

Análisis de imagen con herramientas libres



FIJI (is just image J)

ImageJ is an [open source](#) image processing program designed for scientific multidimensional images. ImageJ is highly [extensible](#), with thousands of [plugins](#) and [macros](#) for performing a wide variety of tasks, and a strong, established user base.

This site is the central online resource documenting ImageJ and its plugins. It is a wiki, meaning that everyone is encouraged to make edits and improvements, benefiting the entire ImageJ community.

There are three major "flavors" of ImageJ:



ImageJ2

The current version of ImageJ focuses on analysis of scientific multidimensional image data. ImageJ2 includes ImageJ1 (see right) with a compatibility layer, so that old-style plugins and macros continue to work.

For users: ImageJ2 is a supercharged version of ImageJ1 with new features.

For developers: ImageJ2 is an entirely redesigned, more powerful set of software libraries.

ImageJ1

ImageJ 1.x, sometimes shortened to ImageJ1 or IJ1, is the stable version of ImageJ developed by Wayne Rasband at NIH since 1997.

ImageJ grew organically over time as Wayne Rasband continuously added features according to user requests. Now there are thousands of plugins written by members of a diverse community.



Fiji

Fiji is a distribution of ImageJ for the life sciences. It provides a large number of additional plugins to facilitate analysis of life sciences images, particularly microscopy images. The Fiji distribution is built on the ImageJ2 platform.



Fiji Is Just ImageJ

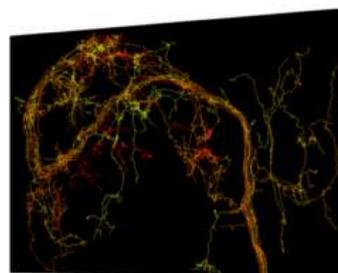
QR for this page

Fiji is an image processing package. It can be described as a "batteries-included" distribution of ImageJ (and ImageJ2), bundling Java, Java3D and a lot of plugins organized into a coherent menu structure. Fiji compares to ImageJ as Ubuntu compares to Linux.

The main focus of Fiji is to assist research in life sciences.

For users Fiji is easy to install and has an automatic update function, bundles a lot of plugins and offers comprehensive documentation.

Developing Fiji Fiji is an open source project hosted in a Git version control repository, with access to the source code of all internals, libraries and plugins, and eases the development and scripting of plugins.



The TrakEM2 plugin provides the means to reconstruct neuronal arbor in 3D, including relationships between trees to represent synapses.

Download Fiji now List of Update sites

How to cite Fiji? Who is citing Fiji?

News

- 2014-10-01 - ImageJ OPS Hackathon
- 2014-08-29 - New skin for imagej.net
- 2014-08-27 - TrackMate v2.5.0 released
- 2014-08-13 - ImageJ 2.0.0-rc-13 released
- 2014-08-08 - ImageJ 2.0.0-rc-11 released

Subscribe to an RSS or Atom feed of the Fiji news.

Browse the news archive.

Downloads

Collaboration

The Fiji project is driven by a strong desire to improve the tools available for life sciences to process and analyze data. To this end, Fiji collaborates closely with the following projects:



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<http://fiji.sc/Fiji>

Requisitos instalación

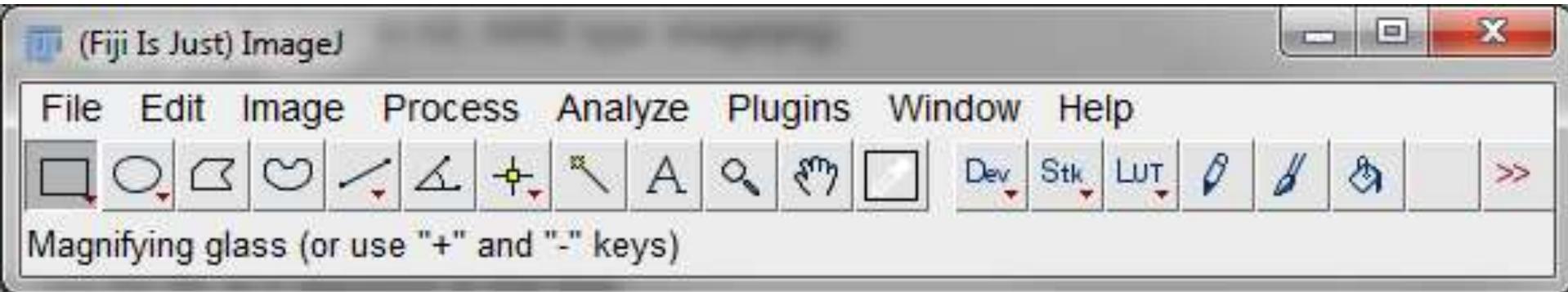
System requirements

ImageJ will run on any system that has a Java 6 (or later) runtime installed. This includes, but is not limited to:

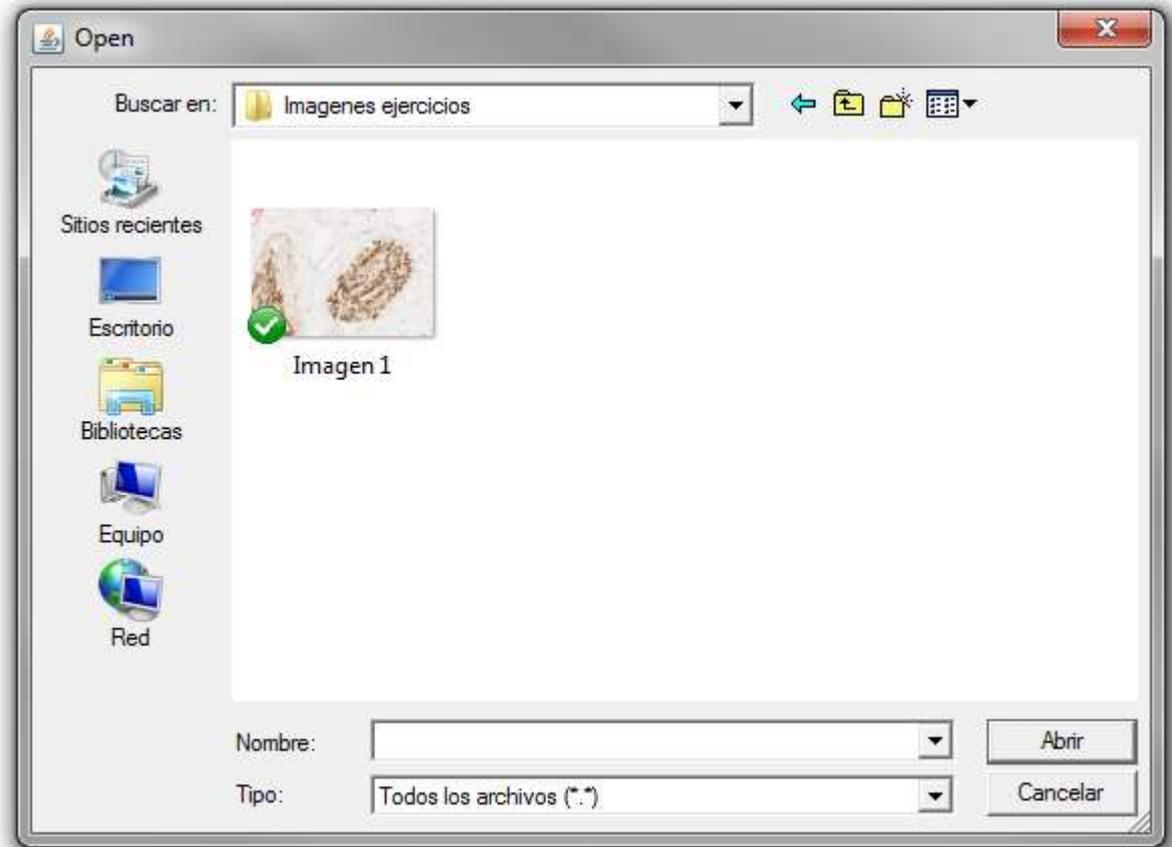
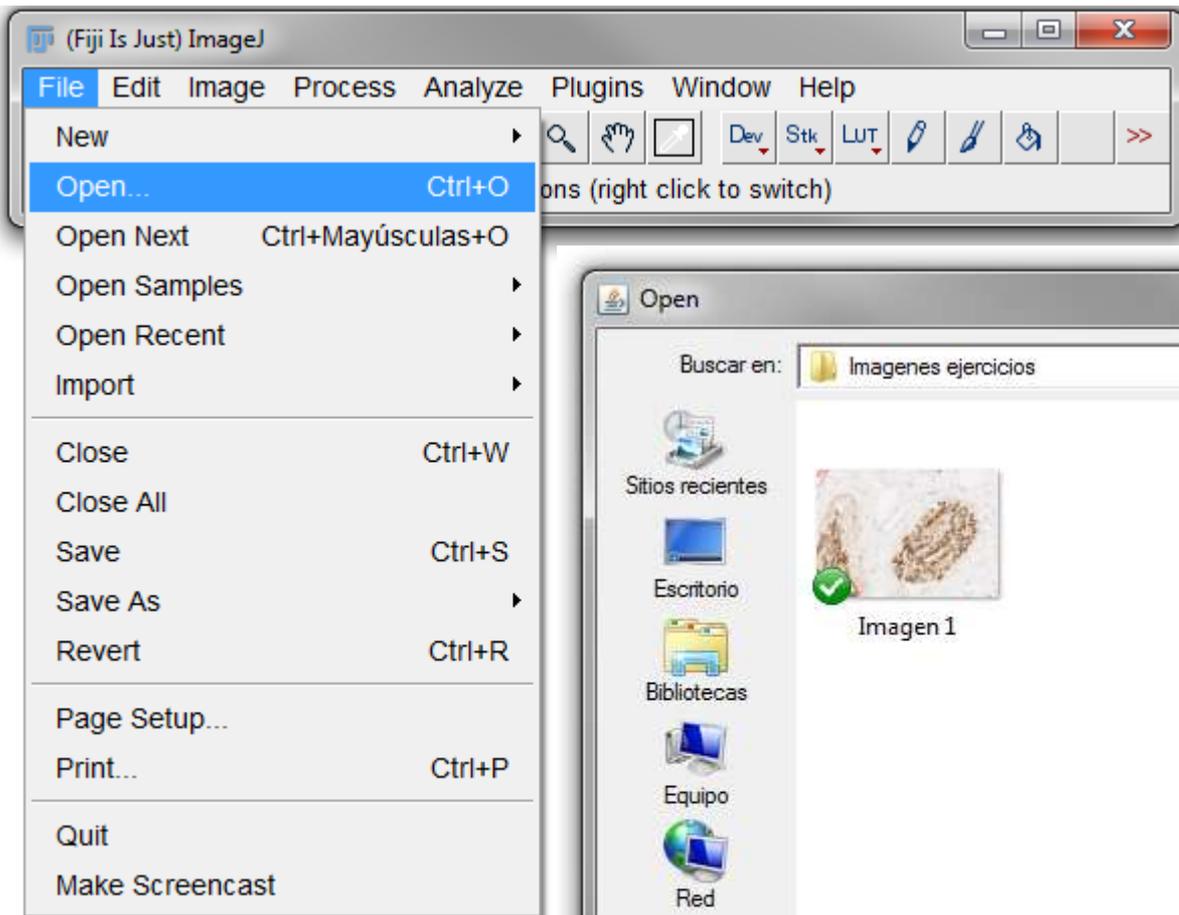
1. Windows XP, Vista, 7 or 8 with Java installed from java.com 
2. Mac OS X 10.5 "Leopard" with an Intel 64-bit processor with the Java 6 update
3. Mac OS X 10.6 "Snow Leopard" (Java 6 is preinstalled)
4. Mac OS X 10.7 "Lion" or later with Java installed from java.com 
5. Ubuntu Linux with `sun-java6-jre` or `openjdk-6-jre` installed from the package manager

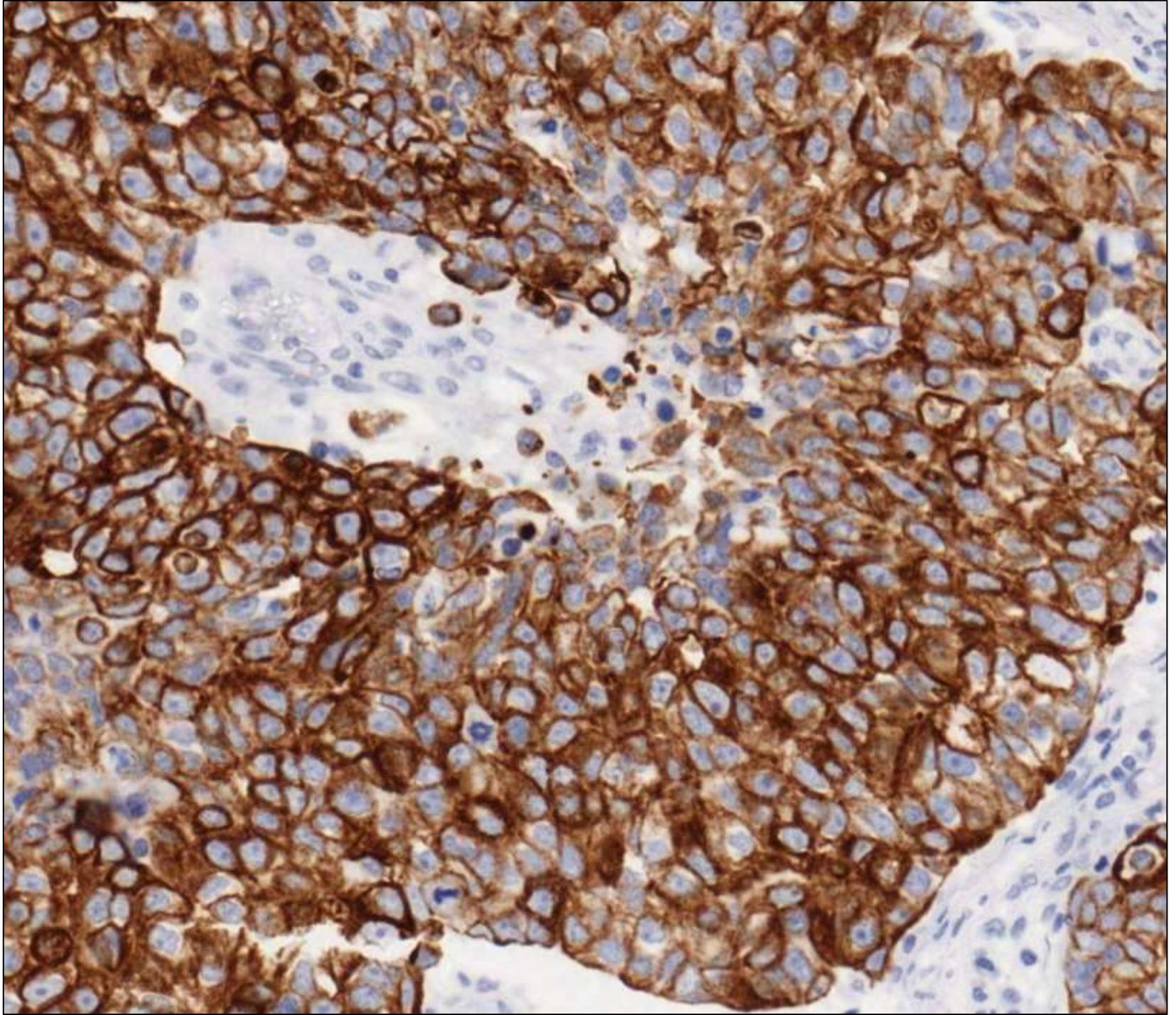
Please note that we currently test ImageJ mostly with Oracle Java 6. We have done a limited amount of testing with OpenJDK 7 and with Oracle Java 8, and things superficially work, but there may be additional bugs in those cases. Feel free to report any such issues to the [Mailing Lists](#).

