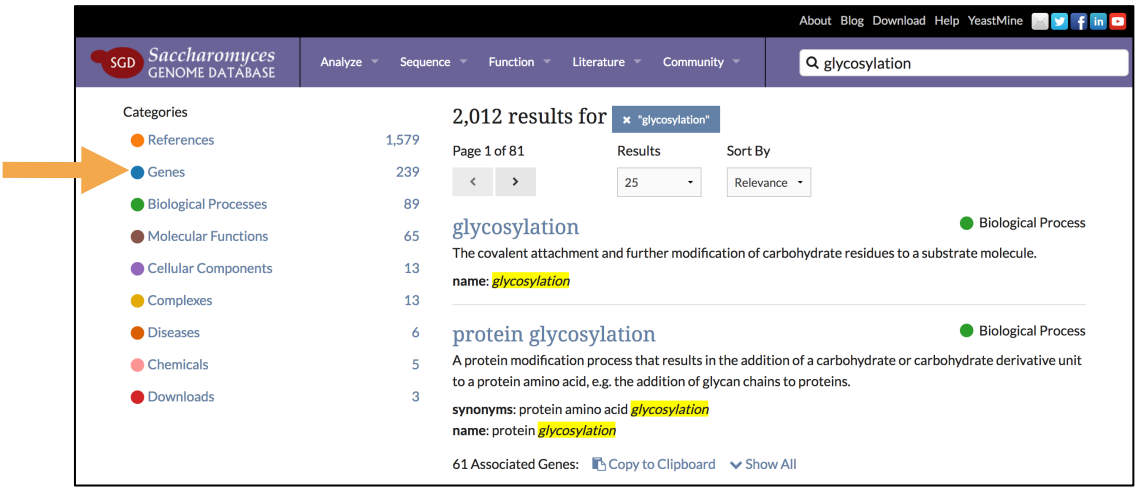
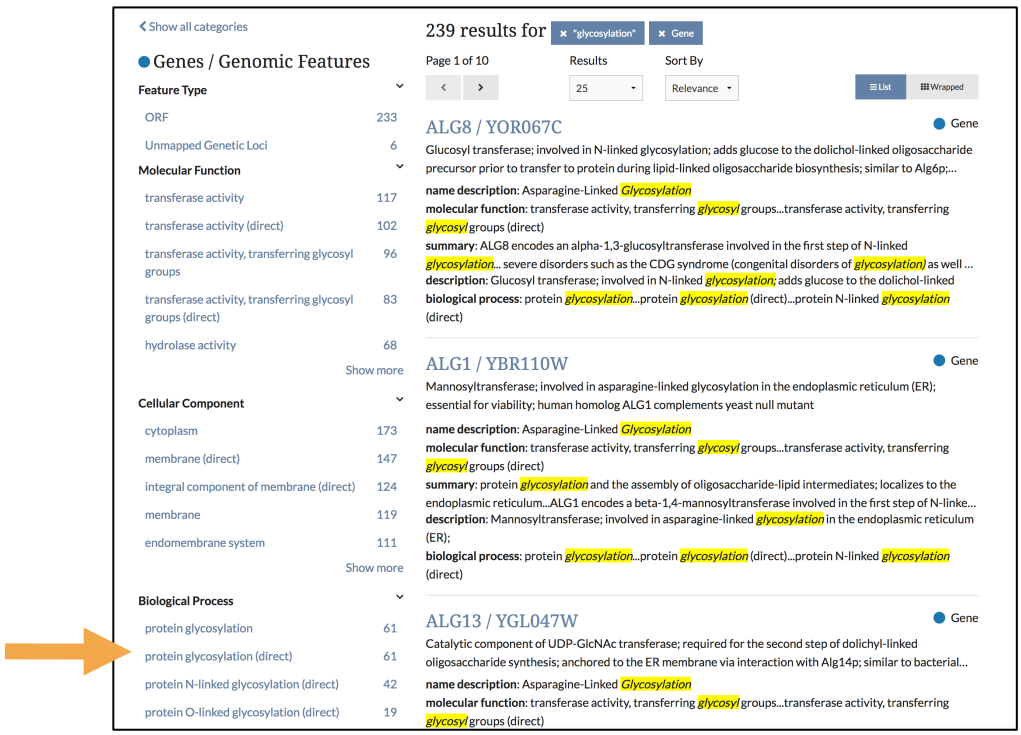
Searching SGD and Navigating Gene Pages

Use SGD's Faceted Search and Locus Summary page to explore gene-specific information about RER2.

