Overview: Landmark

Landmarking Program to Create/Edit Landmark Points Between Samples

http://open2dprot.sourceforge.net/Landmark

Revised: 04-29-2005, P. Lemkin, G. Thornwall

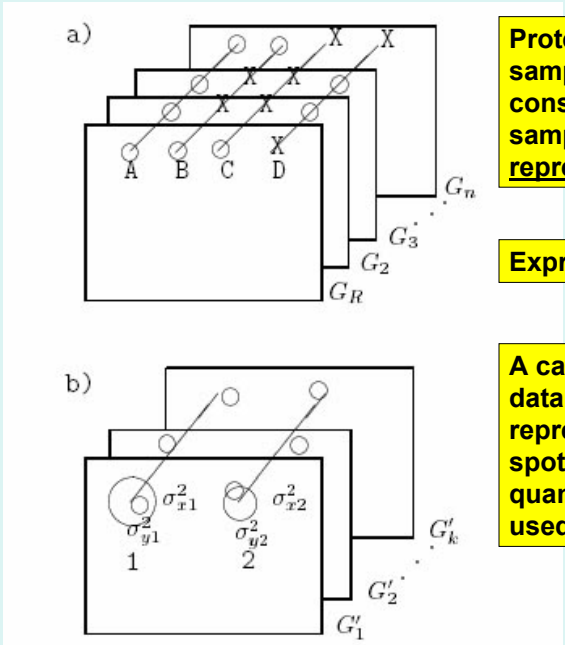
Introduction

- Spot pairing between spots from two samples may require a small set of corresponding spots known to be the same in the two samples.
- Some pairing programs require landmark data.
- Set of landmark points must be created prior to spot pairing and are stored in a landmark database.

Introduction (cont.)

- Landmark program is a step [3] pipeline module used for creating and editing a set of landmarks between a reference sample and sample.
- It uses a graphical user interface to let the user interactively assign corresponding spots.
- It saves the landmark set data for a pair of samples in an XML landmark database used by the other Open2Dprot pipeline modules.

Composite Samples Database (CSD) Paradigm



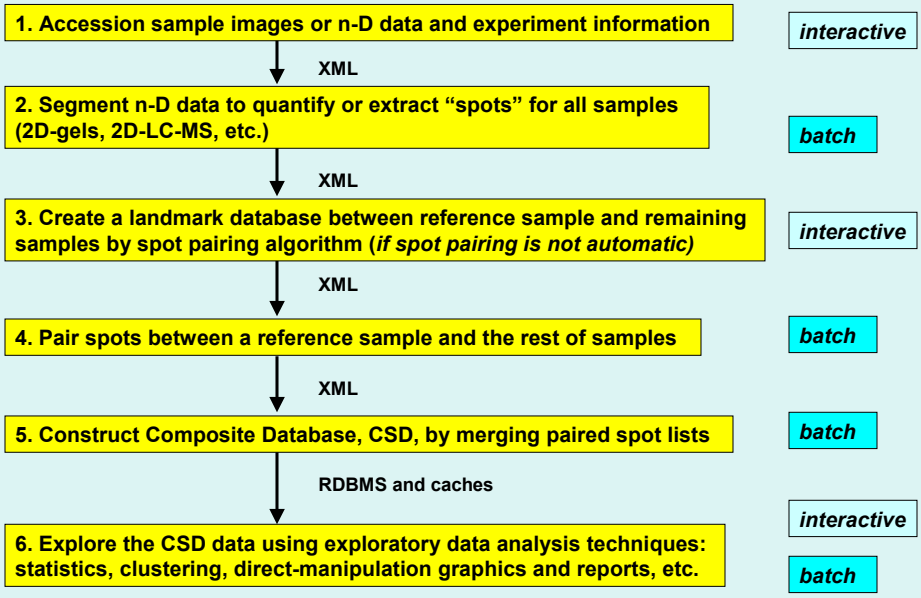
Proteomic composite samples database (CSD) consisting of a set of n samples G_1, G_2, …,G_n with <u>representative</u> <u>sample</u> $G_r = G_1$

Expression profiles A,B,C, ...