Ejecutar FIJI

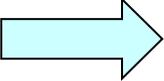


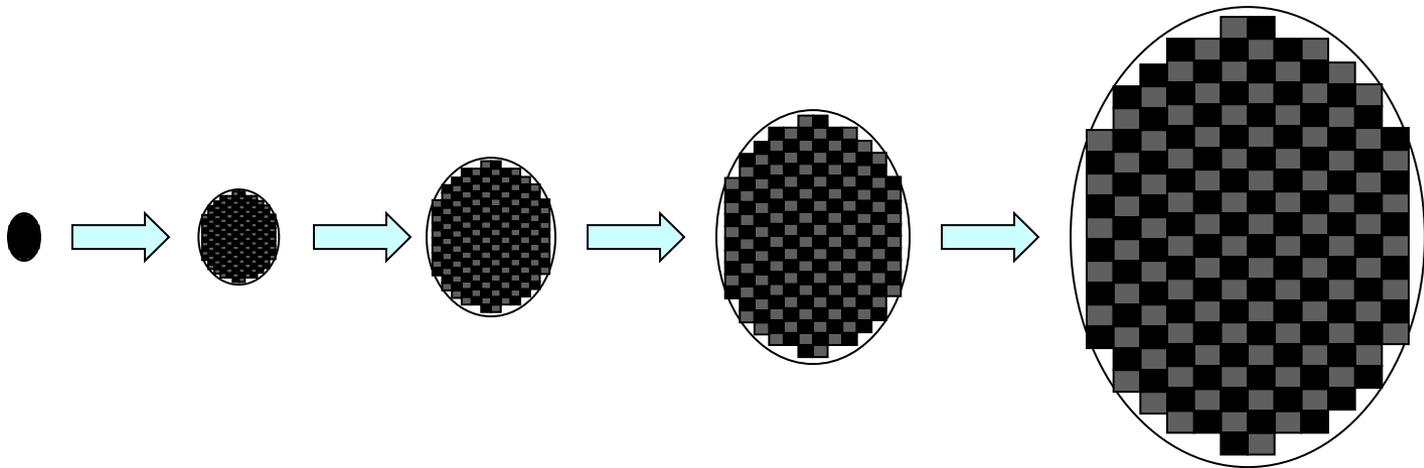
EJERCICIO 1



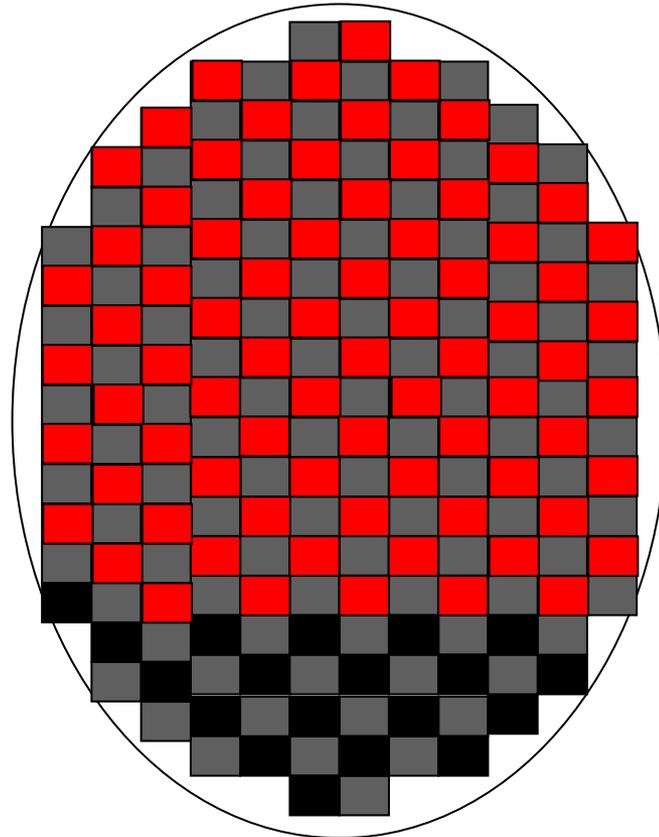


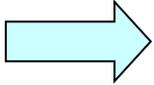
- Imagen digital  Píxel

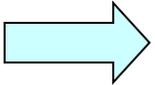
- Píxel  Es la unidad menor de la que se compone una imagen.



Segmentación → Selección de objetos, áreas o características de interés dentro de una imagen (foreground) y no selección del resto de imagen (background).



- Imagen digital  Modelos de color $\left\{ \begin{array}{l} \text{RGB} \\ \text{HSI} \\ \text{CMYK} \end{array} \right.$

- Modelo RGB  Cada color se expresa como la cantidad de luz Roja (R), Verde (G), y azul (B) que contiene cada píxel.

16.777.216

0

255

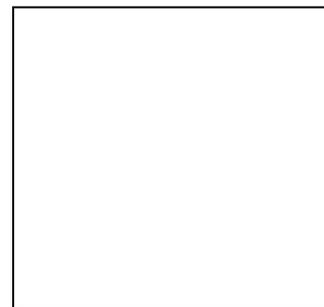
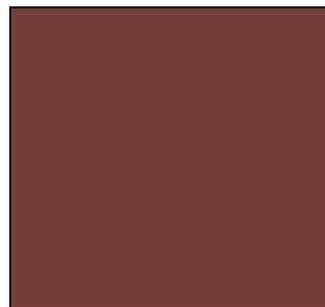
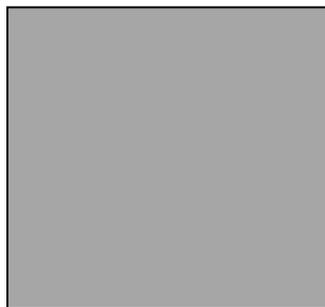
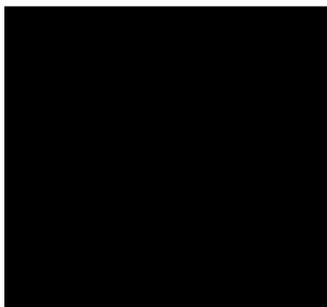
R



G



B



R G B

0 0 0

R G B

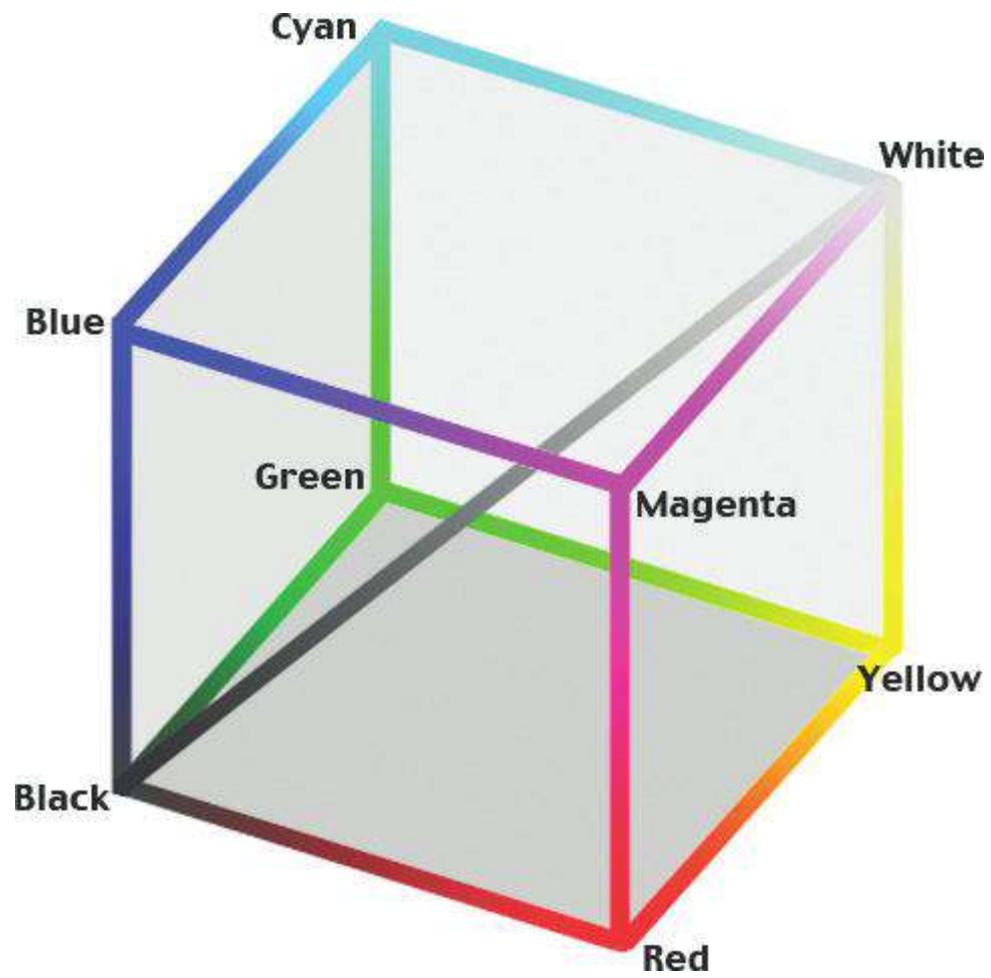
166 166 166

R G B

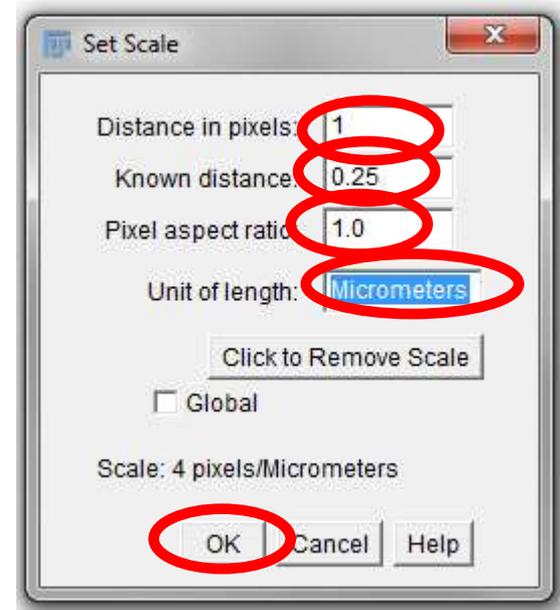
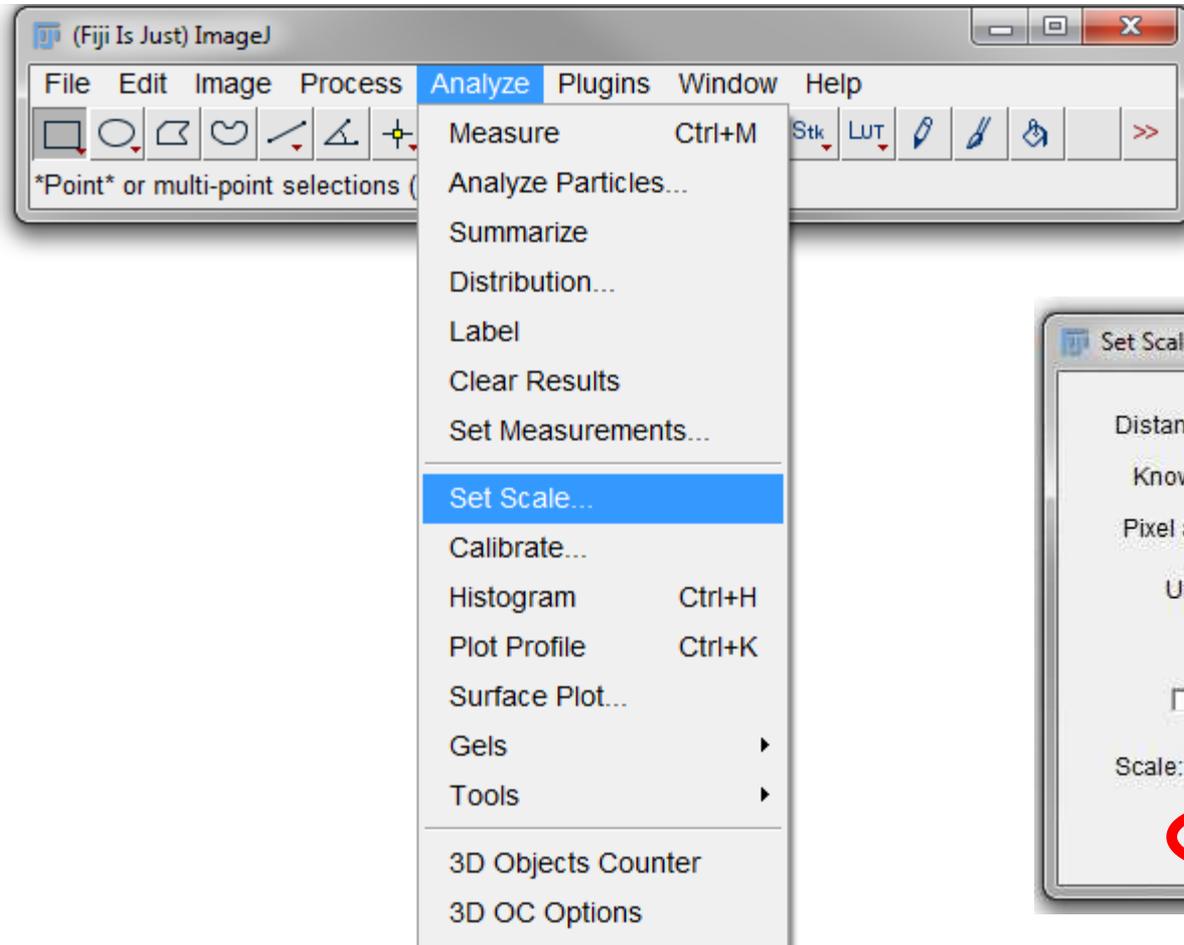
118 62 69

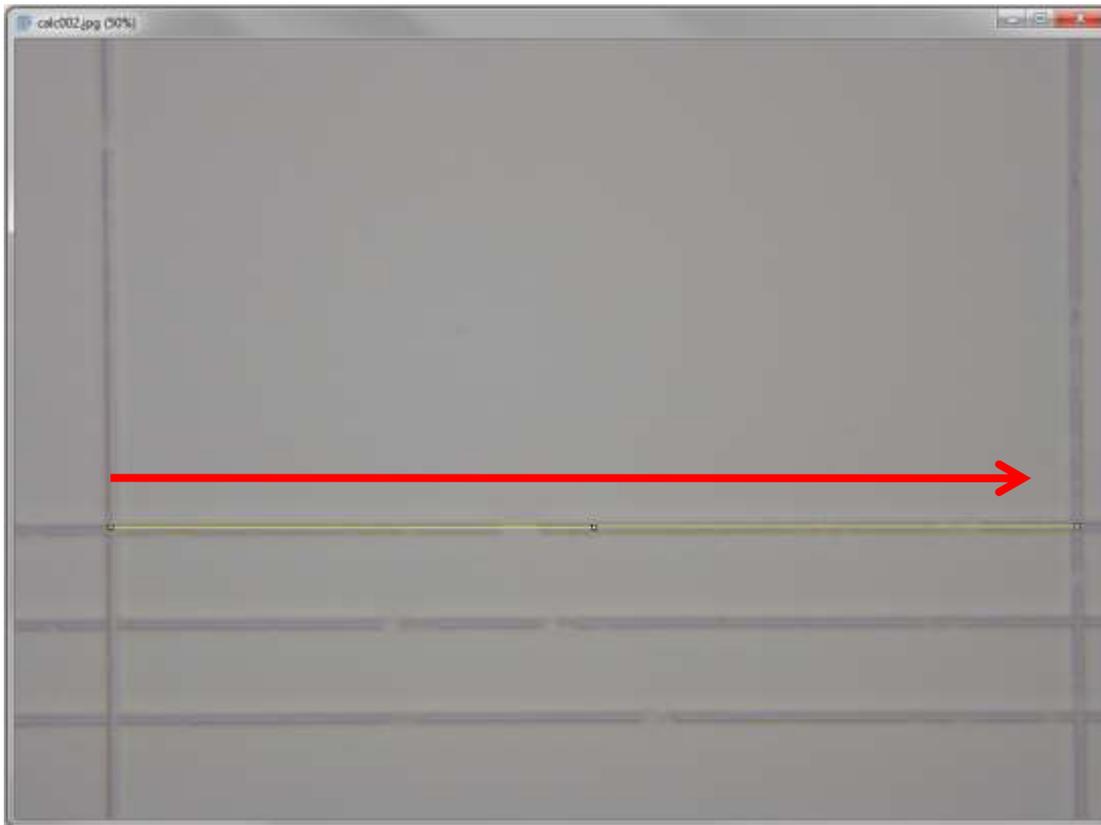
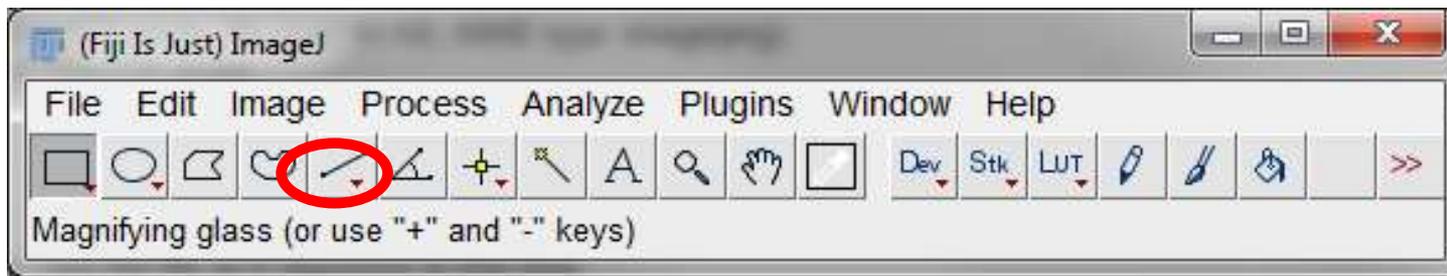
R G B

