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APPENDICES

APPENDIX A

Buffers and Reagents

SDS-PAGE

Stock acrylamide

Acrylamide	15	g
N,N-methylenebisacrylamide	0.4	g
DW	50	ml

Lower gel tris

Tris-base	3.643	g
SDS	0.080	g
DW	20	ml

Adjust to pH 8.8 with 12 N HCL and filter through o.45 µl membrane

Upper gel tris

Tris-base	1.204	g
SDS	0.080	g
DW	20	ml

Adjust to pH 6.8 with 12 N HCL and filter through o.45 µl membrane

Sample buffer (dye marker)

Tris-HCL	0.0985	g
SDS	0.4	g
Glycerol	1	ml
2-ME	0.5	g
Bromphenol blue	10	mg

Adjust to pH 6.8 using 1 N NaOH and add DW to 10 ml

2 % Ammonium persulfate

Ammonium persulfate	40	mg
DW	2	ml

Seperating gel 7.5 %

Stock acrylamide	0.85	ml
Lower gel tris	0.85	ml
DW	1.53	ml
TEMED	2.72	µl
2 % Ammonium persulfate	0.17	ml

Stacking gel 5 %

Stock acrylamide	0.332	ml
Lower gel tris	0.5	ml
DW	1.12	ml
TEMED	2	µl
2 % Ammonium persulfate	40	µl

Electrophosis buffer (running buffer)

Tris-base	1.2	g
Glycine	5.76	g
SDS	0.4	g
DW	400	ml

Coomassie Staining

Stain

Coomassie Brilliant Blue R	0.91	g
Acetic acid	45	ml

MeOH	215	ml
DW	240	ml

Destain

Acetic acid	90	ml
MeOH	430	ml
DW	480	ml

Amido black staining

Stain

Amido black	0.01	g
MeOH	45	ml
Acetic acid	10	ml
DW	45	ml

Destain

MeOH	90	ml
Acetic acid	2	ml
DW	8	ml

WESTERN BLOT REAGENTS

Protein Transfer Buffer , pH 8.3

Tris-base	1.93	g
Glycine	9.0	g
DW	1000	ml

20x Tris-Buffer Saline (TBS), pH 7.5

Tris-base	24.228	g
NaCl	175.32	g
DW	1000	ml

TTBS (0.05 % Tween 20)

Tween 20	0.5	ml
TBS	1000	ml

Blocking Solution (5 % non-fat dried milk, 2 % BSA)

Milk	5	g
BSA	2	g
TBS	100	ml

ECL REAGENTS

90 mM p-Coumaric acid stock solution

p-Coumaric acid	0.015	g
DMSO	1	ml

Store in the dark at 4 °C

250 mM Luminol stock solution

Luminol	0.043	g
DMSO	1	ml

Store in the dark at 4 °C

100 mM tris pH 8.0, sterilize by autoclaving

Tris		1.2114	g
BW		100	ml
Solution A: 5 ml	100 mM tris pH 8.0	5	ml
	90 mM Coumaric acid	22	µl
	250 mM Luminol	50	µl
Solution B: 5 ml	100 mM tris pH 8.0	5	ml
	3 % H_2O_2	30	µl

APPENDIX B

Image processing Global Lab Image/2 (GLI/2) software

1. Main application of Windows

The main Window of this program shown in Figure A.