A canonical sample database is a statistical representation of the CSD spot geometry and quantification that could be used for data mining

in Lemkin *et al.*, *Computers Biomedical Research*, 1981

Basic Open n-D Analysis Pipeline



Initial Open n-D Data-Mining Tools

- Accession n-D sample images or n-D data and experiment data
- Quantify 'spots' from sample images or peptide clusters
- Pair spots between samples and a reference sample
- Construct composite sample database for exploratory data analysis
- Manage subsets of proteins in the database
- Manage replicate samples and condition sets of samples
- Analyze expression profiles for multiple conditions
- Data-filter protein sets by statistics, clustering, set membership
- Direct-manipulation of data in graphics, spreadsheets
- Integrate R language statistical, clustering, classifiers, class prediction, and other methods
- Integrate access to Internet proteomic/genomic/function data servers for user-specified protein sets

Open2Dprot Pipeline Subprojects

Open2Dprot - Subprojects - Netscape

File Edit View Go Bookmarks Tools Window Help

Open2Dprot pipeline subprojects

Open2Dprot consists of a series of coordinated Open2Dprot pipeline processing modules. The scheduler program, also called Open2Dprot, will schedule and run the modules in the pipeline after doing a data-dependency analysis. By using XML as the "glue" between modules, it is possible to substitute alternate modules at the various pipeline steps. As pipeline modules and alternate modules become available, they will be added to this table. *We encourage the donation of alternate pipeline processing modules which will be added to this table.*

We will be using a common O2Plib library in the Open2Dprot pipeline modules. This will help ensure that they use the same conventions, data structures and XML data interchange formats.

Subproject Home	Download	Documentation	Overview (PDF)	PDF documents	Version	Revision history	Status	Pipeline step
Open2Dprot project	(see below)	Open2Dprot	Open2Dprot project	Open2Dprot project	Open2Dprot project	Open2Dprot project	Open2Dprot *design prototype*	-
Open2Dprot program	Open2Dprot program	Open2Dprot program	Open2Dprot program	Open2Dprot program	Open2Dprot program	Open2Dprot program	Open2Dprot *pre-alpha* program	[scheduler]
Accession	Accession	Accession	Accession	Accession	Accession	Accession	Accession *pre-alpha*	[1]
Seq2Dgel	Seq2Dgel	Seq2Dgel	Seq2Dgel	Seq2Dgel	Seq2Dgel	Seq2Dgel	Seq2Dgel *pre-alpha*	[2]
Landmark	Landmark	Landmark	Landmark	Landmark	Landmark	Landmark	Landmark *pre-alpha*	[3]
CmpSpots	CmpSpots	CmpSpots	CmpSpots	CmpSpots	CmpSpots	CmpSpots	CmpSpots *pre-alpha*	[4]
BuildCSD	BuildCSD	BuildCSD	BuildCSD	BuildCSD	BuildCSD	BuildCSD	BuildCSD *design prototype*	[5]
CSDminer	CSDminer	CSDminer	CSDminer	CSDminer	CSDminer	CSDminer	CSDminer *design prototype*	[6]
O2Plib	O2Plib.jar	O2Plib	O2Plib	O2Plib	O2Plib	O2Plib	O2Plib *pre-alpha*	--common--

03-02-2005

Main Window

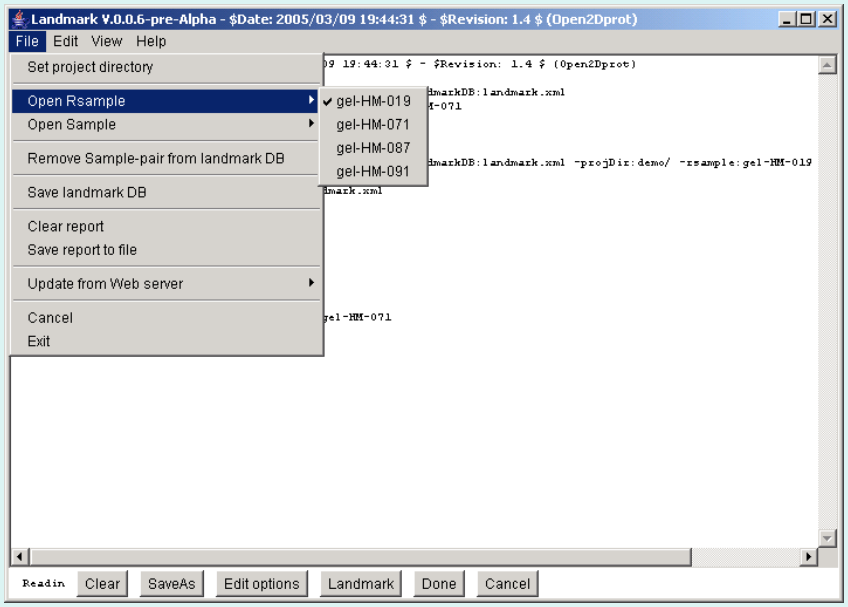
Landmark V.0.0.6-pre-Alpha - $Date: 2005/03/09 19:44:31 $ - $Revision: 1.4 $ (Open2Dprot)

