Adjustable blue gel imaging analysis system BG-gdsAUTO550

User manual

July 2018 1st edition

- Please read this manual carefully before operating the instrument.
- Please keep this manual in a safe place for use when needed.

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In this document, BG-gdsAUTO550 is collectively referred to as the BG-gdsAUTO550 Blu-ray Image Analysis System.

CONTENT

Chart 1 System Introduction

1.1 instrument introduction

BG-gdsAUTO550 adjustable blue gel imaging analysis system integrates high-definition image acquisition, processing, analysis, database management, printing and other functions. It is specially designed for protein and nucleic acid gel electrophoresis experiments. The gel image analysis system helps researchers to acquire gel images correctly and quickly and analyze the results. The system includes a BG-gdsAUTO550 blue gel imager and a Gel Image Anlysis gel imaging analysis software (hereinafter referred to as the software). This software is mainly used for:

Protein lane analysis

DNA/RNA molecular weight calculation

Single band analysis

Dot-blot electrophoresis analysis

Colony Count - Petri Dish Count

Measuring area/density

Blot hybridization membrane autoradiography

Enzyme plate

Experiments such as thin-layer chromatography plates can be used to perform automatic or manual qualitative or quantitative analysis of experimental results. In addition, the software provides an easy way to image processing.

1.2 Performance introduction

1、Intuitive and accurate automatic reading and analysis results can effectively eliminate manual errors;

2. Efficient and automatic image acquisition system and analysis system;

3. Simple information entry method and fast data management system;

4.the interface is friendly, can automatically generate a report form;

5. large data storage capacity, to provide customers with scientific, comprehensive data analysis and information management functions.

1.3 System Configuration

Digital high resolution low illumination integral camera

Motorized zoom lens

Special multi-layer coated filter lens

Transmission blue light source 470nm

Built-in computer

Touch display

Gel imaging analysis software

1.4 Software installation require

System normal operation of the computer configuration requirements are as follows：

CPU > 1.8GHz

RAM > 1G SDRAM

Storage > 40G

USB2.0

LCD resolution：1024 X768

Note: Specifications and designs are subject to change without notice.

Chart 2 Softwar Installation

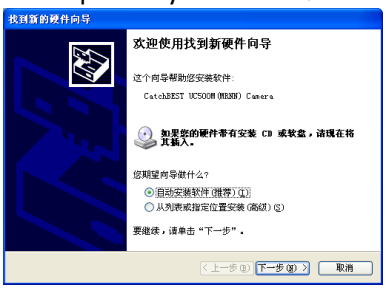
The instrument has a built-in computer, software has been preinstalled. This chapter describes software reinstallation or upgrade。

2.1 connect instrument

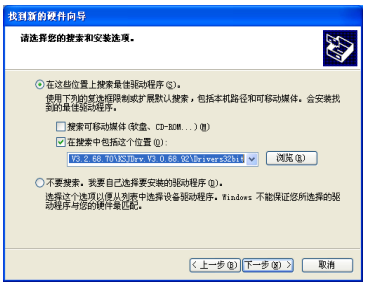
Check instrument finished installation， open the power.

2.2 install device

Connect the instrument and computer by USB cable， as followed：



select“从列表或指定位置安装”， click“下一步”



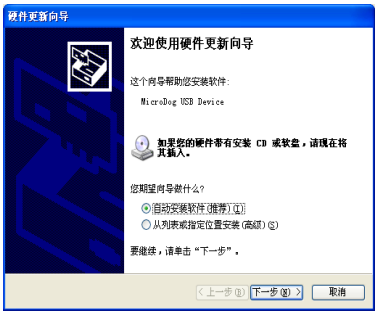
select“在搜索中包括这个位置”， path:\Gel Image Anlysis 软件\Drives\Cammera，click“下一步”；

Click“完成”，finish installation；

2.3 install software

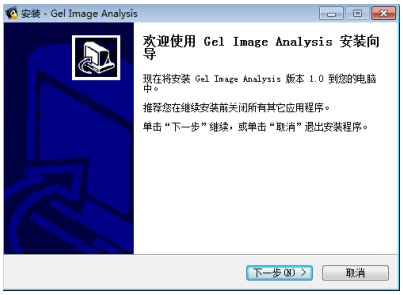
Dongle insert computer USB port；

select“自动安装软件”；click“下一步”bottom，finish the installation；

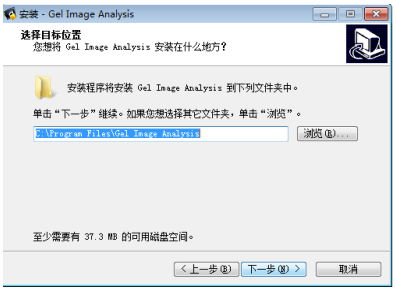


2.4 Application Installation

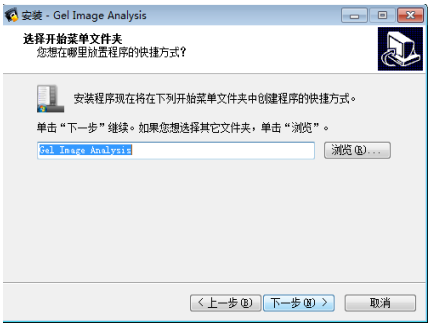
Application installation：open installation files，double click“Gel Image Analysis.setup”files：



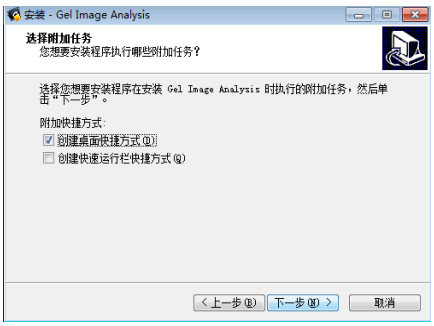
click 下一步



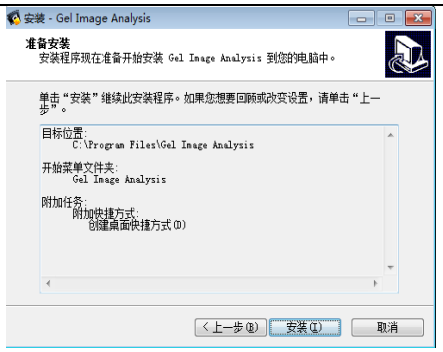
change file path/or use default path，click 下一步

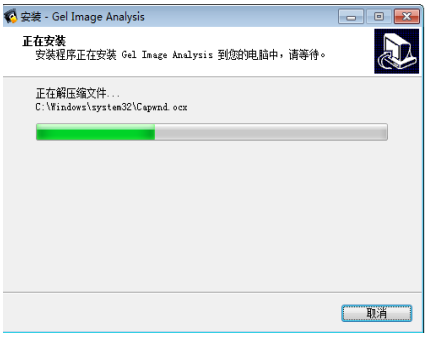


click 下一步

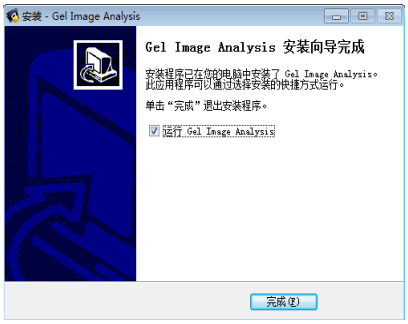


can check the attachment shortcut click 下一步





Click 安装



Click 完成，finish installation.

Chart 3 System Operation

3.1 Instructions

This instrument is a dark box type automatic gel image analyzer. When you use it, you can directly observe and analyze the experiment results on the preview screen or computer by simply placing the experiment sample.

The specific steps are as follows:

1. Insert the instrument into the 220V power supply and open the main power switch on the back of the chassis. (If an external display is required, only one end of the VGA cable is connected to the VGA port of the instrument and one end is connected to the VGA terminal of the display).

2. Open the sample drawer, open the orange filter, place the sample, close the drawer and push it tight.

3. Open **Gel Image Analysis.exe** on the computer and log in, **create a new report** (this software database management), and click to **activate the image** (start preview image), click **POWER** to open, select **UV1, UV2** (for tapping workbench) or **Light**.

4. According to the size and needs of the experimental sample, click the software interface (or the operation panel) **ZOOM+, -, Iris+, -, Focus+,** - to obtain a clear image, and you can **take images** by capturing images.

5. The software has the functions of **image acquisition, image processing and data analysis.** It can process and analyze the captured images (imported into external images), as well as **print reports and export data**.

6. Because of the long-term viewing of blue light, it is harmful to the eyes. The device is equipped with an orange filter to facilitate the operation or observation of the gel, effectively protecting the eyes.

7. Please take out the sample and clean the box after the observation. It is recommended to put a plastic wrap on the sample plate and then put a gel sample on the

cling film, which can effectively keep the inside of the box clean. Finally, turn off the main power on the back of the chassis.

3.2 Software operation

First, make sure the dongle is plugged into the computer's USB port and make sure the computer is automatically recognized (Figure 3-1).

(Figure 3-1)

Double-click the desktop or the Start menu icon.

You can enter the login interface (Figure 3-2): (Initial value: 用户名: admin 密码: admin)

(Figure 3-2)

After the user correctly selects or enters the “user name” and “password”, press〈登录〉to enter the system.

Check the〈记住〉item, the system will automatically remember the password, you can log in without entering the password next time.

After login, as shown in Figure 3-3:

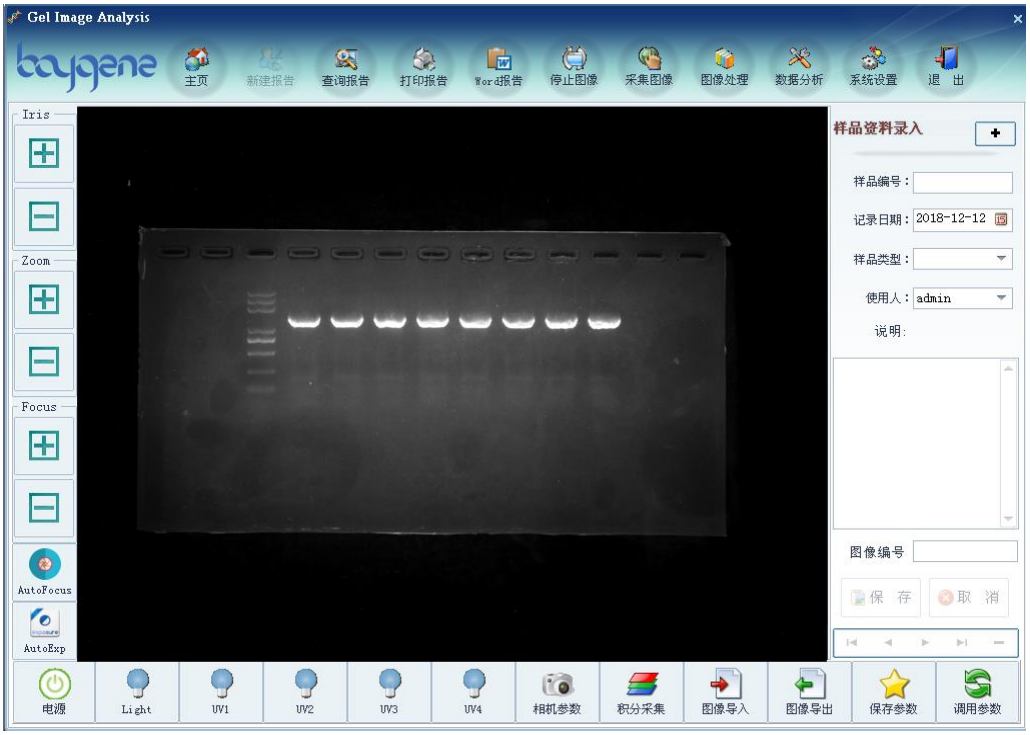
(Figure 3-3)

Chapter 4 Report Management

This chapter describes how to create a report and collect images after the user logs in to the system.

