



icbbl

THE INNOVATION CENTER FOR BIOMEDICAL INFORMATICS

G-DOC *Plus* **Introduction and Help**

Innovation Center for Biomedical Informatics
Georgetown University

Overview

- Register
- Login
- Navigation
- How to create patient groups
- Group comparison
- Gene expression KM plot
- Clinical KM plot

First time user



The Innovation Center for Biomedical Informatics (ICBI)
Lombardi Comprehensive Cancer Center

Thu Jan 22, 2015

email or net-id

Log In

[register now](#) | [forgot password](#)



Welcome to GDOC Plus Beta

Precision Medicine

Registration with
Georgetown Net ID (or any
other email). You will get an
email with a link that you
need to click to confirm
registration

Population genetics

Understanding Data in G-DOC Plus

It all begins with a study...

All data in G-DOC Plus derives from studies on topics such as breast cancer, wound healing, or even 1,000 Genomes. Each study may contain clinical and/or biospecimen data. Below is an overview of studies by topic.

* private studies, ones which are uploaded and marked private, are not counted here

News

October 02, 2014: ICBI Symposium 2014

[\[read\]](#)

May 02, 2014: Featured in Frontiers' Top 10
2013 Most viewed Genetics Research articles

[\[read\]](#)

March 12, 2014: AAAS Big Data Blog [\[read\]](#)

Login



The Innovation Center for Biomedical Informatics (ICBI)
Lombardi Comprehensive Cancer Center

Thu Jan 22, 2015

kb472

.....

Log In

[register now](#) | [forgot password](#)



Welcome to GDOC Plus Beta!

The Georgetown Database of Cancer Plus other diseases (G-DOC Plus) is a precision medicine platform containing molecular and clinical data from thousands of patients and cell lines, along with tools for analysis and data visualization. The platform enables the integrative analysis of multiple data types to understand disease.

Precision Medicine

Translational research

Population genetics

Understanding Data in G-DOC Plus

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G-DOC Plus Launch Pad!

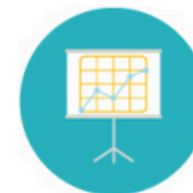
Welcome! The G-DOC Plus Launch Pad is your one-stop resource for learning more about G-DOC and getting started on the platform.



Studies



Lists



It All Starts Here!



G-DOC has over seventy studies, We know this can be overwhelming! Let us guide you to choose the study that is relevant for your research.

[Let's Go! >](#)



Groups



Notifications **0**

What's your area of interest?

G-DOC Plus has three overlapping entry points for the user based on their interests. Choose your area of interest to launch the workflow.



Precision Medicine

Patients' molecular diagnostics and clinical data.



Translational Research

Analytic tools and workflows to enable discovery.



Population Genetics

Race-based, genomic reporting and comparison.