- Find a gene involved in protein glycosylation.
- Open the SGD homepage (https://yeastgenome.org). Search for "**glycosylation**".
- From the categories (**facets**) in the left column, select the category **Genes**. This filters the results to genes that have the keyword "glycosylation" somewhere in their summaries and annotations.

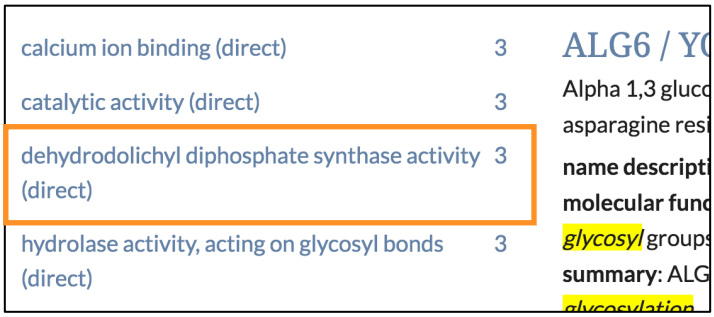


- Select more facets to further filter your results. Since we're interested in protein glycosylation, find **Biological Process** in the left column and select **protein glycosylation (direct)**.



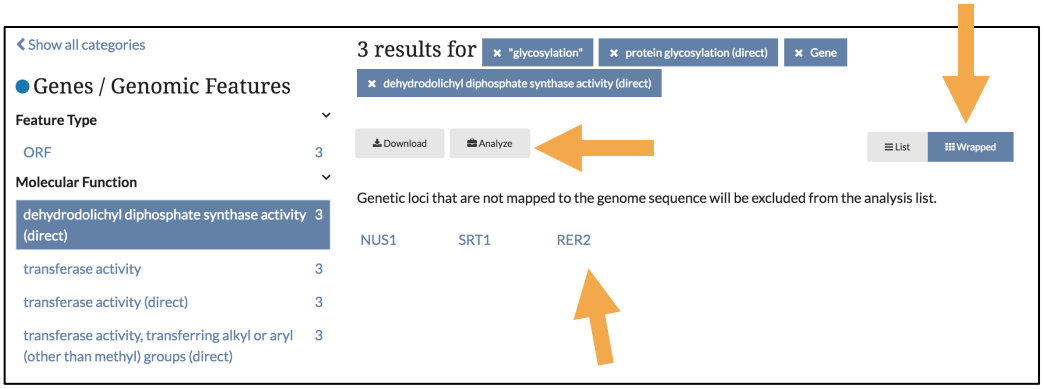
- This filters for genes that are directly annotated to “protein glycosylation”. Terms without the “(direct)” suffix are annotated to either “protein glycosylation” or a more specific term, such as “protein N-linked glycosylation”.

- Let’s also filter for a specific enzymatic activity. Under **Molecular Function**, click on “Show more”. Find the term **dehydrodolichyl diphosphate synthase activity (direct).**



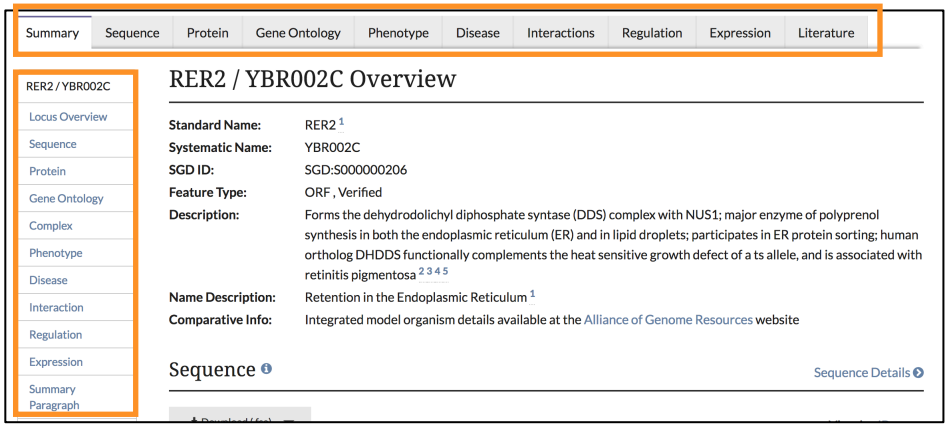
- The results should now show 3 genes that have the following:
  - The keyword “glycosylation” somewhere in their summaries and annotations
  - A direct annotation to “protein glycosylation”
  - A direct annotation to “dehydrodolichyl diphosphate synthase activity”