4.1 Create a new report

Click〈新建报告〉in the toolbar to enter the report interface (Figure 4-1) interface.



(Figure 4-1)

Users can enter relevant information on this interface: (Figure 4-2)

In the report information, the date, the user, etc. are automatically generated by the system.

Users can refer to the modification.

Remember to click the <保存> button after making changes.

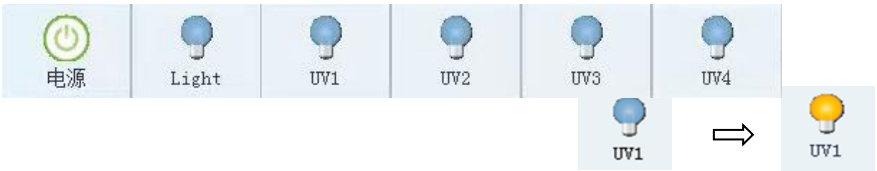
(Figure 4-2)

4.2 acquire image

4.2.1 put the gel into the imaging chamber

4.2.2 Select the light:

Click the <电源> button. If the button turns green, click the corresponding light button (or operate it through the operation panel).

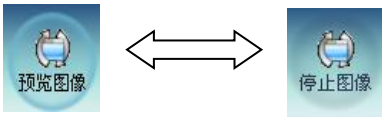


Turn on the light. When the light is turned on, the button icon changes: (Note: Please refer to the reagent manual for the light required.)

4.2.3 Camera control:

Click the <激活图像> button, the button changes to <停止图像>, and the image area displays the dynamic image;

Click the <停止图像> button, the button changes to <预览图像>, and the image area displays a still image.



Click the <采集图像> button to capture the image into the system.

4.3 Dynamic image adjustment

4.3.1 Lens parameter adjustment (Figure 4-3):

If the user is not satisfied with the image, such as blurred, too large or too small, through the software interface (or operation panel)

Iris <+> or <->;Zoom <+> or <->;Focus <+> or <-> buttons to adjust.

The <AutoFocus> button automatically adjusts the Focus.

The <AutoExp> button can automatically adjust Iris;

(Figure 4-3) (Figure4-4)

4.3.2 Camera parameter adjustment (Figure 4-4)

If the user feels that the image brightness is not ideal enough, you can adjust the image quality with the <相机参数调整> button:

Adjustable parameters include:

Preview resolution, acquisition resolution, AutoExp, gain, exposure, brightness, contrast, gamma, image rotation, etc.

Click the <保存> button to save the user-adjusted parameters to the system.

Click the <默认值> button to restore the parameters when the instrument was set at the factory.

(Note: If the bands brightness is not enough, try to reduce the gain and increase the exposure value. The larger the gain value, the more image noise.)

<AutoExp> button: Automatic exposure based on exposure AutoExp value. (Note: need enough amount of light)

4.4 integral capure

After adjusting the lens and camera parameters, if you feel that the image bands is still dark, the system also provides a soft integration function to enhance the image:

Click the <积分采集> button to pop up the window (Figure 4-5):

(Figure 4-5)

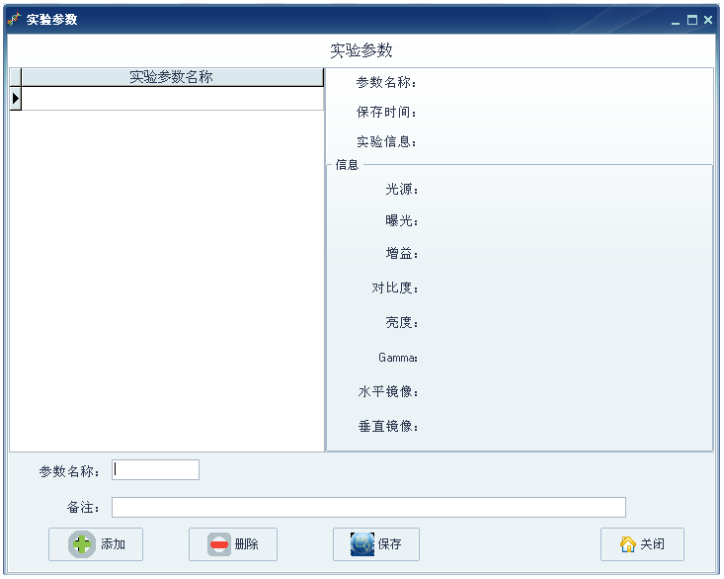
In the collection frame number edit box, fill in the number of frames that need to be integrated, and click Start to take the integral shot.

When finished, you can choose whether to save the captured image.

4.5 Save parameters and call parameters

The user can save the current experimental parameters, which is convenient for the next similar experiment.

Click the <保存参数> button to pop up the window (Figure 4-6)



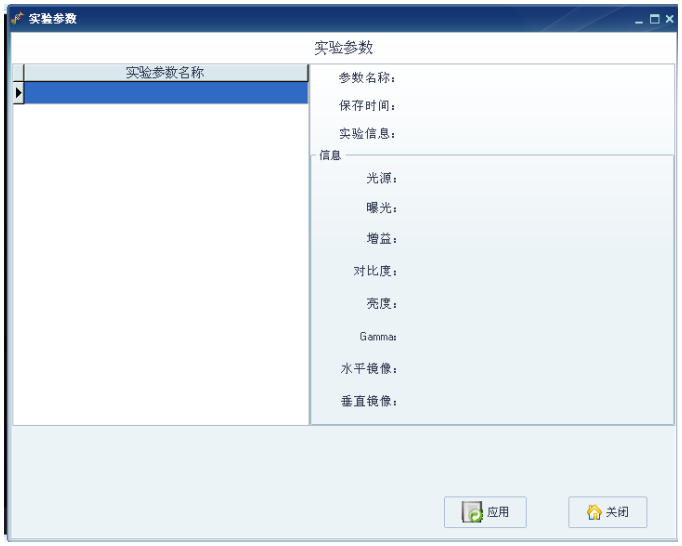
(Figure4-6)

Click the <添加> button, enter the parameter name and related information, and click the <保存> button.

Click the <删除> button to delete the selected experiment parameters.

Click the <调用参数> button to pop up the window (Figure 4-7).

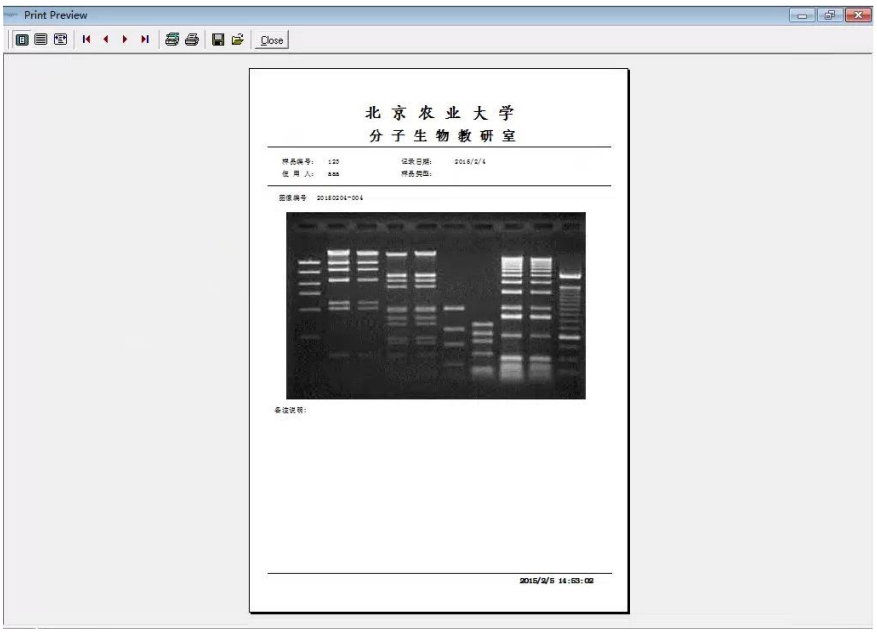
Click the <应用> button to apply the experimental parameters to the current settings.



(Figure4-7)

4.6 Print report

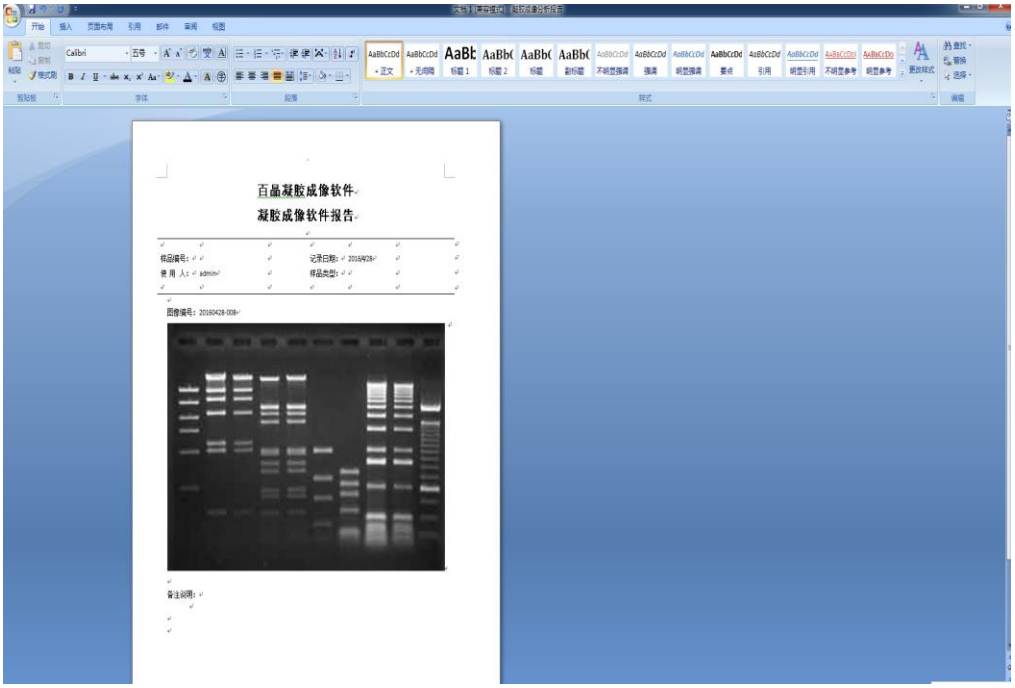
After the capture image is complete, click the <打印报告> button to preview the print effect and click <打印> to print the image report. (Figure 4-8)



(Figure4-8)

4.7 Word report export

After the capture image is completed, click the < Word 报告> button on the toolbar to export the report to the Word document. (Figure 4-8)



(Figure 4-9)

4.8 Image import and export

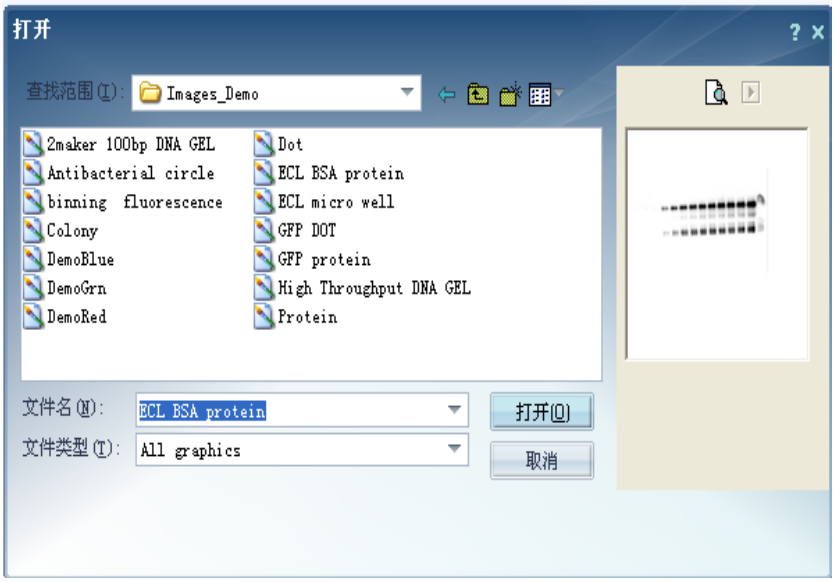
This system supports the import and export of common image formats including *.jpg, *.tif, *.pcx, *.png, *.bmp.