File Edit View Help

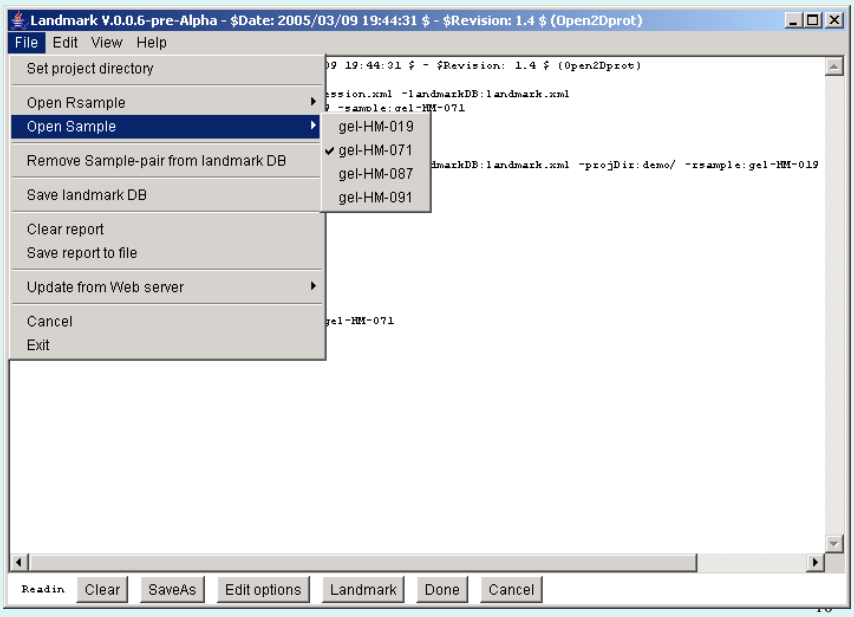
```
Landmark V.0.0.6-pre-Alpha - $Date: 2005/03/09 19:44:31 $ - $Revision: 1.4 $ (Open2Dprot)
Today's date is 03/10/05 13:10:35
Switches:  -inputFormat:X,X -accessionDB:accession.xml -landmarkDB:landmark.xml
           -projDir:demo/ -rsample:gel-HM-019 -sample:gel-HM-071

Can't read [Landmark.properties]

Switches:  -inputFormat:X,X -accessionDB:accession.xml -landmarkDB:landmark.xml -projDir:demo/ -rsample:gel-HM-019
Reading XML accession database file: demo\xml\accession.xml
Reading landmark database file: demo\xml\landmark.xml
List of modified or generated files
---------------------------------------
Accession DB file  [demo\xml\accession.xml]
Landmark DB file   [demo\xml\landmark.xml]

FINISHED!
Run time =0:0:1 (H:M:S) or 1.6 seconds

Finished setting up samples gel-HM-019 with gel-HM-071
```