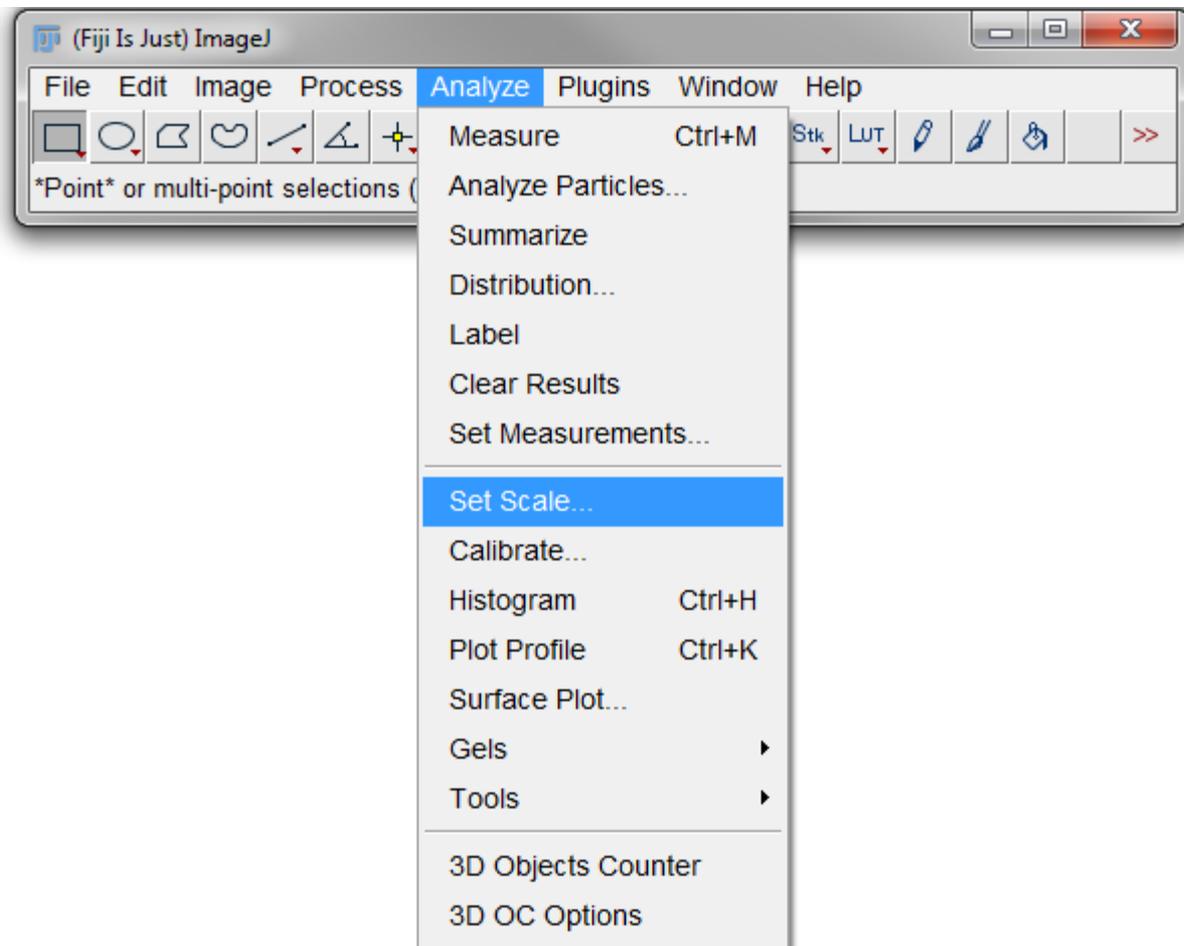
255 255 255

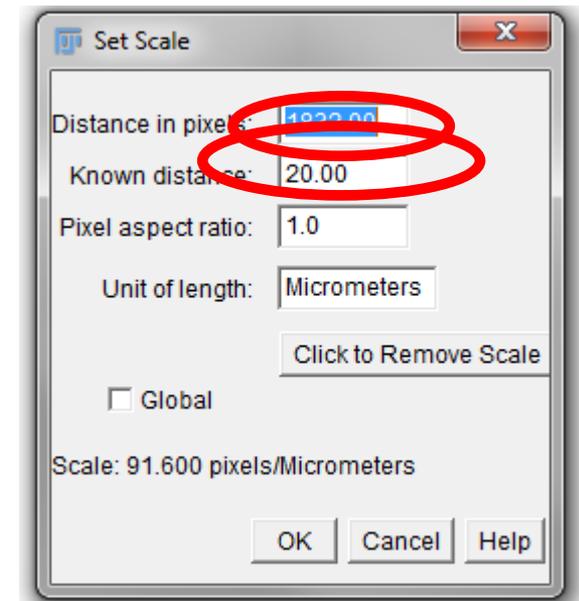
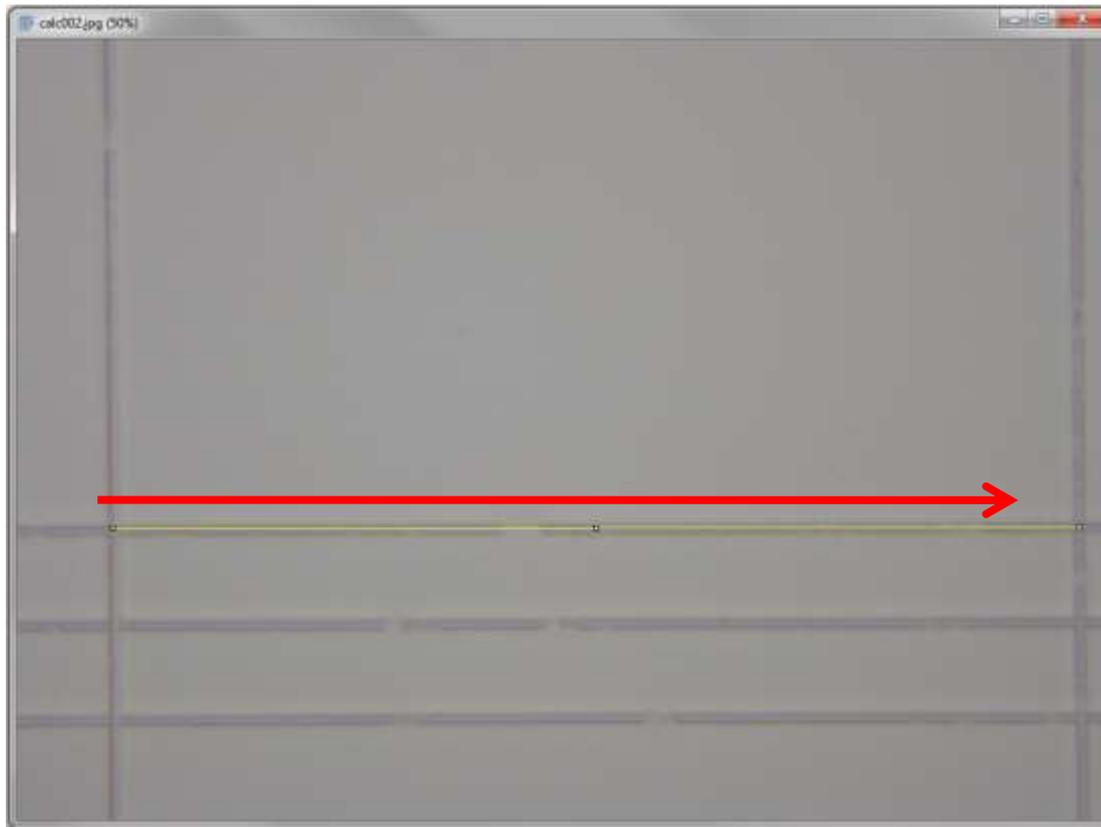
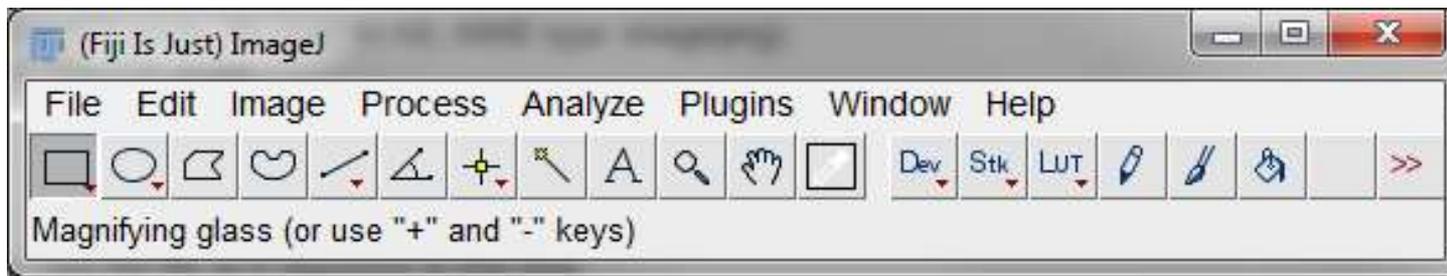


Calibración de imágenes

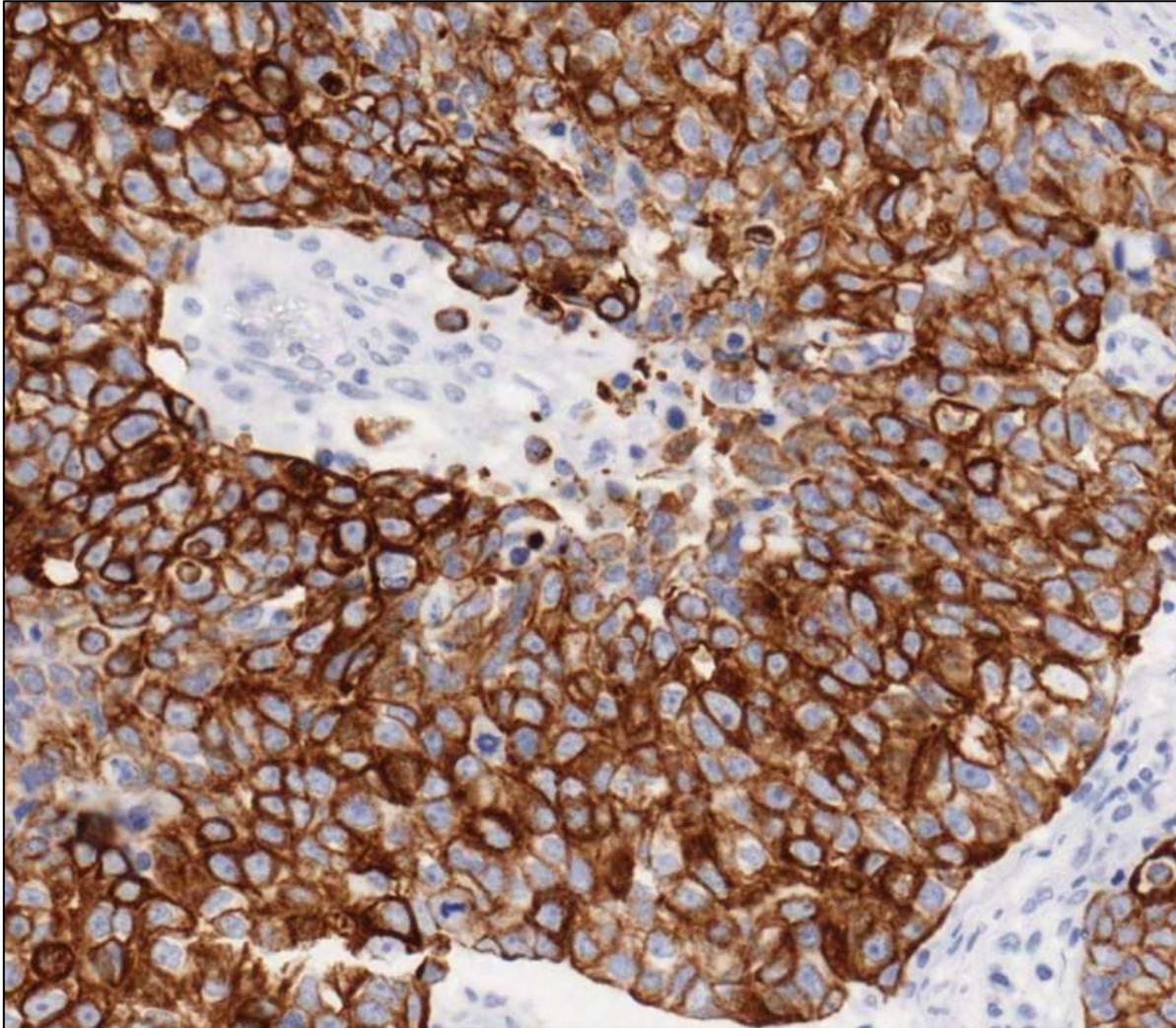


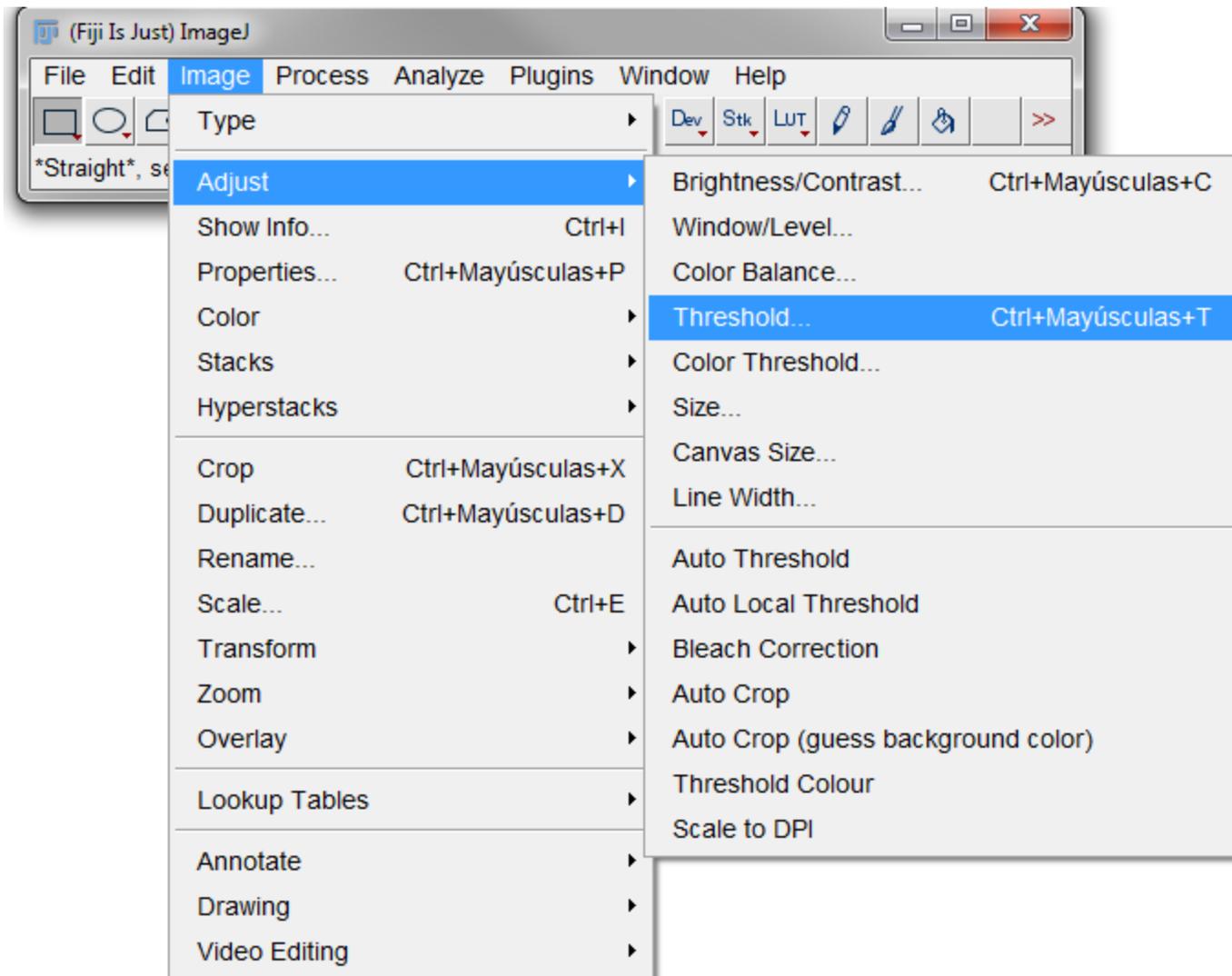






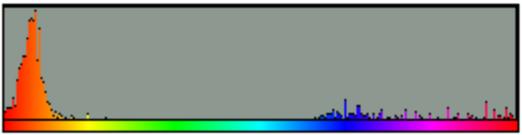
Selección de áreas teñidas de forma positiva.