Click the <图像导入> button to pop up the window (Figure 4-10)

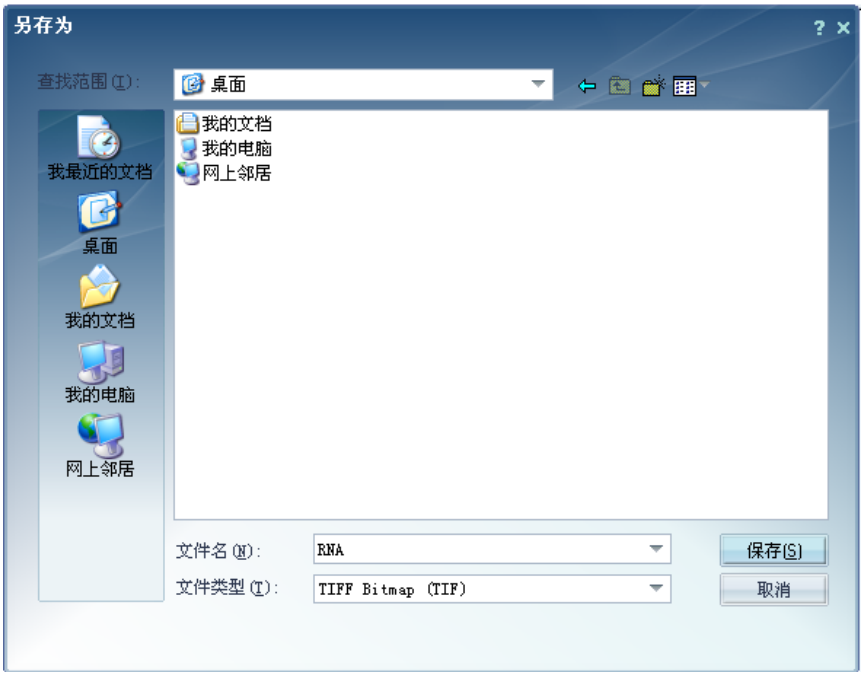
After selecting the relevant image file and clicking the Open button, the image can be transferred to the system for image analysis and processing.

Click the <图像导出> button to pop up the window (Figure 4-11)

Select the file format, enter the file name to be saved, and click the <保存> button to export the image.



(Figure 4-10)



(Figure 4-11)

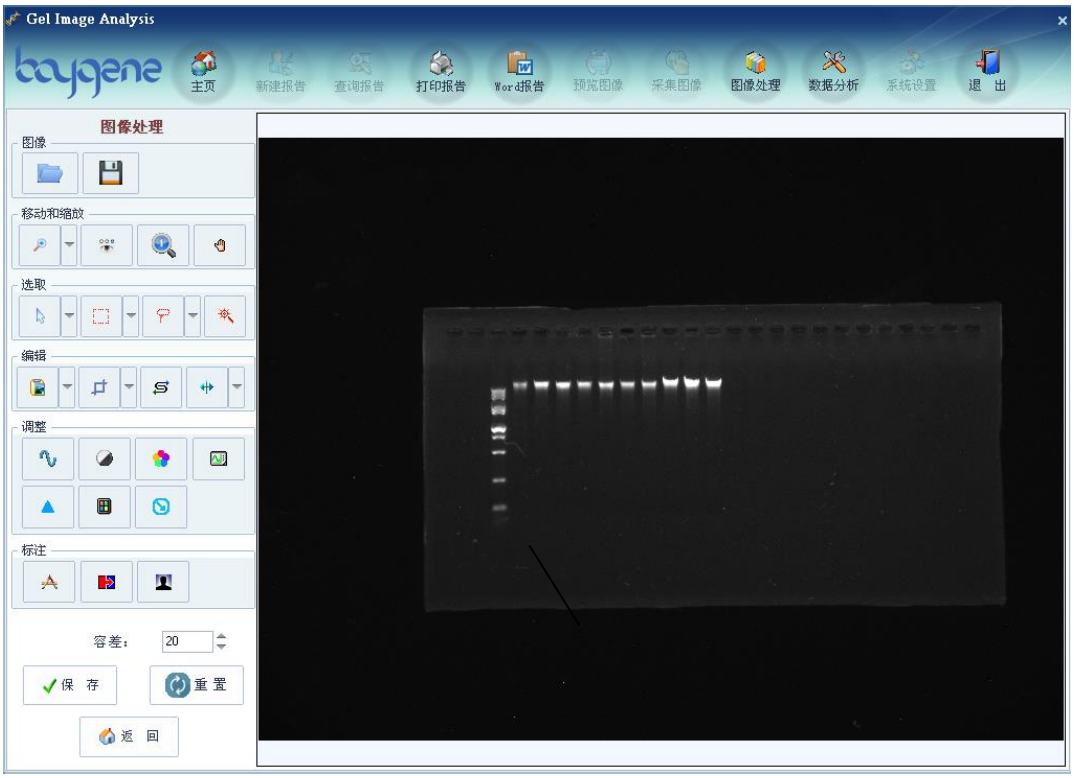
4.9 Close report

Click the <主页> button in the system toolbar to close this report and return to the home page.

Chapter 5 Image Processing

The system provides more complete image processing functions, including image selection, copying, pasting, cutting, cropping, mirroring, adding text arrows, image scaling, rotation, color adjustment, brightness contrast adjustment, reverse, filtering and other functions.

In the capture interface, click the <图像处理> button of the worker to enter the image processing interface (Figure 5-1):



(Figure 5-1)

The user can implement each image processing function by clicking each tool button on the left side of the image window, and hovering the mouse button to prompt the tool button function.

5.1 Image toolbar


Open others


Save image as

5.2 Zoom and move toolbars


Zoom


Range Enlarge


Original Image Size


Image Fits Window


Move

5.3 Selection tool

The software includes the following selection tools: After clicking the corresponding button, drag the image on the image to select the image (press the shift key at the same time to select more)


Object selection


deselect


rectangle


circle


lasso


polygon


magicwand

5.4 Edit toolbar


Paste


Cut


Crop


Delete


Rotate

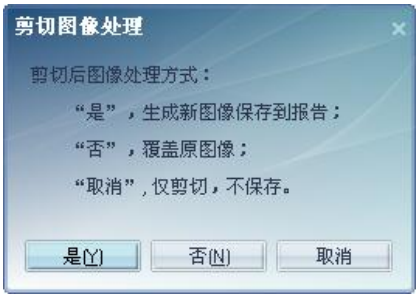

Horizontal Mirror


Vertical Mirror

Paste: First select the area, then click the paste button to complete the copy and paste operation. Select the pasted image and use the mouse to move the pasted image to the appropriate location.

Crop: Select the area first, then click the crop button to crop the image to the desired size. And pop up the processing window (Figure 5-2)

Rotate button: Click the spin button to rotate the image at any angle. (Figure 5-2)



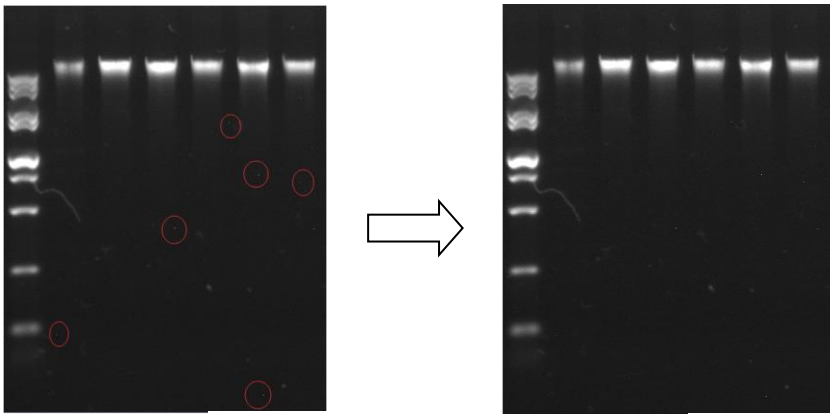
(Figure 5-2)

(Figure5-3)

5.5 Adjustment toolbar

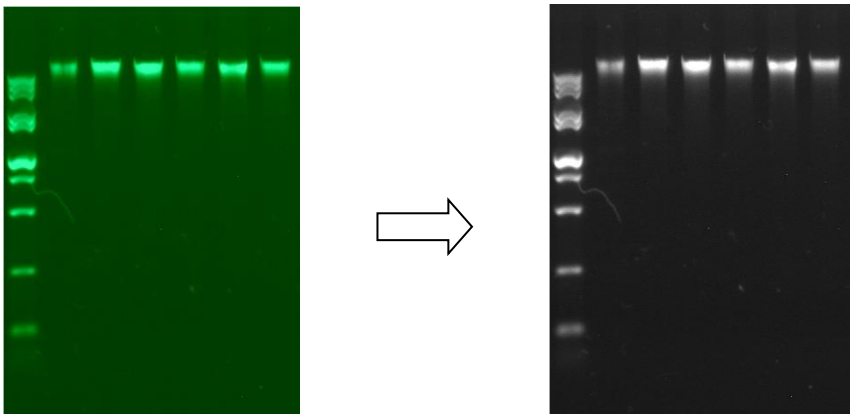
5.5.1  Median filtering：

Not only can you remove outlier noise, but you can also maintain the edge characteristics of the image.



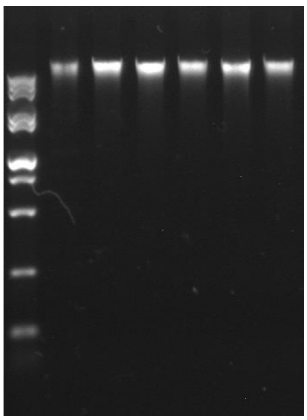
Before filtering (Figure 5-4) after filtering (Figure 5-5)

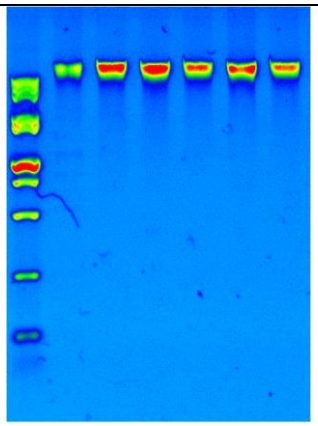
5.5.2  Color to black and white tool: Images can be converted from color mode to black and white mode.



