Electronic Collaborations and the Great Plains Network

Gordon K Springer, U. Missouri

Daniel Berleant, U. A. at Little Rock

MCBIOS 2008

Oklahoma City, OK

February 24, 2008

Outline

- GPN Brief History, Mission & Goals
- Middleware Collaboration Activities
- Current Activities
- Future…

Consortium Cooperation

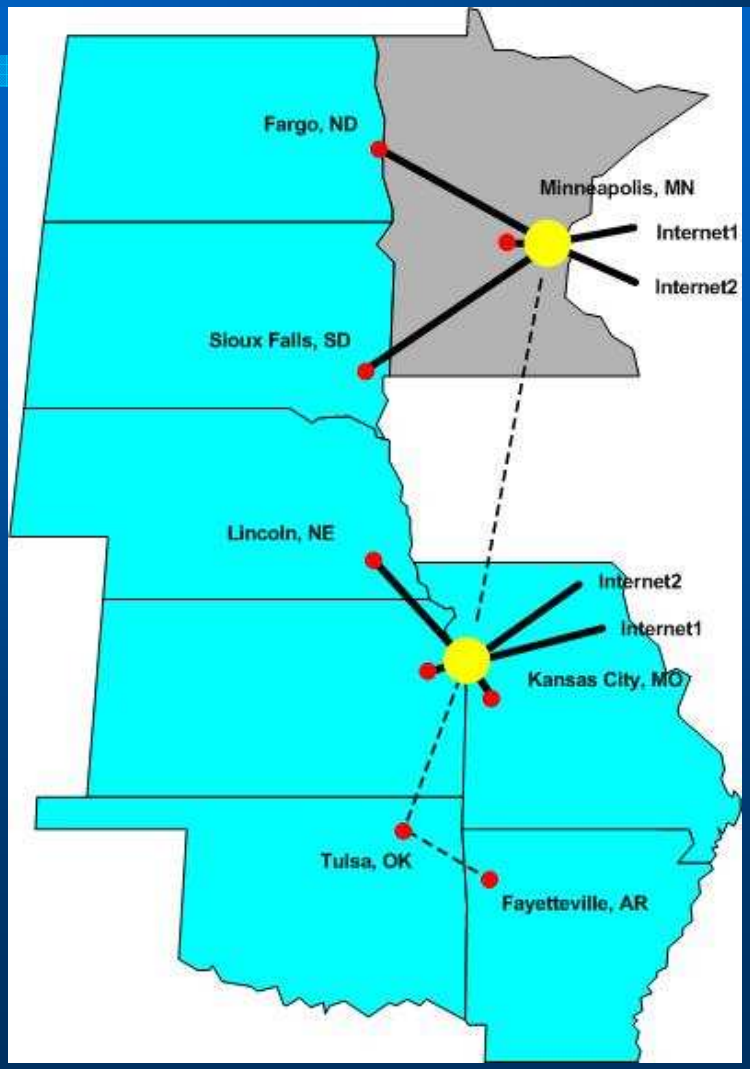
BITNET

MIDnet

Great Plains Network

courtesy of Jerry Niebaum

The GPN Network



GPN Today

Membership

- Arkansas State University
- Kansas State University
- North Dakota State University
- Oklahoma State University
- South Dakota School of Mines & Technology
- South Dakota State University
- University of Arkansas
- University of Arkansas at Little Rock
- University of Arkansas for Medical Sciences
- University of Kansas
- University of Missouri - Columbia
- University of Missouri - KC
- Missouri University of Science & Technology (formerly UMR)
- University of Missouri - SL
- University of Nebraska - Lincoln
- University of North Dakota
- University of Oklahoma
- University of Oklahoma Health Sciences Center
- University of South Dakota
- University of Tulsa
- Wichita State University
- **Iowa State University**
- **University of Minnesota**
- **Ciena, Fujitsu, Adva**

Great Plains Network is

- A consortium
- A community of researchers and educators connected by a high-speed network
- 14% of the United States
- 25% of NSF EPSCoR States
- About 10% of Internet2 Member Institutions

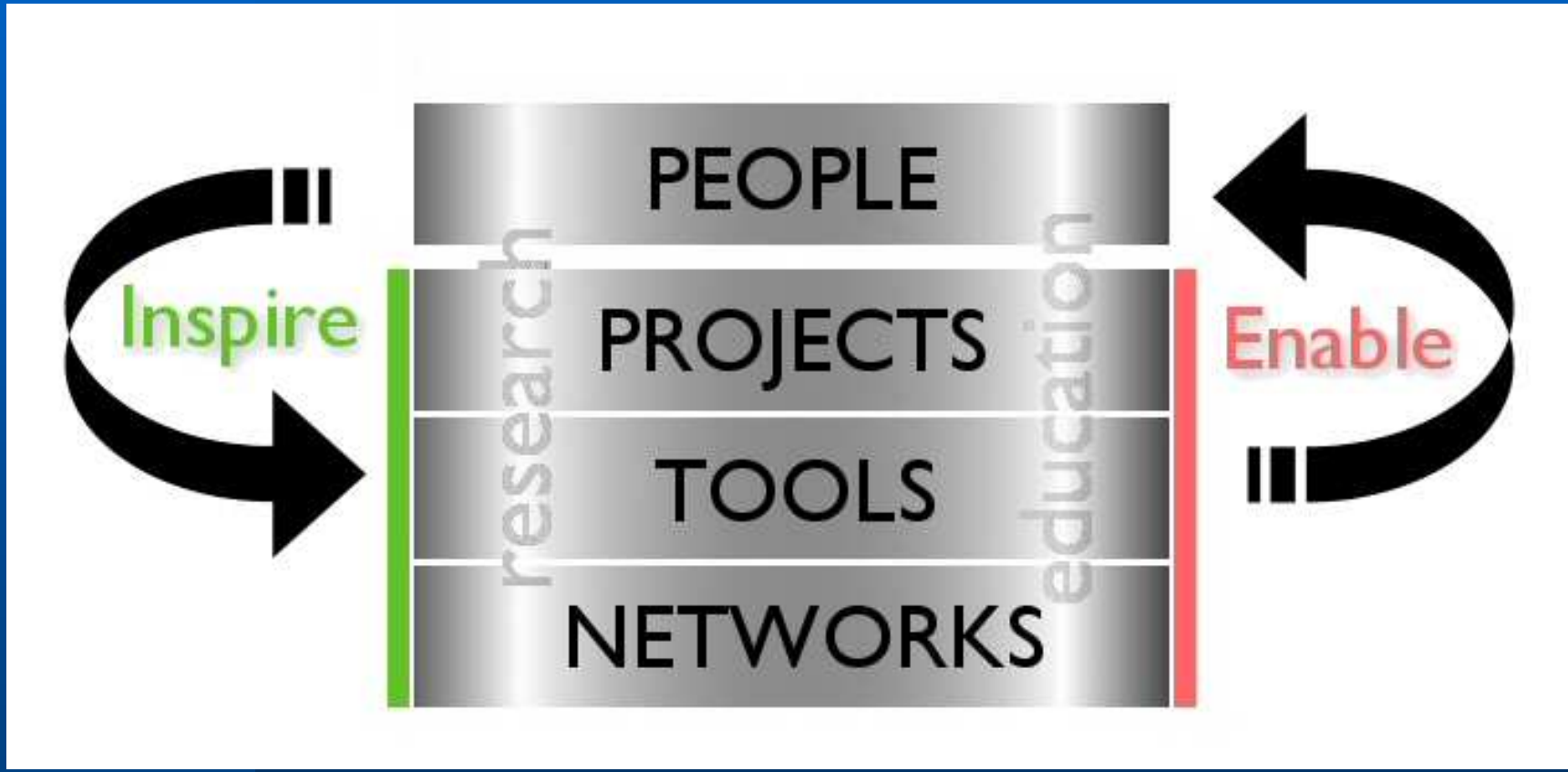
Mission

Enhance competitiveness and economic benefit by providing leadership in advanced high performance applications and network technologies to enable the Great Plains region to lead in innovative learning/educational environments and collaborative research.