Threshold Color

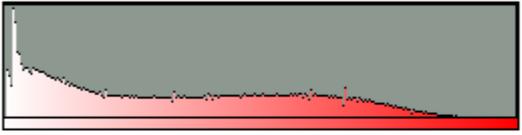
Hue



Pass

0 255

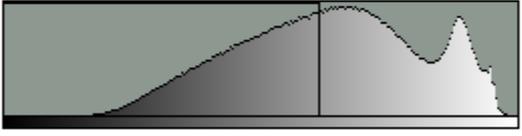
Saturation



Pass

0 255

Brightness



Pass

0 157

Thresholding method: **Default**

Threshold color: **Red**

Color space: **HSB**

Dark background

Original Filtered Sample

Stack Macro Help

(Fiji Is Just) ImageJ

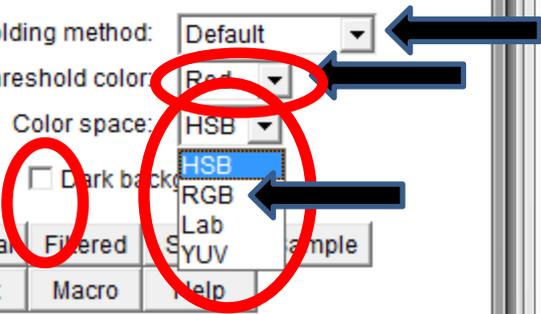
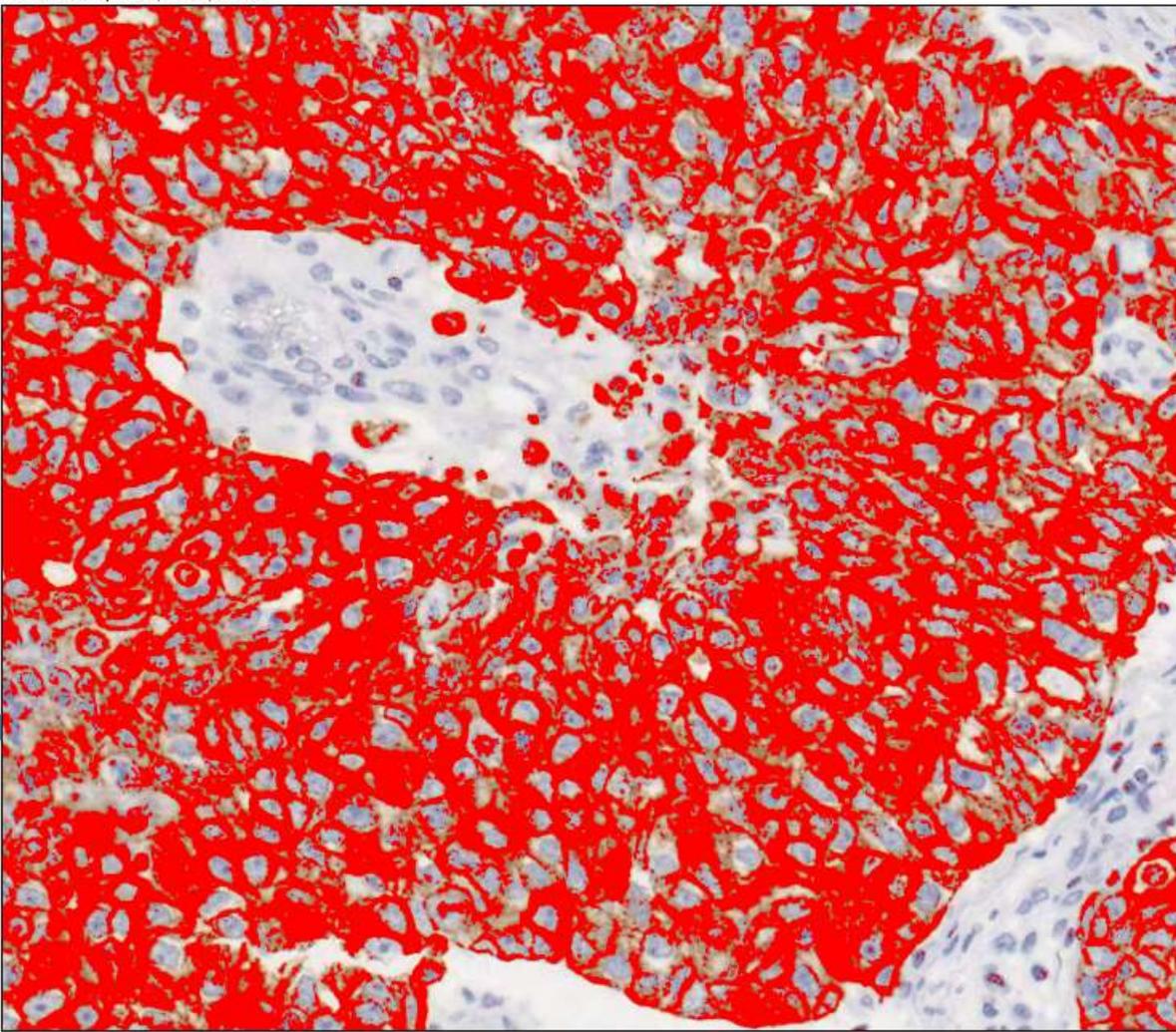
File Edit Image Process Analyze Plugins Window Help



(Fiji Is Just) ImageJ 1.48k; Java 1.6.0_24 [64-bit];

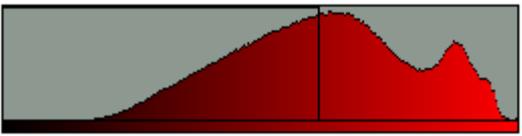
Imagen 4.jpg (50%)

1470x1299 pixels; RGB; 7.3MB



Threshold Color

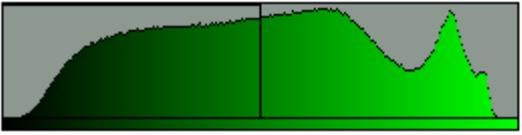
Red



Pass

0 157

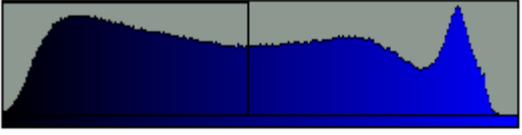
Green



Pass

0 128

Blue



Pass

0 122

Thresholding method: Default

Threshold color: Red

Color space: **RGB**

Dark background

Original Filtered Select Sample

Stack Macro Help

(Fiji Is Just) ImageJ

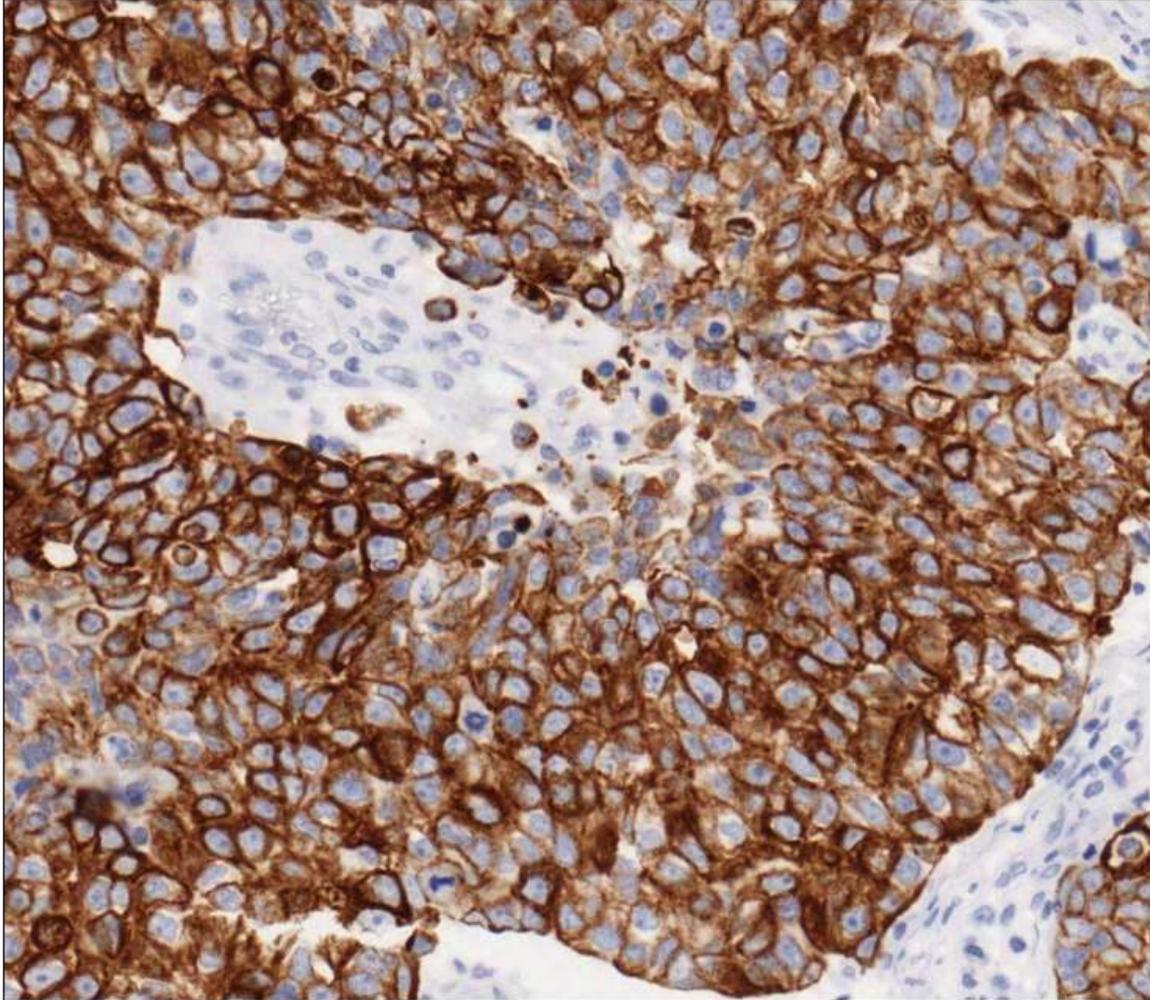
File Edit Image Process Analyze Plugins Window Help



(Fiji Is Just) ImageJ 1.48k; Java 1.6.0_24 [64-bit];

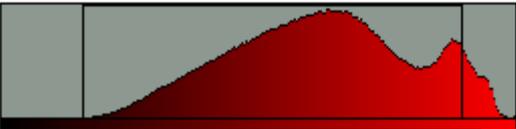
Imagen 5.jpg (50%)

1470x1299 pixels; RGB; 7.3MB



Threshold Color

Red



Pass

41

229

Green

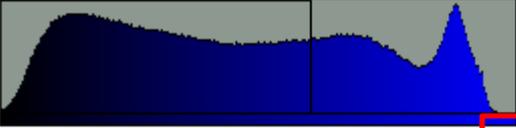


Pass

2

191

Blue



Pass

0

154

Thresholding method: Default

Threshold color: Red

Color space: RGB

Dark background

Original Filtered Selected Sample

Stack Macro Help

(Fiji Is Just) ImageJ

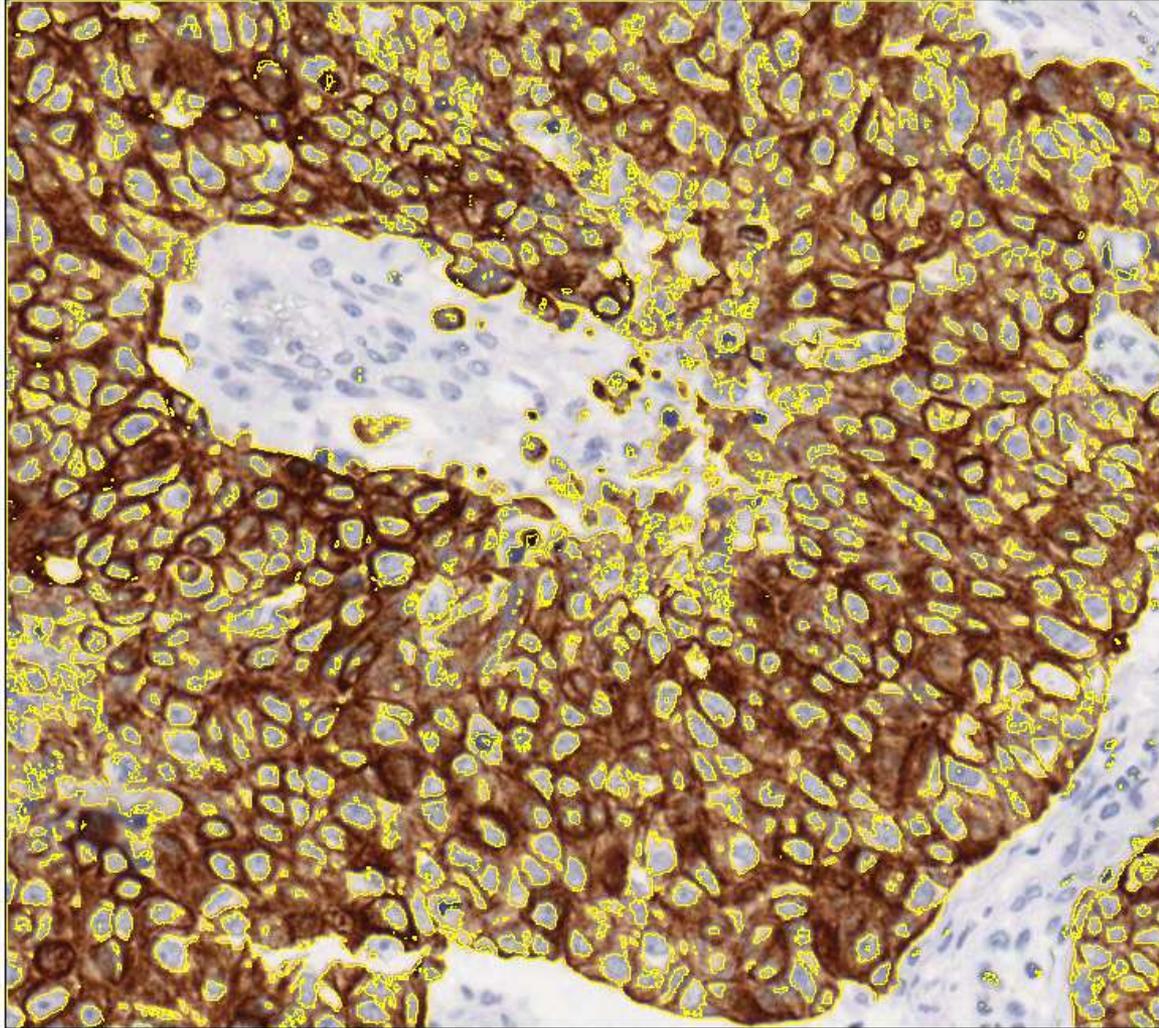
File Edit Image Process Analyze Plugins Window Help

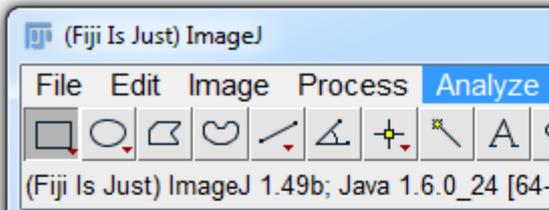


(Fiji Is Just) ImageJ 1.48k; Java 1.6.0_24 [64-bit];

