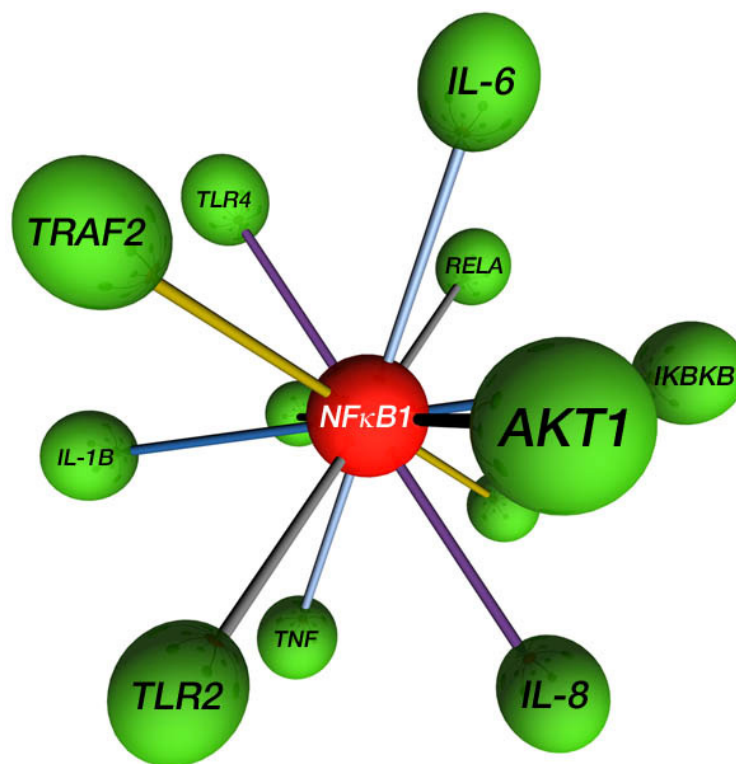


# Gene Network Central™

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**Identifying Gene Expression & Gene Interaction  
Events Important to Your Research**

# Learn About A Gene of Interest (GOI)?

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## *Regulators*

### **Functional Regulation**

- What gene products regulate the protein encoded by the GOI?
- What gene products are regulated by the protein encoded by the GOI?

### **Transcriptional Regulation**

- What gene products regulate the expression of the GOI?
- Does the protein encoded by the GOI regulate the expression of other genes?

### **Chemical Modifications**

- What proteins are modified by the protein encoded by the GOI?
- What proteins modify the protein encoded by the GOI?

# Learn About A Gene of Interest (GOI)?

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## *Interactions*

### **Physical Interactions**

- What proteins physically associate with the protein encoded by the GOI?
- What proteins co-localize with the protein encoded by the GOI?

### **Genetic Interactions**

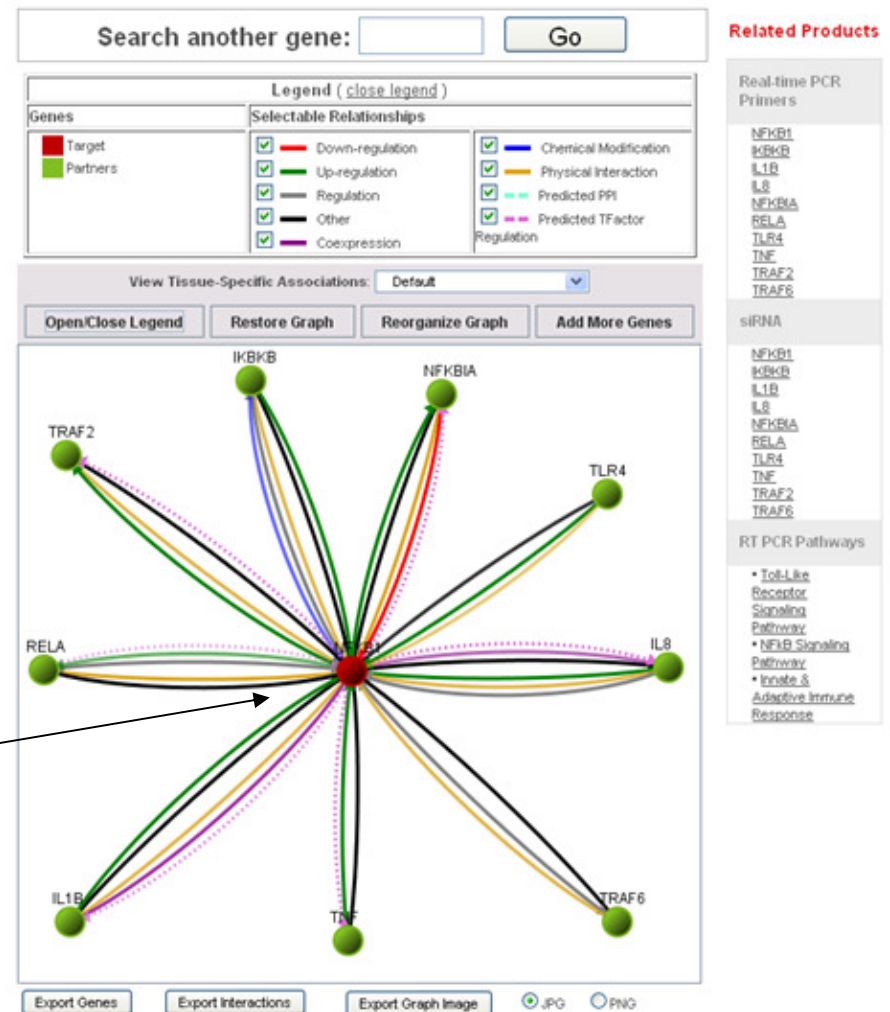
- What genes interact with the GOI genetically?