Leadership Goals for 2008

- **Broaden participation in GPN research initiatives**
- **Increase SHARED access to GPN member resources: Computing, Data storage, Other;**
- **Provide useful, consistent communication to members and interested parties through various mediums & activities**
- **Provide support on emerging technologies.**

GPN Collaborative Framework



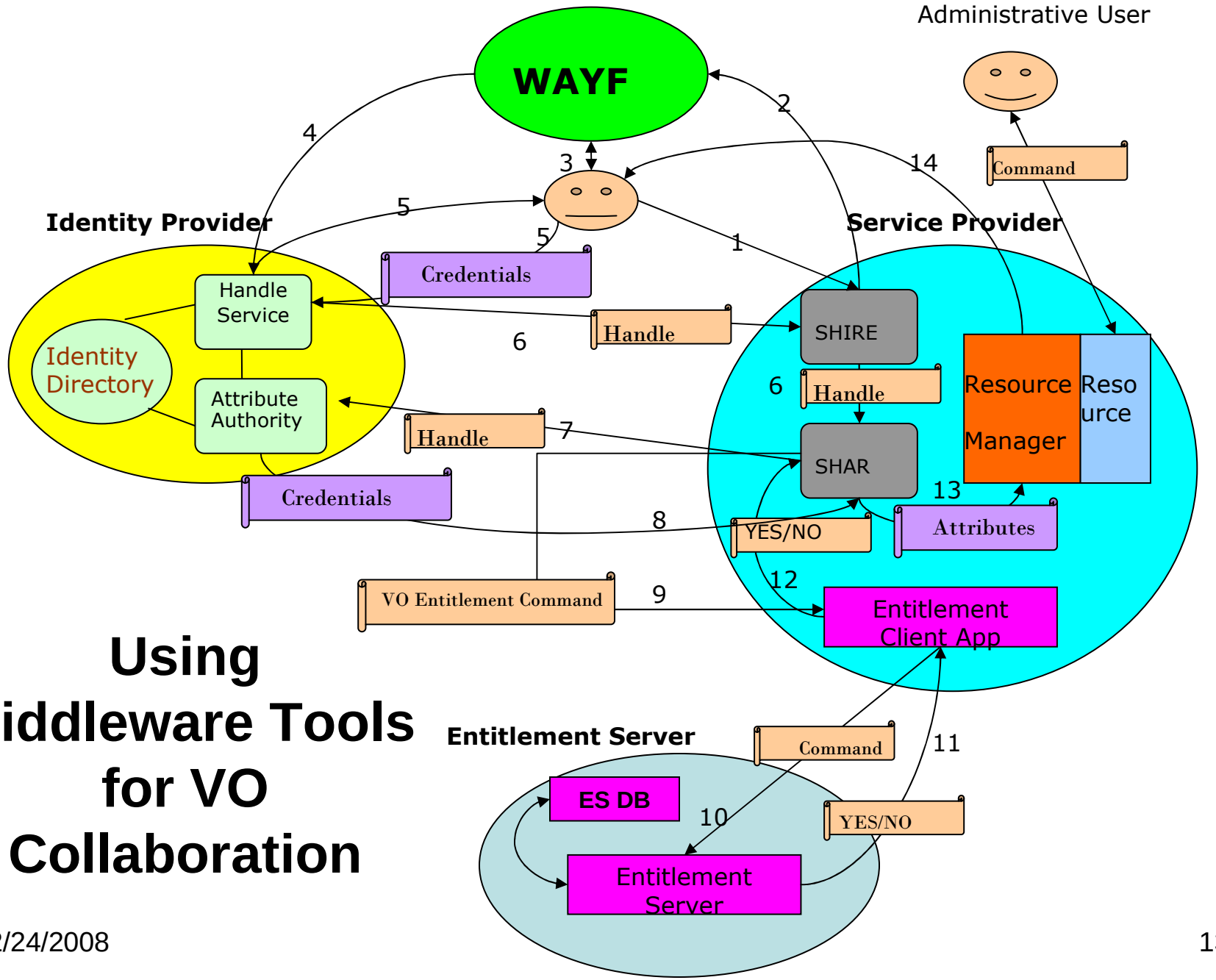
Middleware Collaboration Activities

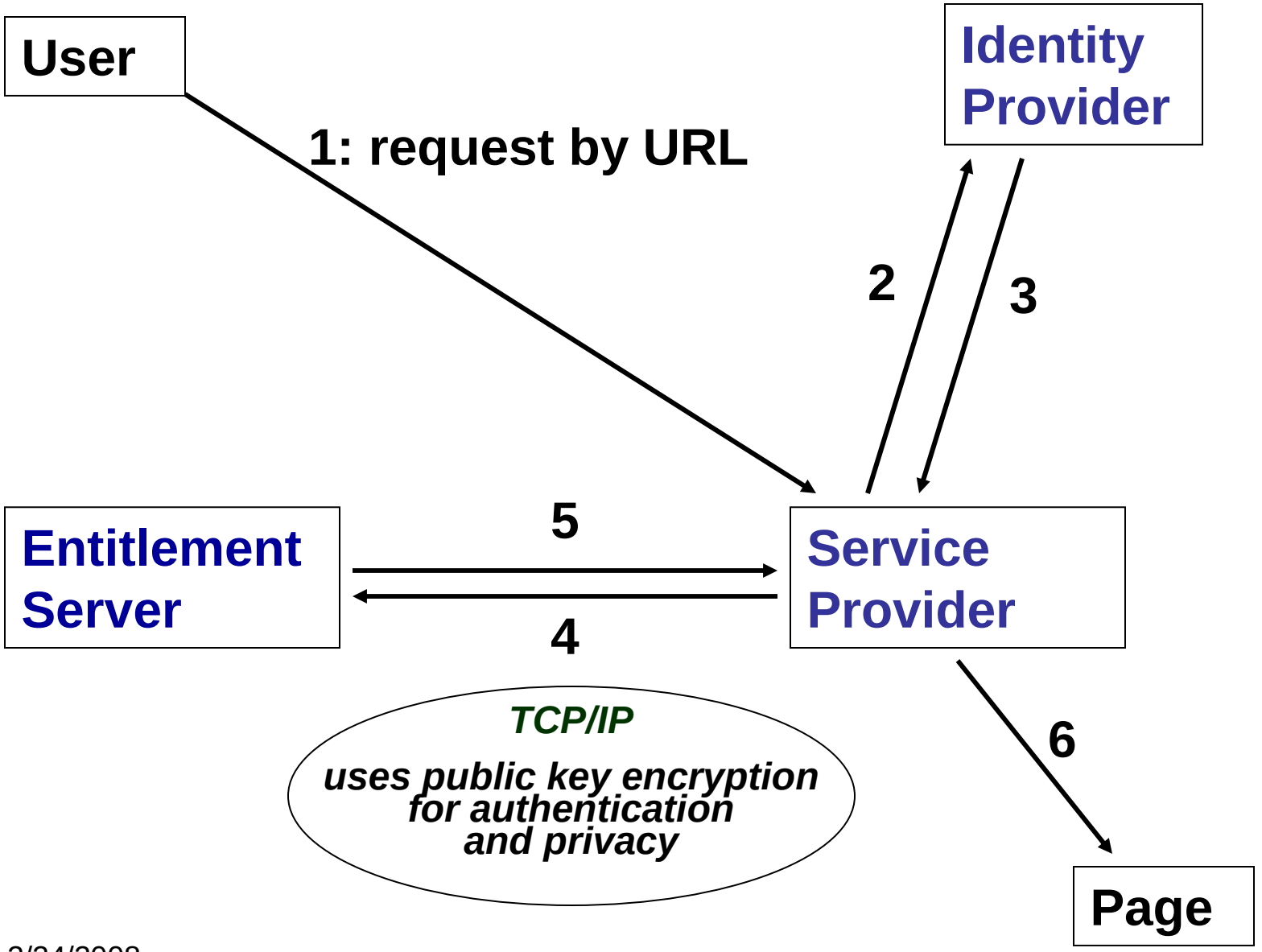
- **2004-06 – Extending the Reach – Educause/NSF NMI-EDIT (authentication across the region)**
- **2005-2008 – Grid Computing – Globus, OSG, etc.**
- **2008-… - Collaboration & resource sharing in Virtual Organizations (e.g., GPNGrid, BioSci)**