Imagen 5.jpg (50%)

1470x1299 pixels; RGB; 7.3MB





- Clear Results
- Set Measurements...
- Set Scale...
- Calibrate...
- Histogram Ctrl+H
- Plot Profile Ctrl+K
- Surface Plot...
- Gels ▶
- Tools ▶
- 3D Objects Counter
- 3D OC Options
- Colocalization ▶
- Color Histogram
- Directionality
- Shape Index Map
- Optic Flow ▶
- Helmholtz Analysis
- 3D Surface Plot
- Classification ▶
- Local Thickness ▶
- QuickPALM ▶



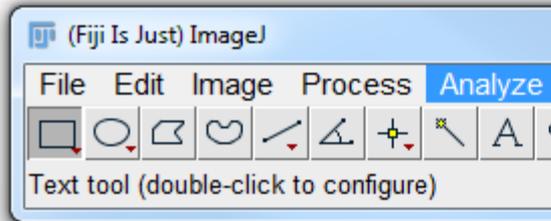
Set Measurements

<input checked="" type="checkbox"/> Area	<input type="checkbox"/> Mean gray value
<input checked="" type="checkbox"/> Standard deviation	<input type="checkbox"/> Modal gray value
<input type="checkbox"/> Min & max gray value	<input type="checkbox"/> Centroid
<input type="checkbox"/> Center of mass	<input checked="" type="checkbox"/> Perimeter
<input type="checkbox"/> Bounding rectangle	<input type="checkbox"/> Fit ellipse
<input type="checkbox"/> Shape descriptors	<input type="checkbox"/> Feret's diameter
<input type="checkbox"/> Integrated density	<input type="checkbox"/> Median
<input type="checkbox"/> Skewness	<input type="checkbox"/> Kurtosis
<input type="checkbox"/> Area fraction	<input type="checkbox"/> Stack position
<input type="checkbox"/> Limit to threshold	<input type="checkbox"/> Display label
<input type="checkbox"/> Invert Y coordinates	<input type="checkbox"/> Scientific notation
<input type="checkbox"/> Add to overlay	

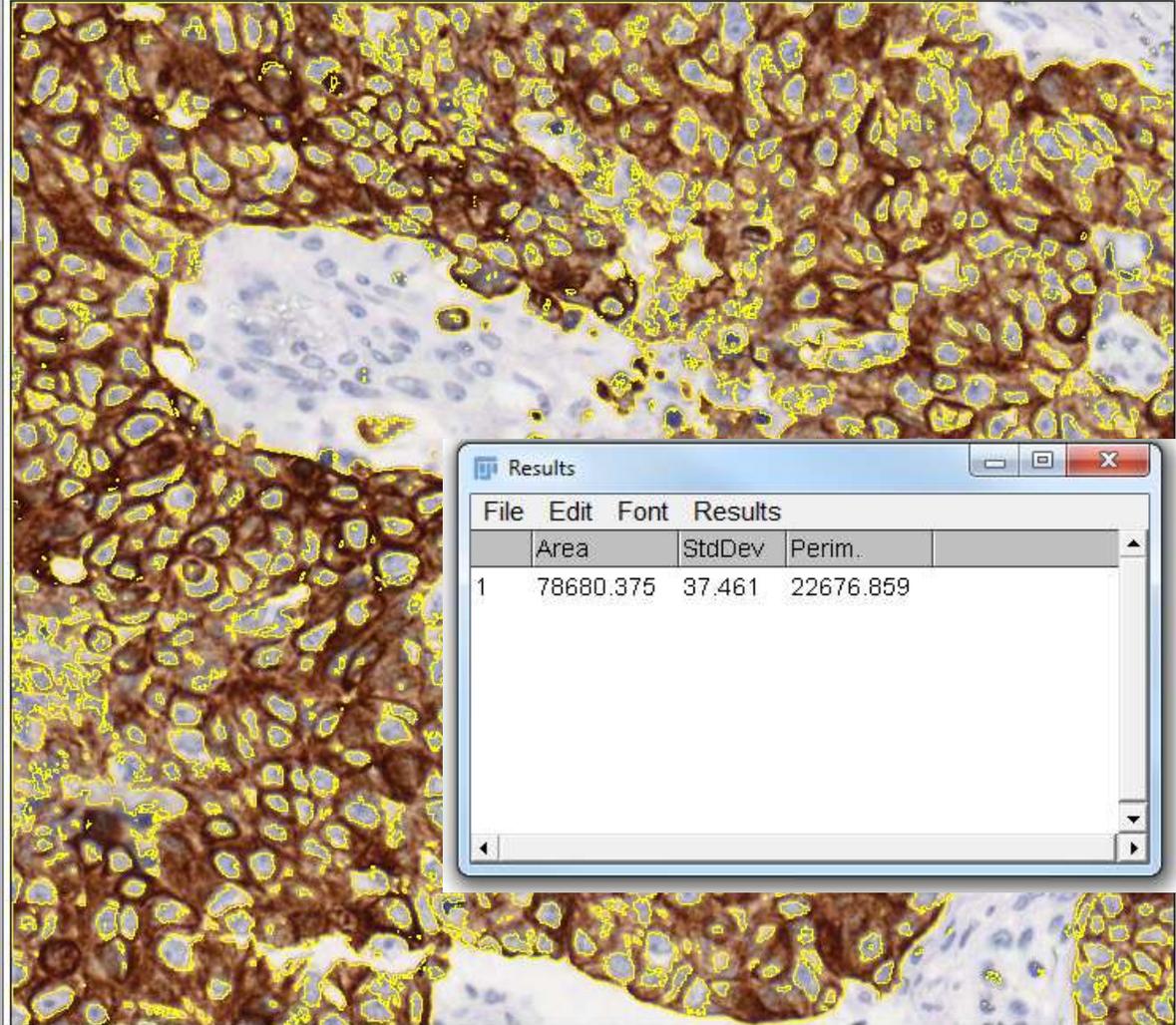
Redirect to:

Decimal places (0-9):

OK Cancel Help



- Measure **Ctrl+M**
- Analyze Particles...
- Summarize
- Distribution...
- Label
- Clear Results
- Set Measurements...
- Set Scale...
- Calibrate...
- Histogram **Ctrl+H**
- Plot Profile **Ctrl+K**
- Surface Plot...
- Gels ▶
- Tools ▶
- 3D Objects Counter
- 3D OC Options
- Colocalization ▶
- Color Histogram
- Directionality
- Shape Index Map
- Optic Flow ▶

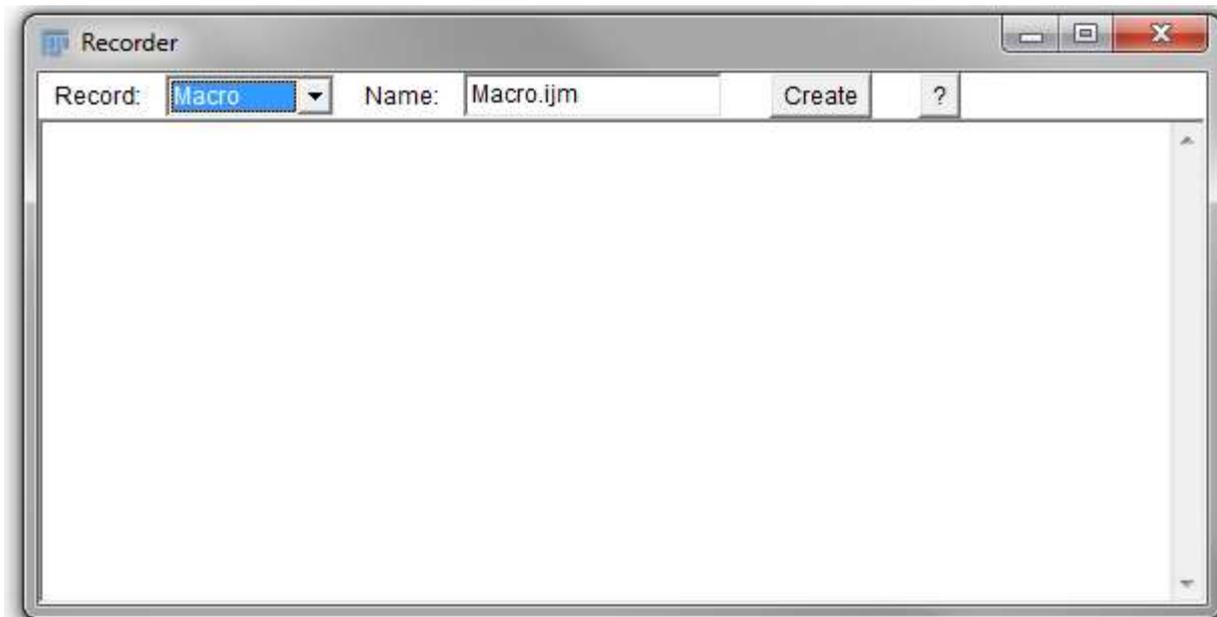
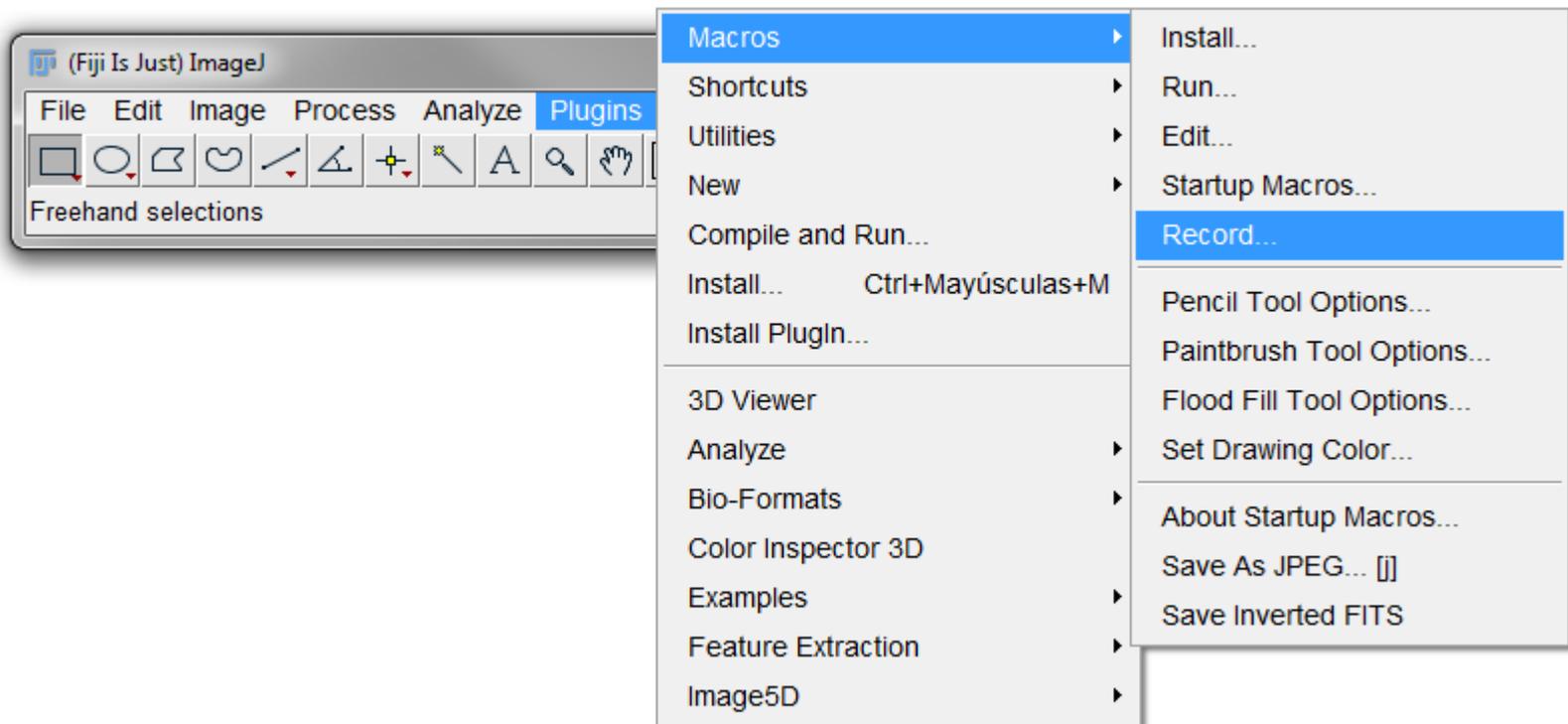


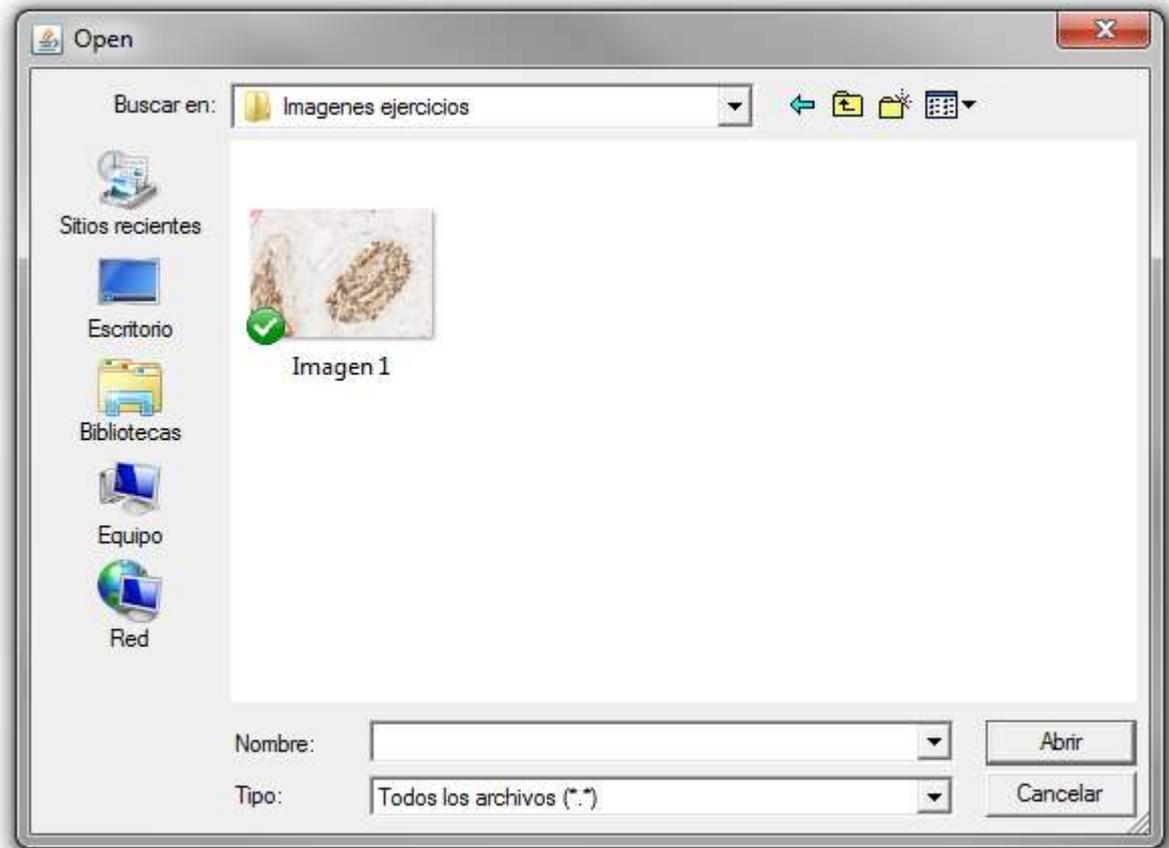
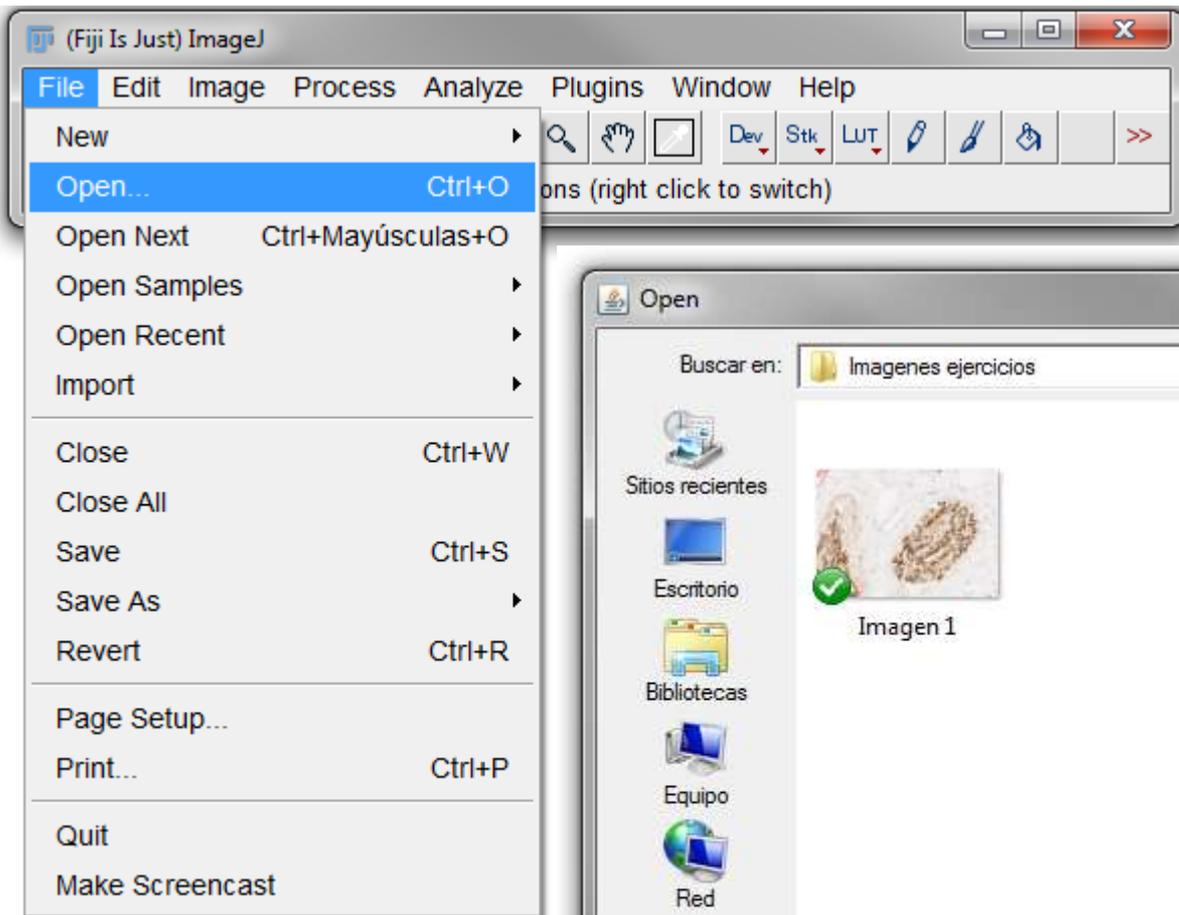
File	Edit	Font	Results
	Area	StdDev	Perim..
1	78680.375	37.461	22676.859