Readin | Clear | SaveAs | Edit options | Landmark | Done | Cancel

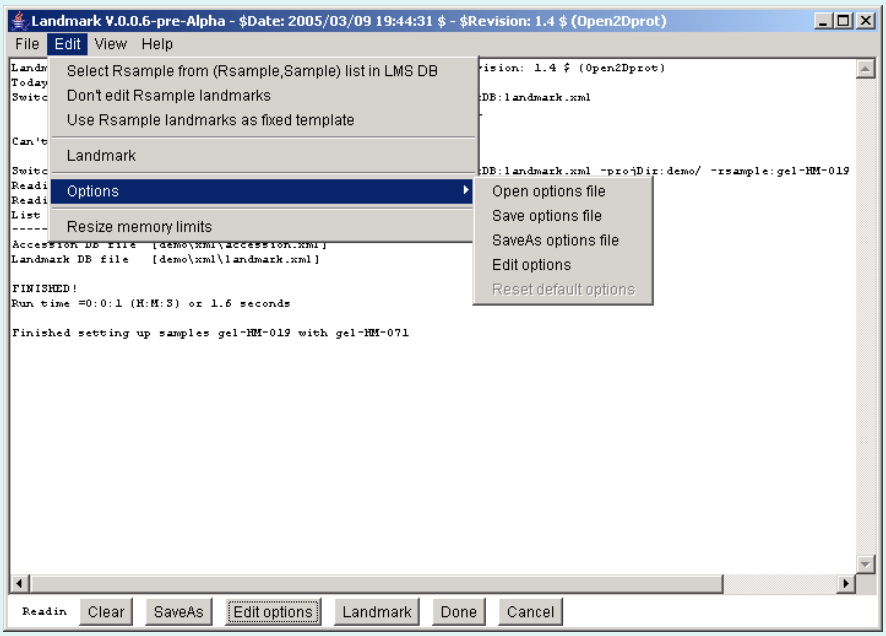
File Menu - Select Reference Sample



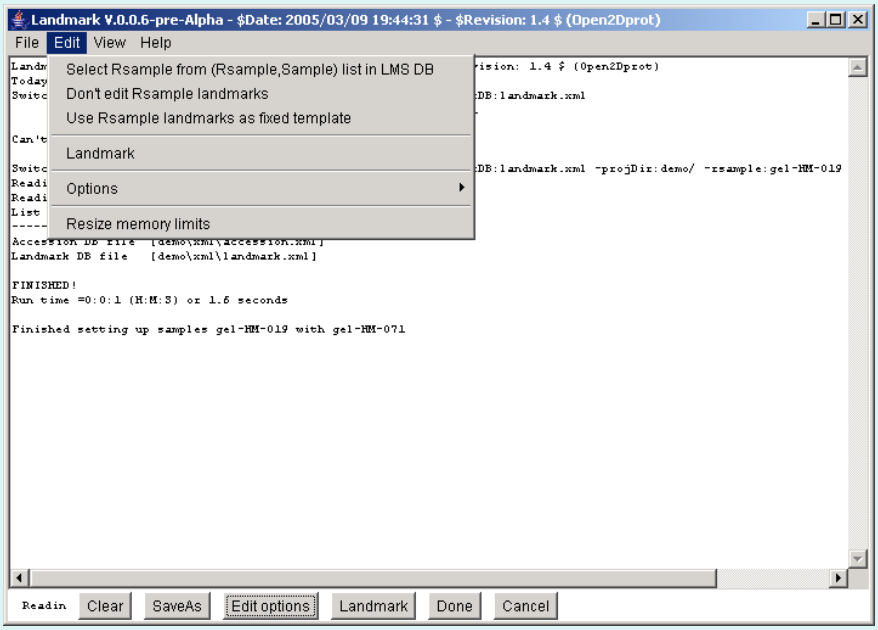
File Menu - Select Current Sample



File Menu - Update From Web Server



Edit Menu



Edit Menu - command line options

Enter sample image and select switch options

Change the startup parameters, then press 'Set new options' button to save them.
At that point, you can press 'Pair spots' to pair the Rsample and Sample with
the new parameters. You may also enter new Rsample and Sample data file names
and/or edit switch options and threshold sliders.

☑ -accessionFile		accession.xml
☑ -backupDatabases		---
☐ -commutativeLMS		---
☐ -debugBits		0,0
☐ -default		---
☑ -demo		---
☐ -dtd		---
☑ -inputFormat		X,X
☑ -landmarkFile		landmark.xml
☑ -projDir	Project directory	demo\
☐ -propertiesFile	Properties file	Landmark.properties
☑ -rsample	Rsample file	gel-HM-019
☑ -sample	Sample file	gel-HM-071

Reset defaults | Done | Cancel

View Menu

Landmark V.0.0.6-pre-Alpha - $Date: 2005/03/09 19:44:31 $ - $Revision: 1.4 $ (Open2Dprot)

