Invitrogen™
life technologies

Instruction Manual

E-Gel® *96* Editor Software

For Macintosh®

Version A
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Installation

Downloading and Installing E-Gel® *96* Editor for Macintosh®

The E-Gel® *96* Editor for Macintosh® installation file can be downloaded for free from the Invitrogen Web site.*

1. Go to the E-Gel® product page at www.invitrogen.com/egels and follow the links to the **E-Gel® *96* Editor Software download** page.

2. Follow the instructions on the page to download the Macintosh® installation file (**E-Gel 96 Editor.sit** or **E-Gel 96 Editor.hqx**) to your computer.

3. After downloading the file, double-click on it to unstuff the application. If your computer does not include the StuffIt™ Expander utility, you can download a version for free from www.stuffit.com.

4. The **E-Gel 96 Editor** folder, containing the program and associated files, will be extracted into the same location as the .sit file. You can move this folder anywhere on your hard drive.

*If your computer is not connected to the Internet, you can download the file to another computer and copy it to a removable disk for installation. If you do not have Internet access, contact Technical Service (see page 16) to obtain a copy of the file.

Computer Requirements

The following are the <u>minimum</u> system requirements for running E-Gel® *96* Editor for Macintosh®:

|	
Operating system:	Mac OS 8.5 or higher (OS X w/ OS 9 emulation only)
Computer:	G3 Power Mac or higher
Built-in memory:	128 MB or higher

QuickTime™ Requirement

E-Gel® *96* Editor for Macintosh® requires that QuickTime™ version 4.5 or later be installed on your Macintosh® to display images. QuickTime™ can be downloaded for free from: http://www.apple.com/quicktime/

Installation, continued

Memory Settings   The default application memory setting for E-Gel® 96 Editor on the Macintosh® is designed for a typical image size of about 1 MB. If your images are larger than this, you may experience system memory problems using the application. You can increase your virtual memory allocation by following the steps below:

1. With the program closed, locate and select the **E-Gel 96 Editor** application icon on your Macintosh® hard drive (do not select a shortcut icon; select only the original program icon).

2. On the Macintosh® Desktop, go to the **File menu** and select **Get Info**, and then select **Memory**.

3. In the Memory settings dialog, set *both* the **Preferred Size** and **Minimum Size** to approximately 20 times the typical image size. For example, if your images are around 2 MB (2000 K), change both sizes to 40000 K.
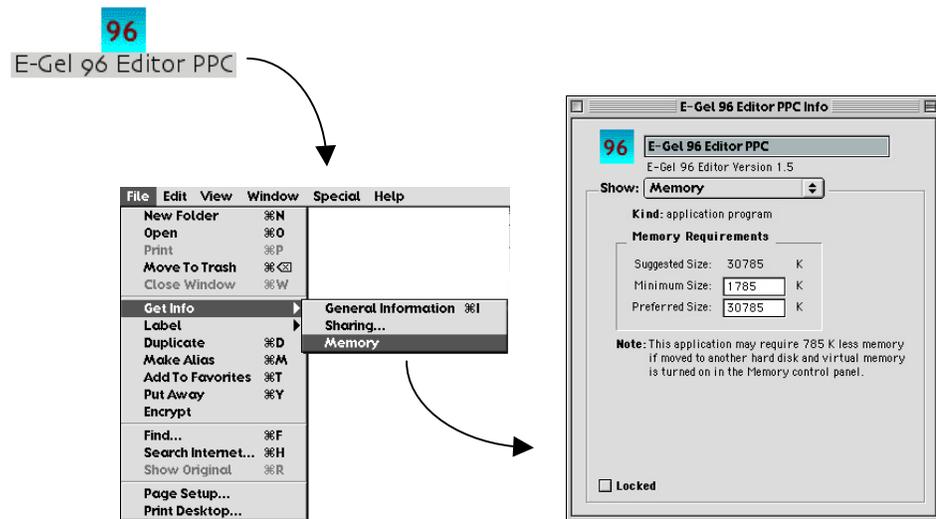
Note

- If the built-in memory on your Macintosh® is lower than 128 MB, increasing the virtual memory may not help with large images.