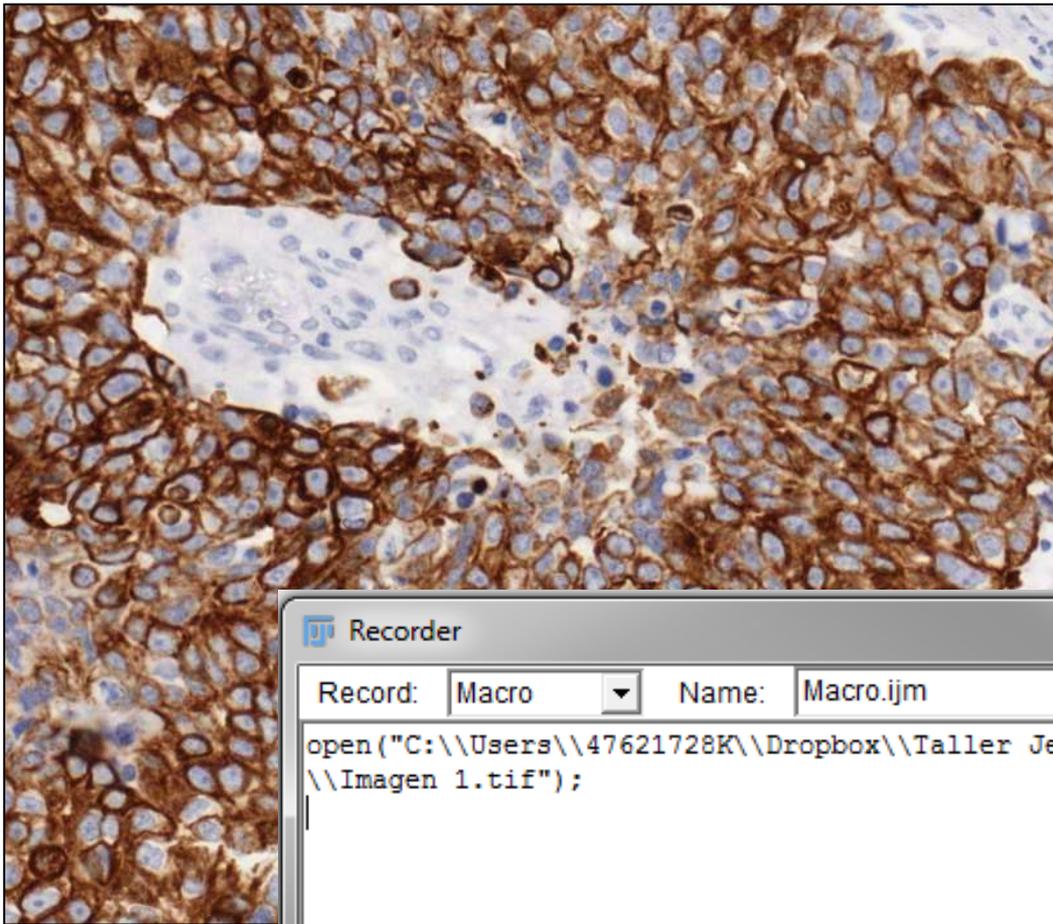
EJERCICIO 2

Macro

Es un programa sencillo que automatiza una serie de comandos del FIJI. La manera más fácil de crear una macro es grabando una secuencia de comandos utilizando el Macro Recorder



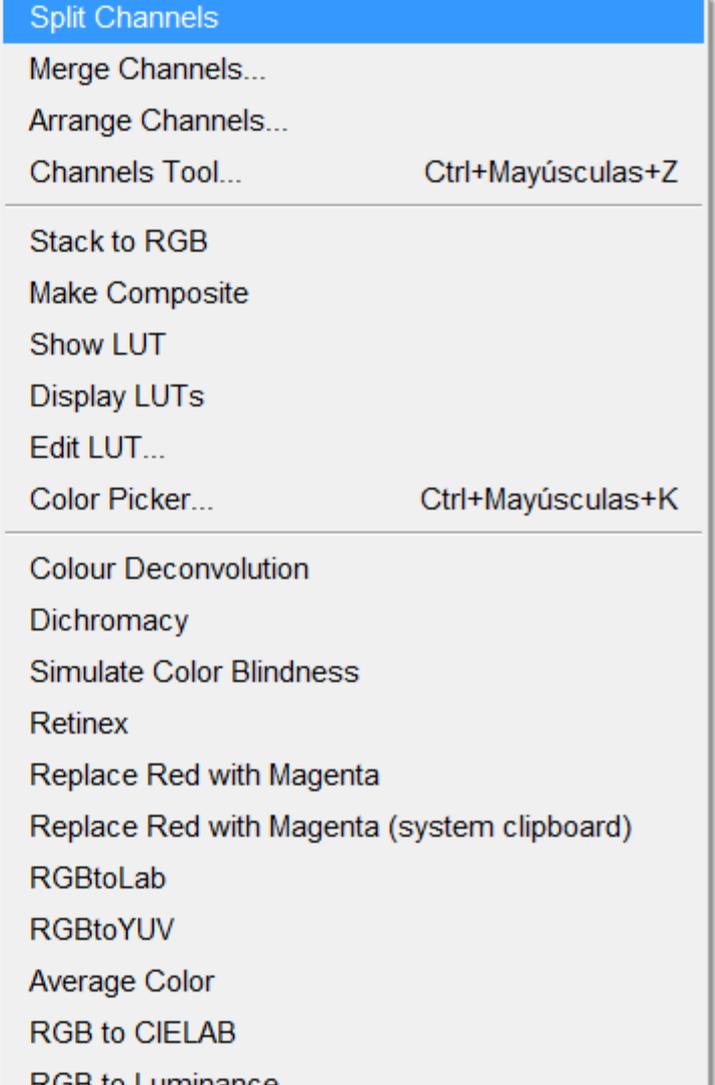
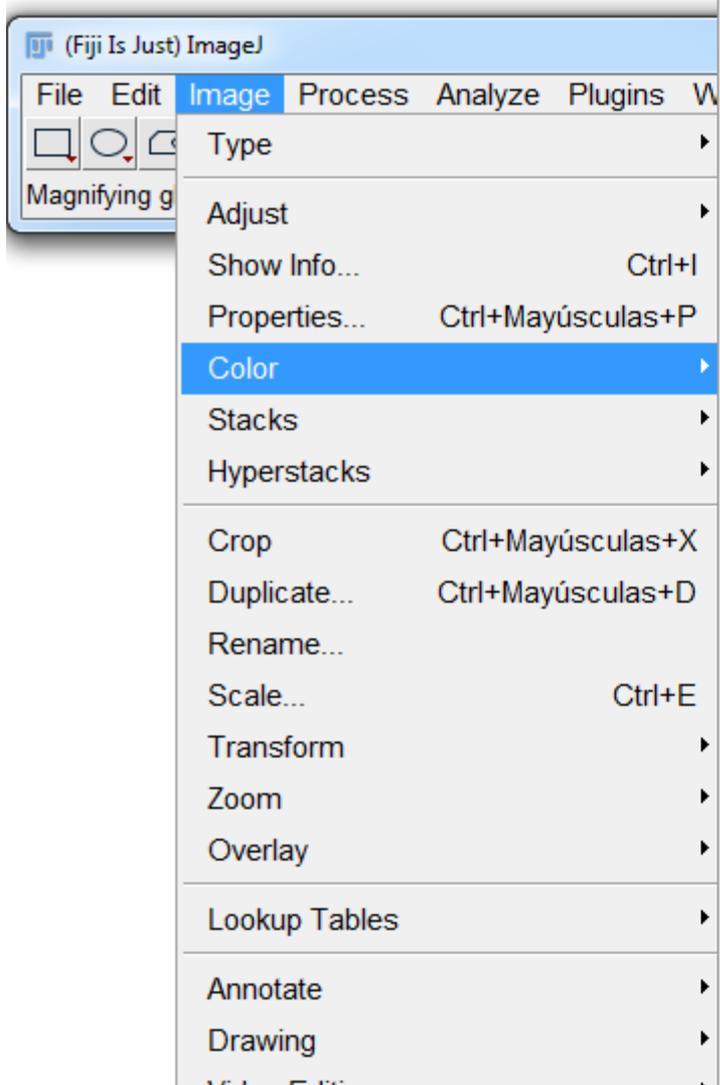


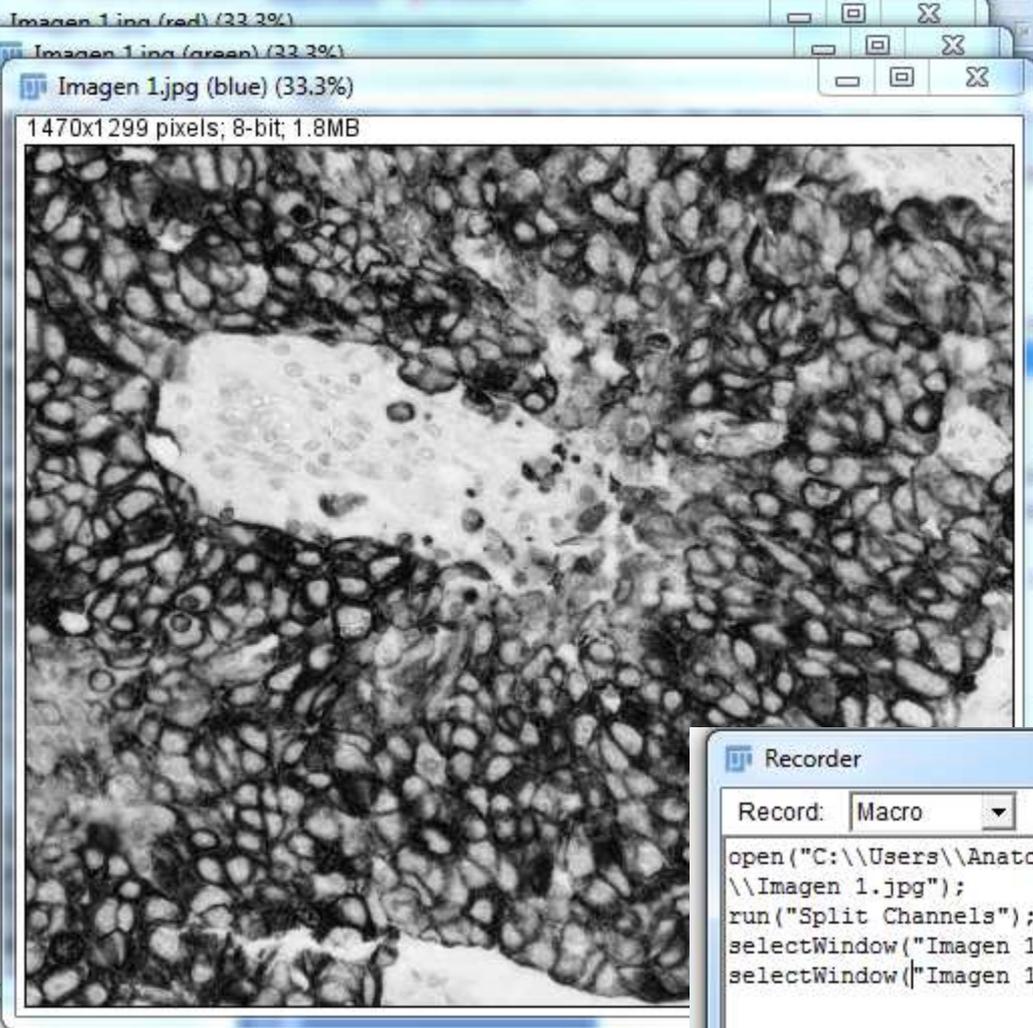


Recorder

Record: Macro Name: Macro.ijm Create ?

```
open("C:\\Users\\47621728K\\Dropbox\\Taller Jerez FIJI\\Imagenes ejercicios  
\\Imagen 1.tif");
```