File Edit View Help

- List Accession Samples
- List Landmark Samples
- Show Rsample accession DB data
- Show Sample accession DB data
- Show landmark DB data
- Show radii of landmark sets
- Show Accession DB in browser
- Show Landmark DB in browser

```
Landmark V
Today's da
Switches:

Can't read

Switches:
Reading XM
Reading la
List of mo
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Accession
Landmark D

FINISHED!
Run time =0:0:1 (H:M:S) or 1.6 seconds

Finished setting up samples gel-HM-019 with gel-HM-071
```
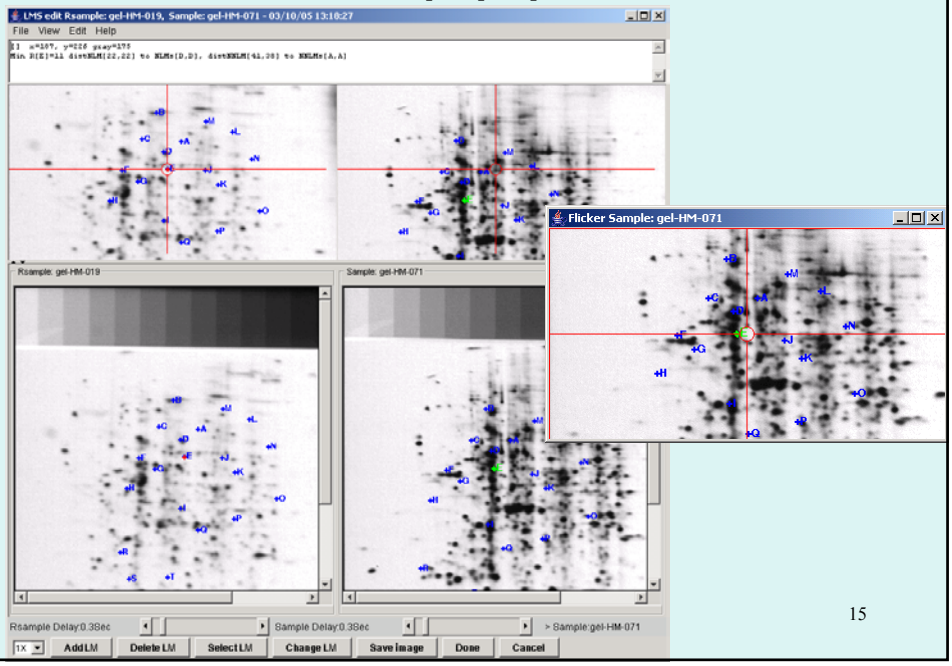
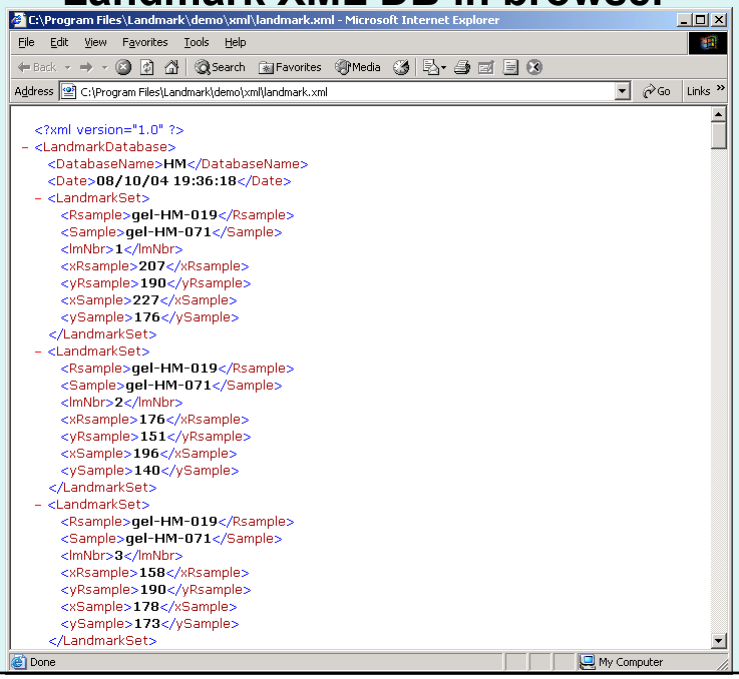

```
4:31 $ - $Revision: 1.4 $ (Open2Dprot)

xml -landmarkDB:landmark.xml
le:gel-HM-071

xml -landmarkDB:landmark.xml -projDir:demo/ -rsample:gel-HM-019
sion.xml
xml
```

Readin | Clear | SaveAs | Edit options | Landmark | Done | Cancel

Landmark popup window



Landmark XML DB in browser



Summary

- Landmark is a fully open-source landmark spot set editing program and is being developed at **http://open2dprot.sourceforge.net/**
- It uses a graphical user interface to let the user interactively assign corresponding spots.
- It saves the landmark set data for a pair of samples in an XML landmark database used by the other Open2Dprot pipeline modules.