- A higher minimum virtual memory setting for E-Gel® 96 Editor may make it difficult for you to run other applications (which also require memory), particularly if your built-in system memory is 128 MB or less. Select the smallest memory setting necessary for the program to run smoothly.

Introduction

Welcome to E-Gel® *96* Editor for Macintosh	E-Gel® *96* Editor software for Macintosh® allows you to quickly reconfigure digital images of E-Gel® *96* gels for analysis and documentation. The staggered lanes in an E-Gel® *96* gel can be difficult to compare and analyze using standard 1-D gel analysis programs such as Bio-Rad's Quantity One, Phoretix 1D, or Kodak 1D software. E-Gel® *96* Editor reconfigures the staggered wells into a side-by-side format for easy comparison and analysis.
	After scanning or capturing a digital image of an E-Gel® *96* gel, open the image in E-Gel® *96* Editor and follow the steps described in this manual to align and arrange the lanes in the image. Then save the reconfigured image for further analysis, print the image, and/or copy and paste selected lanes or the entire image into other applications for printing, saving, e-mailing, and/or publishing on the Web.
Imaging Gels	Use a flatbed scanner or digital camera to capture a digital image of your E-Gel® *96* gel. **Note:** When imaging, the gel should be properly aligned (i.e., not at an angle), and gel features should be clear and distinct in the image.
⊕ Important	The crosshairs ⊕ molded along the sides of the E-Gel® *96* cassette are essential for aligning the image in the software, and must be clear and distinct in the image. We recommend an image resolution of 150 dpi or higher.
Supported File Formats	After imaging, save the image in one of the file formats supported by E-Gel® *96* Editor for Macintosh® listed below:

- tiff
- bitmap
- gif
- jpeg

- png
- pict
- Quicktime

Note: If you will be analyzing the gel image using an analysis software program, be sure to save the image in a format supported by that program.

Compatible Image Analysis Software	Images edited by E-Gel® *96* Editor can be analyzed using many different biological image analysis programs, including Bio-Rad's Quantity One, Phoretix 1D, Kodak 1D, and UVP's LabWorks and GelWorks software. Consult your image analysis software documentation for the appropriate file formats.
Cropping Images	If there is uneven border space around the edges of the E-Gel® *96* image, E-Gel® *96* Editor may misalign the lanes. You may need to crop the border space using a standard image editing program such as Apple® Picture Viewer, QuickTime™ player, or Adobe® Photoshop®. Consult your image editing program documentation for detailed instructions.

Getting Started

Starting the Program

To begin running E-Gel® *96* Editor, double-click on the application icon:

The graphical interface consists of a menu bar, an image window and toolbar, and a status bar.

Workflow Overview

E-Gel® *96* Editor software is designed to guide you through the following series of steps:

1. **Aligning the Image** (page 7). In the first step, you position red targets over the cross-hairs on the gel cassette to facilitate alignment.

2. **Adjusting Lanes** (page 9). In this step, you define the lanes on the gel for reconfiguration.

3. **Copying, Printing, and Analysis** (page 12). In the final step, the reconfigured image will be displayed on the screen, and you can proceed to copying, printing, and analysis.

In each step, use the **Next button** on the main toolbar to proceed to the next step, and the **Previous button** to return to the previous step:

 Note

The image will not be reconfigured until you complete Step 2 above. When you complete Step 2, you should save the reconfigured image under a different name or in a different location if you want to preserve the original image.

Opening and Saving Images

Opening Images

To open an image in E-Gel® *96* Editor:

- Click on the **Open button** or select **Open** from the **File menu** (⌘+O) and select the image file using the **Open dialog** (see figure below); or

- Drag an image file directly into the open application window.

