Pathway resources at the Rat Genome Database: a dynamic platform for integrating gene, pathway and disease information

Rat Genome Database
http://rgd.mcw.edu

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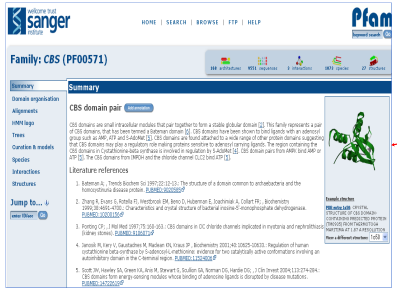
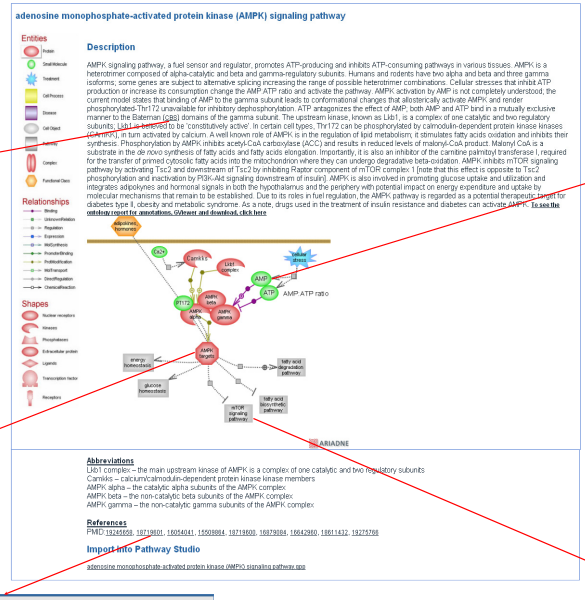
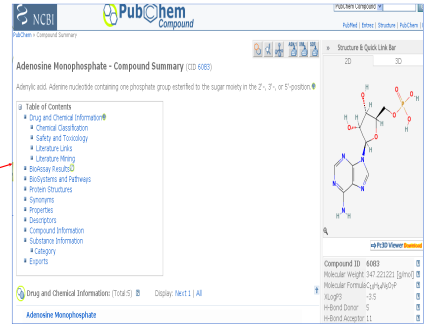
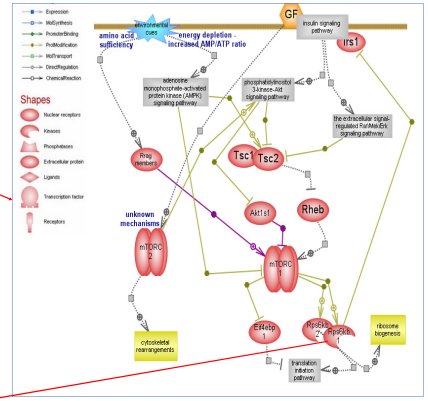
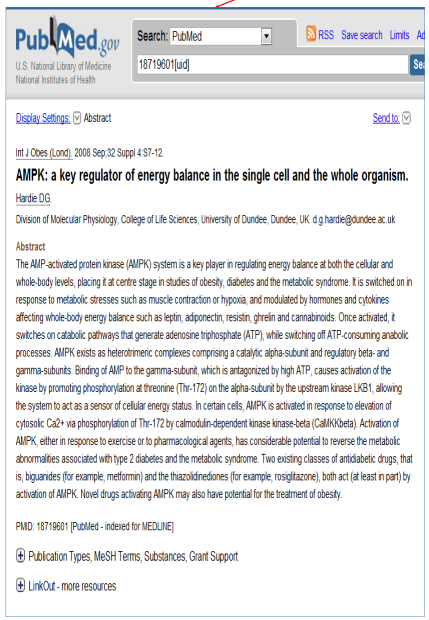
The Rat Genome Database offers comprehensive pathway data and visualization along with tools for easy access and navigation. Important for organizing and making data searchable is the Pathway Ontology (PW). The ontology provides a means to: a) illustrate relationships and dependencies between pathway types; b) standardize annotations of genes to pathway terms, including altered and disease pathways; c) link to interactive pathway diagrams. The diagrams can be accessed directly from the Pathway entry point of RGD's homepage. Pathway terms can be searched using the Ontology Browser, Genome Viewer, keyword search or entries in the Disease Portals. The result is an ontology report with the rat, human and mouse genes annotated to the term. If available, the icon of an interactive pathway diagram is displayed and the diagram page can be accessed. Every diagram page provides links to gene report pages, lists for members of a family or target genes (individual entries link to gene report pages), PubChem entries for small molecules, Pfam entries for domains mentioned in the description, PubMed entries for cited references. Very importantly, links to pathways triggered by or connected to the pathway under investigation, or between a disease pathway and the underlying altered pathways, are provided. This latter feature allows users to 'travel' through the pathway landscape, explore how circuits connect to one another, how the altered version of a pathway differs from the normal one, or how malfunctioning pathways converge on a disease. Annotations and diagrams are based on the available review literature. The selection of pathways is made in conjunction with the Disease Portals project, the roles the pathway play within the global network of integrated circuits of the system or within major physiological pathways. Diagrams are built using the Pathway Studio software from Ariadne Genomics, version 6.0. The diagram pages are created using a Content Management System. The ontology and annotations are available for download from our ftp site. Expansion of RGD's pathway resource is currently underway to include physiological pathways with dynamic and integrative visualization allowing for links to phenotype information as well as molecular and cellular pathways.

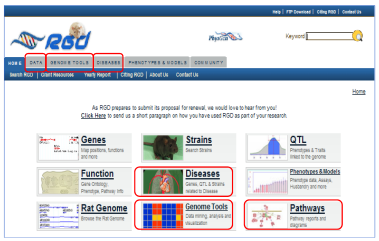


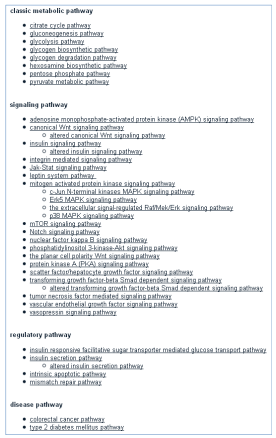


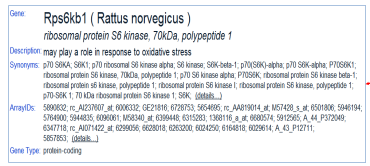












Coming soon

Physiological Pathways

For details, please see poster **X042**.

1 Pathway terms can be searched using the Ontology Browser from DATA, GViewer from Genome Tools, entries in the Disease Portals. Diagrams can be accessed from the ontology report or directly from the list in Pathways.

2 The anatomy of an interactive pathway diagram. The components of the diagram link to gene report pages or dynamic lists of genes, PubMed for cited references, Pfam for domains in the description, small molecules and to other pathways in the diagrams.