Select disease/data of interest

DEMENTIA

1	30	30
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

PEDIATRIC CANCERS

5	256	256
<i>studies</i>	<i>samples</i>	<i>biospecimen</i>

BREAST CANCER

25	3952	4532
<i>studies</i>	<i>samples</i>	<i>biospecimen</i>

COLON CANCER

10	1226	1262
<i>studies</i>	<i>samples</i>	<i>biospecimen</i>

LUNG CANCER

1	478	443
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

MUSCULAR DYSTROPHY

1	36	36
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

LIVER CANCER

3	298	468
<i>studies</i>	<i>samples</i>	<i>biospecimen</i>

CELL_LINE_COLLECTIONS

1	60	59
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

OVARIAN CANCER

1	1711	564
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

PROSTATE CANCER

1	465	538
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

PANCREATIC CANCER

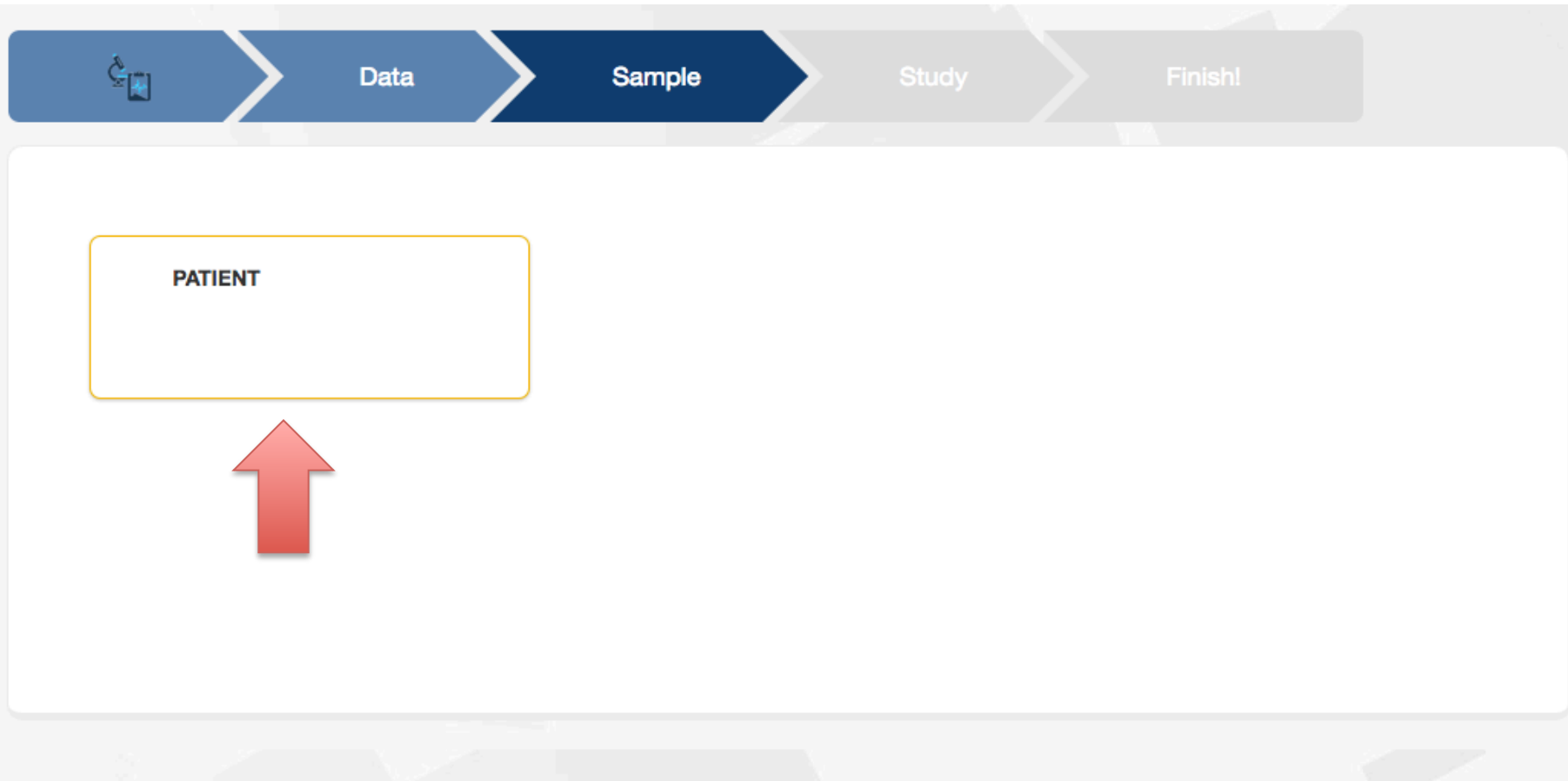
1	52	51
<i>study</i>	<i>samples</i>	<i>biospecimen</i>

BRAIN CANCER

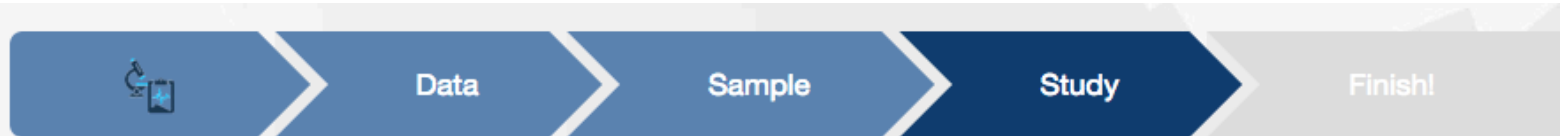
1	671	804
<i>study</i>	<i>samples</i>	<i>biospecimen</i>