- To see only the gene names (useful for many results) as shown in the figure, click on the **Wrapped** button above the list. The **Download** and **Analyze** buttons respectively allow you to save the list locally or send it to one of SGD’s tools for analysis. For now, click on RER2 to open its **Locus Summary page**.

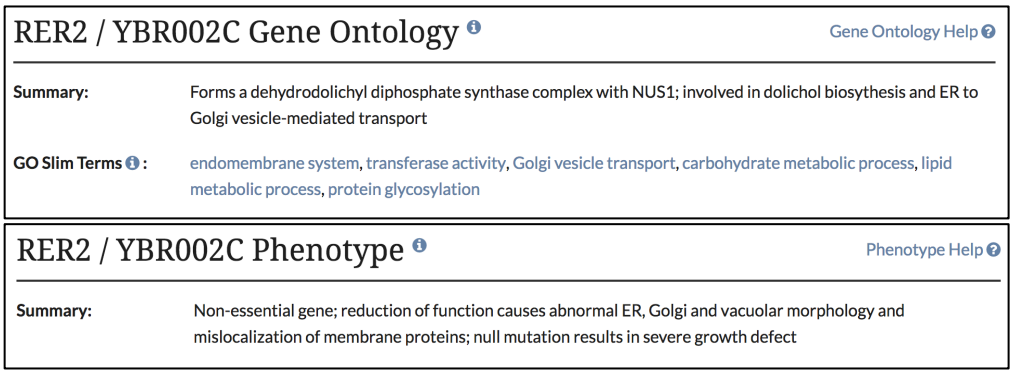


Explore *S. cerevisiae* RER2 Locus Summary page.

You can scroll down and up the page, or you can jump to a specific section using the content table in upper left corner. Full pages for each category of data can be accessed via the top gray toolbar.



- **Summaries**: What is known about this gene? (read the Description in Locus Overview, read summaries in Gene Ontology and Phenotype sections, and read the Summary Paragraph)



RER2 / YBR002C Gene Ontology — Gene Ontology Help

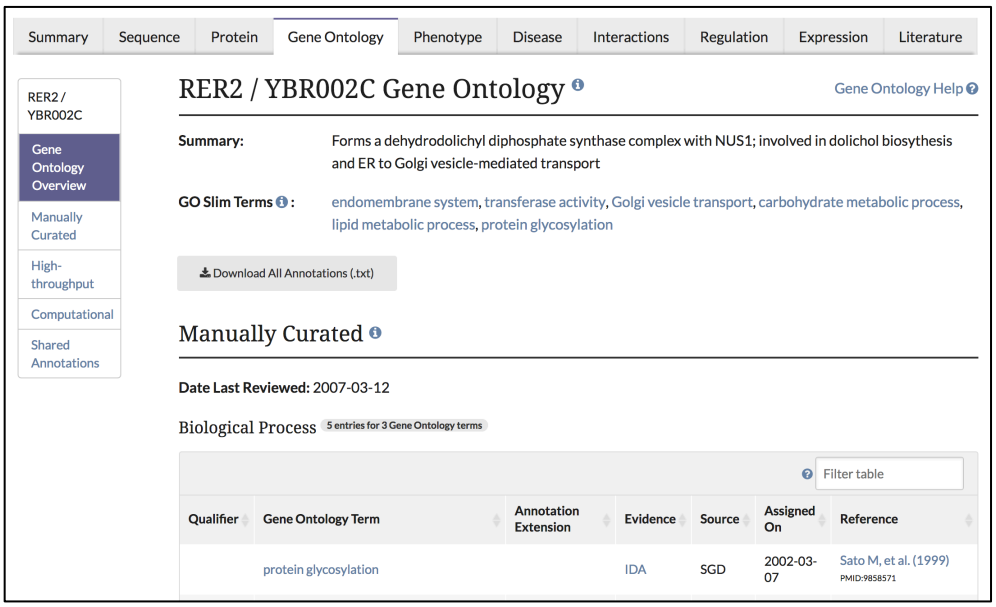
Summary: Forms a dehydrodolichyl diphosphate synthase complex with NUS1; involved in dolichol biosythesis and ER to Golgi vesicle-mediated transport