### **Transcriptional Co-expression**

- Which genes are negatively correlated with expression of the GOI?
- Which genes are positively correlated with expression of the GOI?

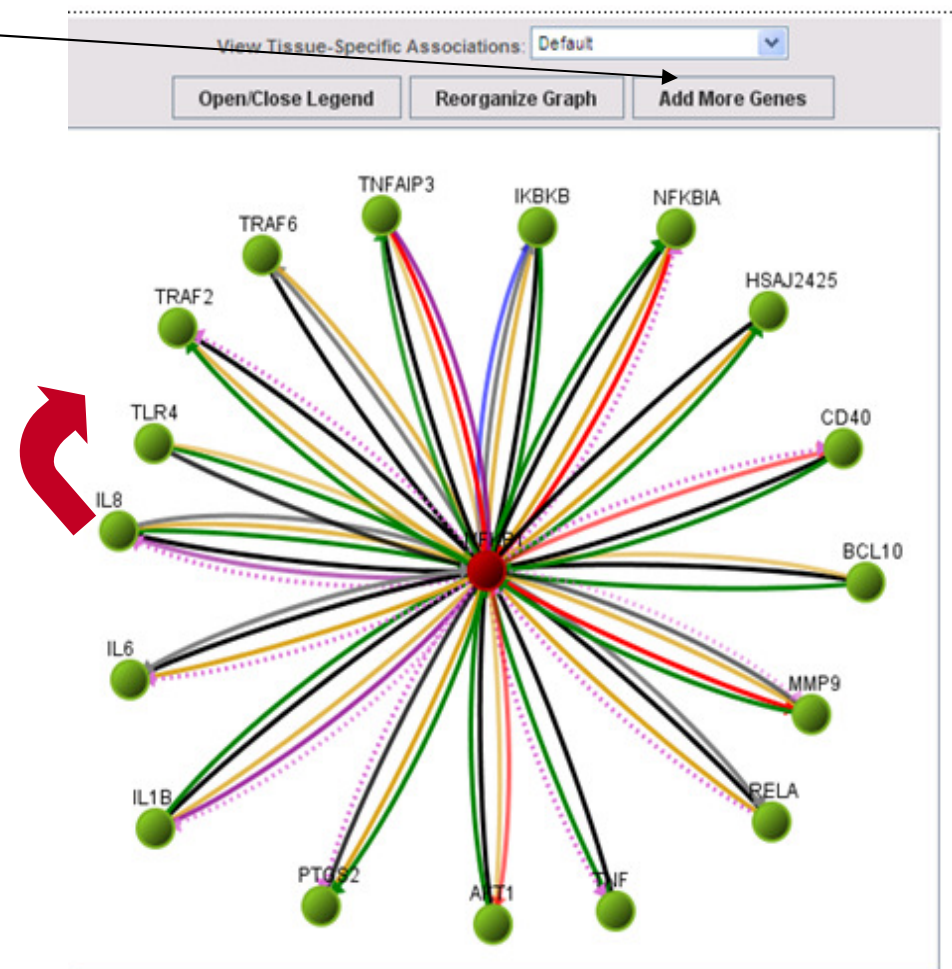
# Gene Network Central (GNC) – Getting Started

