


PlantCyc, AraCyc, PoplarCyc and more . . .

Building databases
with YOUR help
at the Plant Metabolic Network



kate dreher
curator

PMN/TAIR

PMN database content statistics

□ Latest PMN release – April 2011

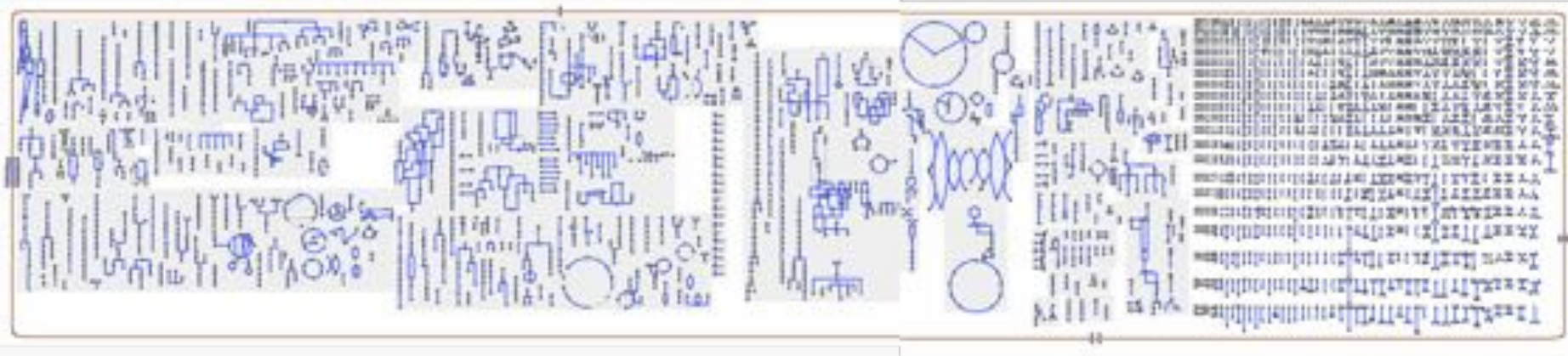
	PlantCyc 5.0	AraCyc 8.0	PoplarCyc 3.0
Pathways *	737	393	309
Enzymes **	11217	5520	3422
Reactions	3142	2525	1758
Compounds	3146	2825	1406
Organisms	366	1	1***

* These represent “base pathways” that are composed entirely of reactions. A base pathway may be joined with additional base pathways and/or reactions to create a superpathway. Superpathways are not included in this statistic.

** The term "enzyme" refers to both monomers and complexes found in the databases.

*** The vast majority of the enzymes present in the database are from *Populus trichocarpa* but experimentally supported enzymes and pathways from other species or hybrids in the *Populus* genus can be included in PoplarCyc.

PMN data



- The PMN houses a large quantity of data, but . . .
 - Numerous previously published enzymes and pathways are missing
 - Exciting new discoveries are continuously made
 - How can we keep up?

Building better databases together

- Anytime . . .
 - Send an e-mail: curator@plantcyc.org
 - Use data submission “tools”



- At the ASPB conference . . .
 - Stay for the curation jamboree tonight!
 - Meet with me at the Plant Genome Resources Outreach Booth – 415
 - E-mail me at kadreher@stanford.edu to schedule an appointment



Community gratitude

□ We

The screenshot shows the PMN website interface. The left sidebar contains a menu with the following items: About PMN, Project Overview, Documentation, Presentations, Statistics, Release Notes, Contact Info, News, PMN Staff, Collaborators, **Contributors** (highlighted with a red box), and Editorial Board. The main content area is titled 'PMN Contributors' and contains the following text:

PMN contributors from around the world have added to or helped to improve the content of AraCyc, PlantCyc, and the other PlantCyc-derived databases that are part of the PMN.

In addition to the active contributions from the PMN editorial board and PMN collaborators, the following individuals have contributed significantly in improving the content of PlantCyc, AraCyc, and the other PlantCyc-derived databases that are part of the PMN.

- Some contributors have contacted us with suggestions and revisions.
- Some have generously responded to appeals for help from the curators.
- Some have attended curatorial jamborees.