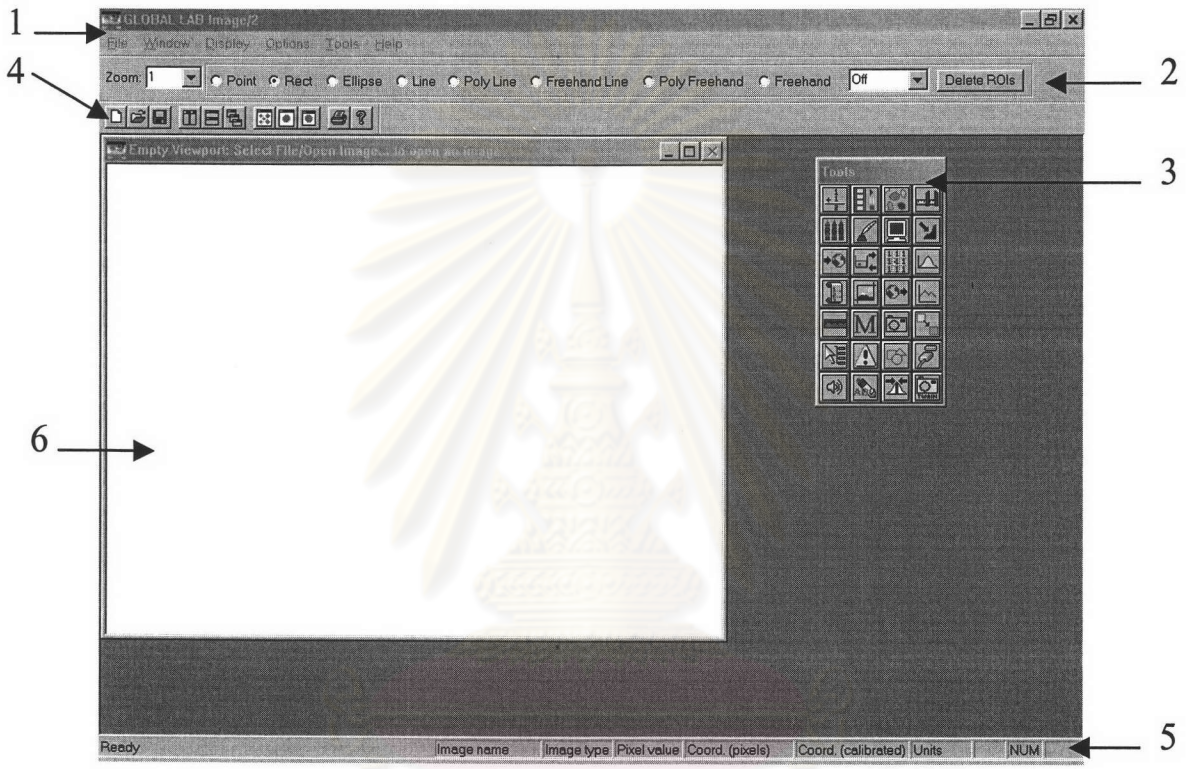

Figure A. Main Window of GLI/2

1. File Menu Options
2. ROI Type
3. Tool box
4. Toolbar
5. Status Bar
6. Viewport

1.1. File Menu Options

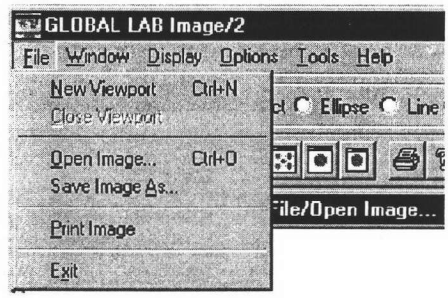

Figure B

New Viewport

Select this option to create a new viewport so that you can view an image. The new viewport becomes the active viewport.

Close Viewport

Select this option to close the active viewport and delete any ROIs attached to the viewport.

Open Image

Select this option to open an image from disk. The image must be stored in standard Windows bitmap format (noncompressed). The image can be opened as a binary, 8-bit grayscale, 16-bit grayscale, 32-bit grayscale, floating-point grayscale, 24-bit RGB (Red/Green/Blue), or 24-bit HSL (Hue/Saturation/Luminance) color image. By default, the image is opened as an 8-bit grayscale image.

Save Image As

Select this option to save the image in the active viewport as a standard Windows bitmap file.

Print Image

Select this option to print the image exactly as it is seen in the active viewport. Zoomed images print exactly as seen. Images are printed as large as possible while keeping their aspect ratios.

Exit

Select this option to close the application and all open tools.

1.2. ROI Type

The ROI type can be specified by using the ROI menu bar which refer to Figure C or Options / ROI Type from the main application. The ROI Manager tool shown in Figure D.