In the **Open dialog**, navigate to the folder containing your images and double-click on the image file name. The image will appear in the E-Gel® *96* Editor image window.
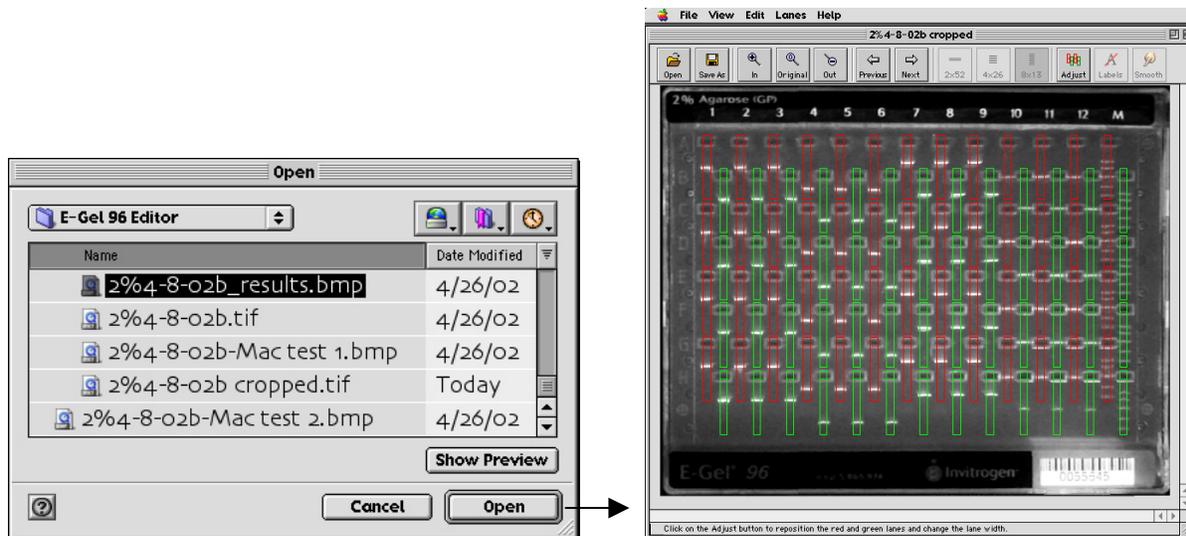
Note

- The E-Gel® *96* Editor window can contain only one image at a time; if you open another image, it will replace the current image. You will be prompted to save any changes to the current image.

- If you open an image that has already been reconfigured using E-Gel® *96* Editor, the **Previous** and **Next buttons** will be disabled, and only the options for reconfigured images will be available (changing the configuration, printing, copying, etc.). (See **Printing, Copying, and Analyzing the Image**, beginning on page 12.)

Saving Images

Click on the **Save As button** to open a dialog box in which you can save the image under the same name or a different name. This command is also on the **File menu**.

When saving images, note the following:

- E-Gel® *96* Editor will automatically append an underscore character ("_") to the original image file name, to avoid overwriting the original file. To overwrite the original file, delete this character.

- E-Gel® *96* Editor automatically adds a file extension to the image file name, based on the file format (e.g.,.jpg for jpeg images,.bmp for bitmaps).

To close an image without saving, select **Close** from the **File menu**.