Choose between patient and cell line data



Select study



REMBRANDT

Title: NCI Rembrandt Study: Molecular Analysis of Brain Neoplasia

Data Type Details:
CLINIC,MICROARRAY,COPY_NUMBER

Abstract: This is the NCI Rembrandt Study: Molecular Analysis of Brain Neoplasia. Primary brain tumors are the fourth leading cause of cancer mortality in adults under the age of 54 years and the leading cause of cancer mortality in children in the United

671
samples

804
biospecimen

[More>>](#)



Note: If you click on “More”, you will see complete description of the dataset

Study selected. Let's now create some groups

[Data](#)[Sample](#)[Study](#)[Finish!](#)

Based upon the study you picked, here is a list of tools you can use:

Analyze

- [Classification](#)
- [KM Clinical Plot](#)
- [HeatMap Viewer](#)
- [KM Gene Expression Plots](#)
- [Group Comparison](#)
- [Chromosomal Instability Index](#)

Search

- [Gene Expression Data](#)
- [Explore Clinical Data and Create Groups](#)

Explore clinical data and create groups



Explore clinical data or create groups

G-DOC^{plus}

Home Studies Lists Analyses Groups Notifications Study Options Help

Filter [reset | tips | advanced search]

Demographics

- ☐ Age range
- ☐ Gender
- ☐ Race

Sample details

- ☐ Anti convulsant status
- ☐ Copy number data
- ☐ Gene expression data

view all (4 more ...)

- ☐ Steroid dose status
- ☐ Institution name
- ☐ Prior therapy surgery done at first follow up
- ☐ Prior therapy surgery done at second follow up

Disease details

- ☒ Disease

Subject Search

WHO_GRADE(All) > DISEASE_TYPE(All) >

Current Split Attribute

WHO grade

Disease	WHO_GRADE_I	WHO_GRADE_II	WHO_GRADE_III	WHO_GRADE_IV
OLIGODENDROGLIOMA	0	40	25	0
ASTROCYTOMA	0	66	63	0
UNKNOWN	0	0	1	0
UNCLASSIFIED	0	0	0	0
NON TUMOR	0	0	0	0
GBM	2	0	0	140
MIXED	0	4	4	0
Total	2	110	93	140

and uncheck the boxes on the left – this will update the patient numbers in the table.

e.g. In this example you can see that among Oligodendroglioma patients, 40 patients have WHO tumor grade II and 25 patients have grade III tumor

Let's save the Oligodendroglioma patients with tumor grade II and grade III

Filter [reset | tips | advanced search]

Demographics

- ☐ Age range
- ☐ Gender
- ☐ Race

Sample details

- ☐ Anti convulsant status
- ☐ Copy number data
- ☐ Gene expression data
- view all (4 more ...)
- ☐ Steroid dose status
- ☐ Institution name
- ☐ Prior therapy surgery done at first follow up
- ☐ Prior therapy surgery done at second follow up

Disease details

- ☒ Disease

Clinical evaluation

- ☐ Disease evaluation by MRI
- ☐ Neurologic exam score
- ☐ Performance Status Score: Karnofsky

Subject Search

WHO_GRADE(All) > DISEASE_TYPE(All) >

Current Split Attribute

WHO grade

Disease	WHO_GRADE_I	WHO_GRADE_II	WHO_GRADE_III	WHO_GRADE_IV
OLIGODENDROGLIOMA	0	40	25	0
ASTROCYTOMA	0	66	0	0
UNKNOWN	0	0	0	0
UNCLASSIFIED	0	0	0	0
NON TUMOR	0	0	0	0
GBM	2	0	0	140
MIXED	0	4	4	0
Total	2	110	93	140

View Detailed Report

Save ids as list

To save a list of patients, click on the hyperlinked number, and select “Save ids as list”.

Repeat this procedure to create as many number of patient groups as needed.

Note: “View detailed report” shows a detailed clinical report of those selected patients.

Enter a name for the list, and click “Save”

Subject Search

Filter [reset] [tips] [advanced search]

Demographics

☐ Age range ⓘ

☐ Gender ⓘ

☐ Race ⓘ

Sample details

☐ Anti convulsant status ⓘ

☐ Copy number data ⓘ

☐ Gene expression data ⓘ

view all (4 more ...)

☐ Steroid dose status ⓘ

☐ Institution name ⓘ

☐ Prior therapy surgery done at first follow up ⓘ

☐ Prior therapy surgery done at second follow up ⓘ

Disease details

☒ Disease ⓘ

Clinical evaluation

☐ Disease evaluation by MRI ⓘ

☐ Neurologic exam score ⓘ

☐ Performance Status Score: Karnofsky ⓘ

WHO_GRADE(All) > DISEASE_TYPE(All) >

Current Split Attribute ⓘ

WHO grade ▾

Disease	WHO_GRADE_I	WHO_GRADE_II	WHO_GRADE_III	WHO_GRADE_IV
OLIGODENDROGLIOMA	0	40	25	0
			63	0
			1	0
			0	0
			0	0
			0	140
			4	0
			93	140

Save your list

List Type:	clinical, patient
List Name:	<input type="text" value="Rem_olig_grade2"/>
<input type="button" value="Cancel"/> <input type="button" value="Save"/> close	

Now we want to compare the Oligodendroglioma tumor grade II patients with Oligo grade III patients

G-DOC^{Plus} Home Studies Lists Analyses Groups Notifications **Study Options** Help

Filter [reset | tips | advanced search]

Demographics

- ☐ Age range
- ☐ Gender
- ☐ Race

Sample details

- ☐ Anti convulsant status
- ☐ Copy number data
- ☐ Gene expression data

view all (4 more ...)

- ☐ Steroid dose status
- ☐ Institution name
- ☐ Prior therapy surgery done at first follow up
- ☐ Prior therapy surgery done at second follow up

Disease details

- ☒ Disease

Clinical evaluation

- ☐ Disease evaluation by MRI
- ☐ Neurologic exam score
- ☐ Performance Status Score: Karnofsky

Subject Search

WHO_GRADE(All) > DISEASE_TYPE

Current Split Attribute

WHO grade

Disease	WHO
OLIGODENDROGLIOMA	0
ASTROCYTOMA	0
UNKNOWN	0
UNCLASSIFIED	0
NON TUMOR	0
GBM	2
MIXED	0
Total	2

Study Options

- Study Selected
- REMBRANDT
- SEARCH
 - Genome Browser
 - Compound/Drug Targets
 - Findings
 - Explore Clinical Data and Create Groups
 - Gene Expression Data
- ANALYZE
 - Group Comparison**
 - Chromosomal Instability Index
 - KM Clinical Plot
 - KM Gene Expression Plots
 - Classification
 - HeatMap Viewer

GRADE_III	WHO_GRADE_IV
0	0
0	0
0	0
0	0
140	0
0	140

Perform Group Comparison Analysis

Current Study: REMBRANDT [change study?](#)

Select a baseline group and a comparison group(s)

Select baseline group

Rem_olig_grade2

p-value

.05

Multiple Comparison Adjustment

False Discovery Rate(FDR): B

Select comparison group

Rem_olig_grade3

Fold Change

1.5

Data-Type

GENE EXPRESSION

Statistical Method

T-Test: Two Sample Test

Dataset

mas5 normalization

Submit Analysis

Select baseline group (less screwed up group), comparison group, and settings for the comparison analysis.

Click “Submit analysis”

Notifications

Below are your latest running analyses. Once completed, click on the Analysis name to see detailed results.

GROUP_COMPARISON (2:05 1/22/2015)

Complete



Once you click “submit analysis”, you will be re-directed to the “Notifications” page. Once the status is “Complete”, click on “Group comparison”

Results of group comparison

Analysis Results

Current Study: REMBRANDT

Analysis Results	
Statistical Method	TTest
Adjustment	FDR
Fold Change	1.5
Pvalue	.05
Study	REMBRANDT
Data File	REMBRANDT.Rda
Baseline Group	Rem_olig_grade2
Groups	Rem_olig_grade3

List Name:

Save Selected ↓

View HeatMap for selected reporters

These are the results of the group comparison.

You can sort this table based on any of the columns.