GO Slim Terms: endomembrane system, transferase activity, Golgi vesicle transport, carbohydrate metabolic process, lipid metabolic process, protein glycosylation

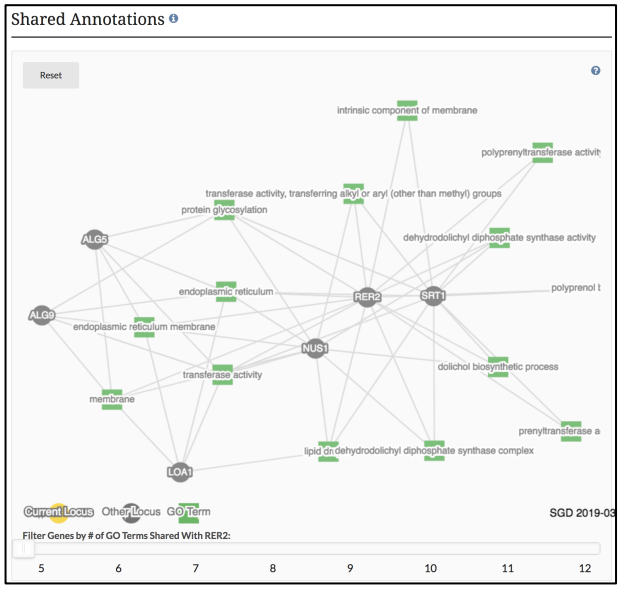
RER2 / YBR002C Phenotype — Phenotype Help

Summary: Non-essential gene; reduction of function causes abnormal ER, Golgi and vacuolar morphology and mislocalization of membrane proteins; null mutation results in severe growth defect

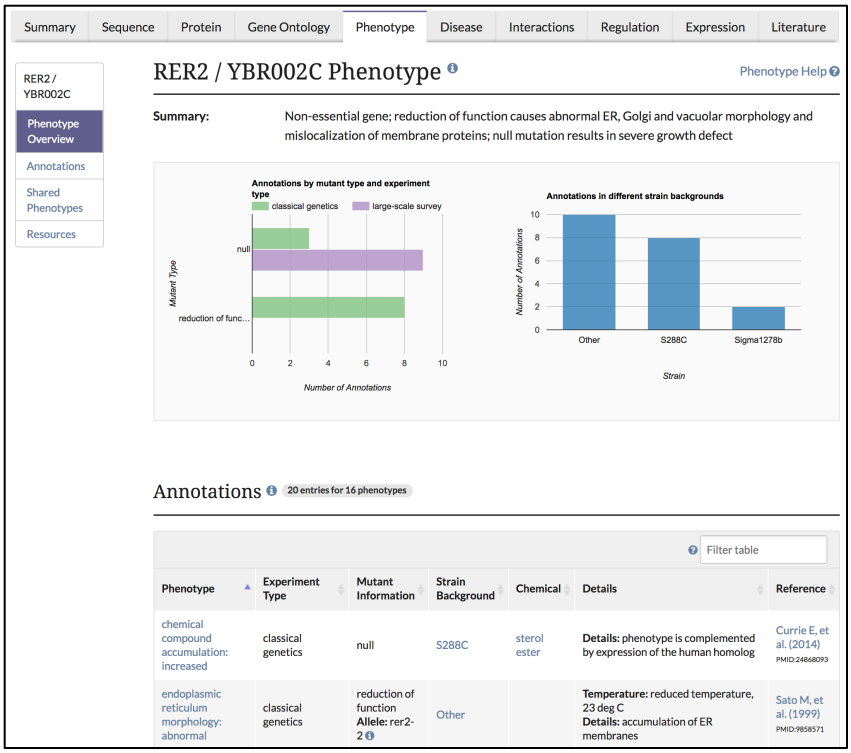
- **Gene Ontology**: Explore functional annotations on RER2 by visiting the Gene Ontology tab. What **biological processes** is RER2 involved in? Does Rer2p have any known **molecular function**, such as kinase activity? What **cellular components** does Rer2p localize to in the cell, and is it a member of any complexes?