Color image (Figure 5-6) black and white image(Figure 5-7)

5.5.3  Pseudo-color operation: Converts bands that are difficult to distinguish with the naked eye into different color representations:



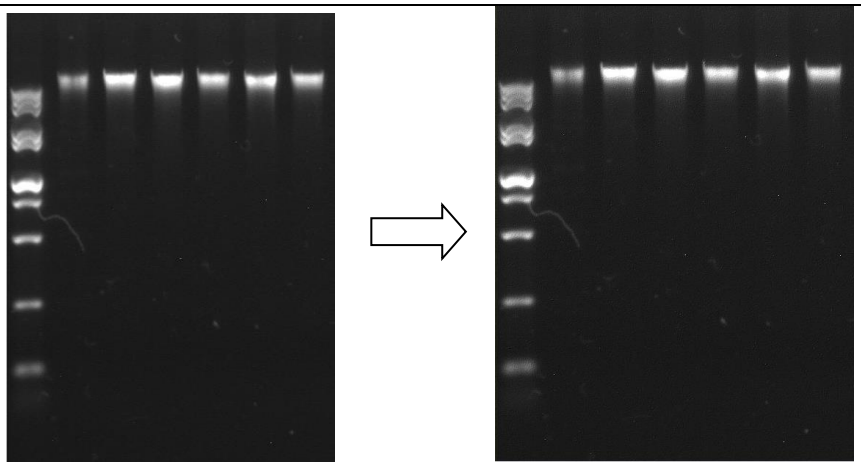


Original image (Figure 5-8) Pseudo-color image (Figure 5-9)

5.5.4  Brightness contrast adjustment: It can adjust the brightness contrast of the image, <复位> cancel the operation

Figure 5-10

5.5.5  Image can be sharpened.

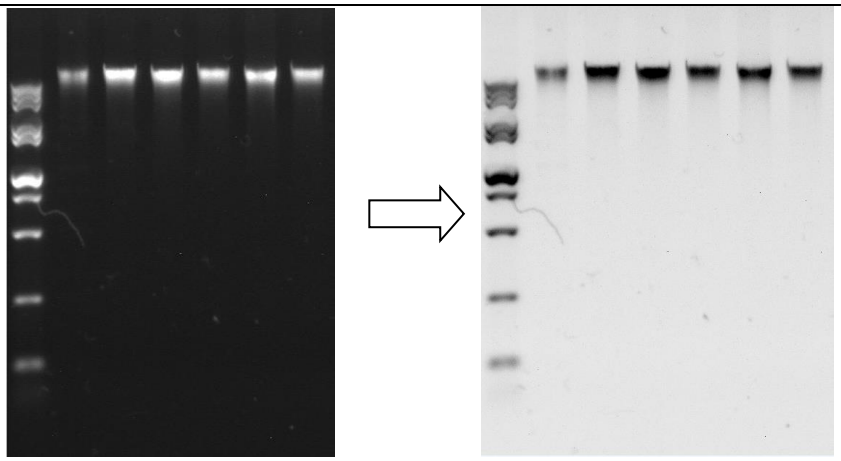


before Sharpening (Figure 5-11) after Sharpening (Figure 5-12)

5.5.6  RGB adjustment tool to adjust the color of the image, <复位> cancel operation;

Figure 5-13

5.5.7  Inverted: The image can reverse the image.



Before invert (Figure 5-14) after invert (Figure 5-15)

5.6 Add text and callout arrows

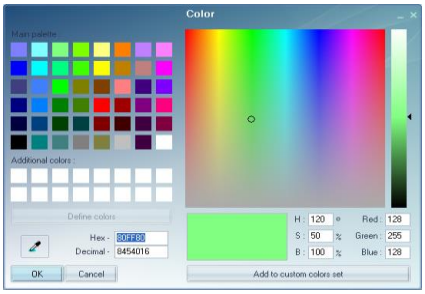
Text tool arrow tool font and arrow settings

Click the <字体与箭头设置> button to set the font and arrow, (Figure 5-16)

(Figure 5-16)

The arrow is set to add the color of the arrow:

Click on Font Settings to display the Font Settings dialog:



(Figure 5-17)

(Figure 5-18)

To delete an added text or arrow, click the object selection tool  select the text or arrow, and click the Delete Object tool  to delete the text or arrow.

5.7 Tolerance setting

When using the Magic Wand tool, you can set the tolerance and change the extent of the selection.

5.8 Image saving and overloading

Save the edited image to the report.

Reload Image: Cancel all image processing operations back to the initial image processing interface.

Chapter 6 Image Analysis

It mainly provides functions such as identification, statistics, analysis and measurement for the experimental results of lane type, spotted gel image and colony culture. Click the <图像分析> button on the main interface to enter the analysis interface, as shown in Figure 6-1.

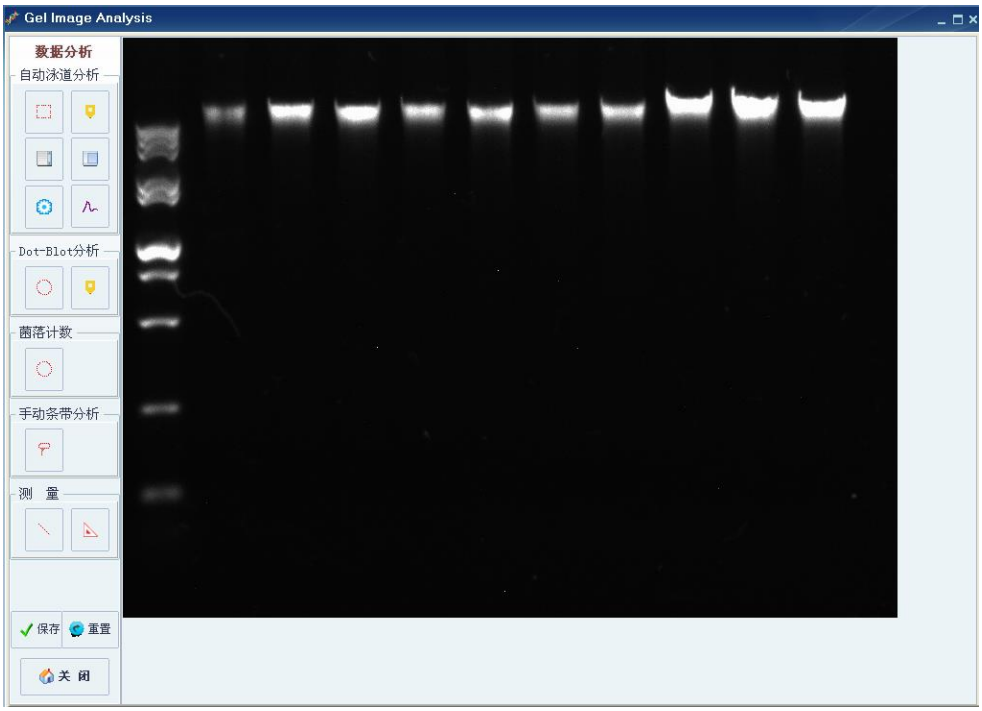


Figure 6-1

6.1 Lane analysis

The system can automatically identify and analyze the lanes and band of the gel image, and can automatically calculate the molecular weight and concentration of each band.

Note: The mouse button will hover for 3 seconds and the button description will be displayed.

6.1.1 Automatic lane recognition

First click on the <Rectangle Marquee Tool> and select the part of the image you want to analyze (Figure 6-2):

Note: If you do not select an image, the entire image will be recognized.

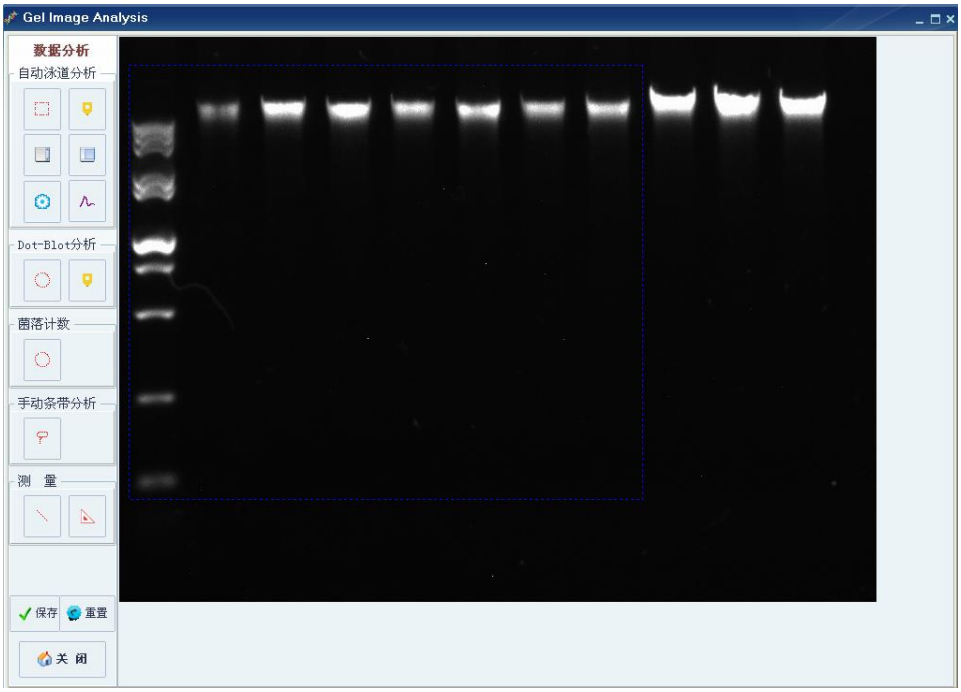


Figure 6-2

Click the <Automatic Identification> button  and the system will automatically identify the lanes and bands in the selected section.

The result is automatically recognized, as shown in Figure 6-3.

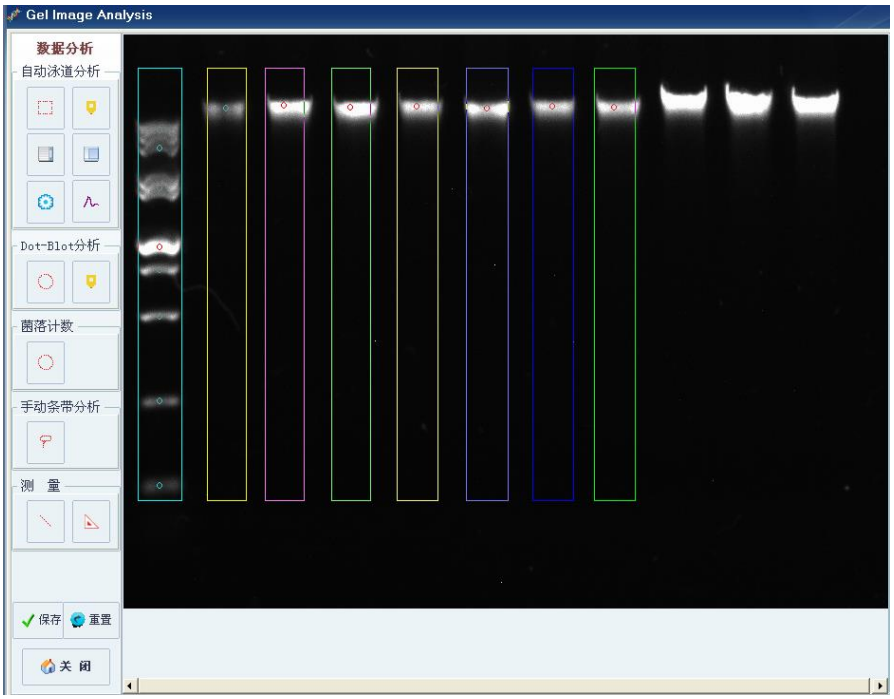


Figure 6-3

a. The lanes are marked with a rectangular frame of different colors.

b. The strip is indicated by "o".

(Note: Figure 6-3, the system has defined lanes 1, 2, and 3 from left to right, and each lane is from the top to the bottom of the 1, 2, 3...bands. There is an "o" recognition, there is Molecular weight or concentration data. Without "o", the system considers no data.)

6.1.2 Manually add, delete lanes and bands

Due to the quality of the gel image, the difference in capture parameters and the difference in illumination, the automatically identified lanes and bands are inevitably biased from the actual situation. You can do this by manually adding, deleting lanes and bands. Click the <Identification Settings> button to display the recognition toolbar, as shown in Figure 6-4:

Figure 6-4

Click the <增加泳道> or <删除泳道> button, a prompt box will appear, as shown in Figure 6-5.

Figure 6-5

Use the mouse to move the cursor to the position where you want to manually add and delete the lane, and click the left button. To end the operation, click the <关闭> button in the prompt box to end the addition and deletion.