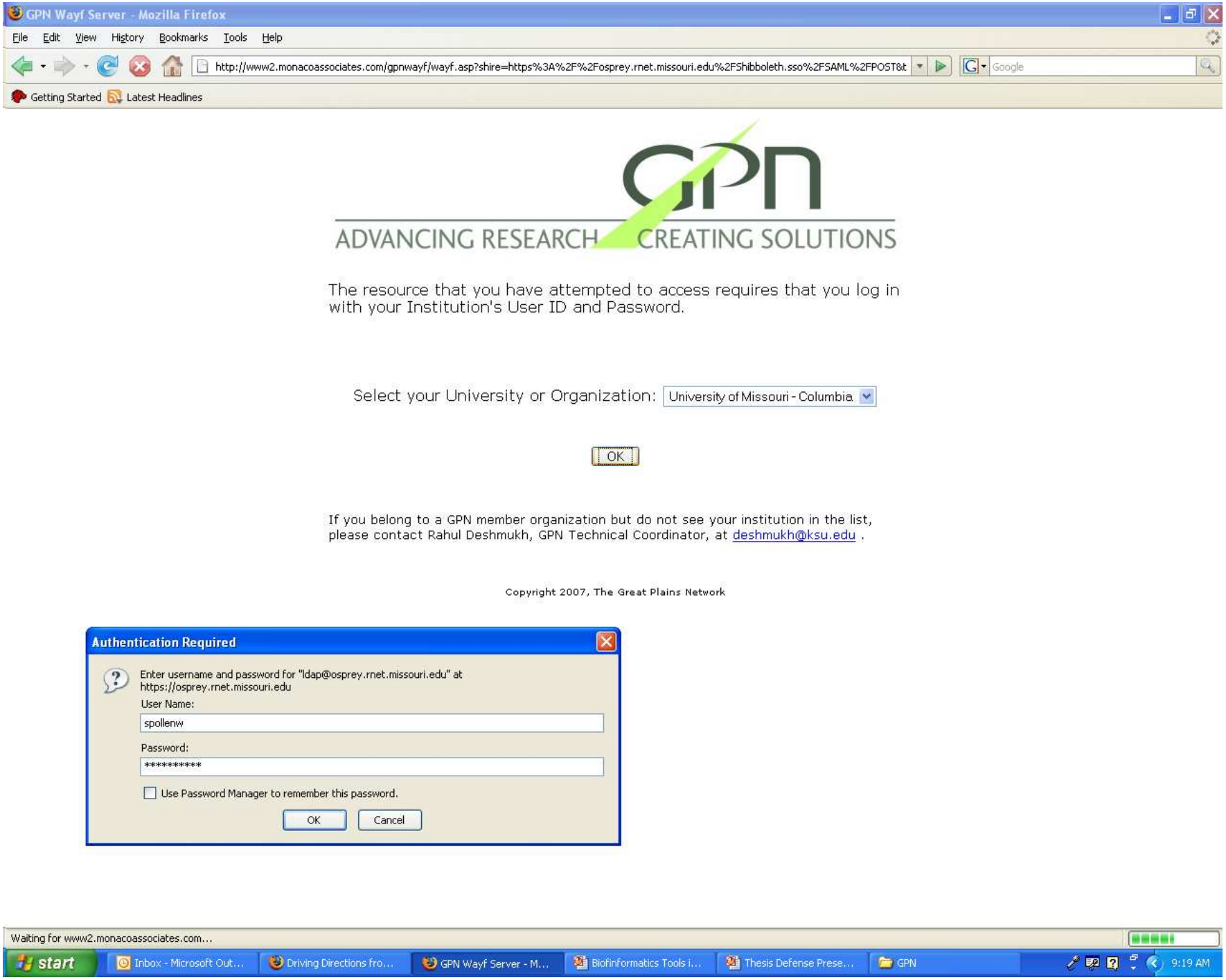
GPN Projects

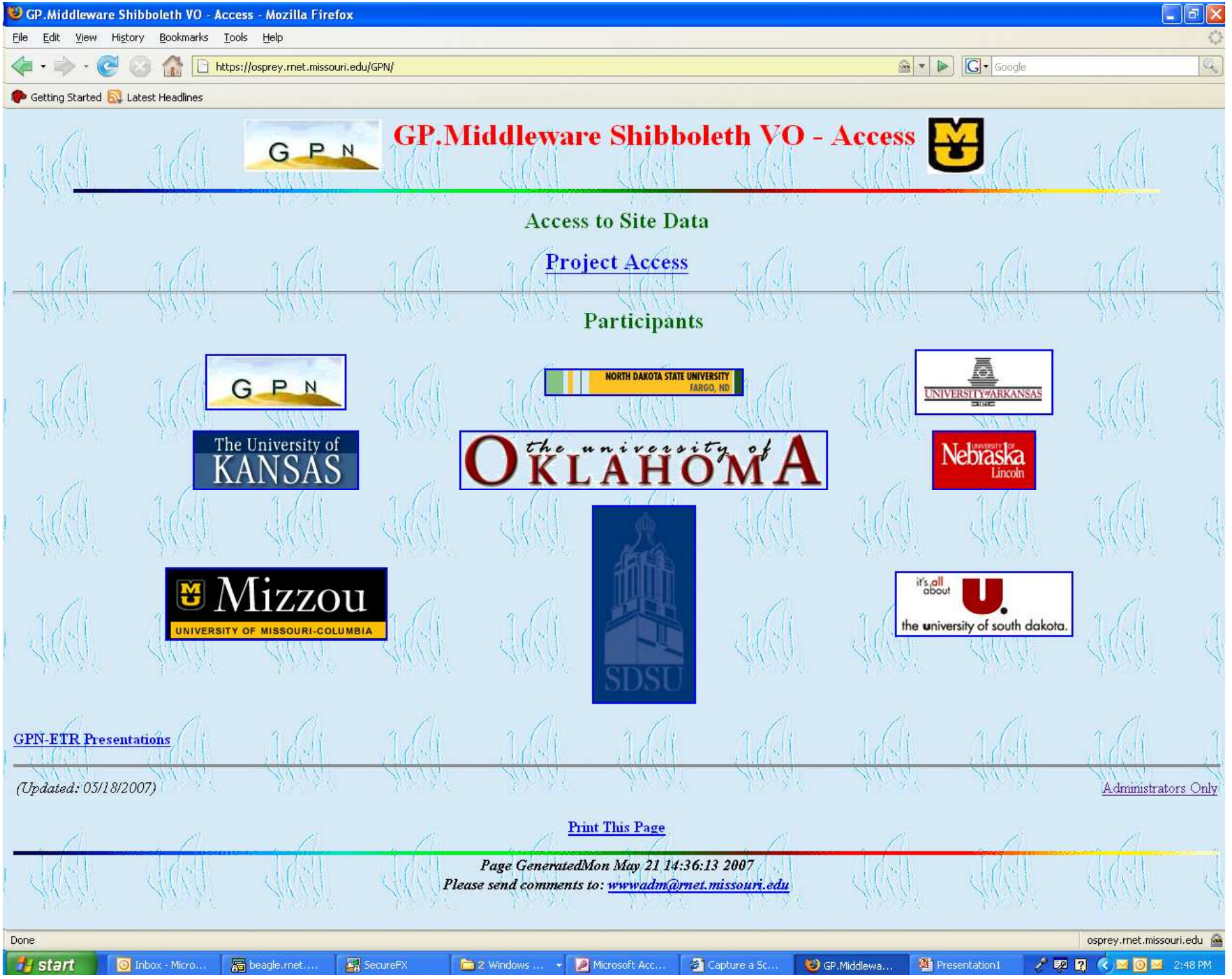
- **Bioinformatics**
  - **Gordon Springer & Dan Berleant**
- **Collaborative Middleware Environment**
  - **Amy Apon**
- **GPNgrid**
  - **David Swanson**
- **Human Language Technology**
  - **Bill Hsu**

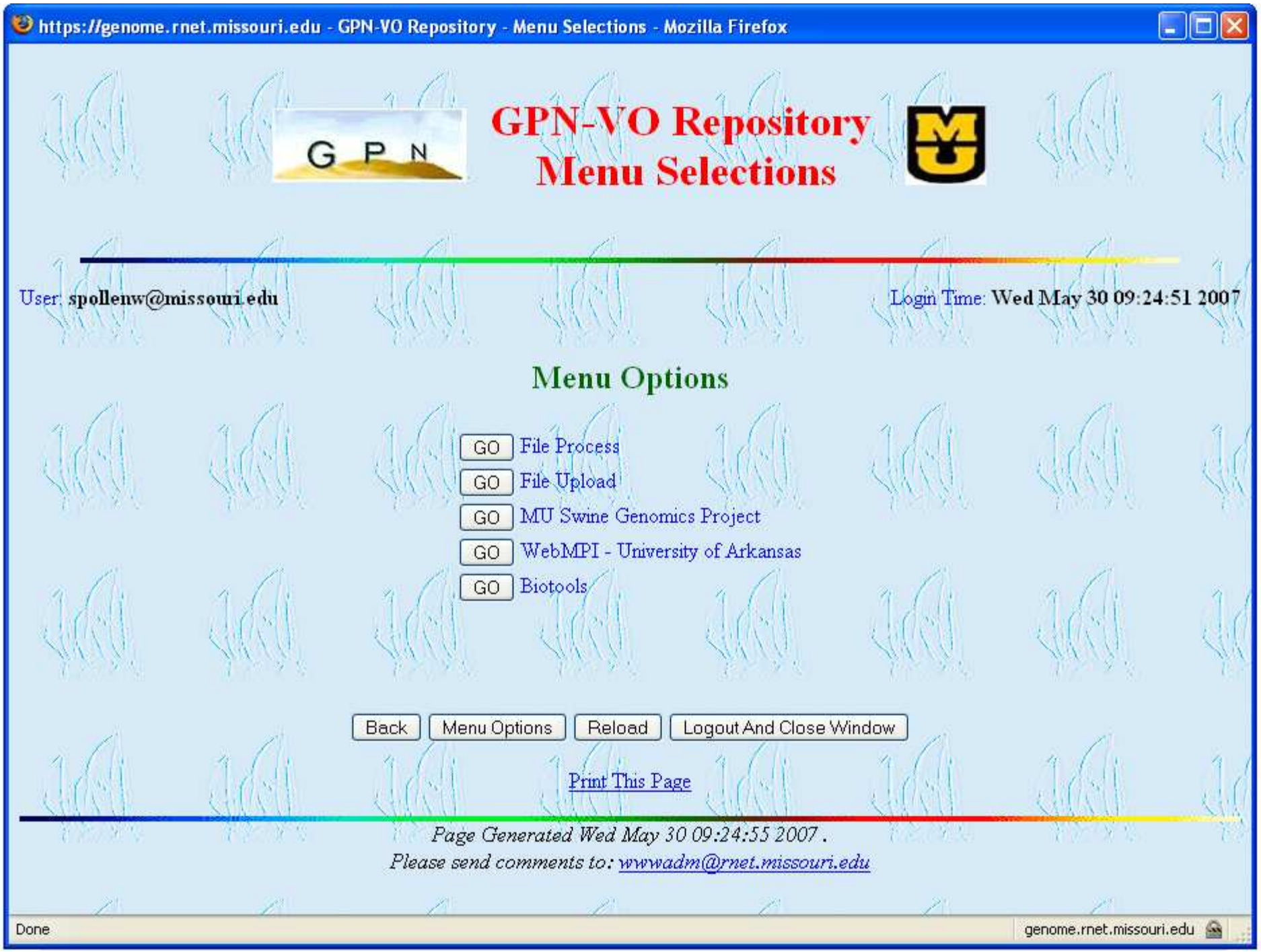
Using Middleware Tools for VO Collaboration



