

APPIC

Atlas of Protein Protein Interactions in Cancer

User Guide

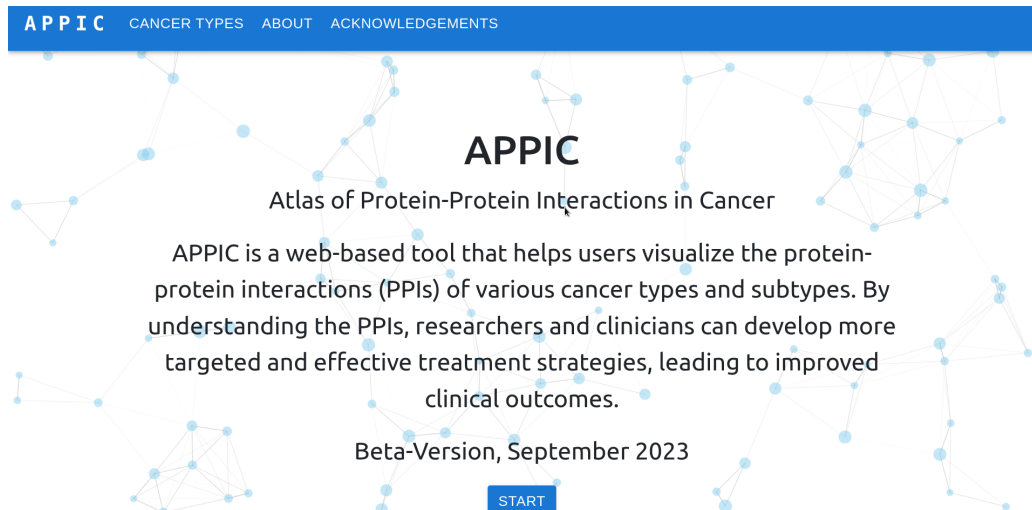
Version 1.0
September 2023

Contact: Benjamin Ahn, benjamin_ahn@brown.edu

Start

Navigate to <https://appic.brown.edu>

This is the landing page. Click on “START” to begin.



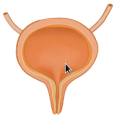
Body Diagram Page

After clicking “START”, the web tool will bring you to this page. Here, you can click on each organ which will drop down a list of different subtypes within that tissue.


APPIC [CANCER TYPES](#) [ABOUT](#) [ACKNOWLEDGEMENTS](#)


Cancer Types


(Datasets extracted from CBioPortal)




bladder
MSI High BLCA
MSI Low BLCA
Non-Papillary BLCA
Papillary BLCA

**brain**

**breast**

**colon and colorectal**


**gallbladder**

Users can also hover their mouse over each subtype to generate a popup box which describes the dataset used to create the cancer subtype. Clicking on a cancer subtype will bring the user to the network diagram page.


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Cancer Types


(Datasets extracted from CBioPortal)





bladder
MSI High BLCA
MSI Low BLCA
Non-Papillary BLCA
Papillary BLCA



bladder
MSI High BLCA
Bladder Urothelial Carcinoma (TCGA, PanCancer Atlas)
Number of patients in cluster
34