Contributors for PMN release - June 25/19

- Lodger Beenhues - Technische Universität Braunschweig, Germany
- David Doon - Durham University, UK
- Natalia Dudareva - Purdue University, USA
- Andrzej Guranowski - The University of Life Sciences, Poland
- Zhihua He - Chinese Academy of Sciences, China
- Jungmi Hur - University of California, Los Angeles, USA
- Peter Lundquist - Cornell University, USA
- Rüdiger Sadre - RWTH Aachen University, Germany
- Bernd Schneider - Max Planck Institute for Chemical Ecology Braunschweig Campus, Germany
- Mitsunori Seo - RIKEN, Japan
- Raimund Tenhaken - Universität Salzburg, Austria
- Chung-Jui Tsai - University of Georgia, USA
- Eleonore Wurzel - The City University of New York, USA
- Zhiyong Xie - Shanghai University of Traditional Chinese Medicine, China

Contributors for prior PMN releases

- Inad Ajawi - Michigan State University, USA
- Jose Alonso - North Carolina State University, USA
- Richard Amasino - University of Wisconsin, USA
- Ian Baldwin - Max Planck Institute for Chemical Ecology, Germany

Introduction

The Plant Metabolic Network (PMN) is a collaborative project among databases and biochemists with a common goal to build a linked network of plant metabolic pathway databases. A central feature of the PMN is PlantCyc, a comprehensive plant biochemical pathway database, containing curated information from the literature and computational analyses about the genes, enzymes, compounds, reactions, and pathways involved in primary and secondary metabolism.

PMN is funded by the National Science Foundation (Grant #: 1026001 and 0640769), governed by an Editorial Board composed of internationally recognized scientists, and executed at the Carnegie Institution for Science, Department of Plant Biology.



Plant Metabolic Pathway Databases

PlantCyc

[Search](#)

[More info](#)

PlantCyc provides access to manually curated or reviewed information about shared and unique metabolic pathways present in over 350 plant species.

ArabCyc

[Search](#)

[More info](#)

[Overlay my data](#)

ArabCyc provides access to manually curated or reviewed information about metabolic pathways for the model plant *Arabidopsis thaliana*. The pathways may be unique to *Arabidopsis* or shared with other organisms.

Data from gene expression, proteomic, and metabolomic experiments in *Arabidopsis* can be **overlayed** on a metabolic map using the [OMICS Viewer](#).

PoplarCyc

[Search](#)

[More info](#)

[Overlay my data](#)

PoplarCyc provides access to manually curated or reviewed information about metabolic pathways for the model tree *Populus trichocarpa* and a few other related *Populus* species and hybrids. The pathways may be unique to poplar or shared with other organisms.

Data from gene expression, proteomic, and metabolomic experiments in poplar can be **overlayed** on a metabolic pathway map using the [OMICS Viewer](#).

News

We want your data at the ASPB Meeting!

Please come to a database overview and hands-on community curation workshop at the ASPB Meeting co-hosted by the PMN. We want your help to get the latest information on plant metabolism into our resources.

PMN ASPB Meeting Workshop

- August 7
- 7:00 PM - 8:30 PM
- Auditorium 1

Please e-mail us at cunliffe@plantion.org to let us know if you can stay after the workshop to directly submit your latest information on plant compounds, enzymes, or pathways to the PMN.

You can also learn more about all the PMN resources at our poster:

[P02029 The Plant Metabolic Network: PlantCyc, ArabCyc, and more metabolic pathway databases for plant research](#)

[Additional excursions...](#)

Item of the Month

Recent Community Contributions

We are grateful to the scientists who submit their data directly to us and to those who answer the questions we send them, including the following contributors from the past few months:

- Dorothy A. Barbers
- Bradley Carlson
- Jihy Seo
- Woon Taek Kim
- Gregg Howe

Com

Tools	Downloads	Useful Sites	Submit Data	Help	Feedback
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Data Submission

Please help us expand the content of the PDB databases, including AraCyc and PlantCyc!

- We welcome any and all new data submissions related to plant biochemical pathways.
- You can also correct an existing pathway
 - Not sure what types of information to include?
Try using one of our [data submission / correction forms](#) below.
- Or, just use our [Feedback Form](#) or send an e-mail to curator@plantcyc.org and append your data as an attachment

Data submission / correction forms

**** You do not need to fill in all the columns. (See our [tutorial](#) for help)

We will be happy to accept whatever information you can easily provide . . .