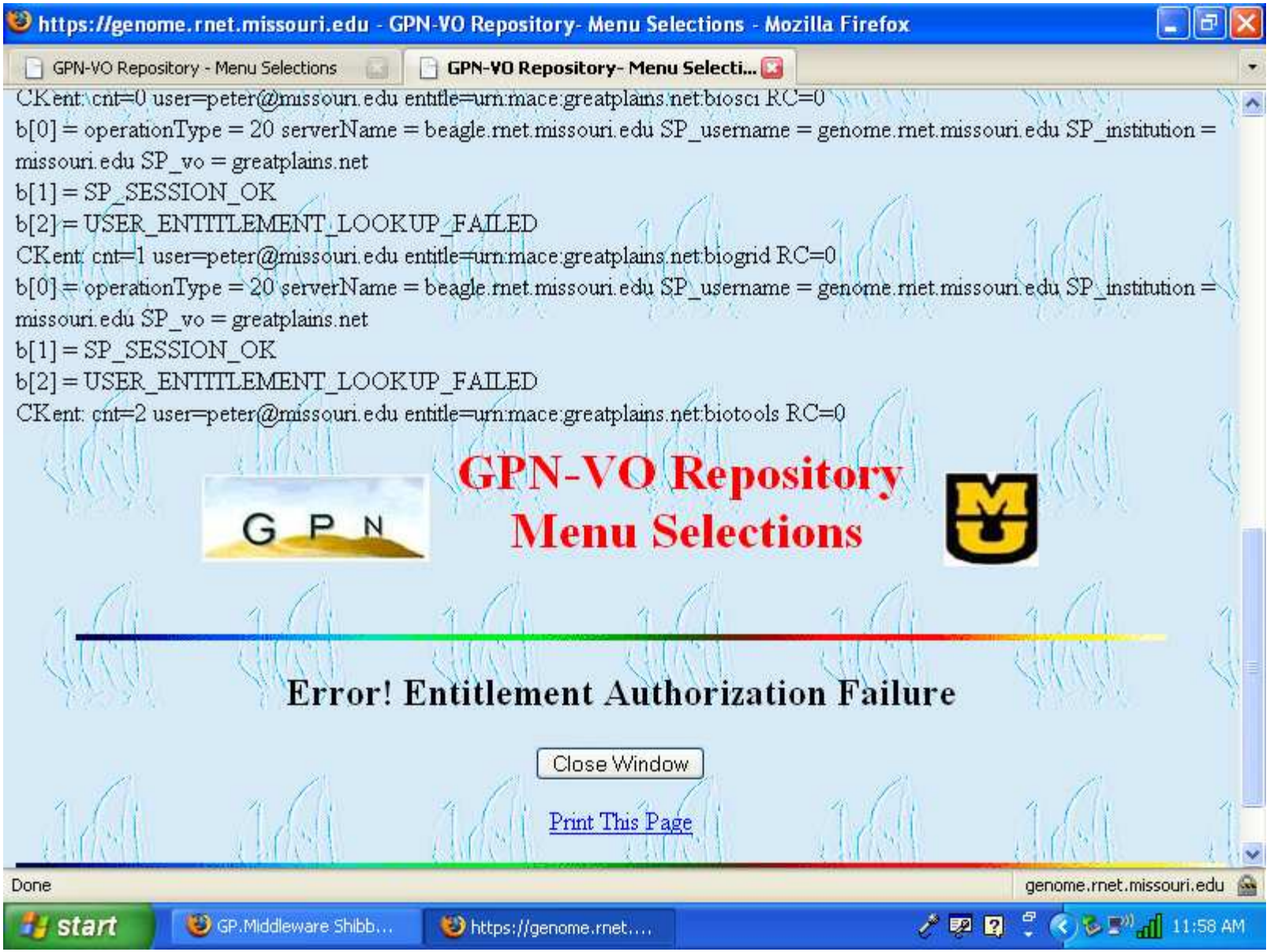

User
Identity Provider
1: request by URL
2
3
Entitlement Server
5
4
Service Provider
TCP/IP
uses public key encryption for authentication and privacy
6
Page


GPN Wayf Server - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www2.monacoassociates.com/gpnwayf/wayf.asp?shire=https%3A%2F%2Fosprey.rnet.missouri.edu%2FShibboleth.sso%2FSAML%2FPOST&t
Google
Getting Started
Latest Headlines
GPN
ADVANCING RESEARCH CREATING SOLUTIONS
The resource that you have attempted to access requires that you log in with your Institution's User ID and Password.
Select your University or Organization:
University of Missouri - Columbia
OK
If you belong to a GPN member organization but do not see your institution in the list, please contact Rahul Deshmukh, GPN Technical Coordinator, at deshmukh@ksu.edu .
Copyright 2007, The Great Plains Network
Authentication Required
Enter username and password for "ldap@osprey.rnet.missouri.edu" at https://osprey.rnet.missouri.edu
User Name:
spollenw
Password:
****
Use Password Manager to remember this password.
OK
Cancel
Waiting for www2.monacoassociates.com...
start
Inbox - Microsoft Out...
Driving Directions fro...
GPN Wayf Server - M...
Biofinformatics Tools i...
Thesis Defense Prese...
GPN
9:19 AM


GP.Middleware Shibboleth VO - Access - Mozilla Firefox
File Edit View History Bookmarks Tools Help
https://osprey.rnet.missouri.edu/GPN/
Getting Started Latest Headlines
GP.Middleware Shibboleth VO - Access
Access to Site Data
Project Access
Participants
NORTH DAKOTA STATE UNIVERSITY FARGO, ND
UNIVERSITY of ARKANSAS
The University of KANSAS
the university of OKLAHOMA
Nebraska Lincoln
Mizzou
UNIVERSITY OF MISSOURI-COLUMBIA
SDSU
it's all about U
the university of south dakota.
GPN-ETR Presentations
(Updated: 05/18/2007)
Administrators Only
Print This Page
Page GeneratedMon May 21 14:36:13 2007
Please send comments to: wwwadm@rnet.missouri.edu
Done
osprey.rnet.missouri.edu
start
Inbox - Micro...
beagle.rnet....
SecureFX
2 Windows ...
Microsoft Acc...
Capture a Sc...
GP.Middlewa...
Presentation1
2:48 PM


https://genome.rnet.missouri.edu - GPN-VO Repository - Menu Selections - Mozilla Firefox
GPN-VO Repository
Menu Selections
User: spollenw@missouri.edu
Login Time: Wed May 30 09:24:51 2007
Menu Options
GO File Process
GO File Upload
GO MU Swine Genomics Project
GO WebMPI - University of Arkansas
GO Biotools
Back
Menu Options
Reload
Logout And Close Window
Print This Page
Page Generated Wed May 30 09:24:55 2007 .
Please send comments to: wwwadm@rnet.missouri.edu
Done
genome.rnet.missouri.edu

When Peter asks for Biotools he is refused:



https://genome.rnet.missouri.edu - GPN-VO BioSci- Bioinformatics Tools - Mozilla Firefox
GPN-VO Repository - Menu Selections
GPN-VO BioSci- Bioinformatics To...
GPN
GPN-VO BioSci
Bioinformatics Tools
User: spollenw@missouri.edu
Login Time: Wed May 30 9:29:21 2007
Please select one of the following analysis tools:
WWWBlast
Run the Web Version of the Blast Tool
mpiBlast - Raptor
Run the MPI Version of the Blast Tool on Raptor
Run-time help
mpiBlast - Lewis
Run the MPI Version of the Blast Tool on Lewis
Run-time help
ClustalW
Run the ClustalW Utility
Run-time help
DeCypher
Run the DeCypher Bioinformatics Engine (UMC Only)
UALR Resources
Access Resources at UALR (UArk, Little Rock)
Close Window
Print This Page
Page GeneratedWed May 30 9:29:21 2007
Please send comments to: wwwadm@rnet.missouri.edu
Done
genome.rnet.missouri.edu

What's Next?