**breast**

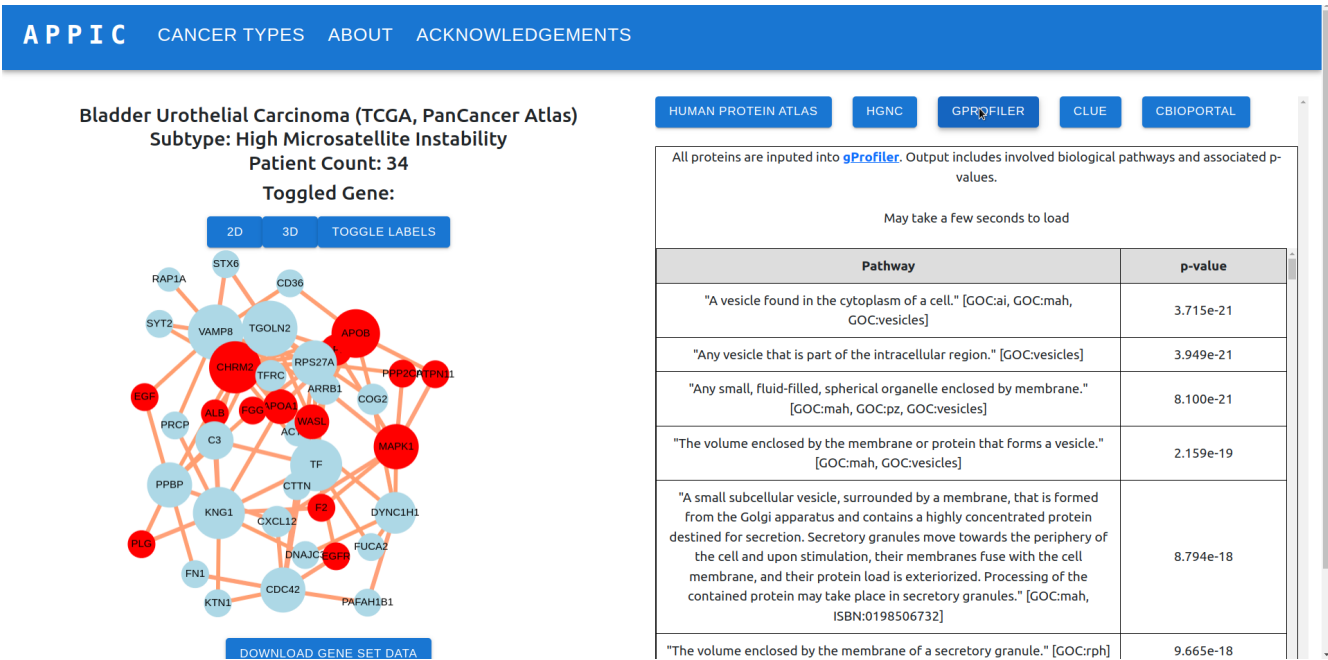
**colon and colorectal**

**gallbladder**

Network Diagram Page

Here, the protein-protein interaction network for this cancer subtype is displayed on the left. Nodes colored in red indicate existing drug targets (see Clue.io database notes).

On the right hand side, info tiles represent the several databases connected to APPIC. Click on the tabs to browse different databases.

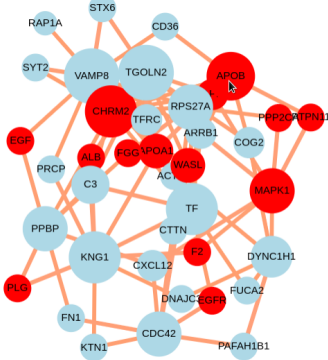


Human Protein Atlas

Users can click on a node in the network diagram to create a response.

Bladder Urothelial Carcinoma (TCGA, PanCancer Atlas)
Subtype: High Microsatellite Instability
Patient Count: 34
Toggled Gene: APOB

2D 3D TOGGLE LABELS



DOWNLOAD GENE SET DATA

HUMAN PROTEIN ATLAS HGNC GPROFILER CLUE CBIOPORTAL

Click on a protein node

THE HUMAN PROTEIN ATLAS

SECTIONS ABOUT NEWS LEARN DATA HE

Search result (2 genes): PYY | SNX25

SUMMARY TISSUE BRAIN SINGLE CELL TISSUE CELL PATHOLOGY DISEASE IMMUNE BLOOD SUBCELL

PROTEIN SUMMARY

SECTION OVERVIEW GENE INFORMATION RNA DATA ANTIBODY DATA

APOB INFORMATION

Protein¹ Apolipoprotein B

Gene name¹ APOB

Protein class¹ Candidate cardiovascular disease genes Disease related genes Human disease related genes Metabolic proteins Plasma proteins

Protein evidence Evidence at protein level (all genes)

Number of transcripts¹ 2

Protein interactions Interacting with 2 proteins

PROTEIN EXPRESSION AND LOCALIZATION

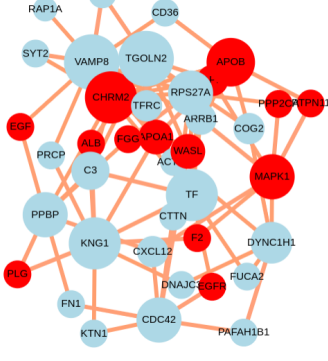
We use cookies to enhance the usability of our website. If you continue, we'll assume that you are happy to receive all cookies. [More information](#). Don't show this again.

HGNC

Users should click on a node in the network diagram to create a response.

Bladder Urothelial Carcinoma (TCGA, PanCancer Atlas)
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2D 3D TOGGLE LABELS



DOWNLOAD GENE SET DATA

HUMAN PROTEIN ATLAS HGNC GPROFILER CLUE CBIOPORTAL

Click on a protein node

HGNC

Gene data Tools Downloads VGNC Contact us More Request symbol

Search results

Filter by type 17

Filter by gene entry status

Filter by gene locus type

Filter by symbol report tag

Items: 1 to 17 of 17

APOB: apolipoprotein B
HGNC ID HGNC:603 Locus type Gene with protein product Status Approved
Matches Gene symbol: APOB
Alias gene symbol: ApoB-100

APOBR: apolipoprotein B receptor
HGNC ID HGNC:24087 Locus type Gene with protein product Status Approved
Matches Gene symbol: APOBR
Alias gene symbol: APOB48R APOB100R