Manually adding and deleting bands is similar to adding and deleting lanes

6.1.3 Molecular weight calculation

After correctly identifying the lanes and bands, the molecular weight calculation can be performed.

Click the <分子量数据> button and the pop-up window is as shown in Figure 6-5:

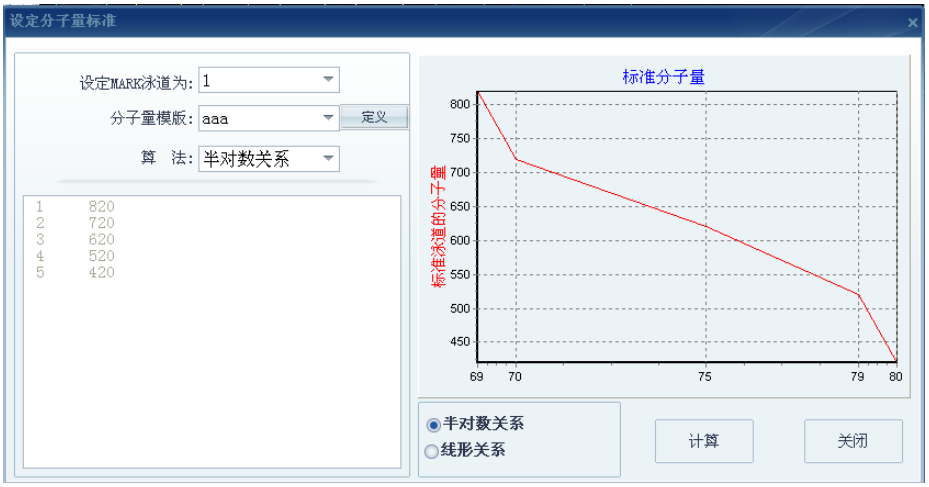


Figure 6-5

On the left side of the dialog box you can customize the standard Mark lanes and customize the Mark's molecular weight template. You can choose from the drop down box. The right side shows Mark's molecular weight curve, you can choose the calculation method, including semi-logarithmic relationship and linear relationship.

6.1.4 Customize molecular weight template

The molecular weight template can be set by itself. Click the <定义> button to open the Molecular Template Setup window, as shown in Figure 6-6

Figure 6-6

Click the < + > button to add a new molecular weight template:

After inputting relevant information, you can directly input each bands of standard data in the form table. Then

Click the < √ > button to save.

After closing, in the Molecular Template Setup window, as shown in Figure 6-7.

。

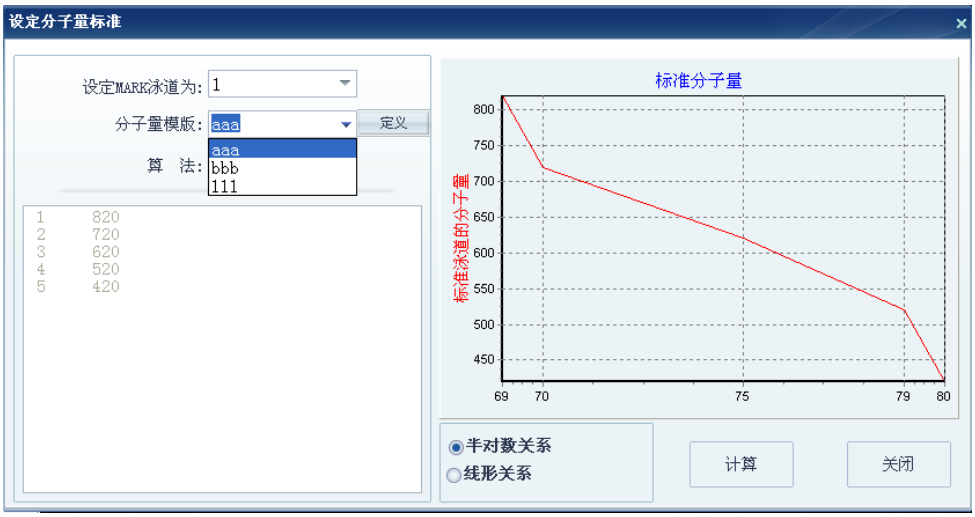


Figure 6-7

After setting each parameter, click the <计算> button, and the system will automatically calculate all the strips identified, as shown in Figure 6-8.

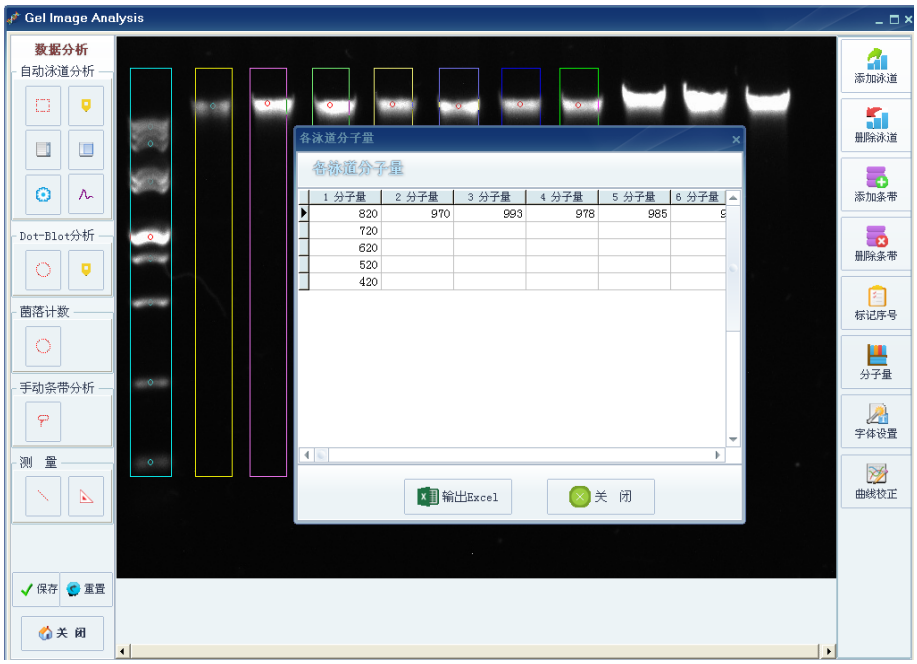


Figure 6-8

Note: The experimental method is a semi-quantitative method, and the calculation will have some errors.

Click the <输出 Excel > button to export the data to the Excel.

6.1.5 Calculated concentratio

Click the <Content Data> button  ，Automatic concentration calculation for all strips, as shown in Figure 6-9

Figure 6-9

“无比对计算”refers to whether the system performs concentration (optical density) calculation based on Mark bands. If you choose “无比对计算”, the system defines the total number of bands in each single lane as 100 (can be 100%, or other units such as np\kp), and then calculates the concentration values of each bands, as shown in Figure 6-10:

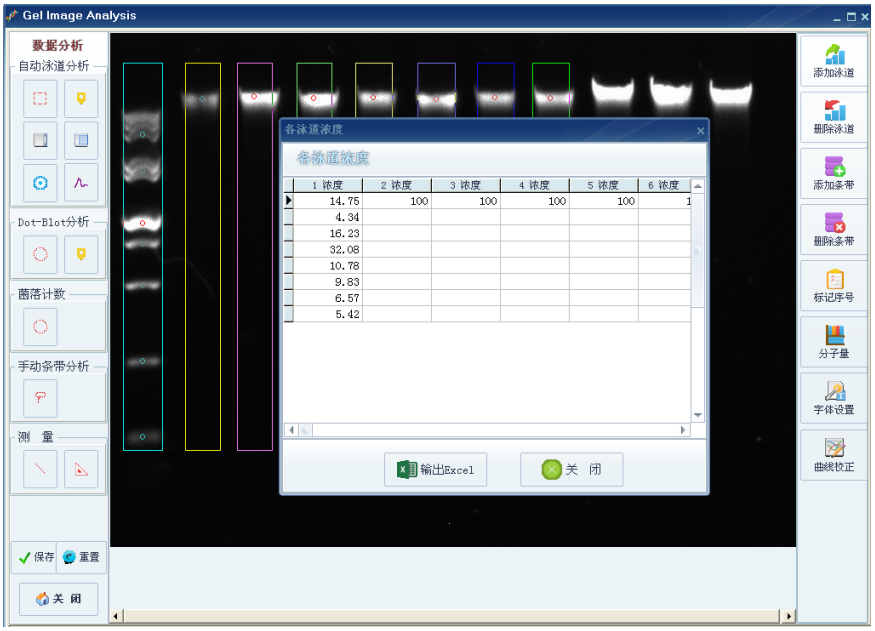


Figure 6-10

As shown in Figure 6-11, if you do not select“无比对计算”, the system uses the bands set by the interface as the standard, and calculates the density of all other bands according to the gray value of the standard bands:

Figure 6-11

The calculation results are shown in Figure 6-12

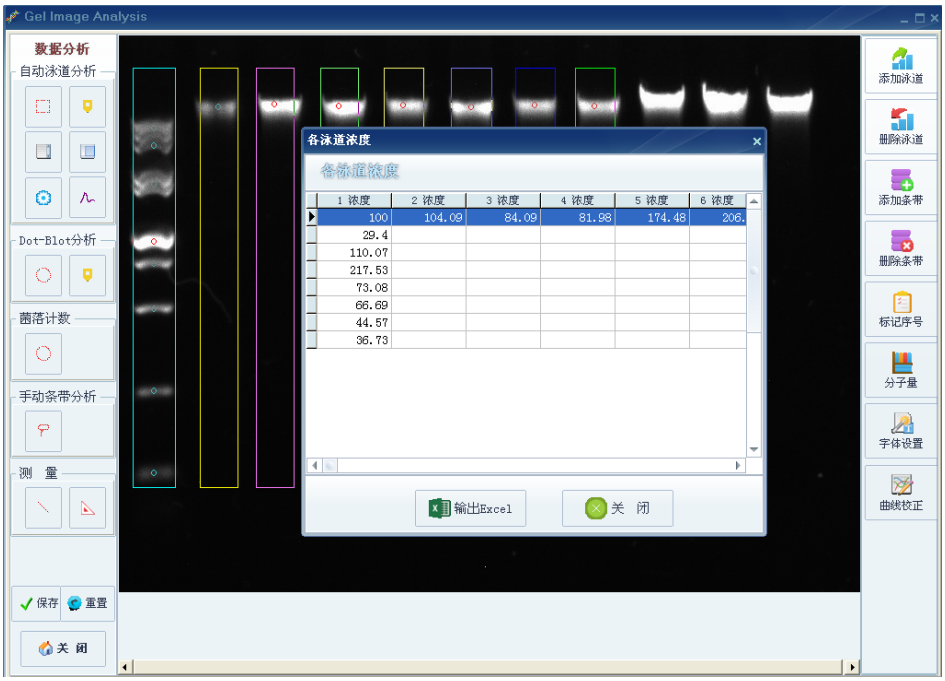


Figure 6-12

Click the <输出 Excel > button to export the data to the Excel.

6.1.6 Molecular weight curve

Click the button  to open the molecular weight curve window, as shown in Figure 6-13.