In this example, they are sorted based on fold change

Analysis Results									
<input type="checkbox"/>	Reporter ID	Gene Symbol	p-value	Fold Change ↕	Mean Baseline (log)	Mean Group (log2)	Std Baseline	Std Group	Target Data
<input type="checkbox"/>	209937_at	TM4SF4	1.073×10^{-3}	12.039	5.403	8.993	2.563	1.988	
<input type="checkbox"/>	1553467_at	FLJ32742	1.295×10^{-3}	9.743	6.182	9.466	2.384	1.901	
<input type="checkbox"/>	1557053_s_at	UBE2G2	1.371×10^{-3}	7.776	5.409	8.368	1.787	2.266	
<input type="checkbox"/>	201981_at	PAPPA	1.776×10^{-3}	7.771	7.376	10.334	2.265	1.779	
<input type="checkbox"/>	1555409_a_at	BAGE2	1.378×10^{-2}	7.102	8.637	11.465	2.428	2.642	
<input type="checkbox"/>	208672_s_at	SFRS3	9.744×10^{-4}	6.746	5.102	7.856	1.918	1.573	

Going from Group Comparison to Gene expression KM

Analysis Results	
Statistical Method	TTest
Adjustment	FDR
Fold Change	1.5
Pvalue	.05
Study	REMBRANDT
Data File	REMBRANDT.Rda
Baseline Group	Rem_olig_grade2
Groups	Rem_olig_grade3

List Name:

Going from Group Comparison to Gene expression KM:

- Click on gene of interest – Select “Perform Gene expression KM” – Select endpoint.

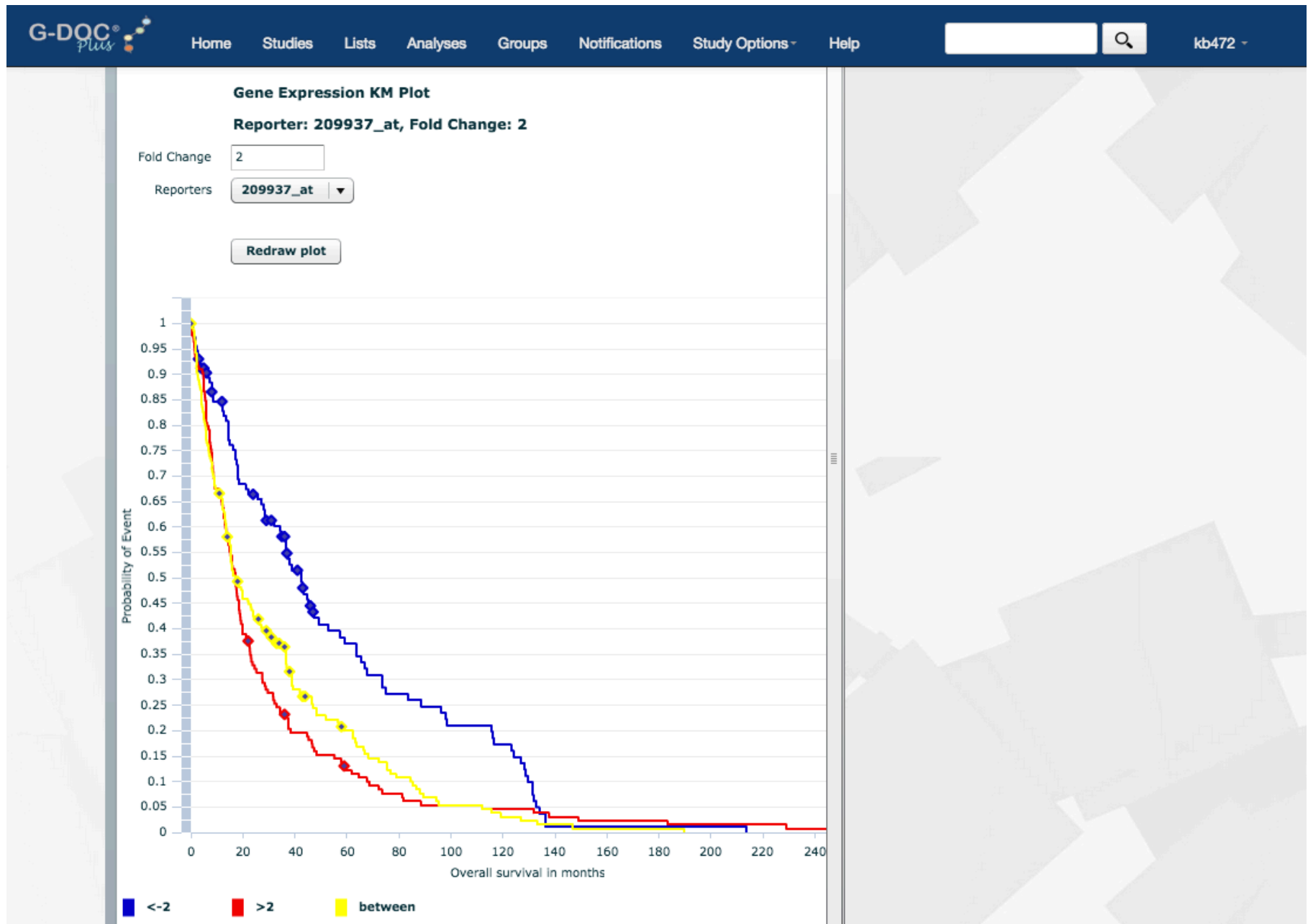
G-DOC allows users to perform Gene expression KM on either all samples or a group of samples

Analysis Results	
<input type="checkbox"/>	Reporter ID
<input type="checkbox"/>	209937_at
<input type="checkbox"/>	1553467_at
<input type="checkbox"/>	1557053_s_at
<input type="checkbox"/>	201981_at
<input type="checkbox"/>	1555409_a_at
<input type="checkbox"/>	208672_s_at
<input type="checkbox"/>	1554593_s_at
<input type="checkbox"/>	208765_s_at
<input type="checkbox"/>	1555238_at
<input type="checkbox"/>	209997_x_at
<input type="checkbox"/>	215234_at

Perform Gene Expression KM ▶	Endpoint: Overall survival in months
Perform Gene Expression Search	
Search in Entrez	
View in UCSC Genome Browser	
Search in iHOP	
Search in PIR	
Search in Ensembl Gene View	
Search in Reactome	
View at KEGG	
View at QuickGO	
View at GeneCards	
View at String DB	

Fold Change	Mean Baseline (log	Mean Group (log2	Std Baseline	Std Group	Target Data
2.039	5.403	8.993	2.563	1.988	
743	6.182	9.466	2.384	1.901	
776	5.409	8.368	1.787	2.266	
771	7.376	10.334	2.265	1.779	
102	8.637	11.465	2.428	2.642	
746	5.102	7.856	1.918	1.573	
469	6.001	8.695	1.764	1.884	
434	5.398	8.084	1.843	1.989	
404	5.562	8.241	1.629	1.810	
328	6.215	8.877	1.709	1.521	
6.133	5.660	8.305	1.137	2.165	

Gene expression KM plot



How to do a clinical KM plot

The screenshot shows the G-DOC Plus Launch Pad interface. The top navigation bar includes links for Home, Studies, Lists, Analyses, Groups, Notifications, Study Options (highlighted with a red box), and Help. A search bar and a user profile (kb472) are also present. The main content area features a welcome message and six large icons representing different functions: Studies (red suitcase), Lists (blue book), Analyses (teal chart), Groups (dark blue people), Notifications (teal lightbulb), and Help me pick a study (red rocket). The 'Study Options' dropdown menu is open, showing a list of options under two categories: 'Study Selected' and 'ANALYZE'. The 'KM Clinical Plot' option is highlighted in blue.

G-DOC Plus Launch Pad

Welcome! The G-DOC Plus Launch Pad is your one-stop re started on the platform.

Study Options

- Study Selected
- REMBRANDT
- SEARCH
- Genome Browser
- Compound/Drug Targets
- Findings
- Explore Clinical Data and Create Groups
- Gene Expression Data
- ANALYZE
- Group Comparison
- Chromosomal Instability Index
- KM Clinical Plot**
- KM Gene Expression Plots
- Classification
- HeatMap Viewer

Studies

Lists

Analyses

Groups

Notifications 1

Help me pick a study

From either the home page, or the current page you are in, go to Study options - > KM Clinical plot

Create Clinical KM Plot

Current Study: REMBRANDT [change study?](#)

Select Patient Groups:

Rem_GBM
Rem_Oligo
Rem_Astro
Rem_NonTumor

Add
Remove

Rem_olig_grade2
Rem_olig_grade3

Select Endpoint:

Overall survival in months ▾

Plot

- Select patient group(s) of interest using the “add” button
- Select endpoint
- Click “plot”

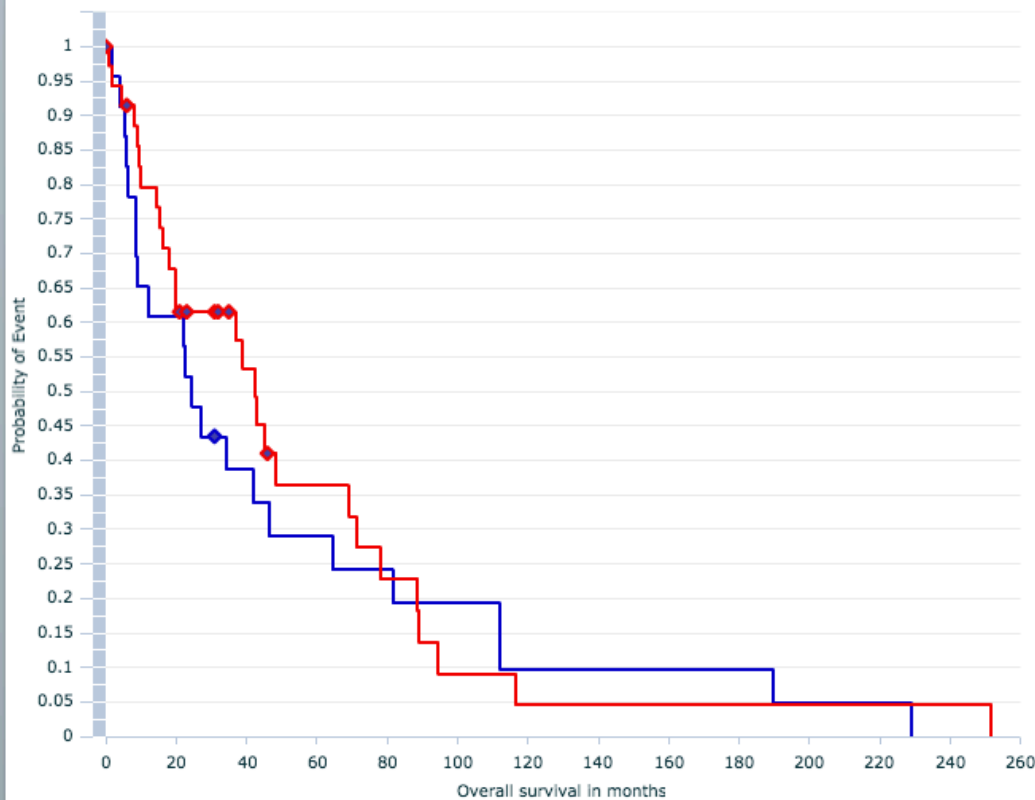
Clinical KM plot results

KM Plot Results

Current Study: REMBRANDT

KM Plot

Chart Options... ▾



Log-rank p-value: 0.5210015465230854

■ Rem_olig_grade3

■ Rem_olig_grade2

General tips

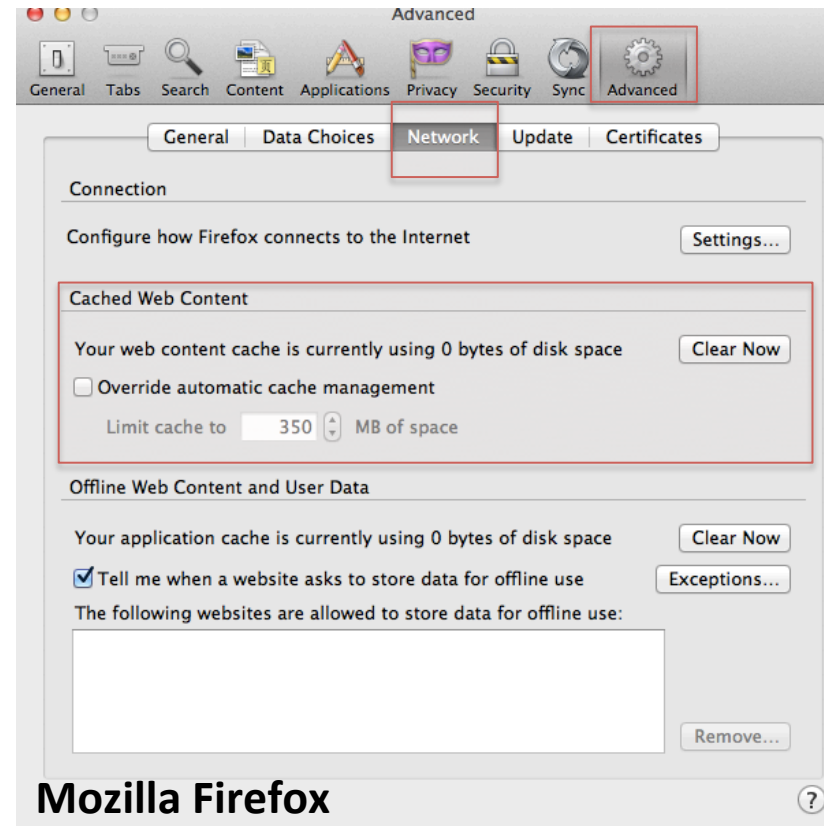
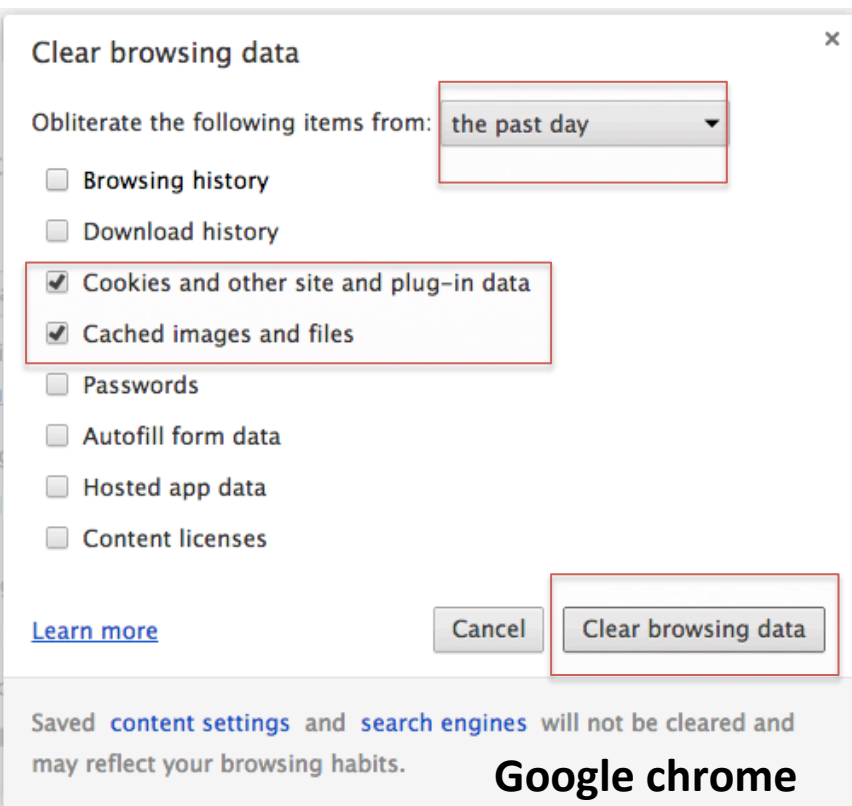
- G-DOC *Plus* works best if you don't use the **back** button in the web browser repeatedly.

Once you select a study, most tools will be easily available from the the top menu bar inside G-DOC *Plus*.

- The Pathway enrichment and the Lists tool may sometimes take a few seconds longer to execute than other tools (since they are directly connecting to the server every time). Your patience is highly appreciated.

Clearing cache

- If the G-DOC web page does not respond after several seconds, try:
 - refreshing the page.
 - Log out and log back in, and try again
 - If the above two do not work, its possible that your web browser cache may need to be cleared
 - For Google chrome, go to **Settings** -> **Show Advanced Settings** -> Under “Privacy”, select **Clear Browsing data**
 - For Mozilla Firefox, go to **Preferences** -> **Advanced** -> **Network** -> Under “Cached Web Content” -> **Clear now**



- We are working hard to improve G-DOC *Plus*. Please feel free to email your questions and comments (no homework questions please) to us at :gdoc-help@georgetown.edu