MycoCosm KEGG Browser


Scenario: You have plated a variety of yeasts on a variety of carbon sources, and discovered that some members of the Pichiaceae grow on galactose (e.g. Dekkera bruxellensis) and some do not (e.g. Pichia membranifaciens). Use MycoCosm to find genes that could explain this metabolic difference.

1) Go to the MycoCosm Pichiaceae PhyloGroup at genome.jgi.doe.gov/Pichiaceae:

2) To verify that Dekkera (which grows on galactose) and Pichia (which does not) are sibling taxa, click on ‘TREE’:

3) Click on ‘Dekkera’ to go to its genome portal:
4) Click on “ANNOTATIONS => KEGG” to go to the portal’s KEGG browser:

5) Scroll down to the ‘Carbohydrate Metabolism’ section, and find the subsection ‘Galactose metabolism’. Dekkera has 24 genes annotated to this metabolic pathway:

6) Click on ‘Galactose metabolism’ to drill down into the KEGG hierarchy and list the EC numbers of that pathway.

7) Go to the ‘Select Model Set(s) to View’ list box and select Dekkera and Pichia and click the ‘apply’ button. The Dekkera and Pichia galactose metabolism gene counts are side-by-side and may be directly compared. Galactokinase (EC = 2.7.1.6) and UDPglucose--hexose-1-phosphate uridylyltransferase (2.7.7.12) are each present in Dekkera but not in Pichia:
8) Scroll back up to the now-familiar ‘Select Model Set(s) to View’ list box and select Dekkera only. Click ‘apply’ to show the Dekkera counts only.

9) Click ‘View KEGG Map’ to see a graphical display of the pathway. Only those enzyme boxes colored red are annotated as such in Dekkera. These include both 2.7.1.6 (Galactokinase) and 2.7.7.12 (UDPglucose--hexose-1-phosphate uridylyltransferase):

10) Use the web browser back button return to the now-familiar Dekkera galactose metabolism page and select Pichia only. Click ‘apply’ to show the Pichia counts only.
11) Click ‘View KEGG Map’ again, and again only those enzyme boxes colored red are annotated as such in *Pichia*. These include neither 2.7.1.6 nor 2.7.7.12. No wonder *Pichia* cannot grow on galactose!

References: