

RGD A UNIQUE RESOURCE FOR RAT QTL DATA: LINKING PHENOTYPE TO THE GENOME

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Abstract

The usage of rat as a research model enables RGD (<http://rgd.mcw.edu>) to collect QTL data and act as a platform for the rat users trying to link genomic variations to phenotypes. Currently we have more than 1600 rat quantitative trait loci (QTLs) in RGD that are manually curated from various literature sources. While searching a QTL one could use the quick search, advance search, or keyword search boxes, trait or ontology term search or even the option of searching by RGD ID or by genomic position. QTL report pages have comprehensive data on strains and crosses, map positions, LOD scores, treatments and methodologies implied during the study of these QTLs. These are linked to other QTLs that lie in the same genomic region, sub region or those which interact with it.

Queries from NCBI are done weekly to get recent publications related to QTLs which keeps our data up to date. Researchers are regularly urged to submit their QTLs to RGD. During the process of registration RGD assigns official nomenclature to these QTLs following to the guidelines laid out by the International Committee on Standardized Genetic Nomenclature for Mouse and the Rat Genome and Nomenclature Committee. The submitters are provided with these QTL symbols and RGD ID prior to their publications and asked to mention these in their papers. These QTLs are released to the website along with the relevant references, after this data appears in a published article or the submitter permits RGD to do so.

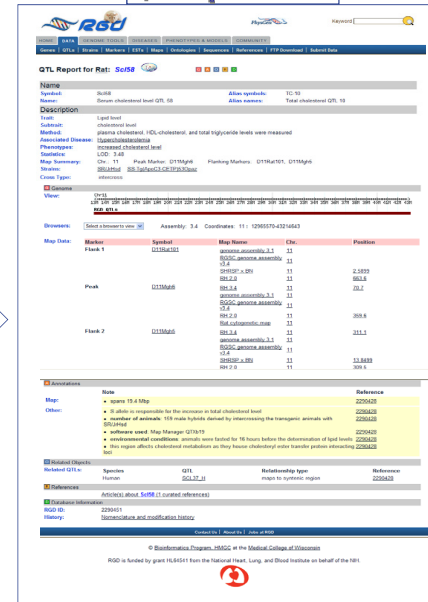
We use controlled vocabularies like Mammalian Phenotype Ontology (http://www.informatics.jax.org/searches/MP_form.shtml) and Disease Ontology (<http://www.nlm.nih.gov/mesh/MBrowser.html>) to annotate these QTLs. QTL tracks on the GBrowse and GViewer allow visual representation of these regions in the genomic context and thereby facilitating the use of comparative genomics for human diseases. These also provide the users the ability to search and display QTLs across species and get gene data that lie within these specific regions. Users have the option to download these data sets and customize them to suit their needs.

Searching a QTL in RGD



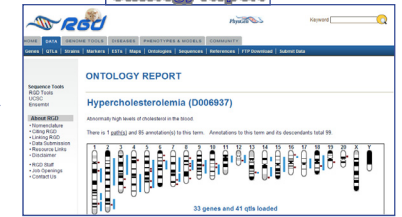
The screenshot shows the RGD search interface with three main search methods: Keyword search, Advance search, and Position search. The Keyword search section includes a search box and a list of keywords. The Advance search section includes filters for keywords, LMI (Locus Mapping Interval) results, and species. The Position search section includes a search box for genomic coordinates and a map view.

QTL Report in RGD



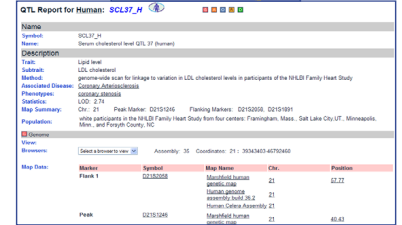
The screenshot shows a detailed QTL report for Rat: Sc5b. It includes the name, symbol, and description of the QTL. The report also displays a map of the QTL region on chromosome 5, showing the position of the QTL and the associated genes. The report includes a table of associated genes and their positions, and a list of references.