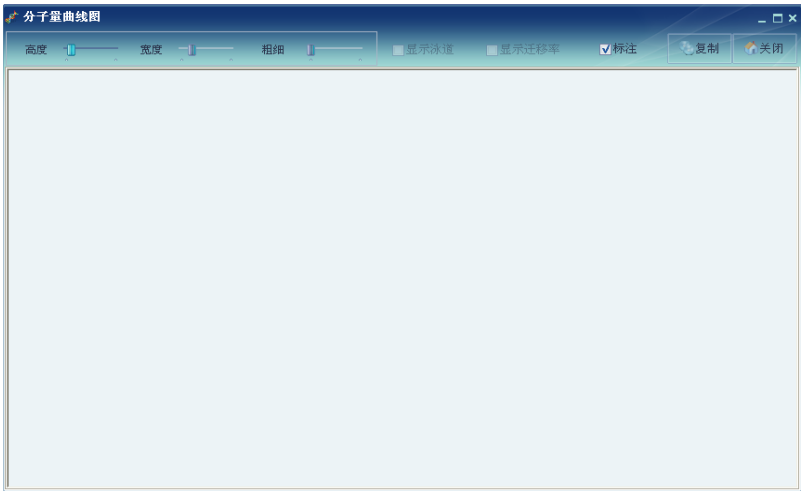


Figure 6-13

Click on the identified lane and the system will automatically plot the lane curve, as shown in Figure 6-14

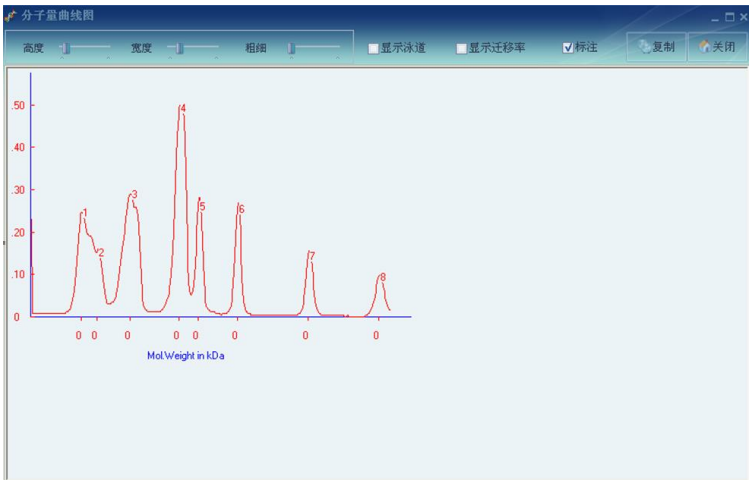


Figure 6-14

The Y-axis (vertical direction) indicates the gray value relationship of each bands of the lane, and the X-axis (horizontal direction) indicates mobility of each bands. Click on a different lane to superimpose the line.

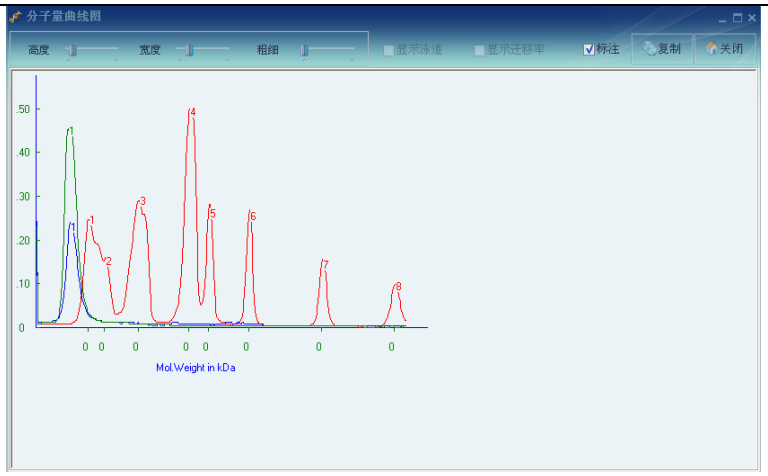


Figure 6-15

The user can adjust the "height", "width" and thickness of the curve.

When "显示泳道" is selected, a single lane image placed horizontally is displayed below the line graph. When "显示迁移率" is selected, the X-axis (horizontal) is labeled as the bands mobility. As shown in Figure 6-16.

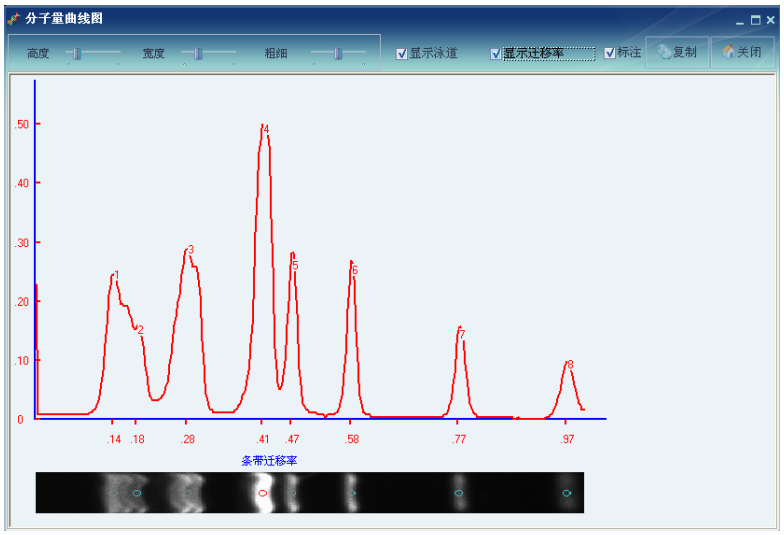


Figure 6-16

Click the <复制> button to copy the image to the pasteboard and paste it into such as word:

6.1.7 Marking lane description

Click the <标记序号> button 

in the lane toolbar to pop up the window (Figure 6-17). You can customize the name of each lane: (Note: only the identified lanes are marked)

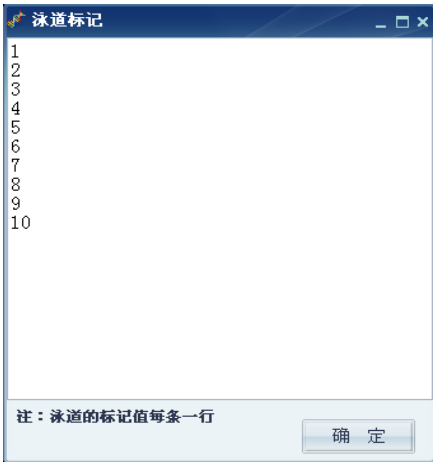


Figure 6-17

After “确定”, the system will mark each value at the top of each lane, as shown in Figure 6-18.

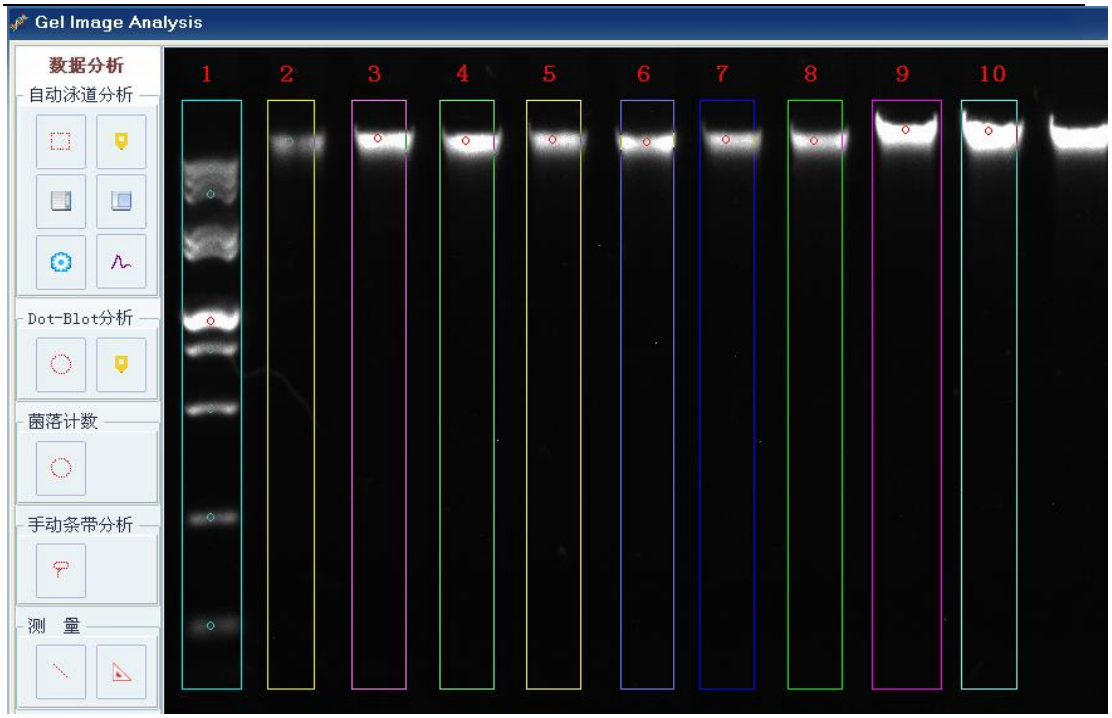


Figure 6-18

6.1.8 Label molecular weight

Click the <分子量> button  in the lane toolbar to label the calculated molecular weight on the gel map, as shown in Figure 6-19.

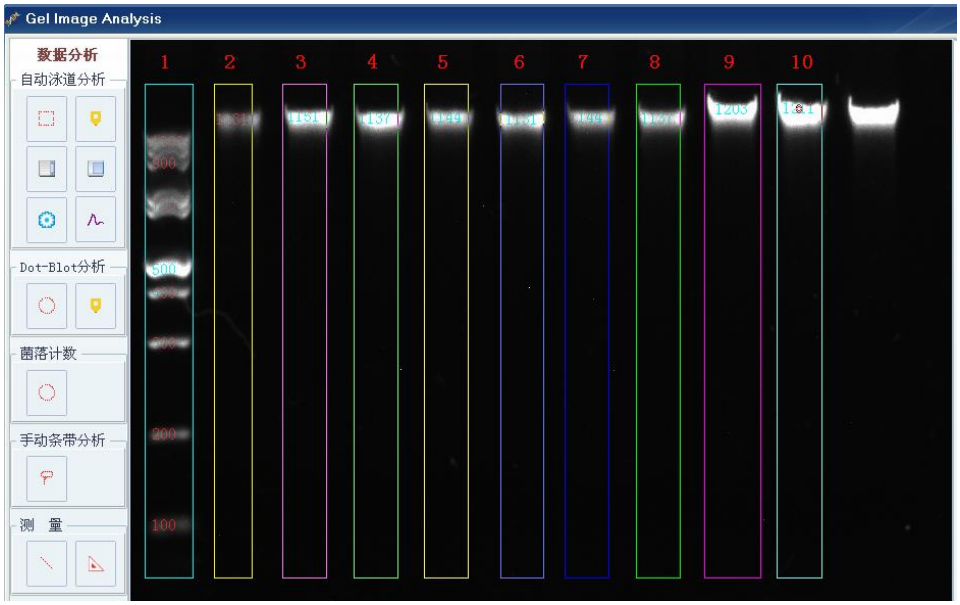


Figure 6-19

6.1.9 Lane curve correction

There are many factors affecting the imaging. Automatic identification of the molecular weight of each bands and the actual situation are inevitable deviation，so the curve can be corrected to meet the requirements.