Adjusting the Image Display

Magnifying Images   With the image open, click on the **Zoom In button** on the main toolbar to magnify the image, **Zoom Out** to shrink it, or **Original** to return the image to its actual size:
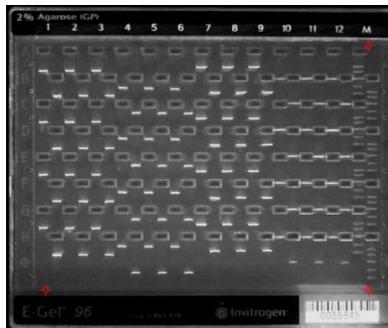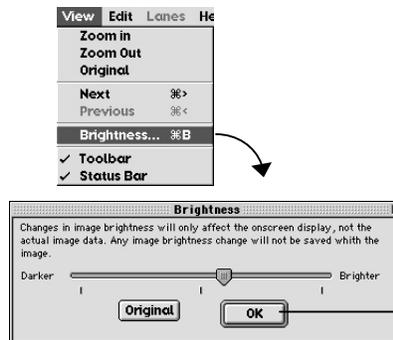

Adjusting the Image Brightness   If the image display is too bright or too dark, you can adjust it using the **Brightness** controls:

1. Go to the **View menu** and select **Brightness**.

2. In the **Brightness** dialog, drag the slider to make the image brighter or darker. To return to the original setting, click on the **Original button**.

3. When you are satisfied with the image brightness, click on **OK**. The image display will appear adjusted.
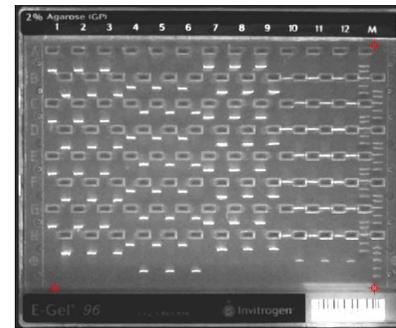
1. Image is too dark.   2. Open Brightness dialog, drag   3. Image display is adjusted
                               slider to lighten image, and click OK


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Aligning the Targets

Introduction

In this step, you prepare the image for alignment. First, make any necessary adjustments to the image orientation and brightness. Then position the three red targets displayed over the image directly over the three crosshairs ⊕ molded on the gel cassette.

Rotating the Image

If the E-Gel® *96* gel has been imaged at a 90° angle or upside-down, you can correct the orientation using the **Rotate** command.

Select **Rotate** from the **Edit menu**. The displayed image will rotate counterclockwise 90°. Select **Rotate** again to continue rotating the image.
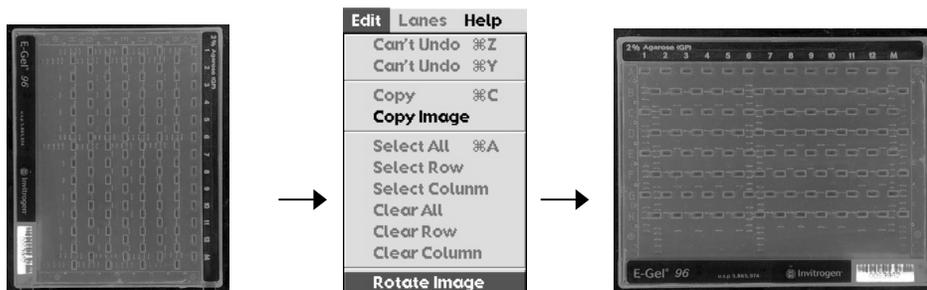
Note: This feature will change the image orientation; however, the image data (e.g., size and intensity of bands) will remain unchanged. The new orientation will be saved when you save the image.
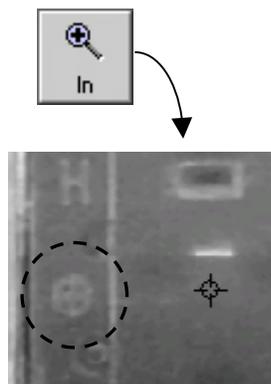
Aligning the Targets, continued

Aligning the Red Targets with the Gel Crosshairs

There are three red targets displayed over the image. To align the image, you must position these targets directly over the three crosshairs ⊕ molded on the lower left, upper right, and lower right corners of the gel cassette.
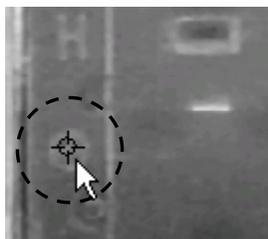
To do this, perform the following steps (see diagram below):

1. Locate a crosshair on one of the corners of the cassette. You can magnify the crosshair using the **Zoom In** tool to aid in target positioning.