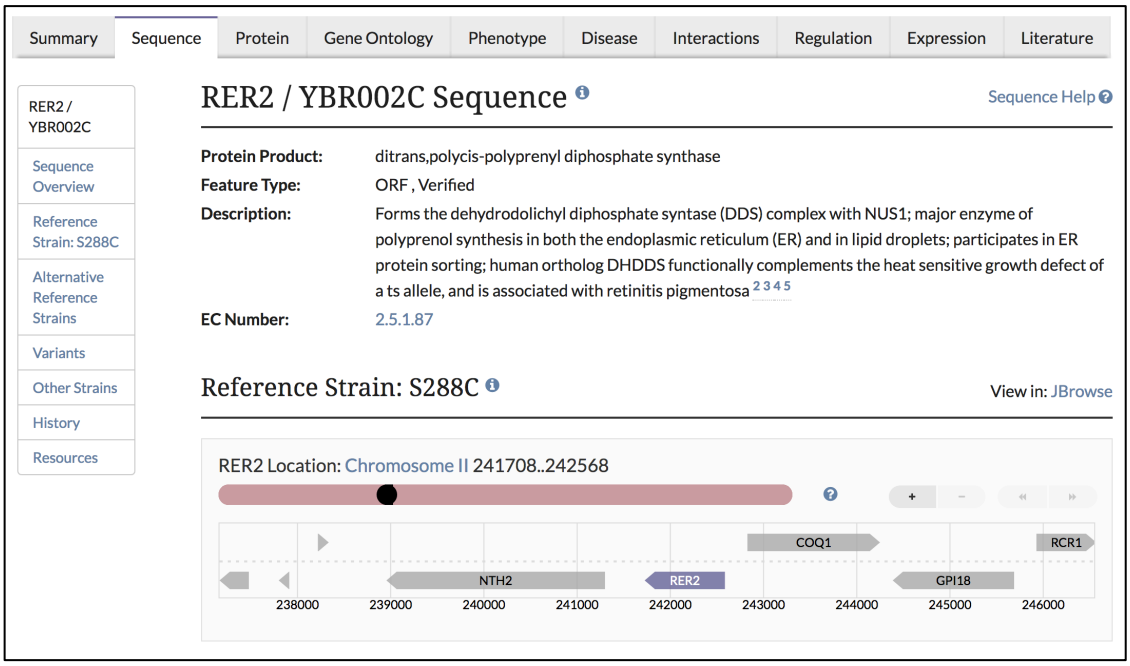
- Scroll down the page and use the Shared Annotations diagram to find other genes that share the same biological processes.



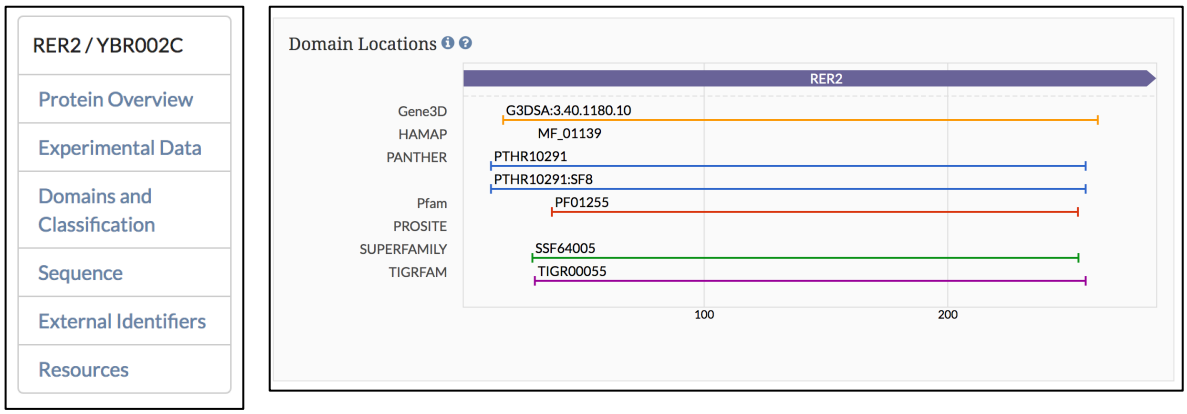
- **Phenotypes**: What details about the mutant phenotypes are available? See the Phenotype tab for information on mutant types, strain backgrounds, references. Based on the role of RER2 in ER to Golgi vesicle-mediated transport, do null mutants have phenotypes you would expect? Find other genes that share the same phenotypes by exploring the Network Diagram at the bottom of the page.