- Enter your gene of interest in the box at the center of the GNC home page
- Click on the Go button
- GNC brings up a graph like the one shown to the right, using NFKB1 as the Gene of Interest (GOI)



# Expanding the Gene Network

- Click “Add More Genes” to bring more genes that are associated with your gene of interest
- Click “Reorganize Graph” to get a better organized image
- Drag the nodes around to customize the view
- Right click a node to delete it from your network
- To view the gene network for an alternative gene, right click on the node for that gene and select “View Gene-Centered Network”

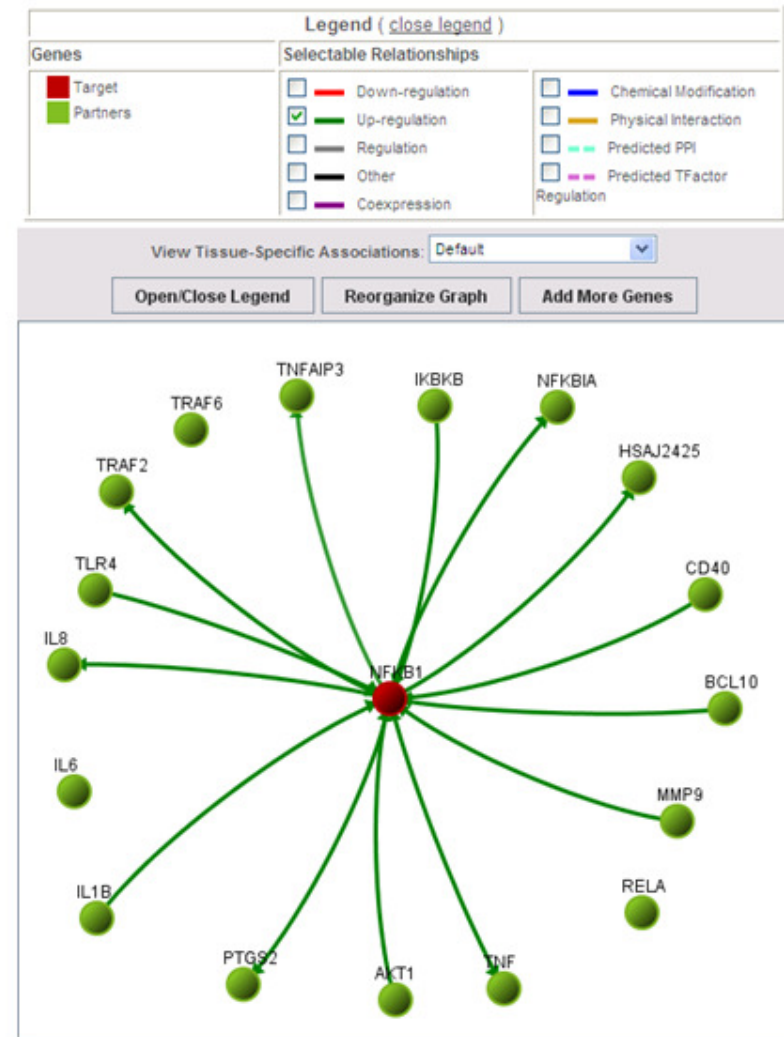


# Identifying Specific Types of Relationships

- If you are interested in the genes that positively regulate the GOI, or are positively regulated by the GOI:

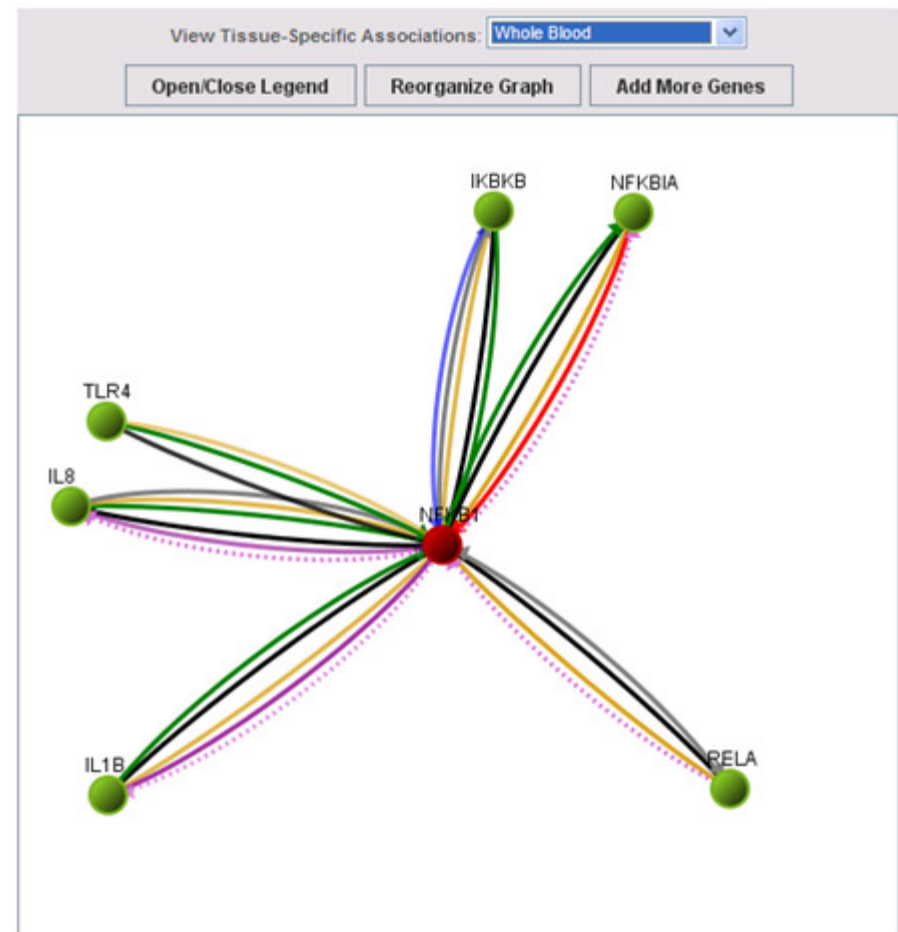
In the legend panel, you can de-select all the relationships except the “Up-regulation” feature

- The image to the right shows genes that up-regulate the GOI, or are up-regulated by the GOI.



# Investigating Tissue-Specific Associations

- To see which genes are expressed in a tissue of interest, use the “View Tissue-Specific Association” drop-down menu to view known associations for the tissue of interest.
- The image to the right shows associations that have been reported from normal human blood samples.



# Accessing the Literature

To determine if a given association is supported by a published research article, click the edge (line) connecting the two genes. If there is a supporting paper, you will be able to view the PubMed abstract.