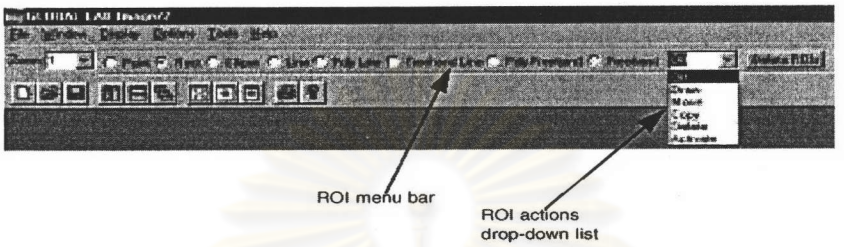

Figure C

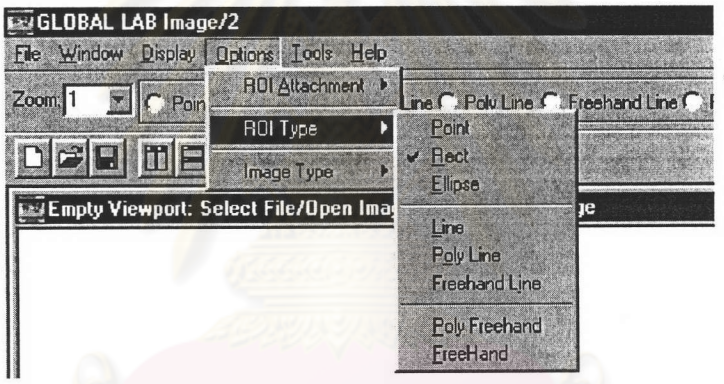

Figure D

An ROI is a region of interest. It it is the portion of an image to manipulate. This section contains additional information about ROIs.

GLI/2 provides eight different types of ROIs. Each ROI is created, moved, copied, selected, used, and deleted in the same way. The ROI type that has been selected determines the type of ROI that is created.

An ROI is a region of interest. It is the portion of an image that you want to manipulate. This section contains additional information about ROIs.

GLI/2 supports the following types of ROIs: Point, Rectangle, Ellipse, Line, and Poly line.

1.3. Toolbox

The Toolbox and Tools/show Toolbox from the main application that holds all the loaded tools were shown in Figure E and F, respectively. To use a tool in the Toolbox, click on the tool icon.

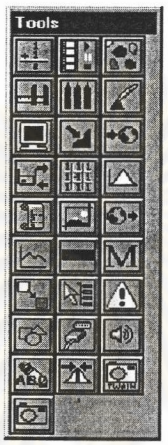

Figure E

Figure F

1.4. Toolbar

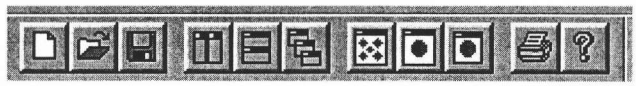

Figure G

The first three buttons on the toolbar correspond to the following menu options:File /New viewport, File/Open Image, File/Save Image As.

The next three buttons on the toolbar correspond to the following menu options: Window /Tile Vertical, Window /Tile Horizontal, Window/Cascade

The next three buttons on the toolbar correspond to the following menu options: Display/Image Display Mode/Size Image to Viewport, Display/Image Display Mode/Show Image Actual Size, Display/Image Display Mode/Fit Viewport to Image

The last two buttons on the toolbar correspond to the following: File/ Print Image menu option, Shows the About box for GLI/2

1.5. Status Bar

The status bar is displayed in the lower right corner of the main application window. An example status bar is shown in Figure H.

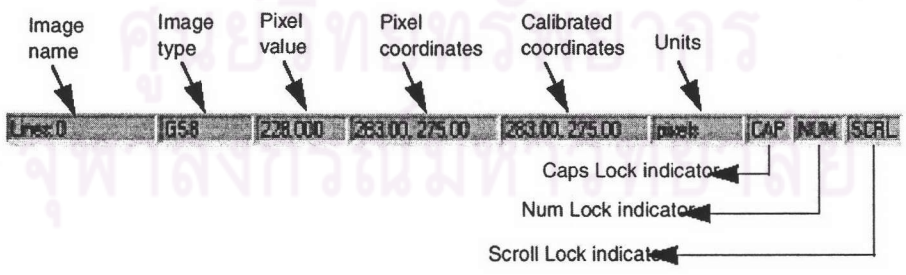

Figure H

The items shown in the status bar are described as follows:

Image name – the name of the image in the active viewport.

Image type – the type of image in the active viewport

Pixel value – the value of the pixel at the current cursor location.

Pixel coordinates – the location (x, y) of the pixel at the currentncursor location, where 0,0 refers to the lower-left corner of the image.

Calibrated coordinates – the location (x, y) of the pixel at the current cursor location in calibrated units (if the image has an attached calibration object).

Units – the unit of measure that GLI/2 uses to perform its calculations. By default, GLI/2 uses pixel measurements. If the image has an attached calibration object, GLI/2 displays the measurements in calibrated units.

Caps Lock indicator – CAPS indicates that the Caps Lock key is ON (alphabetic characters on the keyboard are shifted to uppercase).

Num Lock indicator – NUM indicates that the Num Lock key is ON (the numeric keypad on the keyboard is activated).

Scroll Lock indicator – SCRL indicates that the Scroll Lock key is ON (the cursor control keys on the keyboard are affected).