APOBEC1: apolipoprotein B mRNA editing enzyme catalytic subunit 1
HGNC ID HGNC:604 Locus type Gene with protein product Status Approved
Matches Gene symbol: APOBEC1
Alias gene symbol: APOBEC-1

APOBEC2: apolipoprotein B mRNA editing enzyme catalytic subunit 2
HGNC ID HGNC:605 Locus type Gene with protein product Status Approved
Matches Gene symbol: APOBEC2

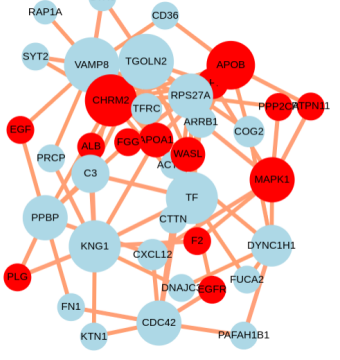
g:profiler

All proteins are passed into g:Profiler. The output is a table that represents biological pathways related to the protein-protein interaction network. Biological pathways are ordered by p-value.

APPICCANCER TYPESABOUTACKNOWLEDGEMENTS

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2D3DTOGGLE LABELS



DOWNLOAD GENE SET DATA

HUMAN PROTEIN ATLASHGNC**GPROFILER**CLUECBIOPORTAL

All proteins are inputted into **gProfiler**. Output includes involved biological pathways and associated p-values.

May take a few seconds to load

Pathway	p-value
"A vesicle found in the cytoplasm of a cell." [GOC:ai, GOC:mah, GOC:vesicles]	3.715e-21
"Any vesicle that is part of the intracellular region." [GOC:vesicles]	3.949e-21
"Any small, fluid-filled, spherical organelle enclosed by membrane." [GOC:mah, GOC:pz, GOC:vesicles]	8.100e-21
"The volume enclosed by the membrane or protein that forms a vesicle." [GOC:mah, GOC:vesicles]	2.159e-19
"A small subcellular vesicle, surrounded by a membrane, that is formed from the Golgi apparatus and contains a highly concentrated protein destined for secretion. Secretory granules move towards the periphery of the cell and upon stimulation, their membranes fuse with the cell membrane, and their protein load is exteriorized. Processing of the contained protein may take place in secretory granules." [GOC:mah, ISBN:0198506732]	8.794e-18
"The volume enclosed by the membrane of a secretory granule." [GOC:rph]	9.665e-18

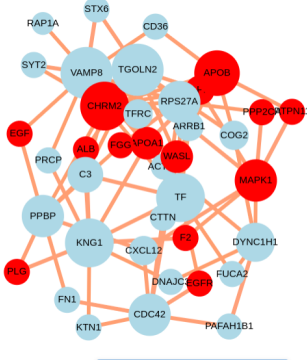
Clue.io

All proteins in the protein-protein interaction network are searched in the Clue.io database to see if they are targets for any existing drugs. The drug name and gene target are included in the table. The gene targets are colored red in the network diagram.