2. Using your mouse:

   - **Drag** the nearest red target directly over the crosshair,

   - **Double-click** on the center of the crosshair to "jump"the target into position (you may need to fine-tune the position of the target after the jump), or

   - **Click on the target and use the arrow keys** to move the target over the crosshair.

3. Repeat this procedure for the remaining two crosshairs. Each red target should be directly aligned over a crosshair.
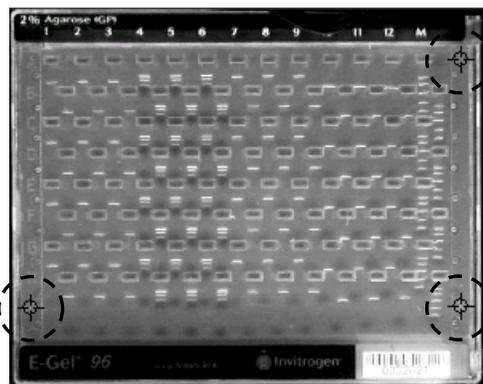
1. Magnify gel crosshair   2. Drag, double-click, or use the arrow keys to move the target   3. Repeat for all targets

Important

The red targets must be positioned *directly* over the crosshairs for correct alignment.

Completing the Alignment

When the red targets are correctly positioned, click on the **Next button** to complete the alignment step.
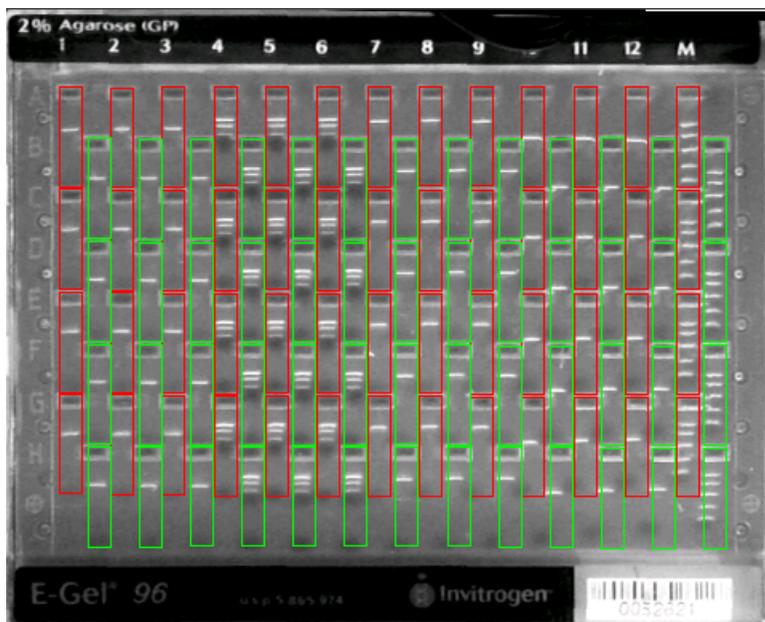
Adjusting the Lane Boxes

Lane Boxes

When you complete the alignment step, red and green lane boxes will appear overlaid on the image (see the figure below).

These lane boxes indicate how the lanes will be cropped and positioned in the final configuration. In this step, you adjust the boxes so that they surround the individual lanes in the gel without overlapping adjacent lanes.

If the image is skewed or the lane boxes are grossly out of position, click on the **Previous button** to return to the alignment step.

You can adjust all the lane boxes at the same time, or you can adjust one or more groups of boxes individually. See the following page for descriptions of both methods.

Important

If you analyze your gels using a 1-D gel image analysis software program, be careful to exclude the slopes of neighboring wells from the lane boxes. The software could misinterpret adjacent wells as bands.

