links to PhenoMiner and Variant Visualizer are provided.

The numbers in the squares will bring up quantitative records in PhenoMiner tool.

Epididymal fat pad weights of ACI and its substrains

Epididymal fat pad weights of classic inbred strains

The abnormal abdominal fat pad morphology (MP:0000010) genes: Adcy3, Angptl8, Camk2n1, Cfb, Ghsr, Gja8, Hsd11b2, Lepr, Leprfa, Pparg, Prkg2, Prlhr, Zbtb16, queried through "Search by Function" link or imported as a gene list, were loaded to the Variant Visualizer to find strain specific variants among inbred strains.

The Sidebar menu opens options to retrieve annotations from Gene Annotator for the analyzed genes or download variant data.