APPICCANCER TYPESABOUTACKNOWLEDGEMENTS

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DOWNLOAD GENE SET DATA

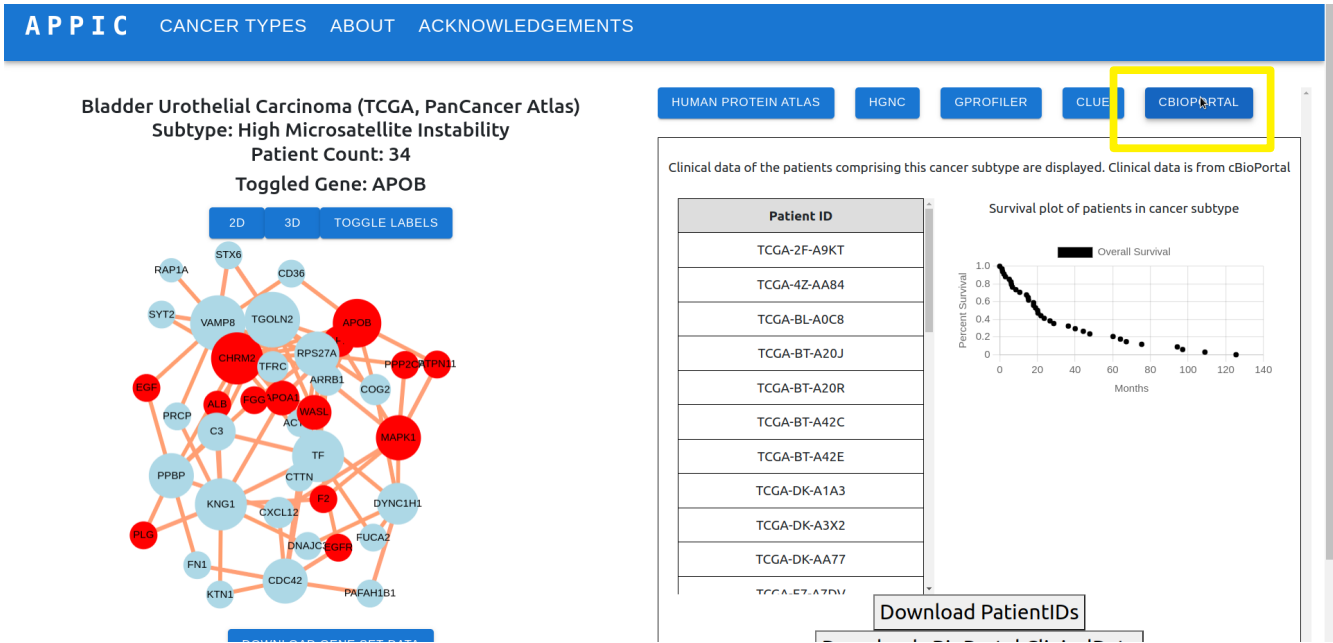
HUMAN PROTEIN ATLASHGNC**GPROFILER****CLUE**CBIOPORTAL

Proteins in network are inputted into **Clue.io**. Proteins with existing drugs are displayed and highlighted in red in the network diagram.

Drug Name	Gene Target
amoxapine	CHRM2
BIBU-1361	EGFR
BIBX-1382	EGFR
biperiden	CHRM2
brompheniramine	CHRM2
brucine	CHRM2
BVT-948	PTPN1
BVT-948	PTPN11
chlorprothixene	CHRM2
desipramine	CHRM2
dicycloverine	CHRM2
disopyramide	CHRM2

cBioPortal

The specific patient IDs that create the cancer subtype are displayed. The Kaplan-Meier survival plot of the specific patients in the cancer subtype is displayed. Users have the options to download the Patient ID list as well as full cBioPortal clinical data set.



3D network diagram

Users can visualize the network diagram in 3D. Clicking on “Toggle Labels” will add or remove the protein labels for the 3D model. Users can also click and drag around the network diagram to move the nodes. Users can also download the protein-protein interaction data files.

APPIC

CANCER TYPES

ABOUT

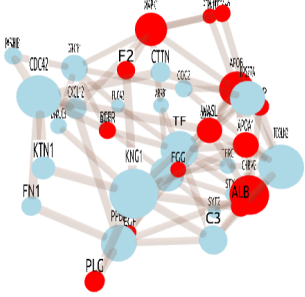
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2D

3D

TOGGLE LABELS



Left-click: rotate, Mouse-wheel/middle-click: zoom, Right-click: pan

DOWNLOAD GENE SET DATA

HUMAN PROTEIN ATLAS

HGNC

GPROFILER

CLUE

CBIOPORTAL

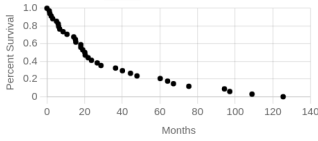
Clinical data of the patients comprising this cancer subtype are displayed. Clinical data is from cBioPortal

Patient ID
TCGA-2F-A9KT
TCGA-4Z-AA84
TCGA-BL-A0C8
TCGA-BT-A20J
TCGA-BT-A20R
TCGA-BT-A42C
TCGA-BT-A42E
TCGA-DK-A1A3
TCGA-DK-A3X2
TCGA-DK-AA77
TCGA-E7-A7DV

Download PatientIDs

Download cBioPortal ClinicalData

Survival plot of patients in cancer subtype

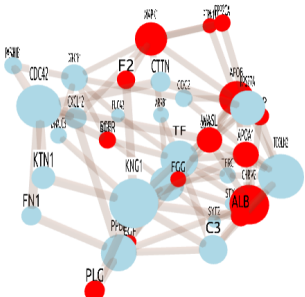


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2D

3D

TOGGLE LABELS



Left-click: rotate, Mouse-wheel/middle-click: zoom, Right-click: pan

DOWNLOAD GENE SET DATA

DOWNLOAD GENE INTERACTION DATA

CAPTURE SCREENSHOT

HUMAN PROTEIN ATLAS

HGNC

GPROFILER

CLUE

CBIOPORTAL

Clinical data of the patients comprising this cancer subtype are displayed. Clinical data is from cBioPortal

Patient ID
TCGA-2F-A9KT
TCGA-4Z-AA84
TCGA-BL-A0C8
TCGA-BT-A20J
TCGA-BT-A20R
TCGA-BT-A42C
TCGA-BT-A42E
TCGA-DK-A1A3
TCGA-DK-A3X2
TCGA-DK-AA77
TCGA-E7-A7DV

Download PatientIDs

Download cBioPortal ClinicalData

Survival plot of patients in cancer subtype