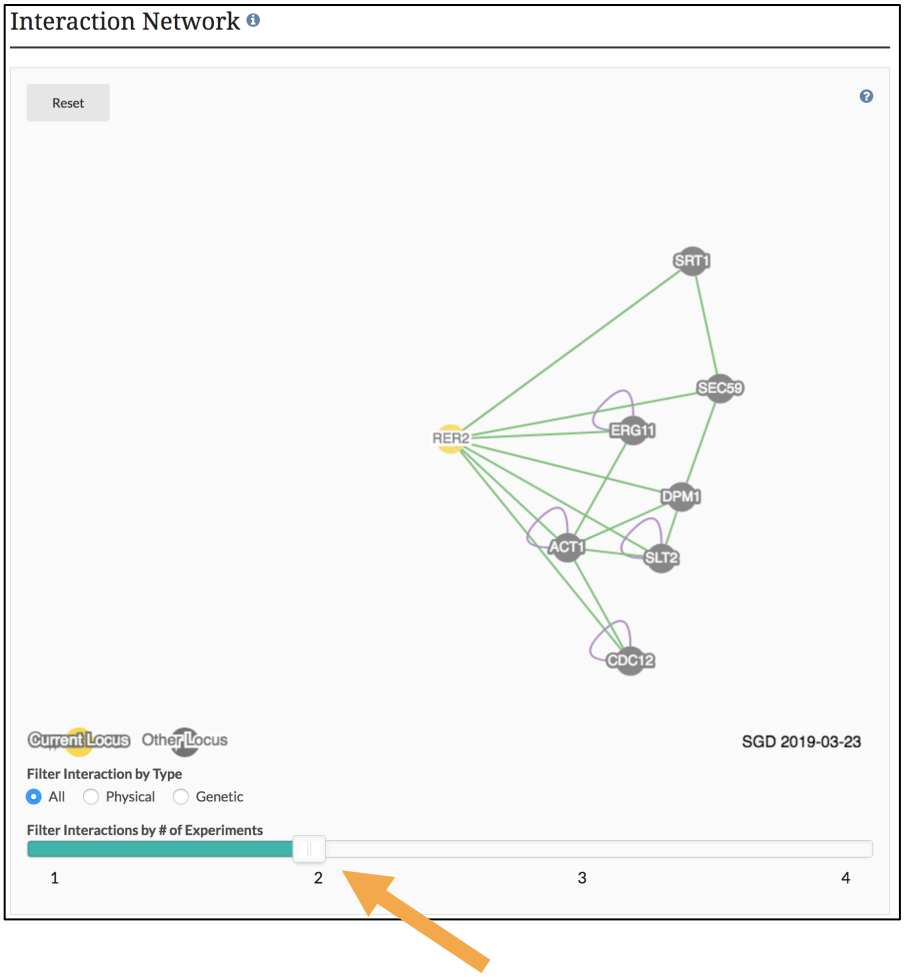
- **Sequence**: Visit the Sequence tab for RER2. What is the chromosomal location of RER2 and its neighboring genes? Note that the RER2 sequence can be downloaded here for the reference strain S288C and alternative strains.