1.6. Viewport

A viewport is a window in which to view an image. Each viewport contains a view and a title bar. The view portion of the viewport is the portion actually showing the image. The title bar contains information about the viewport. Viewports also have scrollbars that you can be used to move the image around if the image does not fit inside the viewport. Figure I shows open viewports with image eNOS standard.

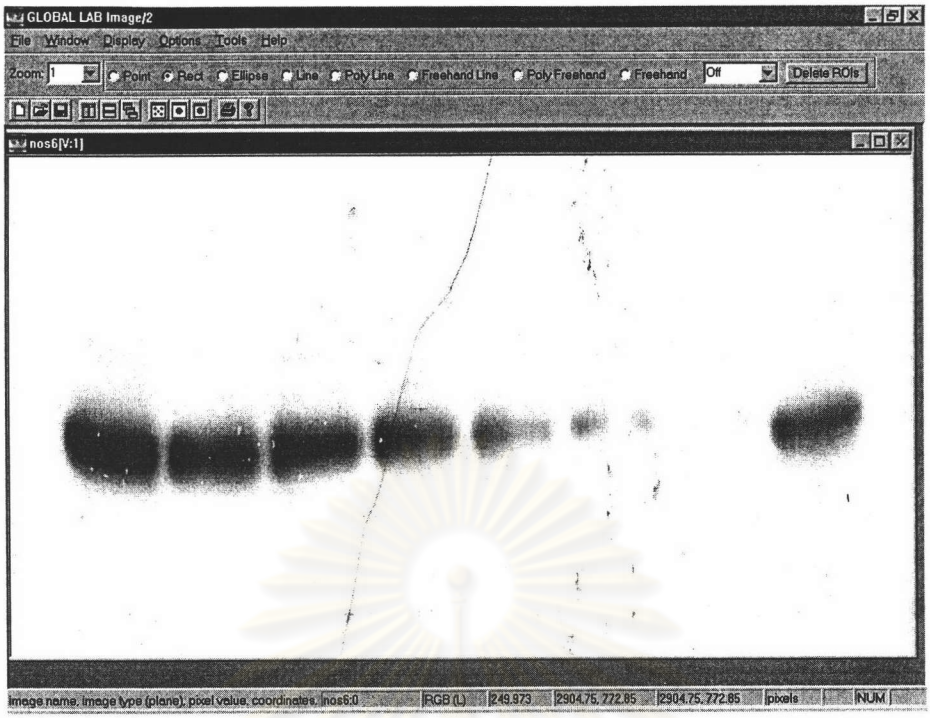

Figure I

2. Using the File Manager Tool

To open a File Manager Tool, select the  icon from the Toolbox or select File Manager from the Tools menu (see Figure J).

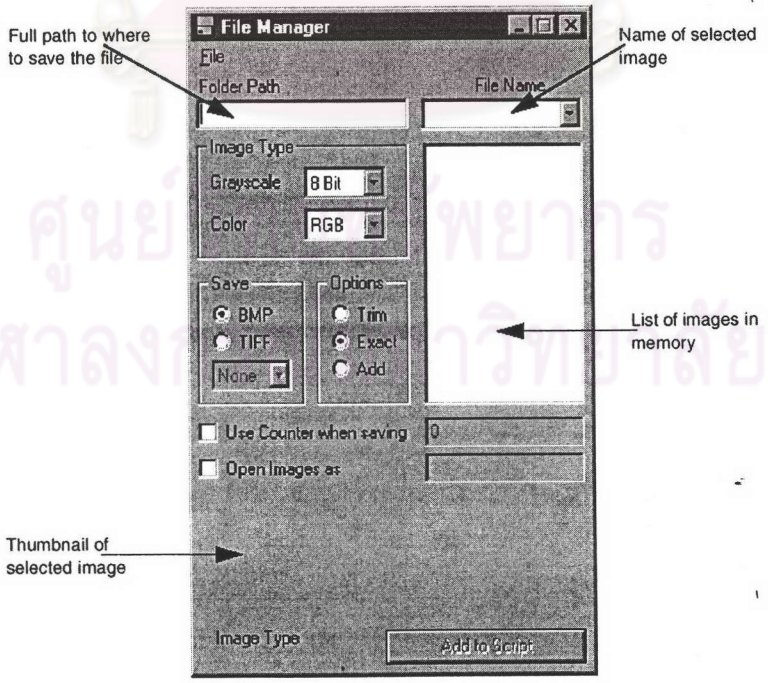

Figure J

File Manager Tool allows to open many popular file formats. It also open a mixture of color and grayscale images of different image types without being concerned with file conversion.