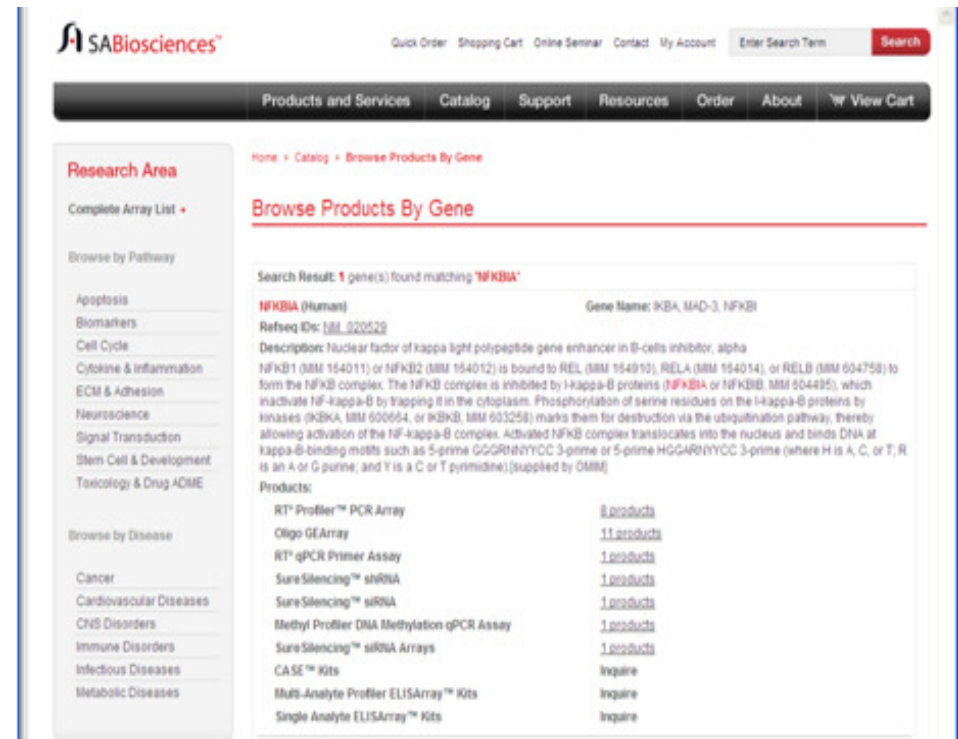


The screenshot shows a web browser window titled "18 selected items - PubMed Results - Windows Internet Explorer". The address bar shows the URL: <http://www.ncbi.nlm.nih.gov/entrez/Query.fcgi?db=PubMed&cmd=showDetailView&...>. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The address bar has a search engine dropdown set to Google. The browser's toolbar shows various icons for navigation and search. The main content area displays the PubMed abstract for the article "Bcl10 activates the NF-kappaB pathway through ubiquitination of NEMO." by Zhou H, Wertz J, O'Rourke K, Ulfisch M, Seshagiri S, Eby H, Xiao W, Dixit VM. The abstract text describes the role of Bcl10 in NF-kappaB activation and the mechanism of NEMO ubiquitination. The abstract is followed by a list of related articles and a section titled "Cited by 43 PubMed Central articles".



# Accessing Gene-Specific Information

- If you would like to learn more about a specific gene on the gene network image, click on the node for that gene.
- For example, the image to the right shows the page that would be brought up from the SABiosciences website describing the NFKB1A gene.
- Information about the SABiosciences' products that are available for studying the NFKB1A gene are accessible from this page.



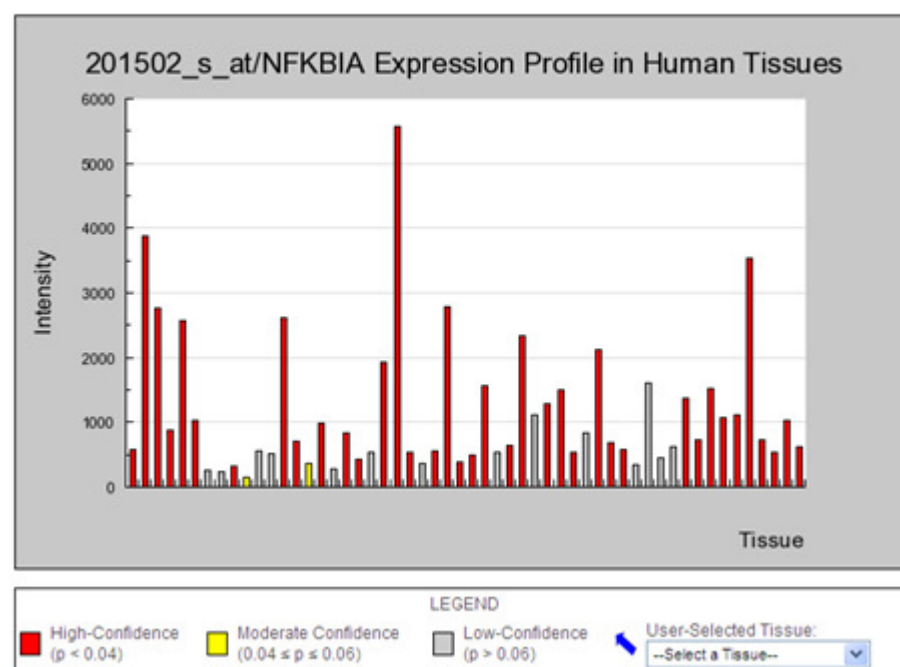
The screenshot displays the SABiosciences website interface. At the top, there is a search bar and navigation links for 'Quick Order', 'Shopping Cart', 'Online Seminar', 'Contact', and 'My Account'. Below this is a main navigation menu with options like 'Products and Services', 'Catalog', 'Support', 'Resources', 'Order', 'About', and 'View Cart'. The page is titled 'Browse Products By Gene' and shows search results for 'NFKB1A (Human)'. The search result includes the gene name, RefSeq ID (NM\_020529), and a detailed description of the gene's function and its role in the NF-kappa-B signaling pathway. A list of products is provided, including RT<sup>2</sup> Profiler<sup>™</sup> PCR Array, Oligo GEArray, RT<sup>2</sup> qPCR Primer Assay, SureSilencing<sup>™</sup> shRNA, SureSilencing<sup>™</sup> siRNA, Methyl Profiler DNA Methylation qPCR Assay, SureSilencing<sup>™</sup> siRNA Arrays, CASE<sup>™</sup> Kits, Multi-Analyte Profiler ELISArray<sup>™</sup> Kits, and Single Analyte ELISArray<sup>™</sup> Kits.