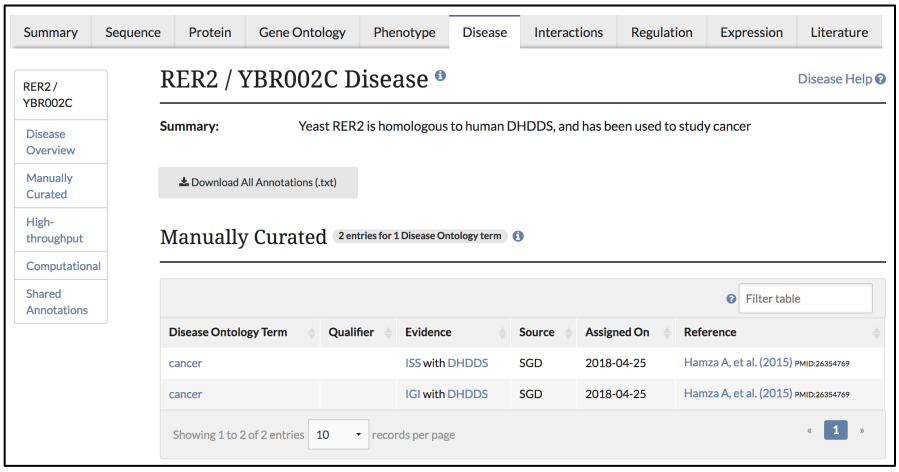
- **Protein**: Visit the RER2 Protein tab. What is the Rer2p amino acid sequence? What is its half-life? What is the highest and lowest protein abundance listed for Rer2p? What protein domains does it have, and with which proteins does it share these domains? Is Rer2p post-translationally modified by ubiquitin? What is the calculated molecular weight and isoelectric point of this protein?



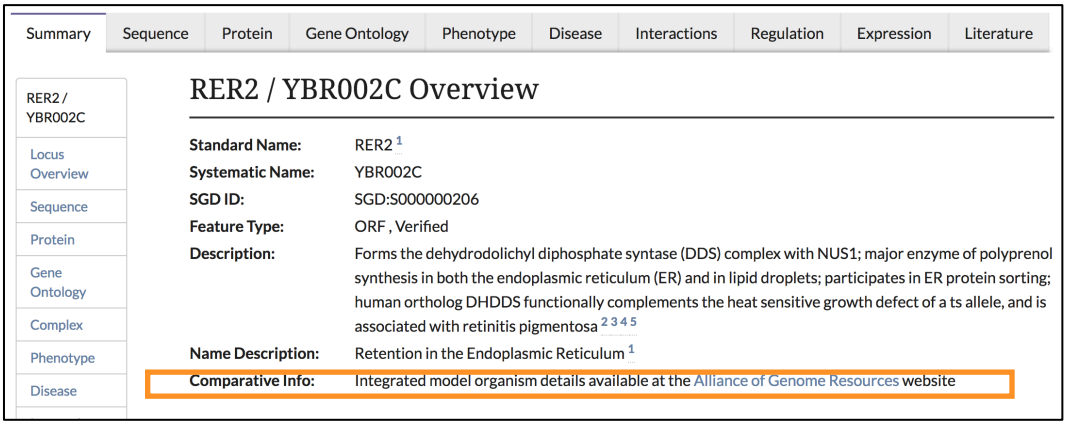
- **Interactions**: Go to the RER2 Interactions tab and look at the Annotations table. With which genes does RER2 have a genetic interaction? What about synthetic lethal interactions (hint: search the table for "synthetic lethal")? Find the Interaction Network and set the # of experiments to 2 (see figure). Do any genetic interactors of RER2 also have a genetic interaction with each other?