3. Using the Edge Finder Tool

To open an Edge Finder Tool, select the  icon from the Toolbox or select Edge Finder from the Tools menu (see Figure K).

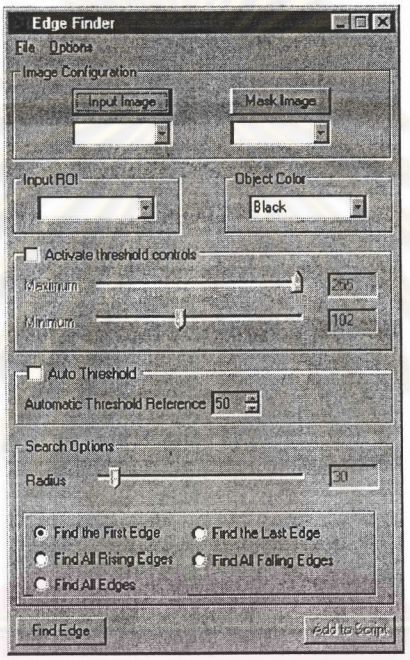

Figure K

The Edge Finder Tool allows to extract points, edges, or contours from a binary image.

4. Using the Histogram Tool

To open a Histogram Tool, select the  icon from the Toolbox or select Histogram from the Tools menu (see Figure L).

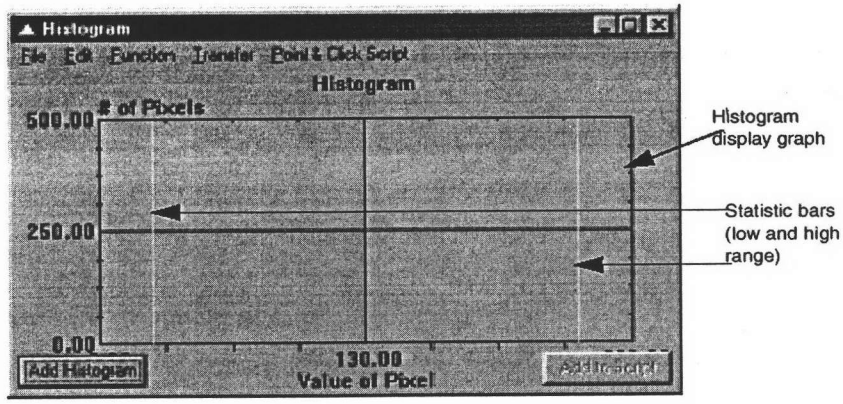

Figure L

The Histogram Tool allows tocreate histograms of images. Up to 100 histograms can be loaded to the same graph. The histograms can be added from multiple images and from multiple viewports. Histogram data can be transferred directly to the Microsoft Excel worksheet program.

APPENDIX C

Lists of Publications

1. Yoysungnoen, P., Wirachwong, P., Bhattarakosol, P., Niimi, H., and Patumraj S. Antiangiogenic activity of curcumin in Hepatocellular carcinoma cells implanted nude mice. *Clinical Hemorheology Micro*, 2005 (in press).

2. Patumraj S., Yoysungnoen, P., Kachonrattanadet, P., and Wirachwong, P. Tumor neocapillary density in Hepatocellular carcinoma cells implanted nude mice model. *Clinical Hemorheology Micro*, 2005 (in press).

BIOGRAPHY

NAME	Miss Pornprom Yoysungnoen
DATE OF BIRTH	October 18, 1971
PLACE OF BIRTH	Nakornratchasima, Thailand
INSTITUTIONS ATTENDED	Khonkaen University, 1988-1991: Bachelor of Nursing Changmai University, 1993-1997: Master of Science (Physiology) Chulalongkorn University, 2000-2004 Ph.D. candidate (Physiology)
POSITION&OFFICE	1991-1992 Registered Nurse Intensive Care Unit, Payathai 2 Hospital 1998-present Lecturer Faculty of Medical Science, Naresuan University
RESEARCH GRANTS	Thai Asahi Glass Foundation Chulalongkorn University and the Ministry of University Affairs, Thailand

LISTS OF PUBLICATIONS

1. Yoysungnoen, P., Wirachwong, P., Bhattarakosol, P., Niimi, H., and Patumraj S. Antiangiogenic activity of curcumin in Hepatocellular carcinoma cells implanted nude mice. *Clinical Hemorheology Micro*, 2005 (in press).

2. Patumraj S., Yoysungnoen, P., Kachonrattanadet, P., and Wirachwong, P. Tumor neocapillary density in Hepatocellular carcinoma cells implanted nude mice model. *Clinical Hemorheology Micro*, 2005 (in press).