[Compound form](#)
[Enzyme / Reaction form](#)
[Pathway form](#)

Please fill-in any information you would like to share on the appropriate forms above and send it as an attachment using our [Feedback Form](#) or send it as an e-mail attachment to: curator@plantcyc.org

We also welcome . . .

- diagrams and images (.gif, .jpg, .pdf, .ppt, .pod, etc.)

Submitting compound data

[illegible]

Submitting compound data

Microsoft Excel - compound_form.xls

File Edit Insert Format Tools Data Window Help

100%

MQ2 Anything else you'd like to share

	A	B	C	
1	Please SAVE this form and send as an ATTACHMENT to: excels@pubchem.org	COMPOUND SUBMISSION / CORRECTION		
2	Compound name <i>example</i>	Submission or Correction? <i>example</i>	Alternative compound names / synonyms / abbreviations	Organism(s)
3	Example: bromazepam	submission (new compound)	7-hydroxy-4-methoxyisoflaxone; 4-O-methylclonazepam	Tribolium pratense (Book title), Medicago truncatula (PMD, 10000000), Medicago sativa
4	Please begin entering your data below			
5				
6				
7				
8				

Other instructions:
Please separate multiple compounds with a semi-colon

Submitting compound data

E		F	G	H	I
Thank you for sharing your knowledge with us!					
IDs in other databases	Compound classification(s)	References / Links to supporting evidence		Comments / Summary	
PubChem: C05280376, KEGG: C00088, CAS: 485-72-3, ChEMBL: 18080	caffeine	PMID: 183705852, PMID: 18353084, Cayen et al. Biochem Biophys Acta 1965 Dec 16;111(2):349-57 (first report of structure)		Any comments you want to add. NOT REQUIRED	

Submitting compound data

Compound Location and Structure =>			
Subcellular Localization	Tissue/Organ Localization	SMILES	Anything else you'd like to share . . .
		<chem>C2(=C(C1(C=CC(=CC=1)OC))C(=O)C3(=C(O2)C=C(O)C=C3))</chem>	

- Please, please, please send a visual representation
 - .mol, png, pdf, ppt, etc.

Submitting enzyme data

Please SAVE this form, and send as an ATTACHMENT to: curator@ebi.ac.uk			
ENZYME and REACTION SUBMISSION / CORRECTION FORM			
Enzyme name <small>(required)</small>	Submission or Correction? <small>(required)</small>	Synonym(s)	Organism (only if) <small>(required)</small>
Example triose-phosphate isomerase	submission (new enzyme)	glyceraldehyde-3-phosphate isomerase; DHAP isomerase	Arabidopsis thaliana
Example: oleoyl-ACP desaturase	submission (new enzyme)		Persea americana
Please begin entering your data below			

Submitting enzyme data

[illegible]

Submitting enzyme data

[illegible]

Submitting enzyme data

[illegible]

Submitting enzyme data

If you don't have an identifier in column H		
Protein sequence	Coding sequence (no introns) (starting with ATG)	Anything else you'd like to share . . .
	AAAAAAAAAAAAAAAAAAAAAAAAAAAA	

Submitting pathway data

Please <u>SAVE</u> this form and send as an <u>ATTACHMENT</u> to: curator@plantcyc.org		PATHWAY SUBMISSION / CORRECTION FORM		Thank you for sharing your knowledge with us!		
Pathway name <i>(required)</i>	Submission or Correction? <i>(required)</i>	Pathway synonym(s)	Organism(s) where the pathway exists <i>(required)</i>	Reaction <i>(required)</i>	Enzyme(s) (*Please add more detailed information using an enzyme/ reaction submission form)	Reference(s) / Link(s) to supporting evidence <i>(required)</i>
Example: isoliquiritigenin biosynthesis	submission (new enzyme)	424: trihydroxychalcone biosynthesis	Arabidopsis thaliana, medicago sativa, sesbania rostrata	cseenzyme A + 4-coumarate + ATP = 4-coumaryl-CoA + PPi + AMP	4CL1, 4CL2, 4CL3, 4CL5 - Arabidopsis thaliana (Phytochemistry 66(17):2072-91, 2005)	PMID: 14769935
Example: isoliquiritigenin biosynthesis	submission (new enzyme)	same as row 4	same as row 4	4-coumaryl-CoA + 3 malonyl-CoA + NADPH = isoliquiritigenin + 4 coA + 3CO2 + NADP(+) + H2O	CHR7 (chalcone reductase Medicago sativa - PMID), SrCHR1 (Sesbania rostrata)	Medicago sativa (Ballance, 1995, Plant Physiol 107(3):1027-8); srCHR1: (PMID 10467030)
Please begin entering your data below:						