Click the <曲线校正> button 

in the lane toolbar to pop up the window, as shown in Figure 6-20:

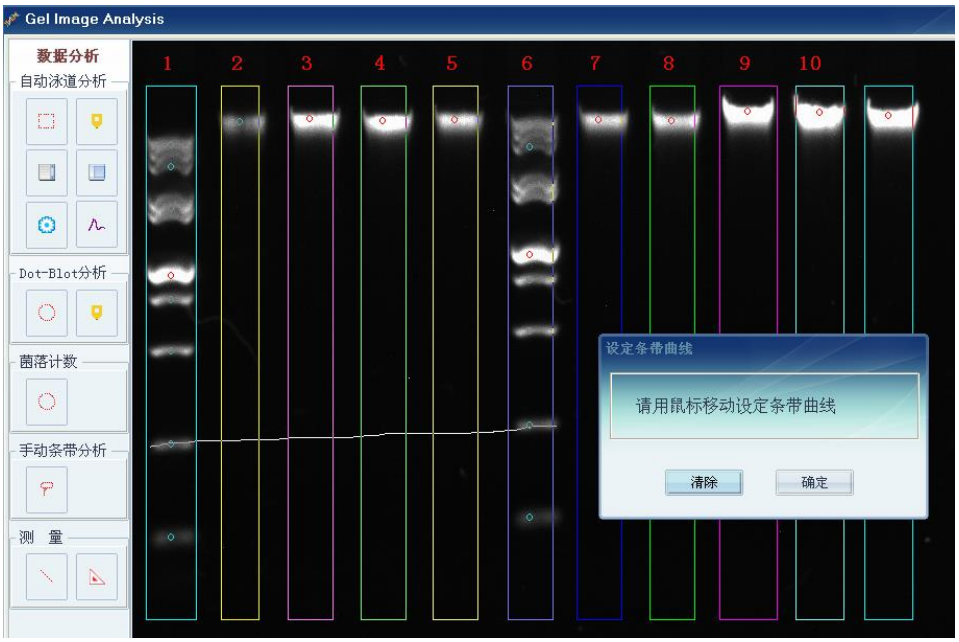


Figure 6-20

The user can drag the mouse to manually draw the bands calibration curve as needed; after confirming, click the <分子量数据> button and the system will recalculate the molecular weight based on the calibration curv

6.2 Dot-Blot analysis

The system provides recognition and analysis of Dot-Blot gel images. Click the <圆形选框工具>  in the Dot-blot block to open the Spots toolbar.

Figure6-21

As shown in Figure 6-21:

After clicking the <添加斑点> button, you can click on the image to add a spot, as shown in Figure 6-22:

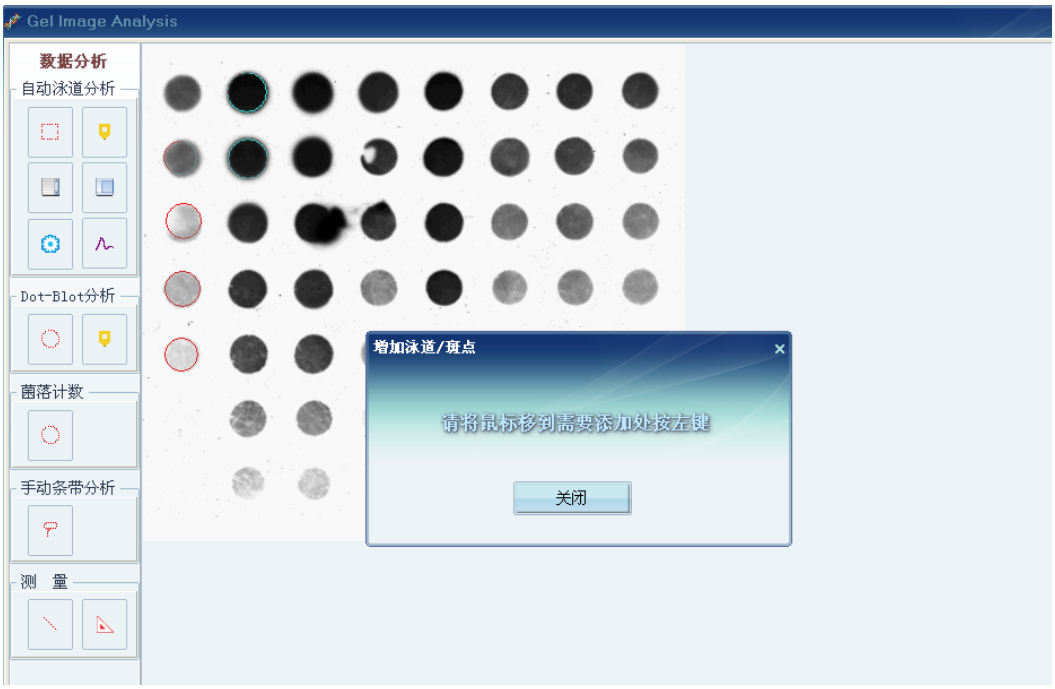


Figure 6-22

When the addition is complete, click the <关闭> button. If you add it by mistake, you can click the <删除斑点> button to delete it.

The system only calculates the data in the added circle, dragging the edge of the circle with the mouse to zoom in and out, and dragging the center of the circle to move the circle:

Click the <计算> button  to perform the dlot calculation. The calculated result is the mass and optical density of each spot.

As shown in Figure 6-23:

Figure 6-23

Click the <添加> button to increase the calibration point, as shown in Figure 6-24

Figure 6-24

Use the mouse to click on an added circle as the calibration point, enter the quality of the point, and click OK:

Multiple correction points can be added continuously as above. When the calibration point is selected, the <编辑>, <删除> button can perform the relevant calibration point operation.

Click the <计算> button to calculate all the dot data, including the maximum, minimum, average, sum, etc. The right side of the window is the dot quality curve, as shown in Figure 6-25:

Figure 6-25

Click the Output Excel button to export to Excel.。

6.3 Colony count

The system provides colony counting function, can automatically identify the number of colonies in the culture dish, calculate the size of each colony and carry out related classification:

Click the <圆形选框工具> button  in the colony count block and drag the mouse to select the petri dish, as shown in Figure 6-26:

Figure 6-26

The rounded edge can be dragged with the mouse for zooming. Click the <确定> button to capture the image of dish, as shown in Figure 6-27:

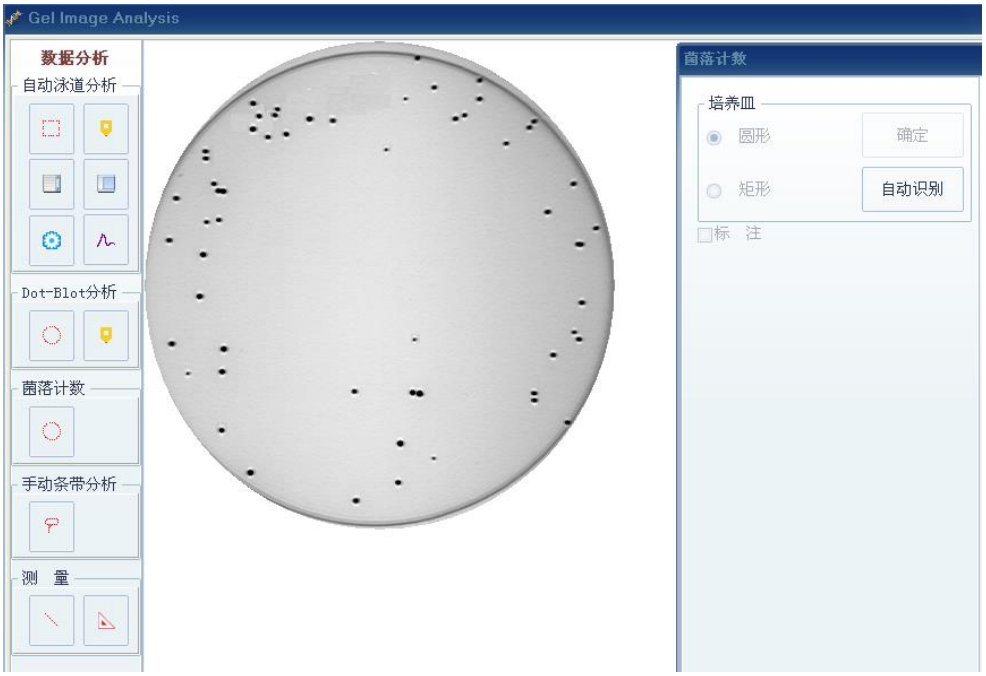


Figure 6-27

After clicking the <自动识别> button, select <标注编号> to mark the colony number. The “面积阈值” is used to retain colonies that match the area. If the image is unclear, you can set the manual adjustment threshold to identify it, as shown in Figure 6-28.

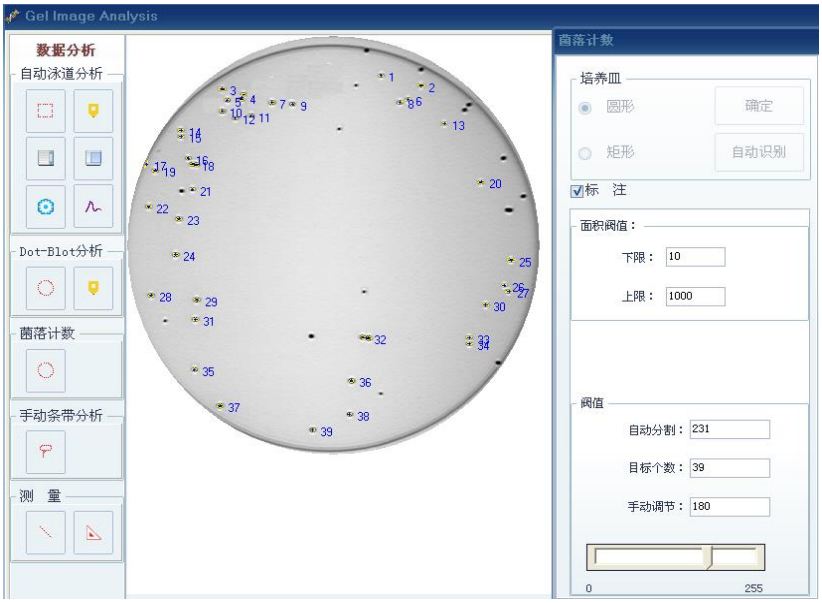


Figure 6-28

Click the <计算> button to calculate each colony data, as shown in Figure 6-29:

Figure 6-29

6.4 Manual bands analysis

The system provides users with different bands comparison functions between lanes, which is convenient for users to view the slight difference. Click the <套索工具> button , and the pop-up window is shown in Figure 6-30.

Figure 6-30

Select the appropriate tool to determine area in the image, and the result can be reflected in the data window in time, as shown in Figure 6-31.

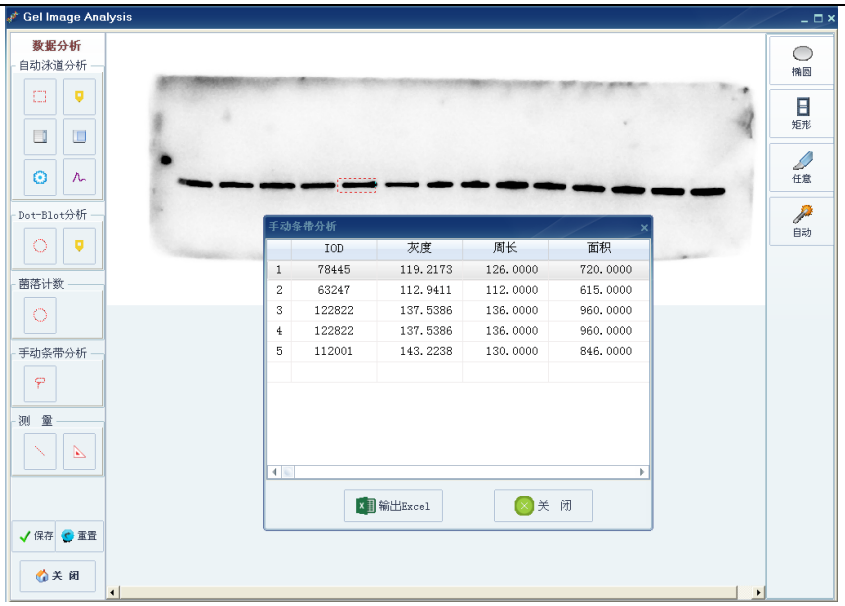


Figure 6-31

6.5 measuring

The measurement function can be corrected by a known length to obtain the actual value of the target bands. First click the <校正> button  to drag the mouse to measure the known length, as shown in Figure 6-32:

Figure 6-32

The system automatically calculates the actual pixel value, fills in the actual value of the length in the correction value edit box, the system automatically calculates the proportional relationship, click the save button to save.