Note

If you cannot successfully align the lane boxes, the image may contain border space around the edges, preventing proper alignment. Follow the steps below to remove this extra space:

1. Close the image in E-Gel® 96 Editor.

2. Open the image in an image-editing program such as Apple® Picture Viewer, QuickTime™ player, or Adobe® Photoshop® and crop any extra space around the edges of the gel (see the program documentation for detailed instructions).

3. Re-open the image in E-Gel® 96 Editor and return to the alignment step.

Adjusting the Lane Boxes, continued

Adjusting the Width or Horizontal Position of All Lane Boxes

To adjust the width and/or horizontal position of all of the lane boxes , click on the **Adjust button** or select the **Adjust** command from the **Lanes menu** to open the **Adjust Lanes** dialog box:
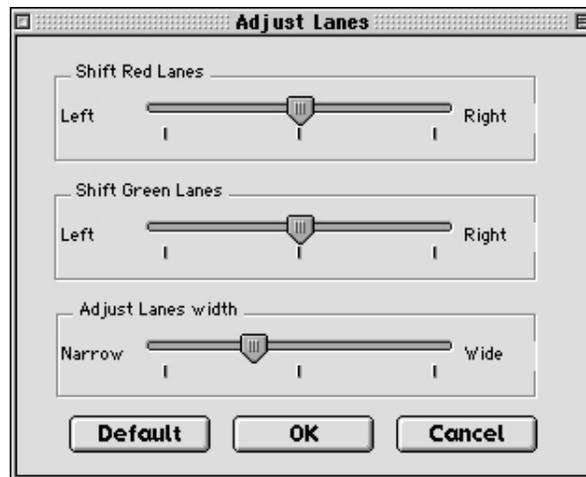
Use the **Shift Red Lanes** and **Shift Green Lanes** sliders to control the horizontal position of the lane overlays. Drag the sliders to move the red or green overlays left or right on the image.

Use the **Adjust Lane Width** slider to control the width of the lane overlays. Drag the slider to make the lanes wider or narrower.

The **Default button** resets the sliders to their default positions.

When the boxes are in the correct position, click on **OK** to close the dialog box.

Adjusting the Lane Boxes, continued

Manually Repositioning One or More Lane Boxes

To adjust the horizontal and/or vertical postion of one or more lane boxes:

1. Select the lane box or boxes:

   - To select lane boxes individually, click on them one at a time..

   - To select all the boxes in a column, select **Select Column** from the **Edit menu** and click on the column, or hold down the **Ctrl key**, click on the column, and select **Select Column** from the context menu.

   - To select all the boxes in a row, select **Select Row** from the **Edit menu** and click on the row, or hold down the **Ctrl key**, click on the row, and select **Select Row** from the context menu.

   - To select all the boxes in the image, select **Select All** from the **Edit menu** or hold down the **Ctrl key**, click on any lane in the image, and select **Select All** from the context menu.

2. Drag the lane box(es) to the new position, or use the arrow buttons on your keyboard to reposition the boxes.
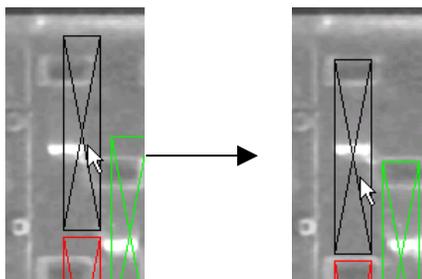
Undoing Lane Box Adjustments

To undo a manual lane box position change, select **Undo** from the **Edit menu** (⌘+Z). To redo the change, select **Redo** (⌘+Y).

Saving Alignment Settings

To save the aligned lane boxes for use on similar gel images:

1. Reconfigure the lane boxes as desired.

2. Select **Export Settings** from the **Lanes menu**.

3. In the **Export Settings dialog**, enter a name for the settings and save them in an approriate location on your computer.