- Each row represents ONE STEP in a pathway

Submitting pathway data

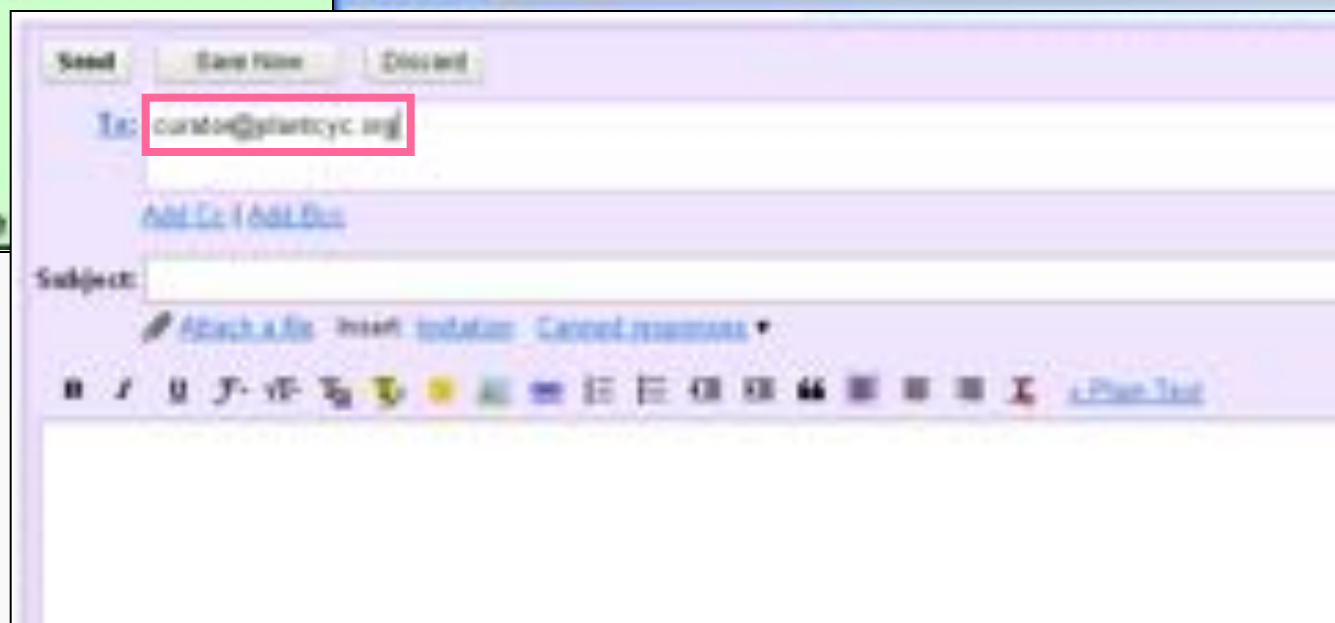
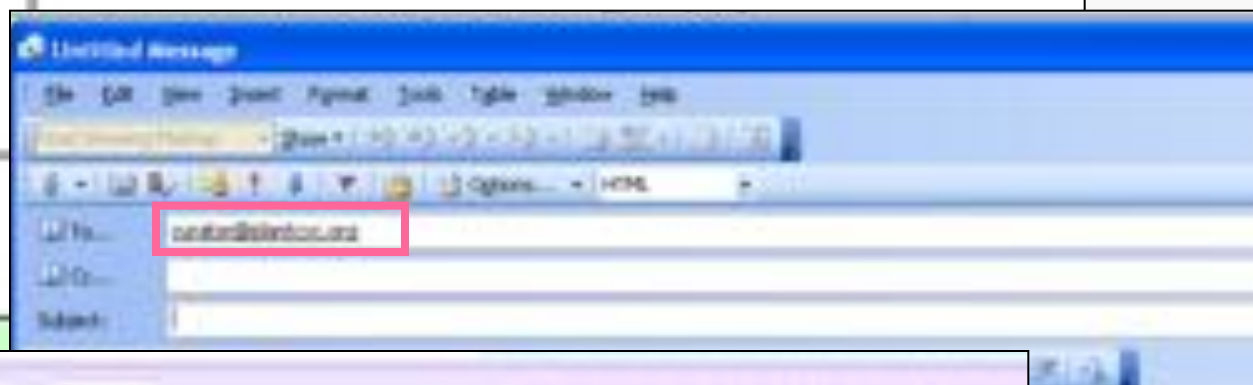
Subcellular Localization for pathway	Tissue/Organ Localization for pathway	Comments / Summary	Anything else you'd like to share . . .
cytosol and ER (PMID: 3321063)	?	Flavonoids are secondary metabolites formed from	
same as row 4	same as row 4	same as row 4	