Ontology Report



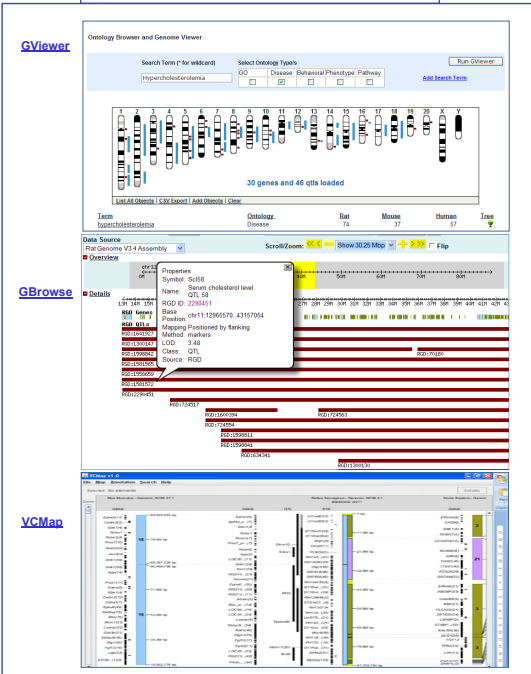
The screenshot shows an Ontology Report for Hypercholesterolemia (D006937). It displays a list of associated QTLs and their positions on the genome. The report includes a table of associated QTLs and their positions, and a list of references.

Human QTL Report



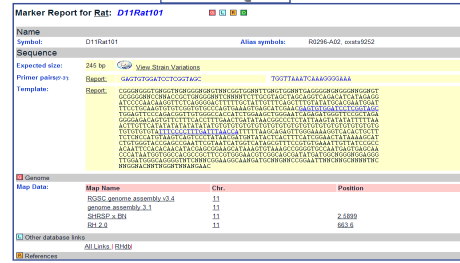
The screenshot shows a Human QTL Report for SCL37_H. It displays the name, symbol, and description of the QTL. The report also displays a map of the QTL region on chromosome 17, showing the position of the QTL and the associated genes. The report includes a table of associated genes and their positions, and a list of references.

Genomic Tools to Visualize QTLs



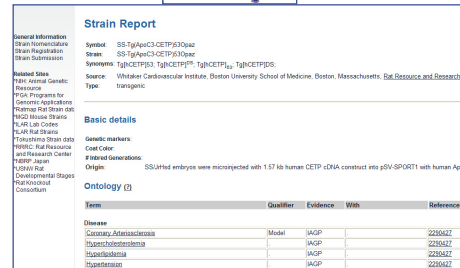
The screenshot shows two genomic visualization tools: GViewer and GBrowse. GViewer displays a map of the genome with QTLs and associated genes. GBrowse displays a detailed view of a QTL region, showing the position of the QTL and the associated genes. The screenshot includes a table of associated genes and their positions, and a list of references.

SSLP Report



The screenshot shows an SSLP Report for Rat: D11Rat101. It displays the name, symbol, and description of the SSLP. The report also displays a map of the SSLP region on chromosome 11, showing the position of the SSLP and the associated genes. The report includes a table of associated genes and their positions, and a list of references.

Strain Report



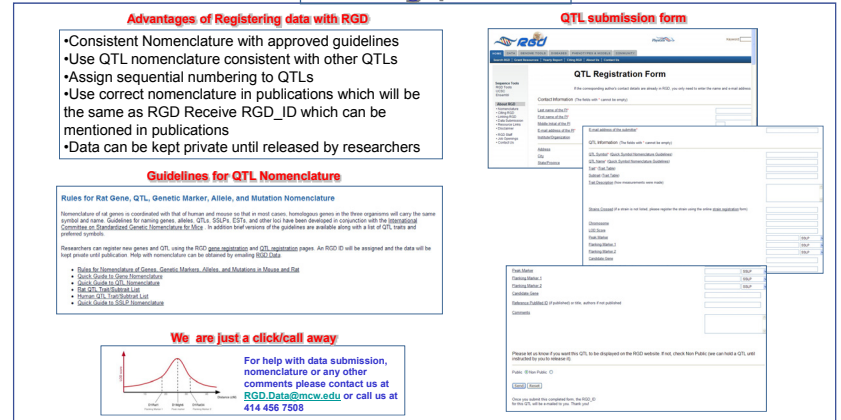
The screenshot shows a Strain Report for SS-TgApc3-CETP3Qaz. It displays the name, symbol, and description of the strain. The report also displays a map of the strain region on chromosome 11, showing the position of the strain and the associated genes. The report includes a table of associated genes and their positions, and a list of references.

Reference Report



The screenshot shows a Reference Report for RGD ID: 71003. It displays the name, symbol, and description of the reference. The report also displays a map of the reference region on chromosome 11, showing the position of the reference and the associated genes. The report includes a table of associated genes and their positions, and a list of references.

Submitting QTLs to RGD



The screenshot shows the QTL submission form and registration process. It includes a section for Advantages of Registering data with RGD, a section for Guidelines for QTL Nomenclature, and a section for the QTL submission form. The form includes fields for QTL name, symbol, description, and position. The screenshot also includes a section for the QTL registration form, which includes fields for user name, email, and password.