- **What needs do you have that could be aided by this collaborative environment?**
- **An open invitation to all MCBIOS members**
  - **Bring your ideas**
  - **Join the discussion**
  - **Let us link to your tools**

Why Mine Biological Texts?

- Objective:
  - Harvest the biomedical "literaturome"
  - This adds value to existing knowledge
- Impact:
  - Enhanced ability of existing knowledge
    … including ***your*** work! …
    to contribute to scientific progress
- Let's look at some text mining tools now

Welcome to PathBinder!

Introduction

PathBinder is a collection of sentences extracted from MEDLINE. Every sentence contains 2 or more different biomolecules. A dictionary of 40,000 biomolecules (80,000 names) were used to scan against all MEDLINE abstracts. The sentences are organized in a 2-level indexed structure.

How to use PathBinder

1. Look up in the Synonym Index to find the main entries of the biomolecules of interest.
2. Start with the initial letter of the first biomolecule in index level 0.
3. Find the first biomolecule in index level 1. Click the link, and go to index level 2.
4. Find the second biomolecule in index level 2. Click the link. All sentences containing the two biomolecules will popup in a new window.

NOTE: we're interested in feedback. Please let us know what you found, or did not find. For more information, contact: jdberleant@ualr.edu or dingjing0105@gmail.com

PathBinder Index

level 0

0...9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Other

Words: 177 100%

Written by Jing Ding, Ph.D.

MedRep Index

level 1 (G)

G ANTIGEN
G PROTEIN PATHWAY SUPPRESSOR
G PROTEIN-COUPLED RECEPTOR APJ
G PROTEIN-COUPLED RECEPTOR EDG-1

. . .

GHILANTEN
GIANT HEMOGLOBIN
GIANT PROTEIN
GIARDIN
Gibberellin
GIBBON APE LEUKEMIA VIRUS RECEPTOR
GICERIN
GILATOXIN

. . .

MedRep Index

level 2 (Gibberellin -->)

1,3-beta-D-Glucan
1-Aminocyclopropane-1-carboxylate
1-AMINOCYCLOPROPANE-1-CARBOXYLATE OXIDASE
14.6 KDA PROTEIN

. . .

Protochlorophyllide reductase
Purine
Pyrimidine
Pyruvate kinase
Quinone

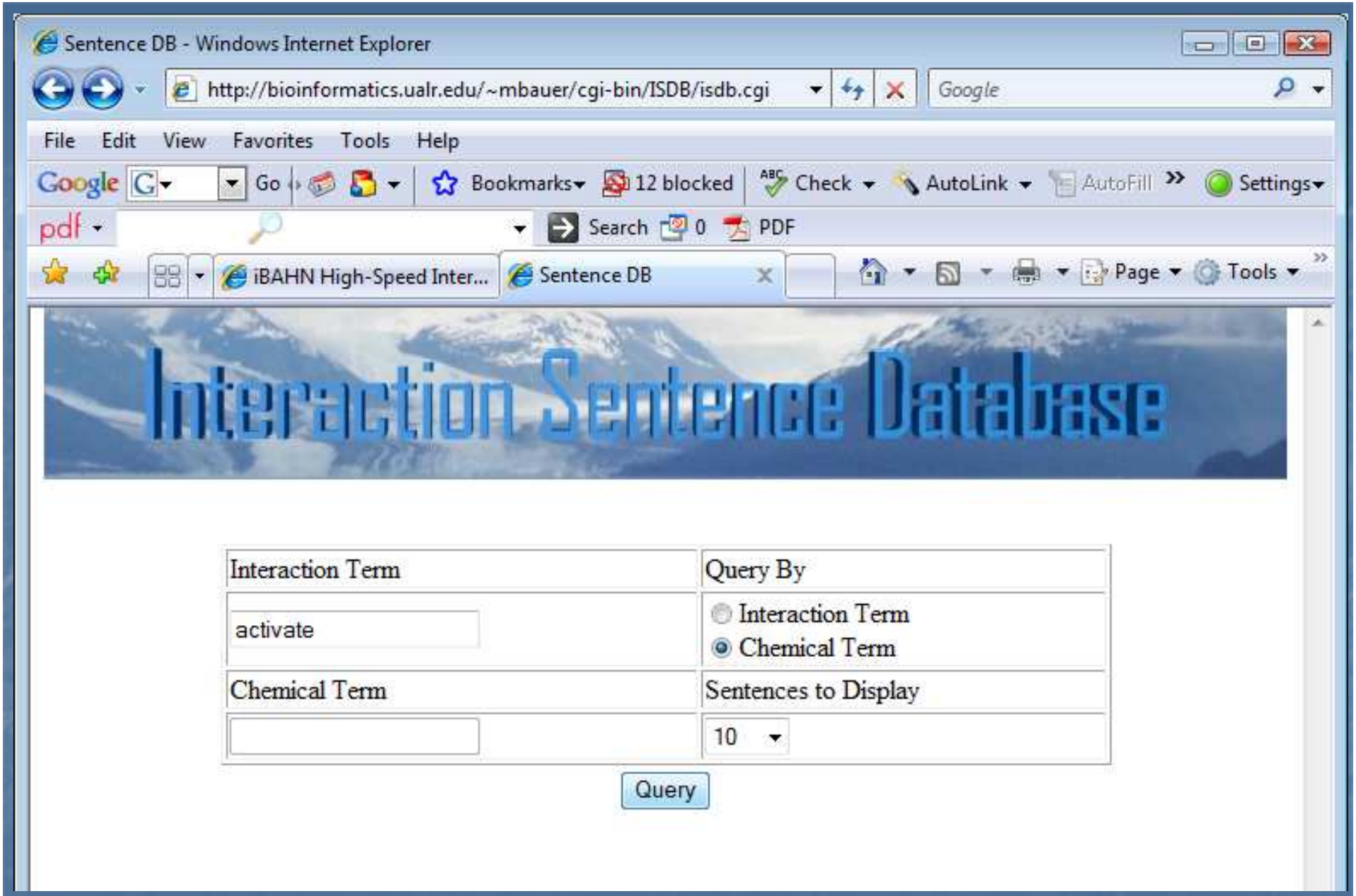
. . .