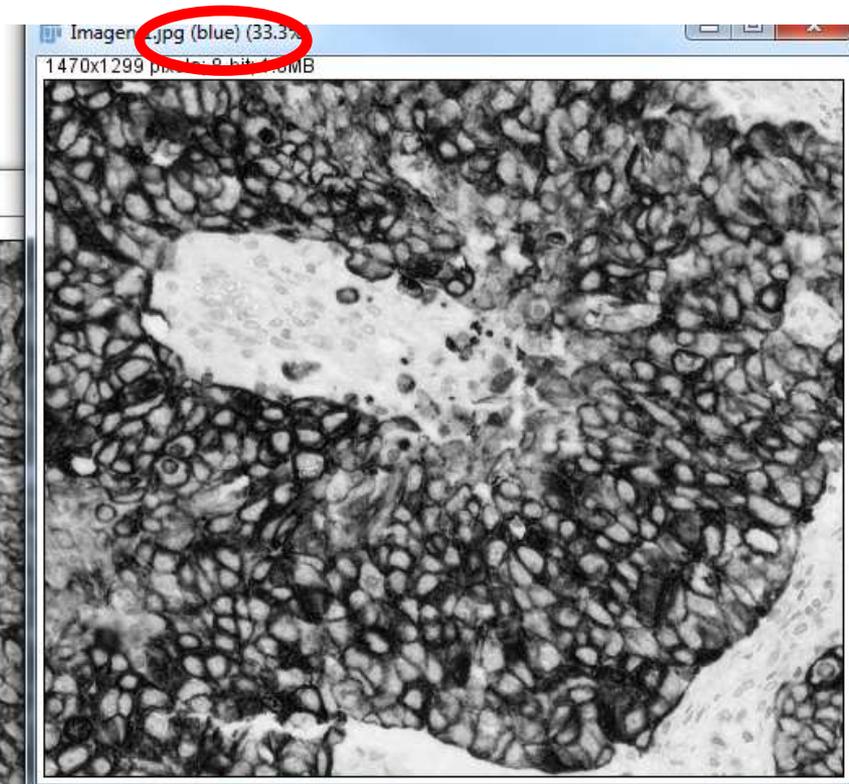
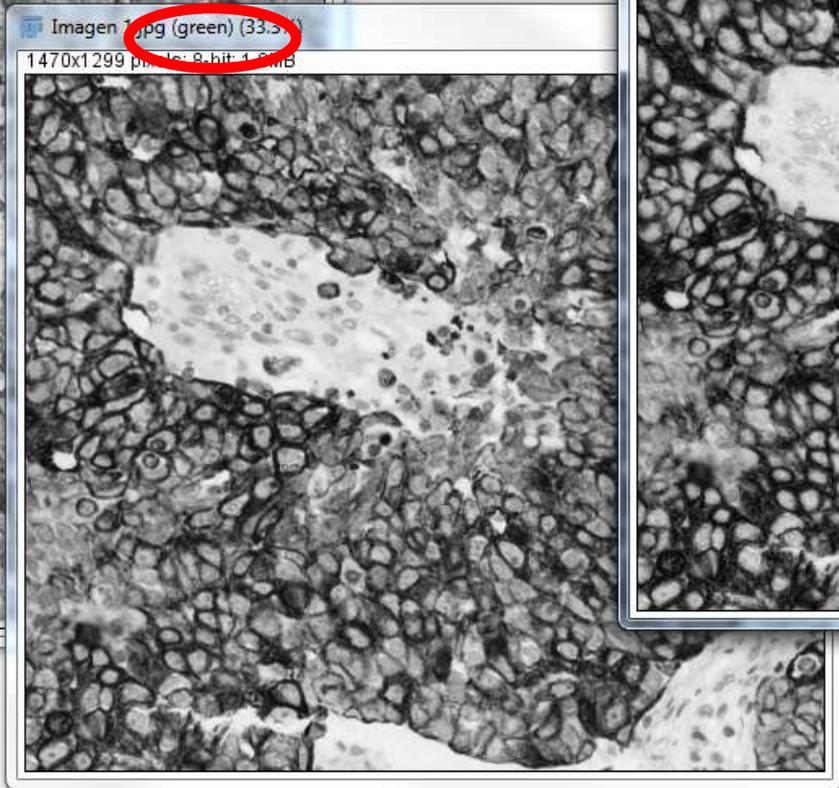
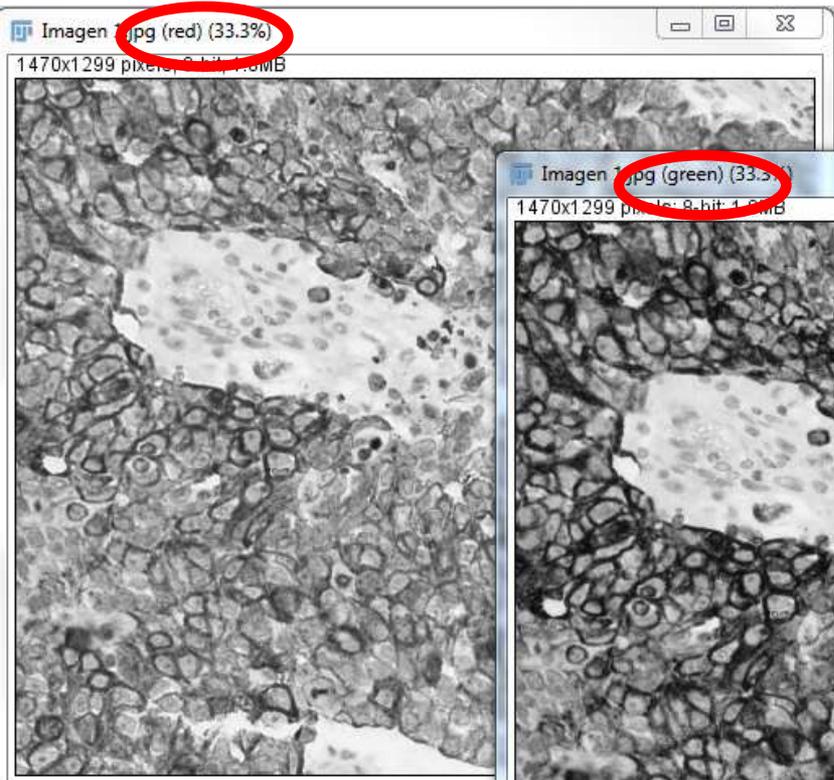




Recorder

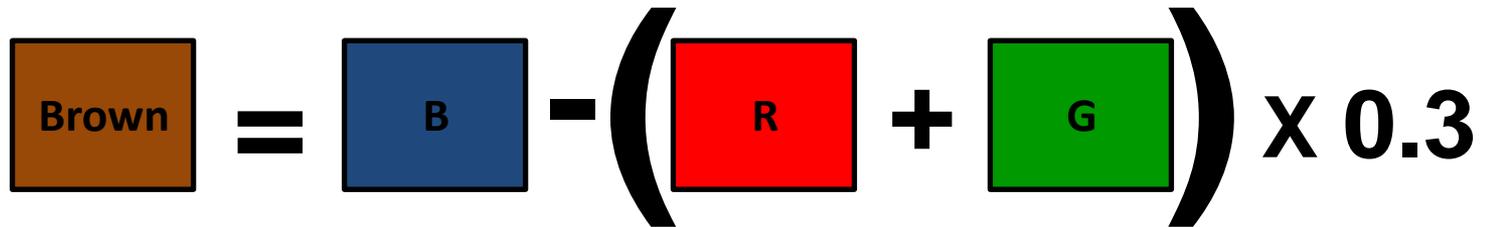
Record: Macro Name: Macro.ijm Create ?

```
open("C:\\Users\\Anatomia\\Dropbox\\Taller Jerez FIJI\\Imágenes ejercicios  
\\Imagen 1.jpg");  
run("Split Channels");  
selectWindow("Imagen 1.jpg (green)");  
selectWindow("Imagen 1.jpg (blue)");
```

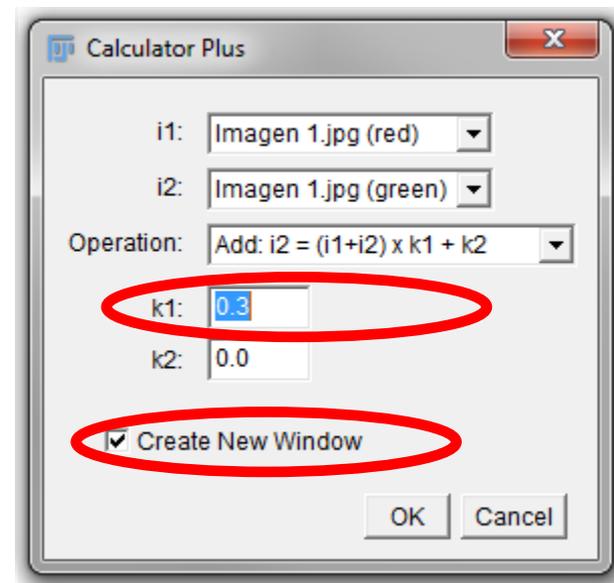
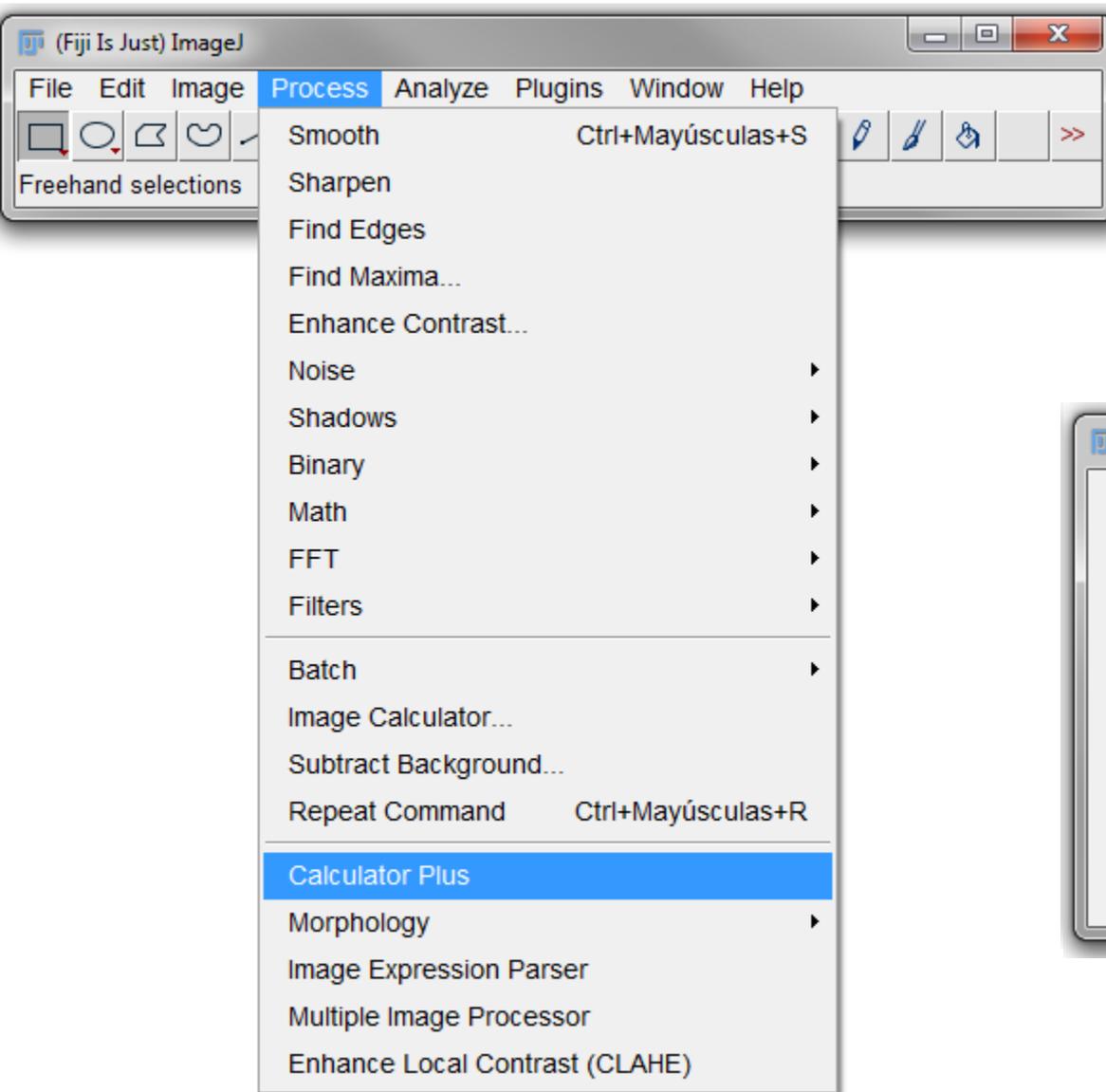


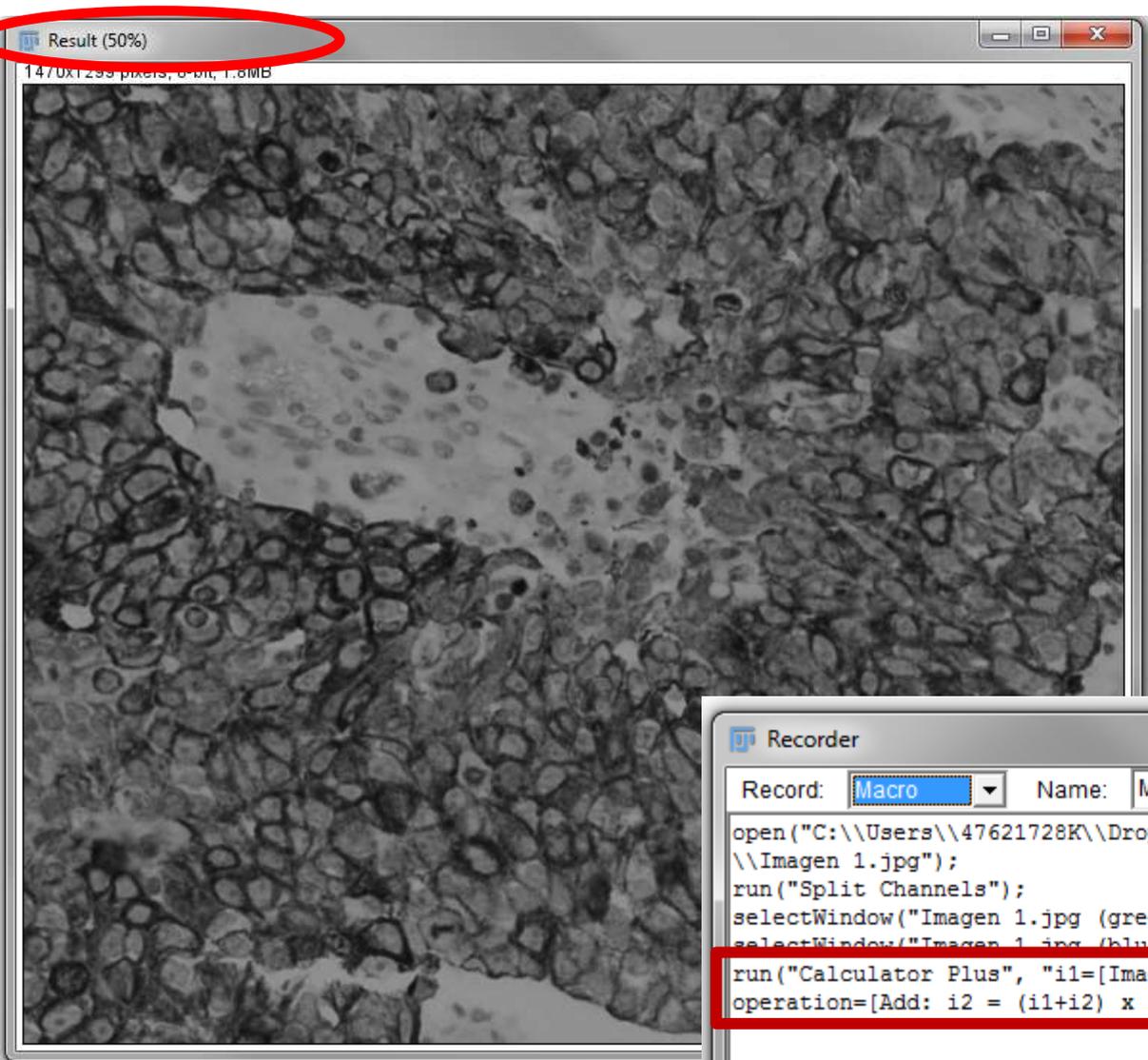
Ruifrok, A.C.: Quantification of immunohistochemical staining by color translation and automated thresholding. *Anal Quant Cytol Histol.* 19, 107-113 (1997).