# Viewing Expression Profiles Across Tissues

- After right clicking on a node from a network diagram, you also have the option of clicking on “View Tissue Expression”.
- The image to the right shows the page that would be brought up that reports what is known about the expression profile of the NFKB1A gene across different human tissues.

## NFKB1A Tissue Expression Profile

Instructions: Mouse over bars to get the tissue and intensity reading.

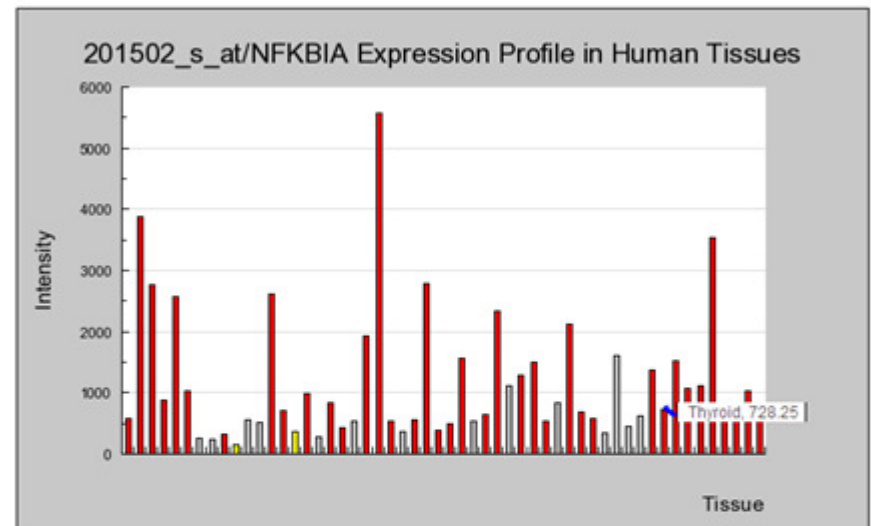


# Viewing Tissue-Specific Expression Results

- To quickly determine the expression of your GOI in a specific tissue, use the “User Selected Tissue” pull-down menu.
- The image to the right displays the data for NFKB1A expression in thyroid tissue.
- The average signal strength from the GNF data set, for the [201502\_s\_at] probe targeting NFKB1A, is 728.25, with a p-value <0.04.

## NFKB1A Tissue Expression Profile

Instructions: Mouse over bars to get the tissue and intensity reading.



Click Probe ID to switch dataset

<a href="#">GNF (Human)</a>	<a href="#">[201502_s_at]</a>
<a href="#">HuGE Dataset</a>	<a href="#">[M69043_at]</a>
<a href="#">U. of Tokyo Dataset</a>	<a href="#">[201502_s_at]</a>

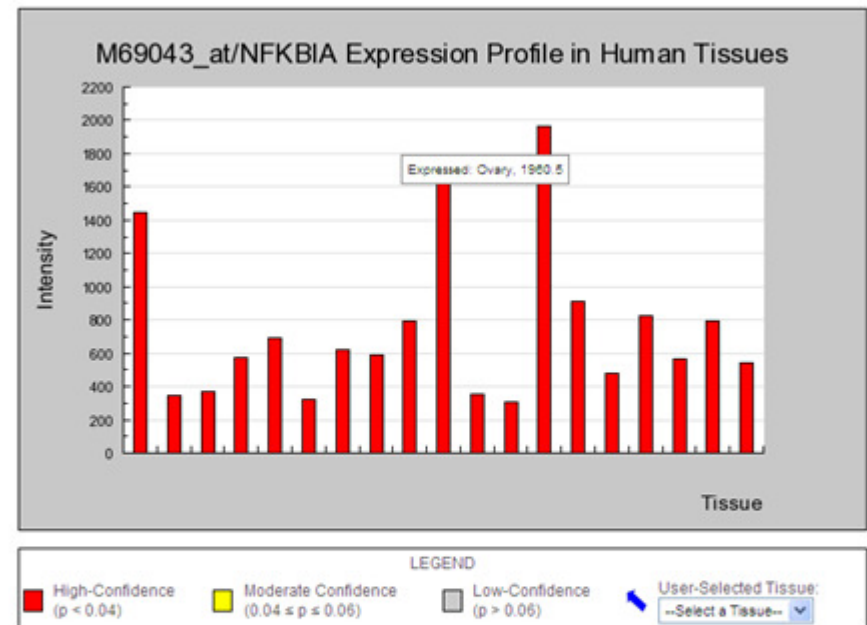
[Close Window](#)

# Accessing Multiple Database Results

- Results from three microarray data sets are integrated into the GNC database.
  - GNF
  - HuGE
  - Univ. of Tokyo
- Click on each dataset, to view the results from that database, to assess the agreement of results across these data sets.
- You can also mouse-over the bar to view from which tissue the record came.