Click the “测量” button  to measure and drag the mouse to measure the actual length , as shown in Figure 6-33:

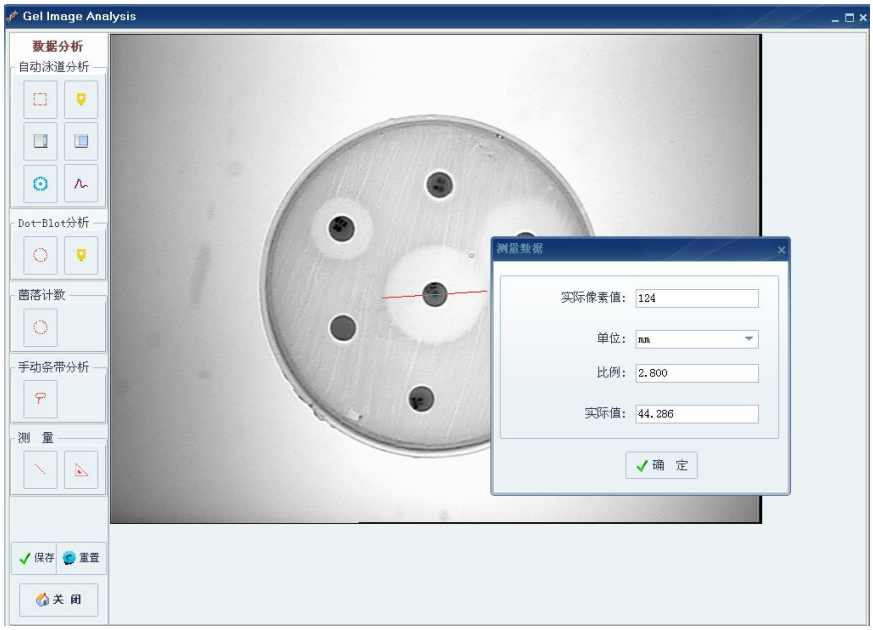


Figure 6-33

6.6 Save and reset

保存 : After the analysis is completed, you can click the <保存> button to save.

重置 : Reset means restoring the image to the initial state before analysis.

Chapter 7 Report query and open

7.1 Report query

Click the <查询报告> button, the interface for query report will appear, as shown in Figure 7-1.

While entering the interface, all records in the library that the current user can view are displayed by default in the browse box.

According to different query requirements, the user enters the corresponding query condition option. After clicking the <查询> button, all the query results which meet the query conditions will be displayed in the following navigation box.

If you want to modify the query conditions, you can move the cursor to the specified query condition, edit directly, or click the <清除条件> button to clear all current query conditions, and then re-enter the query options.

Figure7-1

7.2 Open report

After the query is completed, the user can directly select the record in the list , click the target record with the mouse, click the <详细> button or double-click the target record to open it.

If the user does not enter the conditions, click the <详细> button, the system will open the first record by default.

7.3 Delete report

The user can directly select the record to be deleted in the record list, and click the <删除> button below the window to delete the record, as shown in Figure 7-2.

Figure 7-2

7.4 Report modification and editing

After opening the report, you can modify the content of the report according to your own requirements. After the modification is completed, click the “保存” button to save the current modification. If you click the "取消" button at the bottom left, you will discard the previous modification and keep the original record.

Chapter 8 System Settings

Click the <系统设置> button to pop up the window, as shown in Figure 8-1.

Figure 8-1

8.1 System user management

The system provides flexible system user management functions, and different users can set different operation permissions.

Click the <用户管理> button to enter the system user management interface, as shown in Figure 8-2.

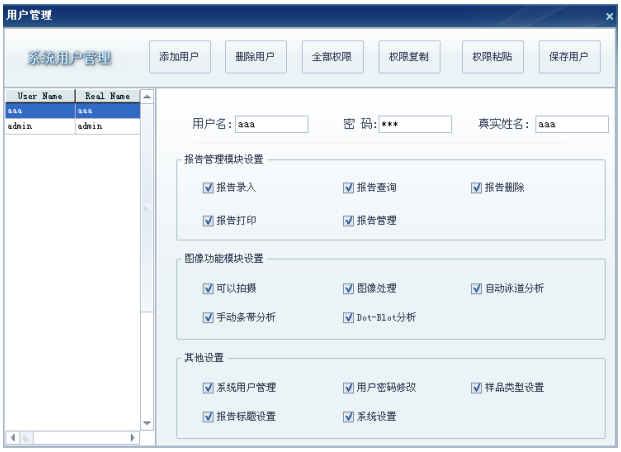


Figure8-2

This module can perform operations such as adding users, deleting users, and setting user permissions. After the user is set up, click the <保存用户> button to save the operation.

8.2 change Password

Click the <修改密码> button to pop up the window, as shown in Figure 8-3.

The user enters the corresponding content in the corresponding edit box, and clicks 确定 to modify the password (as shown in Figure 8-4).

Figure 8-3

Figure 8-4

8.3 Report title setting

The content of the report title can be freely set by the user according to his own requirements.

Click <标题设置> to pop up the window, as shown in Figure 8-5. The user enters or modifies the contents of the main and subtitles.

Figure 8-5

The font size, color of the main and subtitles can be changed. Click the font button to the right of the edit box, as shown in Figure 8-6.

Figure 8-6

After setting, click the <确定> button to save.

8.4 Sample type setting

The sample type in the report data can be added by the user.

Click <样品类型> to pop up the window, as shown in Figure 8-7.

Users can add, delete, and modify sample types. Click the <确认> or <取消> button when done.

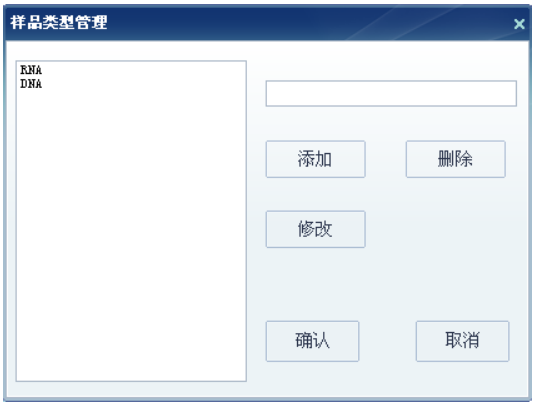


Figure 8-6

8.5 Serial port settings

Click <串口设置> to pop up the window, as shown in Figure 8-8.

Users can set up computer and instrument communication ports.

Figure 8-8

8.6 System backup and recovery

Copy the installation root folder completely to the backup address. As shown in Figure 8-9.

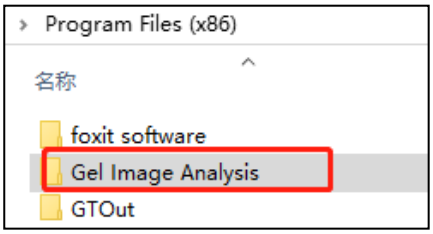


Figure8-9

Chapter 9 Precautions for use

9.1 . Instrument high voltage considerations

The input voltage of the instrument is AC 220V voltage, and the power switch and leakage protection are configured. Users can use it with confidence. Users should not arbitrarily change the circuit and electrical layout of the instrument. If smoke, leakage or other phenomena are found, the power should be cut off in time. Please call service of Baygene.

9.2 Precautions for labor safety measures

According to the experimental conditions, try to avoid direct exposure to UV light or skin contact, and strictly follow the experimental process specifications.

9.3 maintenance and maintenance

- Built-in camera, fragile valuables (no warranty), please protect it carefully.
- Never disassemble the instrument at will, otherwise you will not be responsible for the warranty.
- After use is complete, power off and clean the sample stage.
- The instrument should be placed in a place which is ventilated, dry, and less dusty. When not in use, turn off the main power switch on the back of the cabinet.
- The instrument should be placed in the package when it is stored and transported, with shockproof materials on the upper and lower sides, and the accessories are placed in the accessory box. The outer packaging shall be fastened with an outer tie and shall have the specified markings. Each instrument must have a product certificate and instructions for use. Carton should be handled with care during transportation, and the stored warehouse should be well ventilated and free of corrosive gases.

9.4 reagents (CFDA filing) (if any)

- The following reagents are recommended only by Baygene Biotechnology Co., Ltd., and these reagents can achieve the best results.

reagents	Specification (or Cat no)	Remarker

Chapter 10 Common use of Q&A

Q1、Start the software and the "相机未连接" prompt window will pop up.	A1、 (1) Check if the camera device is installed in the device manager. (2) Please contact the engineer to check if the camera is properly connected to the built-in computer;
Q2、Start the software and the "通讯连接错误” prompt window will pop up.	A2、 （1）Detect the communication port number; （2）Please confirm the data connection between the instrument and the computer.
Q3、Click the light button and the light does not illuminate.	A3、 （1） Same as A2 （2） Check if the power switch is turned on （3） Check if the lamp is damaged;
Q4、Image is not clear	A4、Please contact the engineer to check if the lens focus is clear.
Q5、The instrument is turned on and the screen is not displayed.	A5、Contact the engineer to confirm: (1) Whether the built-in computer is normal; (2) Whether the built-in display is normal; (3) test the connecting line.
Q6、others	A6、Please contact the engineer to check

Chapter 11 Terms of Service

11.1 warranty

In order to enable the majority of consumers to use our products with confidence and satisfaction, our company will strictly stipulate the company's after-sales service system in strict accordance with the relevant laws and regulations issued by the state.

1. When purchasing the products of our company, consumers should fill in the contents of the complete warranty card and stamp the seal of the dealer.

2. Service period: If the company's products fail during normal use within 7 days from the date of sale, consumers can choose refund, exchange, warranty and other services. After the consumer purchases our company's products, if there is a failure caused by non-human damage within one year, the warranty is free. For consumers who do not meet the free replacement or free warranty service, our company still provides technical services, only charge for materials when repairs need to replace parts.

3. The purchase time is based on the invoice or receipt date issued by the dealer.

4. One of the following conditions cannot be used for the “Three Guarantees” service:

1) All human factors are damaged and used in an abnormal working environment, failure or damage caused by the use of the environment not in accordance with the instructions or not in accordance with the instructions;

2) The user disassembles, repairs, or modifies the product without the consent of the company;

3) Damage caused by bad transportation after purchasing our products;

4) Damage caused by other irresistible forces (such as floods, lightning strikes, earthquakes, abnormal voltages);

5) normal use, wear, cracking and dip dyeing;

6) Products that are not part of the company (such as fakes);

7) Can not produce valid shopping vouchers, no warranty card, etc.;

8) The body barcode is damaged.

11.2 Service procedure

In the event of a malfunction of the customer's products, the customer should bring the invoice or relevant receipt to the dealer for repair. If the problem has not been solved properly, please call or write to our customer service department, we will help you solve the problem in the shortest possible time.

产品保修卡（客户联）

产品信息

产品名称及型号：_____

产品序列号：_____

安装日期：_____

安装工程师签字：_____

发票号码：_____

客户信息

客户名称：_____

联系人：_____

地址：_____

联系电话：_____

电子邮箱：_____

（客户联由客户自己保管）

地址：北京天竺空港工业区 B 区科技创业园 7 号楼

电话：010-80483100 80483200 传真：010-80482859

网址：www.baygenebiotech.com E-mail：info@baygenebiotech.com

产品保修卡（公司联）

产品信息

产品名称及型号：_____

产品序列号：_____

安装日期：_____

安装工程师签字：_____

发票号码：_____

客户信息

客户名称：_____

联系人：_____

地址：_____

联系电话：_____

电子邮箱：_____

（公司联由客户填好后交给公司）

地址：北京天竺空港工业区 B 区科技创业园 7 号楼

电话：010-80483100 80483200 传真：010-80482859

网址：http://www.baygenebiotech.com.cn E-mail：info@baygenebiotech.com