To recall saved settings on a new image:

1. With the image open and lane boxes displayed, select **Import Settings** from the **Lanes menu**.

2. In the dialog, select the settings file to open.

3. The lane boxes will be reconfigured based on the saved settings.

Completing the Adjustment

Confirm that the lane boxes completely surround the lanes in the gel without overlapping adjacent lanes. When you are satisfied with the position of the overlays, click on the **Next button** to complete the step.

Printing, Copying, and Analyzing the Image

Displaying the Configured Lanes

When you complete the adjust lanes step, the gel image will appear reconfigured in the application window:
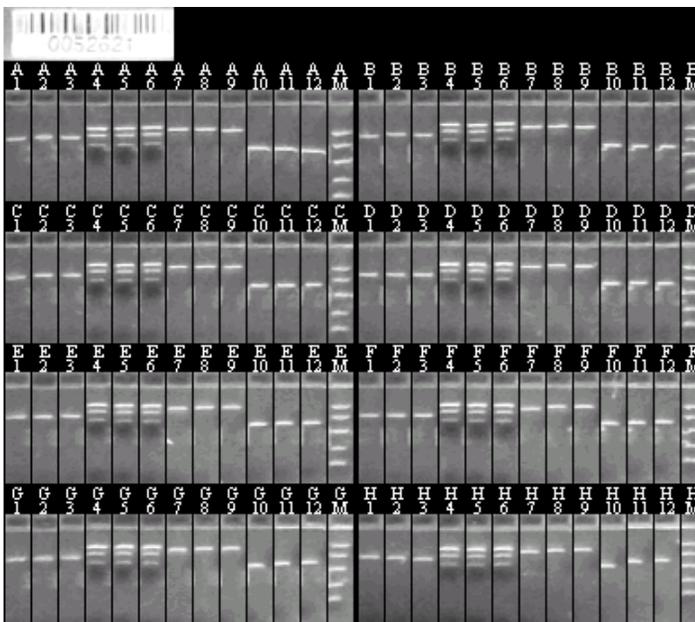
All of the lanes in each row will appear side-by-side for easy comparison. To change the configuration, click on the desired configuration button to rearrange the rows and columns in the image:

Hiding and Displaying Lane Labels

The labels marking each lane (A1, A2, A3, etc.) can be displayed or concealed for copying, printing, and publishing purposes. Click on the **Labels button** to hide the labels, and click on it again to display the labels.
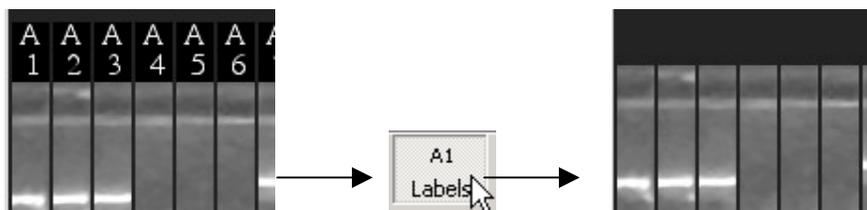
Printing, Copying, and Analyzing the Image, continued
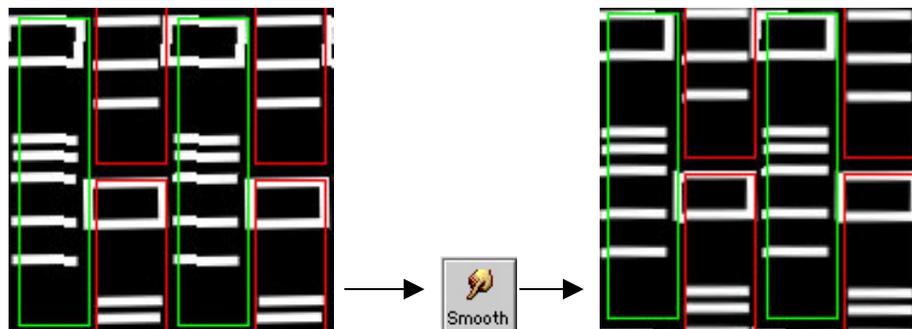
Smoothing the Image

Image smoothing may be desirable if the bands in the configured image appear jagged or speckled. Smoothing will remove minor imperfections in the image and create more uniform edges (see the example images below).