Submitting the forms

Please SAVE this form
and send as an
ATTACHMENT to:
curator@plantcyc.org

Compound name
(required)

Example



Submitting th



PMN Feedback Form

To send a message to a helpful PMN curator, please fill in your name and e-mail address, then select a category and add a subject to your message before you submit it. We're also happy to receive attachments of pathway images, compound structures, PDFs of good papers, and more...

Name:

E-mail: *required

Category:

Subject:

Referencing URL:

Please enter your message here:

Attach a file:

Send a copy to myself ☒

Would you like to send us more information about a pathway, an enzyme, or specific compounds?

Please use one of our [data submission forms](#) and attach it using this form... or send an e-mail with your attachments to curator@plantcyc.org

Building better databases together

■ Details are very, very welcome!!



□ Compounds

- Structures – drawing / compound file (**.mol file**, preferred)
- Synonyms
- Unique IDs (e.g. ChEBI, CAS, KEGG)

□ Enzymes

- Unique IDs (e.g. At2g46480, UniProt, Genbank)
- Specific reactions catalyzed
 - All co-factors, co-substrates, etc.
 - EC suggestions – partial or full

□ Pathways

- Basic info for each step – but submit MORE details using
 - Compound Form
 - Enzyme Form
- References for each organism associated with the pathway

Plant metabolic NETWORKING

- Please use our data
- Please use our tools
- **Please help us to improve our databases!**
- Please contact us if we can be of any help!

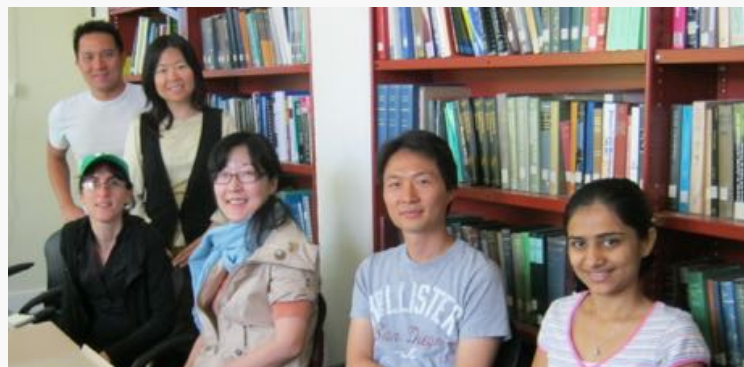


curator@plantcyc.org

www.plantcyc.org

Plant metabolic NETWORKING

- ❑ Please use our data
- ❑ Please use our tools
- ❑ Please help us to improve our databases!
- ❑ Please contact us if we can be of any help!



curator@plantcyc.org

www.plantcyc.org



Booth 415:
Plant Resources Outreach
Tuesday, 10:10 – 10:25 AM
Wednesday, 1:00 – 1:30 PM

Poster **P02029** :
Monday: 5:30 – 7:30 PM

Building better databases together