Medline Repository

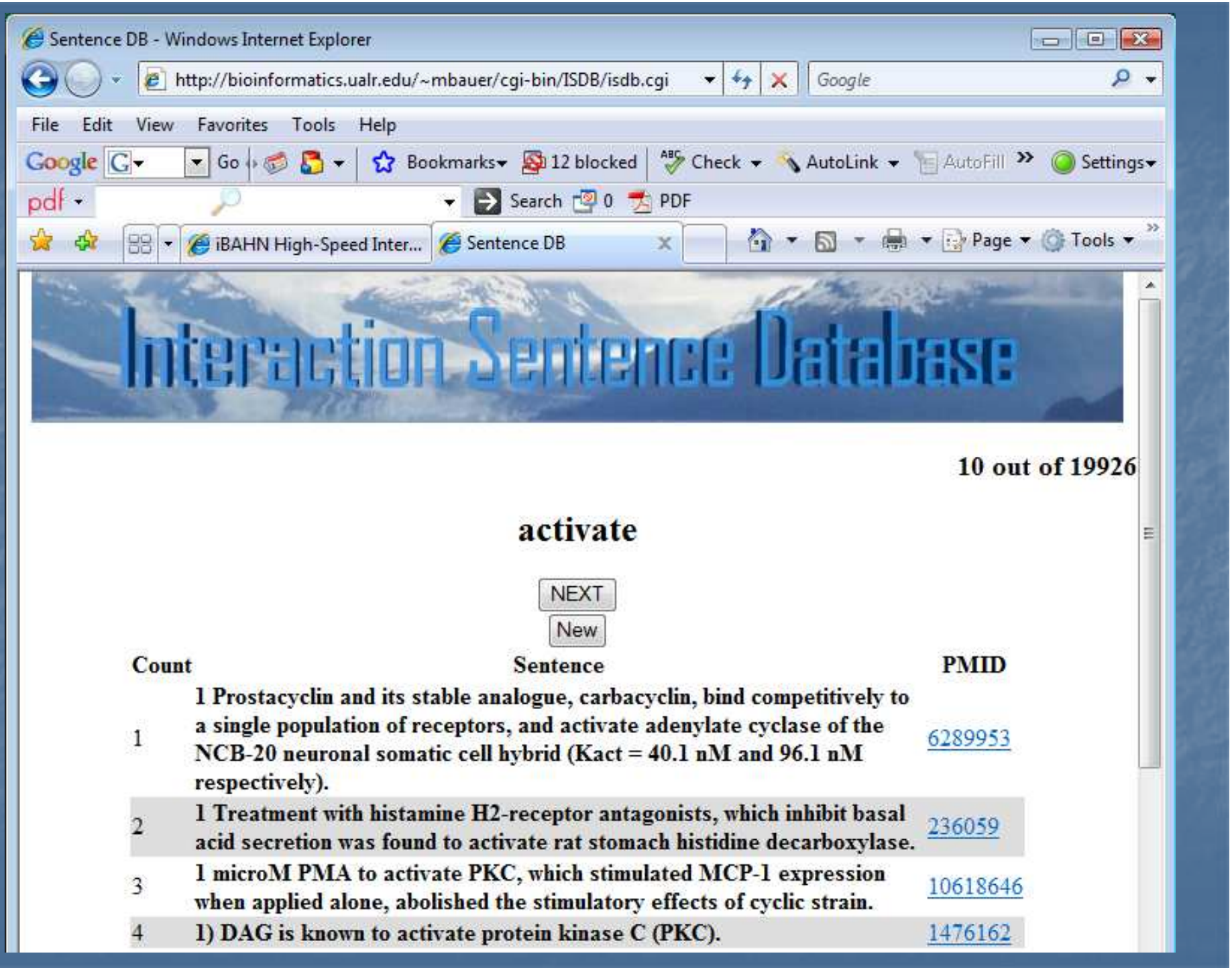
Gibberellin --> Pyrimidine

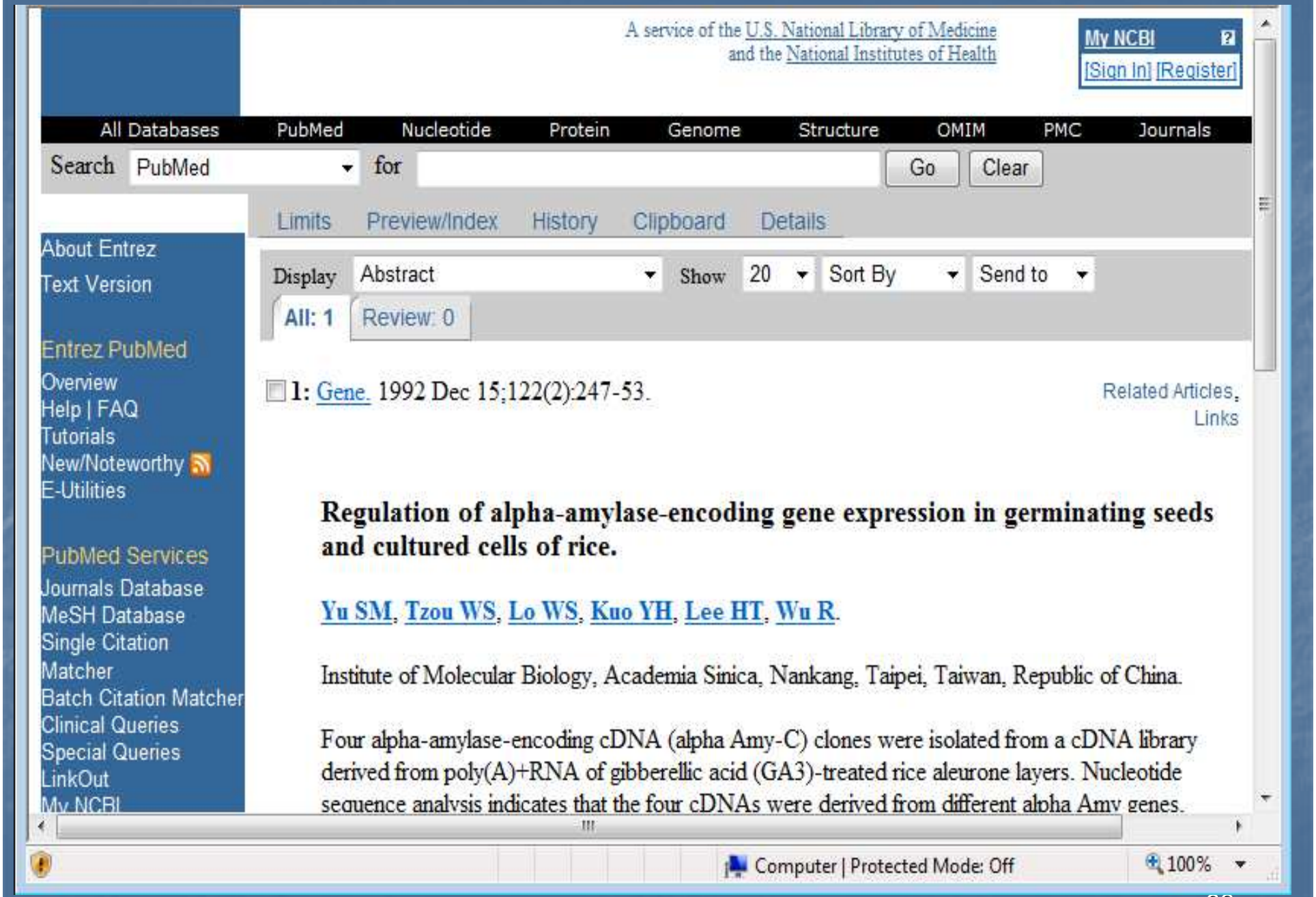
PMID	Sentence	Species
1339378	One fragment is located between nt -131 to -170 and contains two imperfect directly repeated pyrimidine elements and a putative GA3-response element.	unknown
1627776	The rice gene for carboxypeptidase contained some pyrimidine boxes (C/TCTTTTC/T), in the 5' flanking region, which are a characteristic of a GA-responsive gene.	unknown

. . .



Written by Michael Bauer


Sentence DB - Windows Internet Explorer
http://bioinformatics.ualr.edu/~mbauer/cgi-bin/ISDB/isdb.cgi
Google
File Edit View Favorites Tools Help
Bookmarks 12 blocked Check AutoLink AutoFill Settings
Search 0 PDF
iBAHN High-Speed Inter...
Sentence DB
Page Tools
Interaction Sentence Database
10 out of 19926
activate
NEXT
New
Count
Sentence
PMID
1 Prostacyclin and its stable analogue, carbacyclin, bind competitively to a single population of receptors, and activate adenylate cyclase of the NCB-20 neuronal somatic cell hybrid (Kact = 40.1 nM and 96.1 nM respectively).
6289953
2 1 Treatment with histamine H2-receptor antagonists, which inhibit basal acid secretion was found to activate rat stomach histidine decarboxylase.
236059
3 1 microM PMA to activate PKC, which stimulated MCP-1 expression when applied alone, abolished the stimulatory effects of cyclic strain.
10618646
4 1) DAG is known to activate protein kinase C (PKC).
1476162


A service of the U.S. National Library of Medicine
and the National Institutes of Health
My NCBI
[Sign In] [Register]
All Databases PubMed Nucleotide Protein Genome Structure OMIM PMC Journals
Search PubMed for Go Clear
Limits Preview/Index History Clipboard Details
About Entrez
Text Version
Entrez PubMed
Overview
Help | FAQ
Tutorials
New/Noteworthy
E-Utilities
PubMed Services
Journals Database
MeSH Database
Single Citation Matcher
Batch Citation Matcher
Clinical Queries
Special Queries
LinkOut
My NCBI
Display Abstract Show 20 Sort By Send to
All: 1 Review: 0
1: Gene. 1992 Dec 15;122(2):247-53.
Related Articles, Links
Regulation of alpha-amylase-encoding gene expression in germinating seeds and cultured cells of rice.
Yu SM, Tzou WS, Lo WS, Kuo YH, Lee HT, Wu R.
Institute of Molecular Biology, Academia Sinica, Nankang, Taipei, Taiwan, Republic of China.
Four alpha-amylase-encoding cDNA (alpha Amy-C) clones were isolated from a cDNA library derived from poly(A)+RNA of gibberellic acid (GA3)-treated rice aleurone layers. Nucleotide sequence analysis indicates that the four cDNAs were derived from different alpha Amy genes.
Computer | Protected Mode: Off
100%