Note: Smoothing will permanently change the underlying image data; therefore, we strongly recommend that you save the smoothed image under a different file name for visual analysis, printing, or publishing only, and preserve the unsmoothed original for analysis using gel analysis software.

To perform smoothing:

1. Click on the **Smooth button**. You will be prompted to save the image under a different file name after smoothing is complete.

2. Click on **OK** to proceed.

Smoothing before and after:

Note

Only the regions of the image defined by the lane boxes will be affected by the smoothing function. If you use the **Previous button** to go back to the unconfigured image, the areas defined by the lane boxes will appear smoothed, while the remaining areas will appear unchanged.

Copying the Entire Image

You can copy the entire image to the Macintosh® clipboard and then paste it into a document or other file. (To copy individual lanes, see below.)

To copy the entire image:

1. Select **Copy Image** from the **Edit menu** or hold down the **Ctrl key**, click on the image, and select the command from the context menu:

2. Open your word processing, spreadsheet, or other application and paste the image using the tools in that application.

Printing, Copying, and Analyzing the Image, continued

Copying Individual Lanes

To select individual lanes in the image for copying, drag across the lanes or click on them one at a time. They will appear highlighted with a red border:

To deselect individual lanes, click on them again. To select all the lanes in the image, hold down the **Ctrl key**, click on the image, and select select **Select All** from the context menu. To clear all selections, select **Clear All**.

When you are satisfied with your selections:

1. Select **Copy** from the **Edit menu** or context menu, or use the ⌘+C key command. Only the selected lanes will be copied to the Macintosh® clipboard.

2. Paste the lanes into a word processing, spreadsheet, or other application for documentation and analysis. The lanes will be pasted as a block in alphanumerical order (regardless of the order of selection):
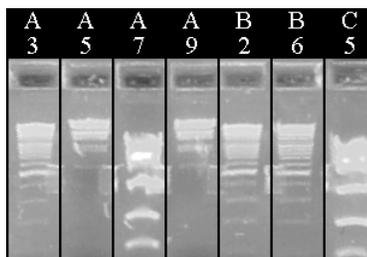
Printing the Image

To print the image, select **Print** from the **File menu**.

To change the printer and orientation settings, select **Page Setup** from the **File menu**.

Further Analysis

After you have reconfigured the image, click on the **Save As button** (⌘+S) to save it under a different name and open it in a 1-D gel analysis software program for further analysis.

Software License

Software License   By your use of E-Gel® *96* Editor Software, you accept and acknowledge the following terms and conditions:

- Invitrogen Corporation ("Invitrogen") reserves all copyrights to E-Gel® *96* Editor Software.

- E-Gel® *96* Editor Software is free to customers who purchase E-Gel® *96* gels and E-Gel® *96* apparatus from Invitrogen.

- E-Gel® *96* Editor Software may be obtained at www.invitrogen.com/egels.

- E-Gel® *96* Editor Software will be used only with E-Gel® gels and E-Gel® *96* apparatus and will be used only for the internal research use of customers who purchase E-Gel® *96* gels and E-Gel® *96* apparatus from Invitrogen.

- E-Gel® *96* Editor Software will not be copied, transferred or redistributed.

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http://www.invitrogen.com

...and the program will connect directly. Click on underlined text or outlined graphics to explore. Don't forget to put a bookmark at our site for easy reference!

Contact Us

For more information or technical assistance, please call, write, fax, or email. Additional international offices are listed on our Web page (www.invitrogen.com).

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