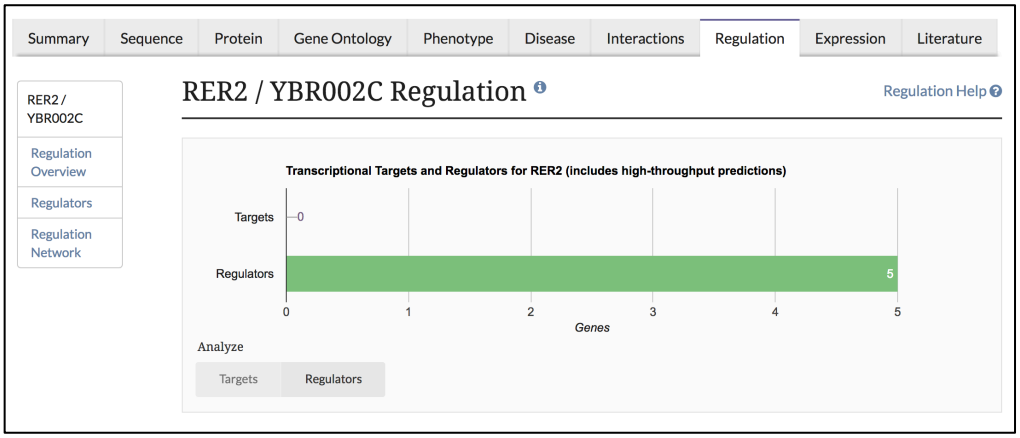
- **Homology & Disease**: What human gene is RER2 homologous to? Has yeast RER2 been used to study any diseases? On the Disease summary tab, scroll to the bottom of the page and find the Shared Annotations network diagram. What other yeast genes have been used to study cancer? Do they have a human homolog?



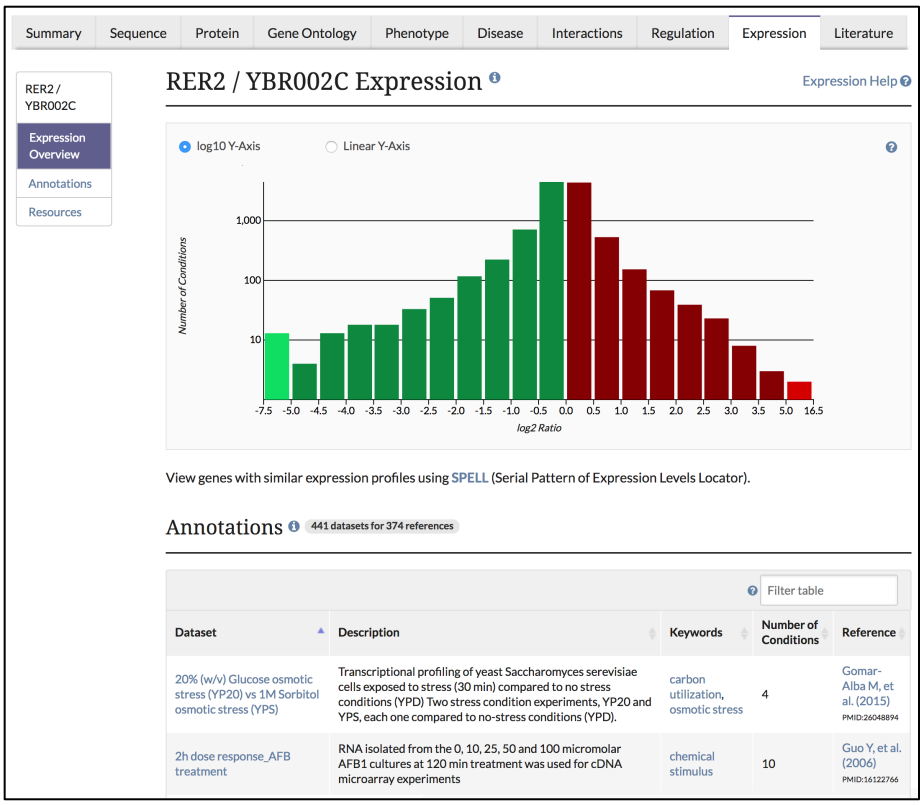
  - If you wish to see more homology & disease information, you can visit the **Alliance of Genome Resources** (alliancegenome.org) page for RER2. You can access this page by returning to the main RER2 Summary page and clicking on the Alliance of Genome Resources link in the "**Comparative Info**" section of the Locus Overview.



- **Regulation**: Open the RER2 Regulation tab. What regulatory relationships does RER2 have? Do any RER2 regulators regulate another (hint: see network diagram)?



- **Expression**: Go to the RER2 Expression tab. What factors affect the expression of RER2? The columns in the histogram indicate how many conditions result in a given increase/decrease in expression level of RER2 – click on a column to show the datasets, categories and references in the table below; hyperlinks lead to more details.



- **Literature**: Open the RER2 Literature tab. What reviews have been published that deal with RER2? Jump through the page using the content table.