## NFKBIA Tissue Expression Profile

Instructions: Mouse over bars to get the tissue and intensity reading.



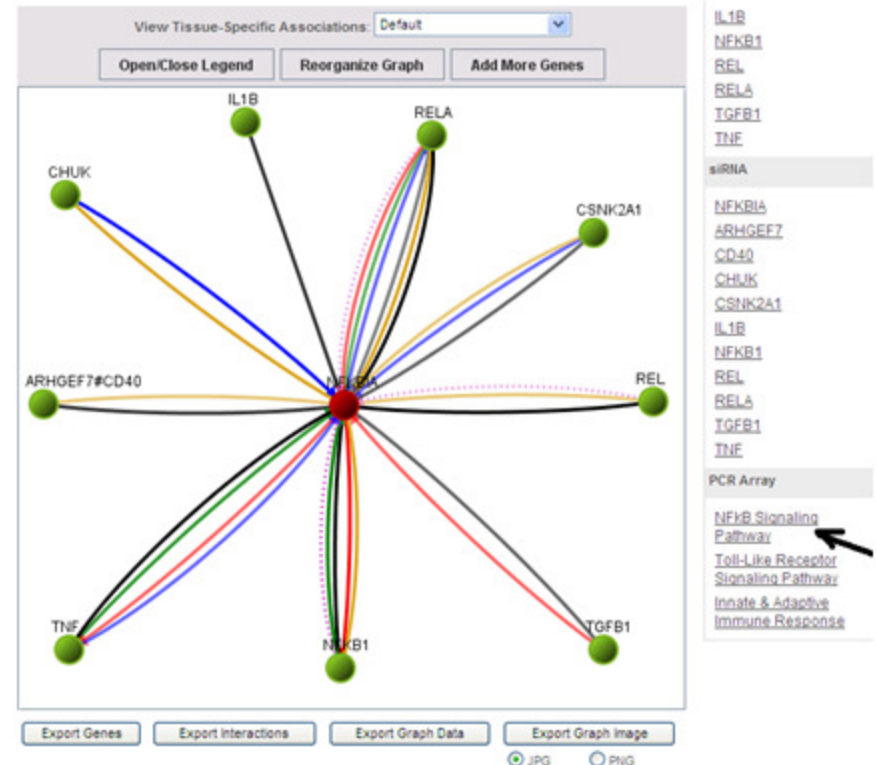
Click Probe ID to switch dataset

<a href="#">GNF (Human)</a>	[201502_s_at]
<a href="#">HuGE Dataset</a>	[M69043_at]
<a href="#">U. of Tokyo Dataset</a>	[201502_s_at]

Close Window

# Finding Relevant SABiosciences Products

- In order to access information on qPCR Primer Assays or siRNA for genes displayed on the gene network diagram, click on the appropriate link to the right of the network diagram.
- In order to investigate the pathways that include genes displayed on the network diagram, click on the pathway found on the lower right hand side of the network diagram.



# Finding the Right PCR Array

- Clicking on a pathway hyperlink will bring up:
  - Pathway description
  - PCR Array Gene Tables
  - “How It Works” tutorial
  - Technical Resources
  - Related product links

## NFκB Signaling Pathway PCR Array

Human Mouse Rat

**Human NFκB Signaling Pathway PCR Array** [Price & Ordering](#)

The Human NFκB Signaling Pathway RT<sup>2</sup>Profiler™ PCR Array profiles the expression of 84 key genes related to NFκB-mediated signal transduction. The array includes genes that encode members of the Rel, NFκB, and IκB families, NFκB-responsive genes, extracellular ligands and receptors that activate the pathway, and kinases and transcription factors that propagate the signal. NFκB-mediated signal transduction has been implicated in the regulation of viral replication, autoimmune diseases, the inflammatory response, tumorigenesis and apoptosis. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes involved in the NFκB signal transduction pathway with this array.

Both 96-well and 384-well (4 x 96) formats are available. Available for cells, tissues, FFPE samples and small samples.

[HOW IT WORKS](#)  
Protocol Guide

Functional Gene Grouping [How It Works](#) [Manual & Resources](#) [Reagents & Software](#)

[Modify this Array](#) [Gene Table](#)

**Activation of NFκB pathway**

Ligands and receptors: IL1B, IL6, MYD88, TLR1, TLR2, TLR3, TLR4, TLR5, TLR6, TNF, TNFRSF10A, TNFRSF10B.