MedKit: A Helper Toolkit for Automatic Mining MEDLINE/PubMed Citations

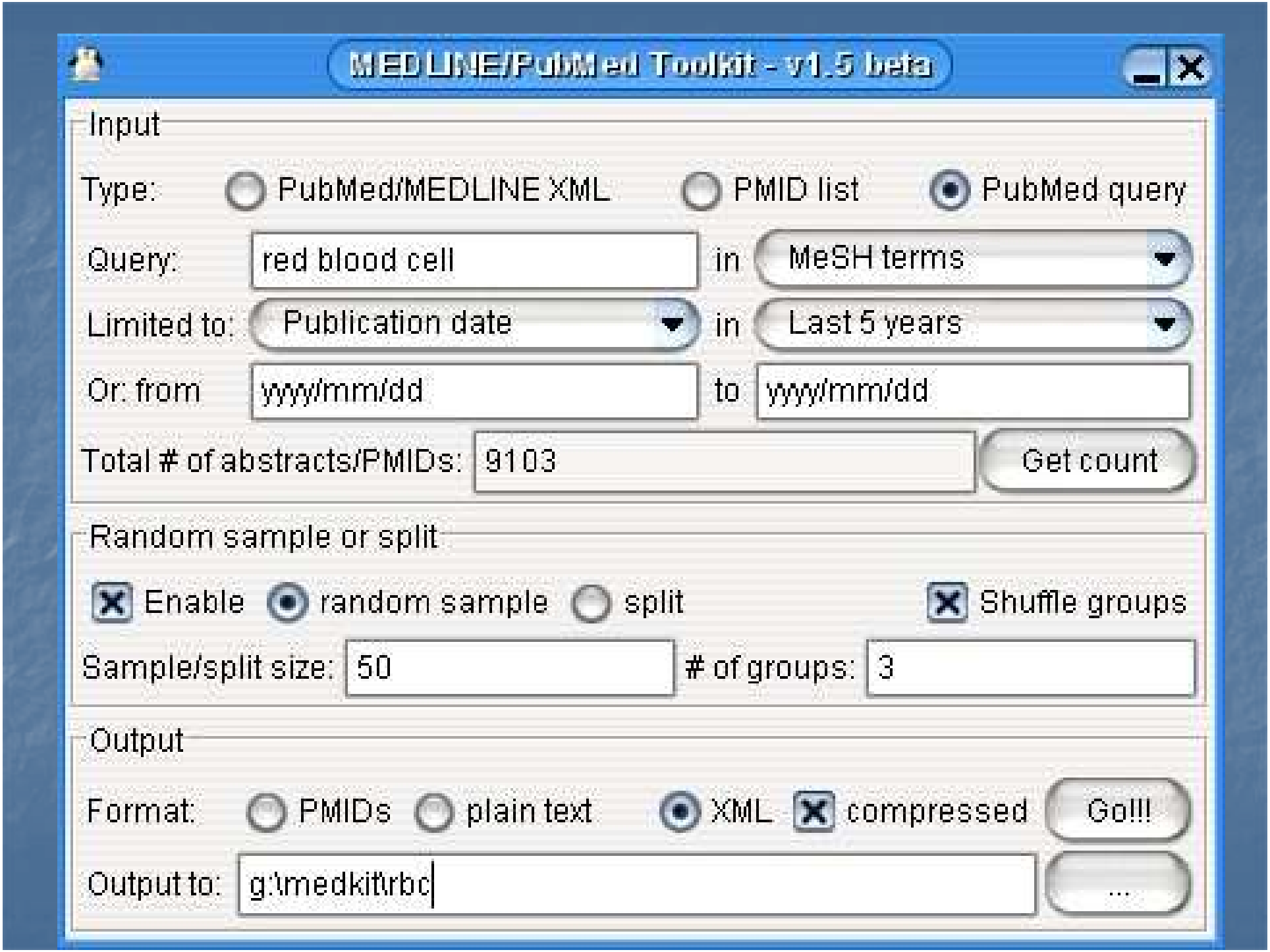
1. Overview
2. System requirement
3. Download
4. Third party libraries
5. User guide

1. Overview

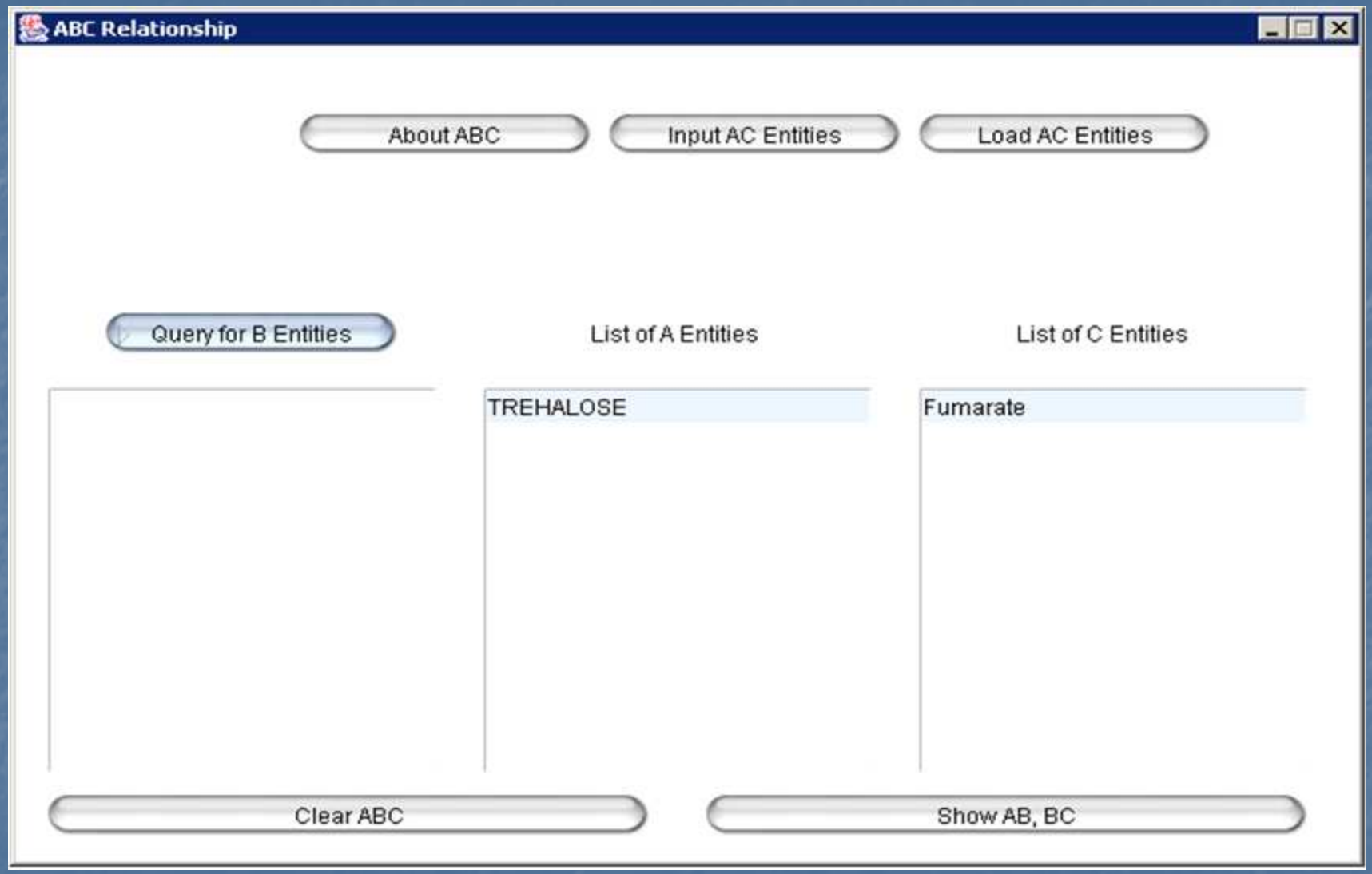
MEDLINE/PubMed is one of the most important information sources for bioinformatics text mining. However, there are some limitations in working with MEDLINE/PubMed citations. For example, PubMed imposes an upper limit of 10,000 for downloading PMID list or citations; and MEDLINE files are too large for most off-the-shelf XML parsers. We developed a Java package, MedKit, to work-around the limitations, as well as provide other useful functionalities, e.g. random sampling. Its four modules, querier, sampler, fetcher and parser, can work independently, or be pipelined in various combinations. It can be used as a stand-alone GUI application, or integrated into other text mining systems (for

Words: 568 100%

http://collaboration.greatplains.net/wiki/index.php/Portal:Bioinformatics


MEDLINE/PubMed Toolkit - v1.5 beta
Input
Type:
PubMed/MEDLINE XML
PMID list
PubMed query
Query:
red blood cell
in
MeSH terms
Limited to:
Publication date
in
Last 5 years
Or: from
yyyy/mm/dd
to
yyyy/mm/dd
Total # of abstracts/PMIDs:
9103
Get count
Random sample or split
Enable
random sample
split
Shuffle groups
Sample/split size:
50
# of groups:
3
Output
Format:
PMIDs
plain text
XML
compressed
Go!!!
Output to:
g:\medkit\rbc
...