Membrane molecules: IRAK1, IRAK2.

Kinases: CHUK, IKKα, IKKβ, IRAK1, IRAK2.

IκB kinase/NF-κB cascade: EDARADD, IKKα, IKKβ, STAT1, TLR6.

Cytoplasmic signaling molecules of NF-κB: BCL3, IL10, NLRP12, NFκB1, CD27 (TNFRSF7), TNFRSF14.

Transcription factors: IKKα, IKKβ, IRAK1, NFκB1, NFκB2, REL, STAT1, TNF.

Inflammatory response: IL1B, IL6, IRAK2, MYD88, NFκB1, TLR1, TLR2, TLR3, TLR4, TLR5, TLR6, TNF.

**Positive regulation of IκB kinase/NF-κB cascade**

Ligands and receptors: CD40 (TNFRSF5), F2R, FASLG (TNFRSF6), HTR2B, LTBR, SLC28A1, TICAM2, TNFRSF1A, TNFRSF10, TICAM1 (TRIF).

Membrane molecules: EDG2, GJA1, HMOX1, RHOA.

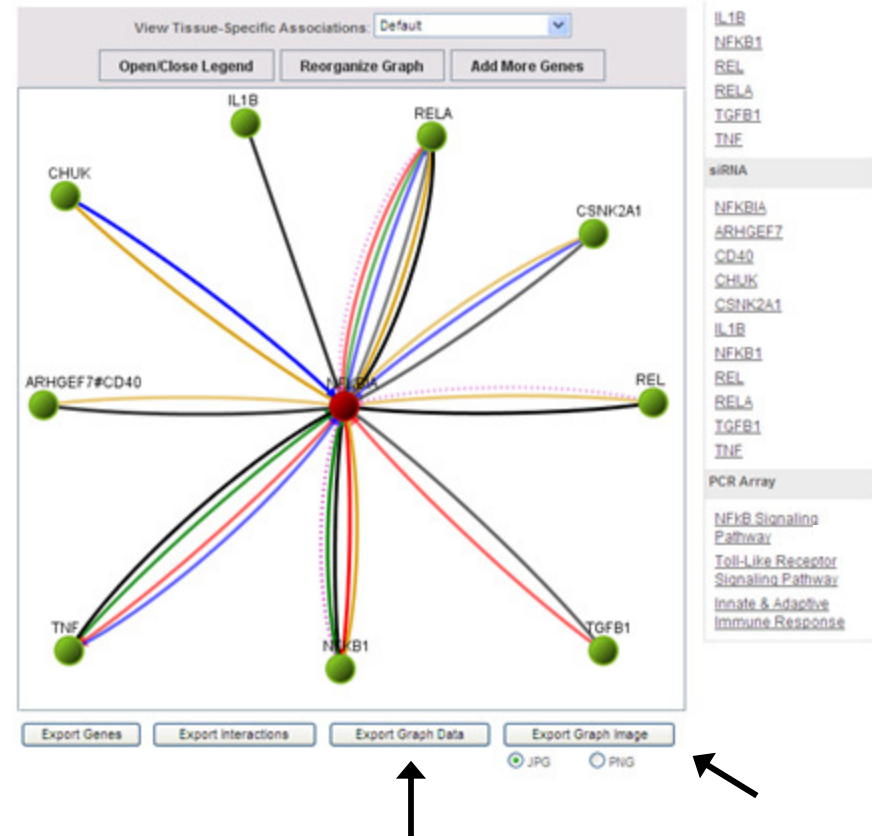
Kinases: IKKα, IKKβ, RIFK1, TBK1.

Other: BCL10, BIRC2, NOD1 (CARD4), CASP1, CASP8, CFLAR, SLC44A2 (CTL2), FADD, MALT1, PPM1A, REL, TRAF1/3 (RFP2), TRAF4 (RNF1), TRADD.

**NFκB Responsive Genes**

# Saving Gene Network Central Results

- In order to export any graphic as a jpg or png formatted picture, click on the “Export Graph Image” button below the gene network image.
- In order to export the records for the relationships displayed on the gene network image, in a spread sheet file, click on the “Export Interactions” button below the gene network image.



# Contact Us

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- If you have any questions on using Gene Network Central, please drop us a note at [support@SABiosciences.com](mailto:support@SABiosciences.com) or call our Technical Support team at 1-888-503-3187.