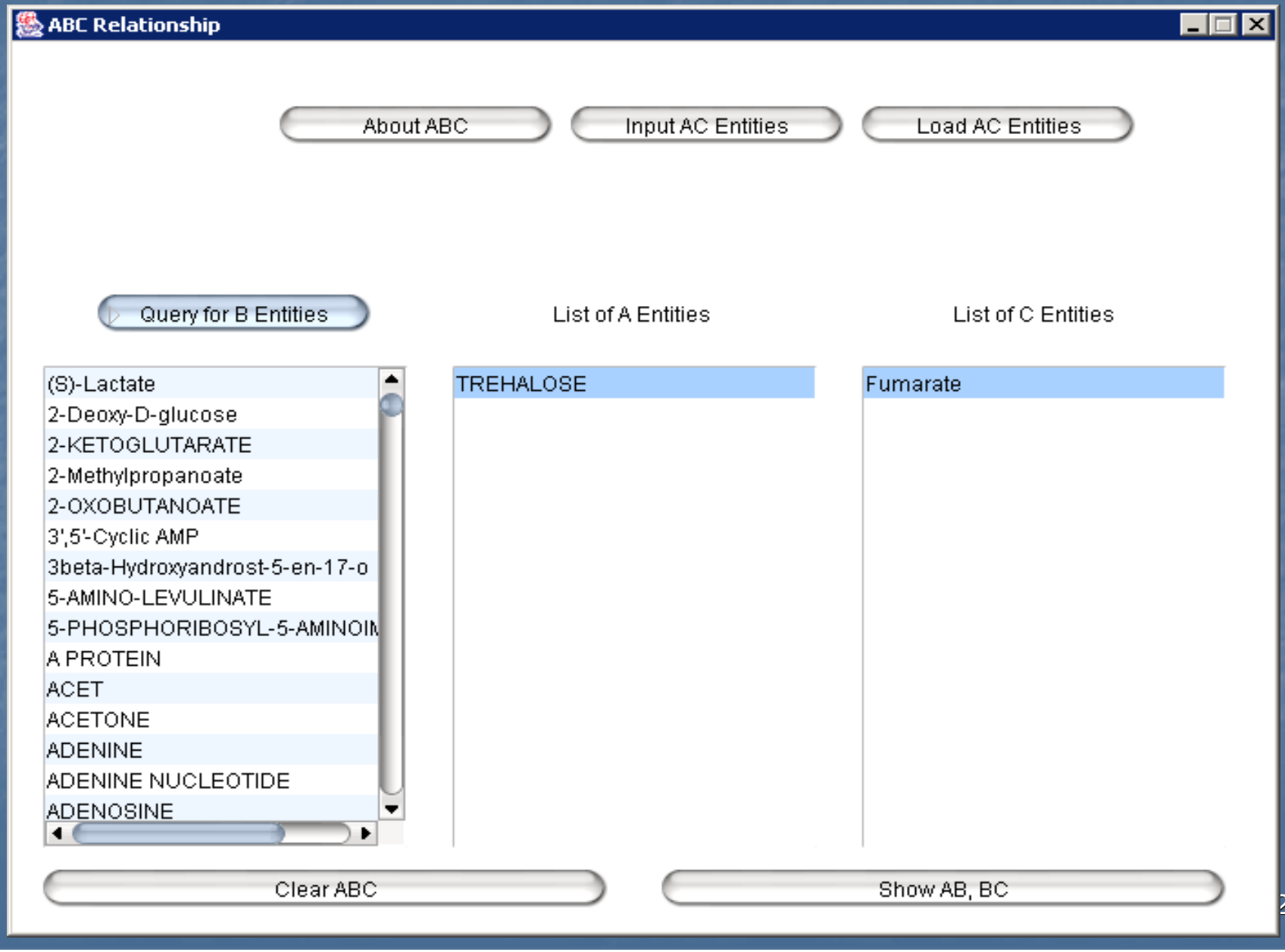
MetNet Interaction Discoverer, Screen 1



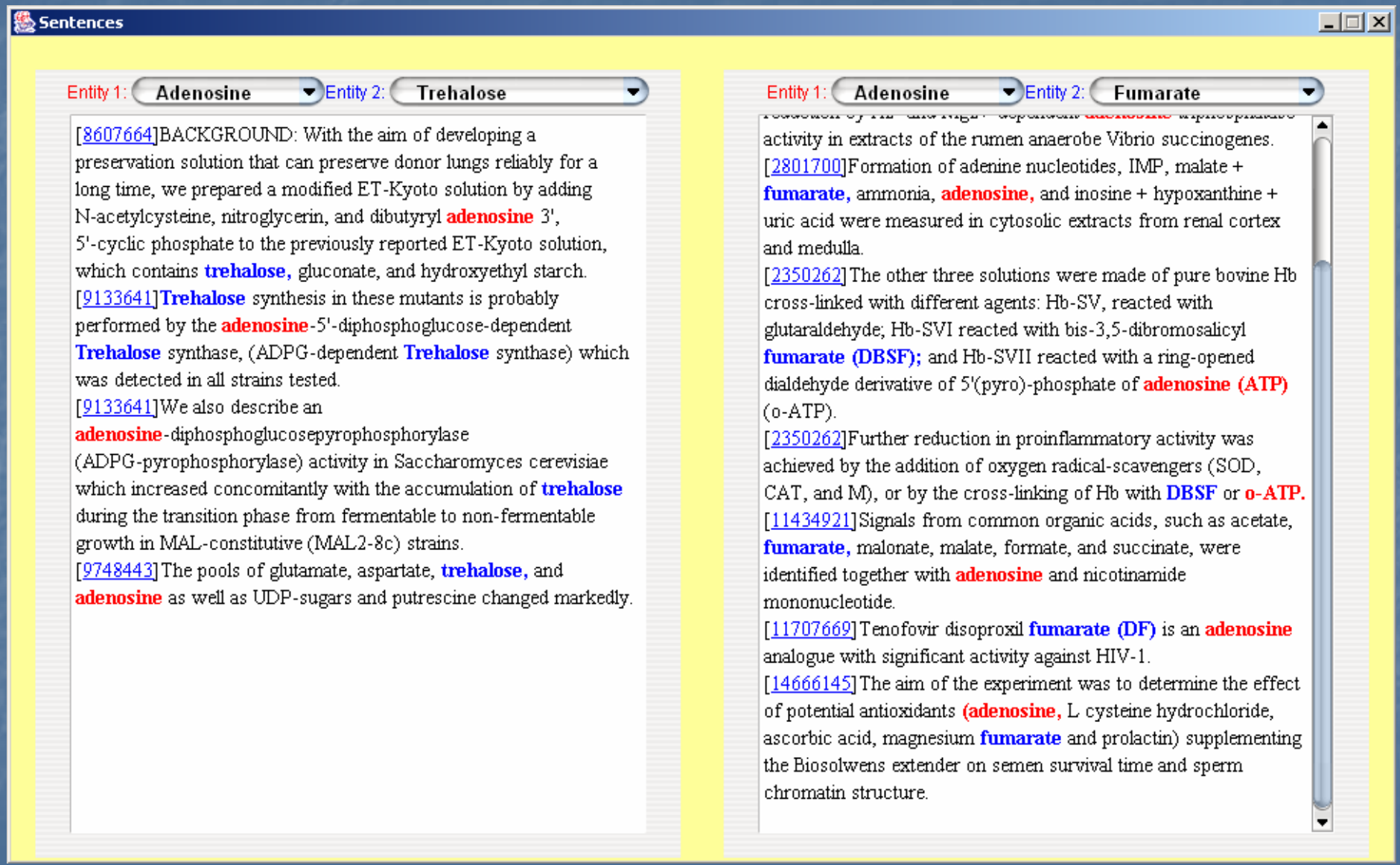
http://metnet.vrac.iastate.edu/MetNet_PathBinder.htm

Written by Lifeng Zhang, Jing Ding, Ph.D., and Tuan Cao

MetNet Interaction Discoverer, Screen 2



MetNet Interaction Discoverer, Output



FOR MORE INFO...

- Where to get tools
  - Go to www.greatplains.net
  - Follow the links to the GPN Wiki and the bioinformatics group page
- Contacts:

  greg@greatplains.net
  springer@missouri.edu

Questions?