$$\text{Brown Channel} = B - (R + G) * 0.3$$



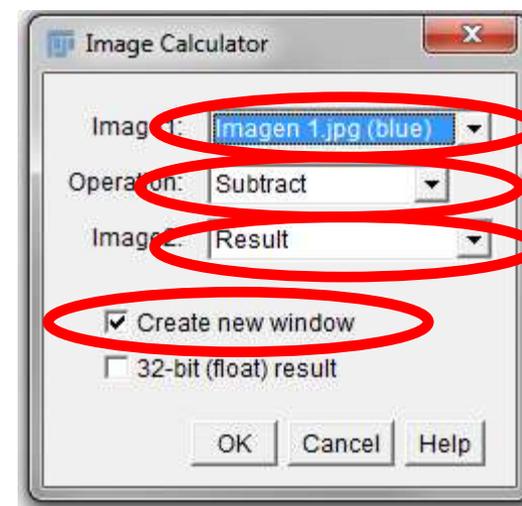
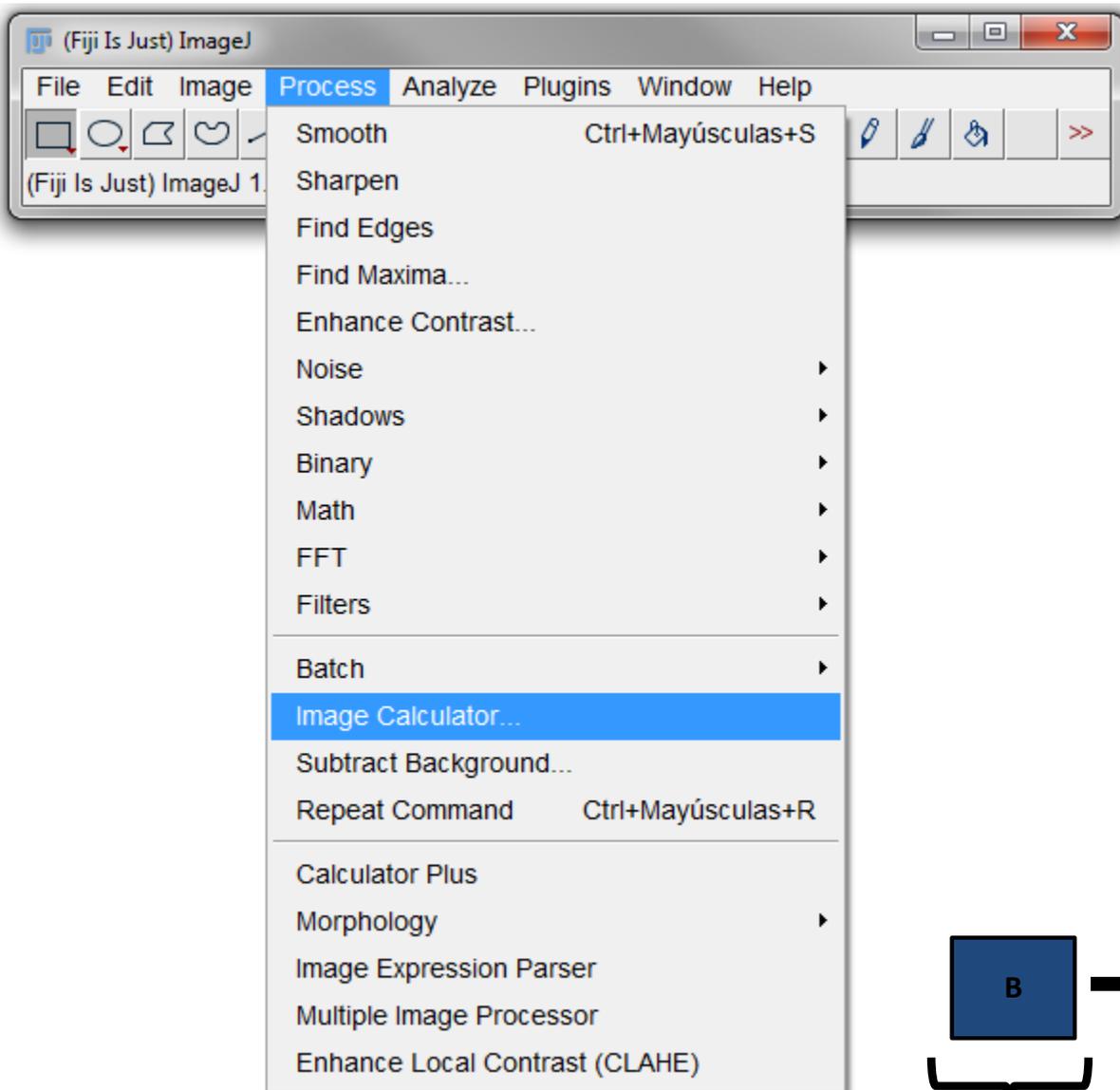
The diagram illustrates the formula for the Brown Channel using colored squares and mathematical symbols. On the left is a brown square labeled "Brown". This is followed by an equals sign. To the right of the equals sign is a blue square labeled "B". This is followed by a minus sign. To the right of the minus sign is a large right parenthesis. Inside this parenthesis are a red square labeled "R" and a green square labeled "G", separated by a plus sign. To the right of the parenthesis is a multiplication sign followed by the number "0.3".



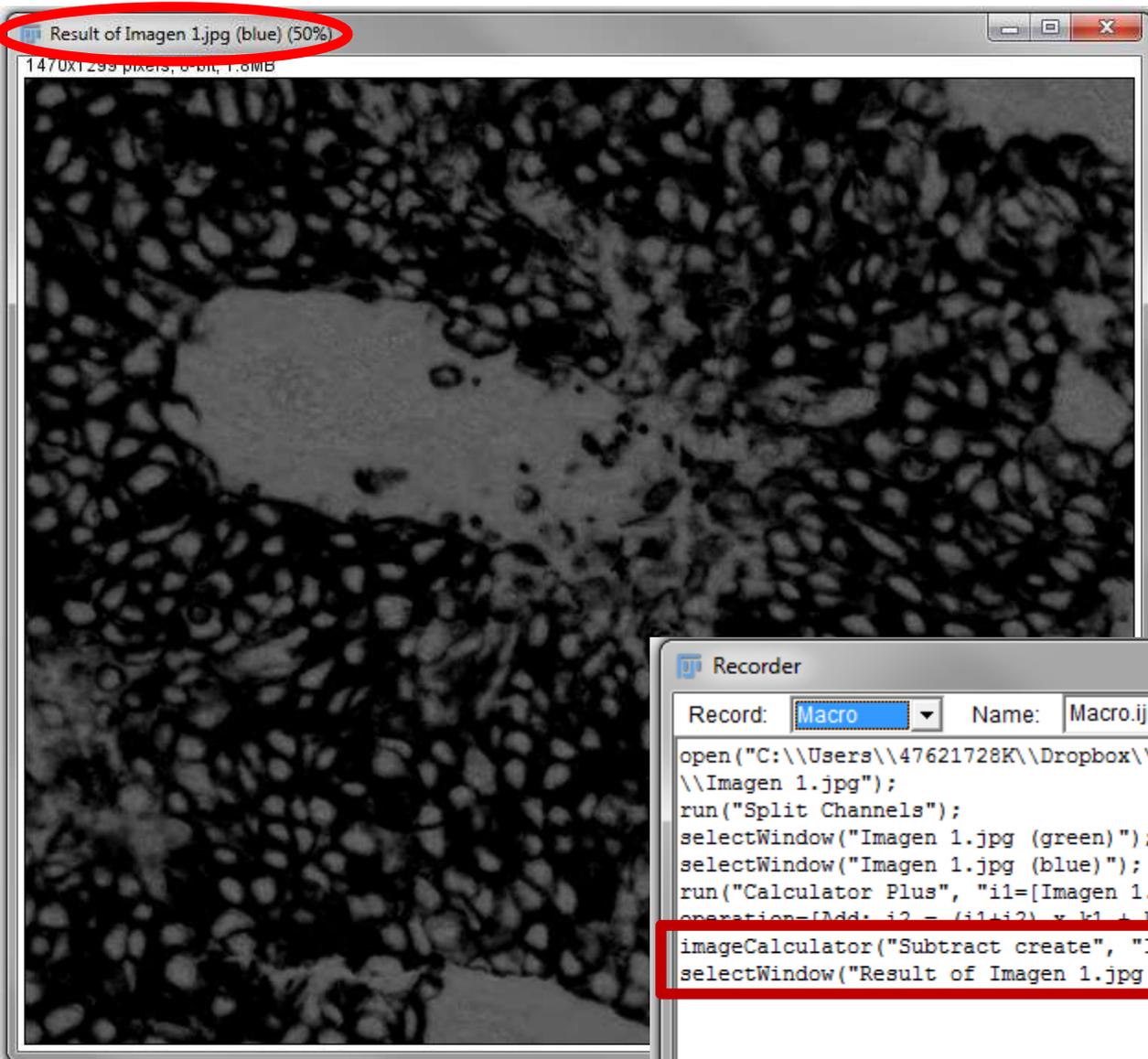


$$\left(\begin{array}{c} \text{R} \\ \text{G} \end{array} \right) \times 0.3$$

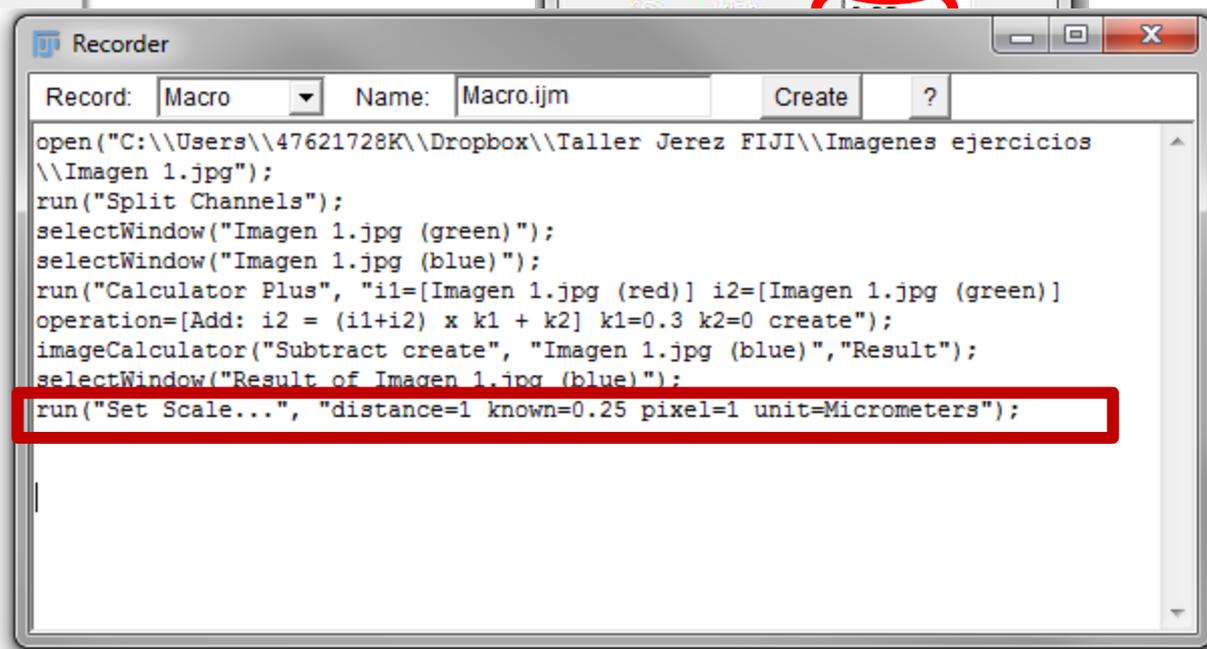
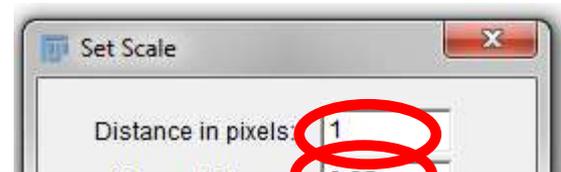
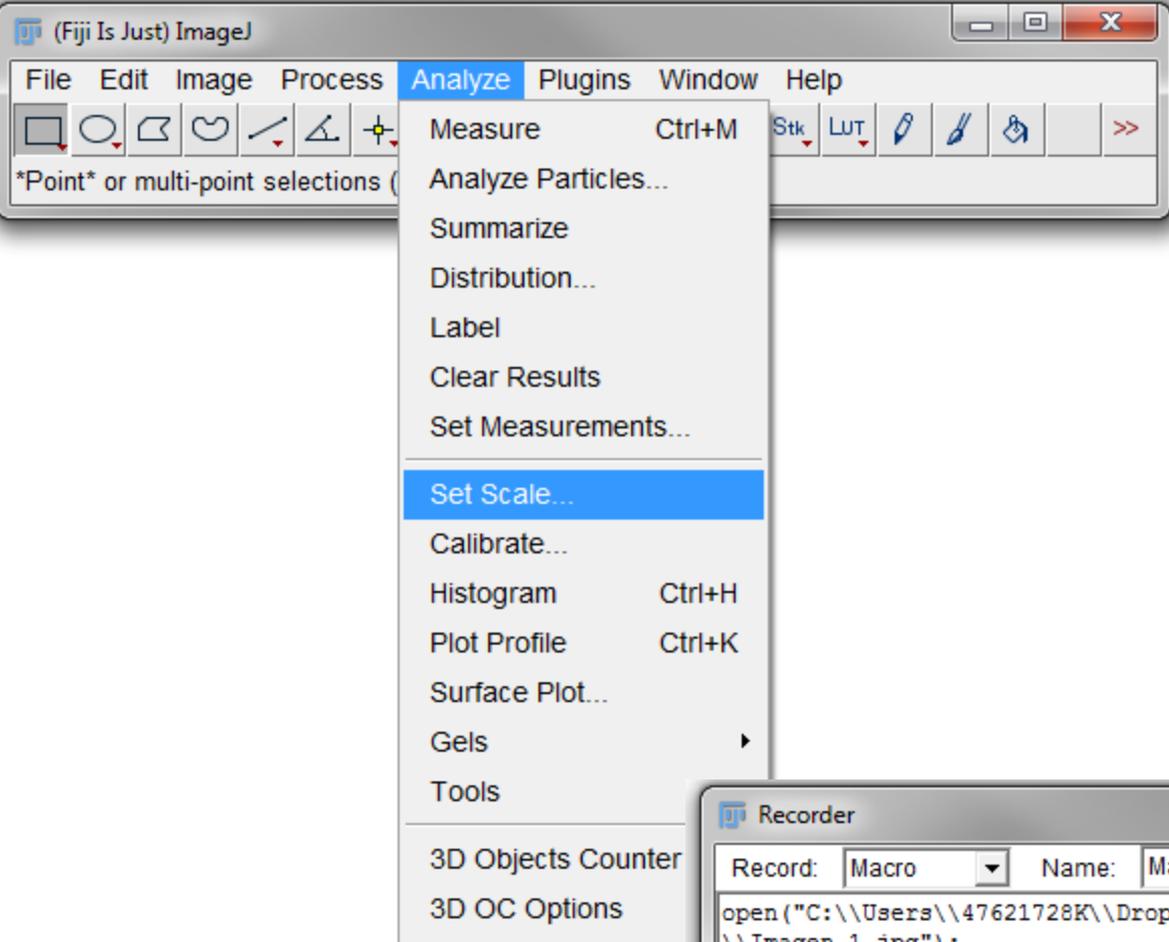
```
Recorder
Record: Macro Name: Macro.ijm Create ?
open("C:\\Users\\47621728K\\Dropbox\\Taller Jerez FIJI\\Imagenes ejercicios
\\Imagen 1.jpg");
run("Split Channels");
selectWindow("Imagen 1.jpg (green)");
selectWindow("Imagen 1.jpg (blue)");
run("Calculator Plus", "i1=[Imagen 1.jpg (red)] i2=[Imagen 1.jpg (green)]
operation=[Add: i2 = (i1+i2) x k1 + k2] k1=0.3 k2=0 create");
```

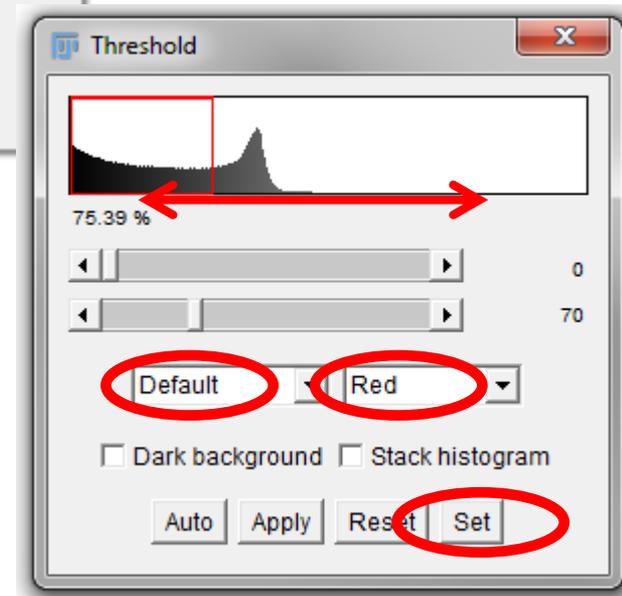
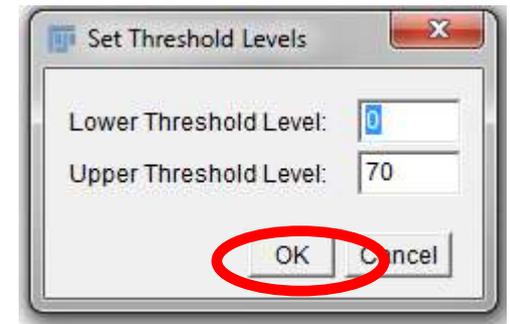
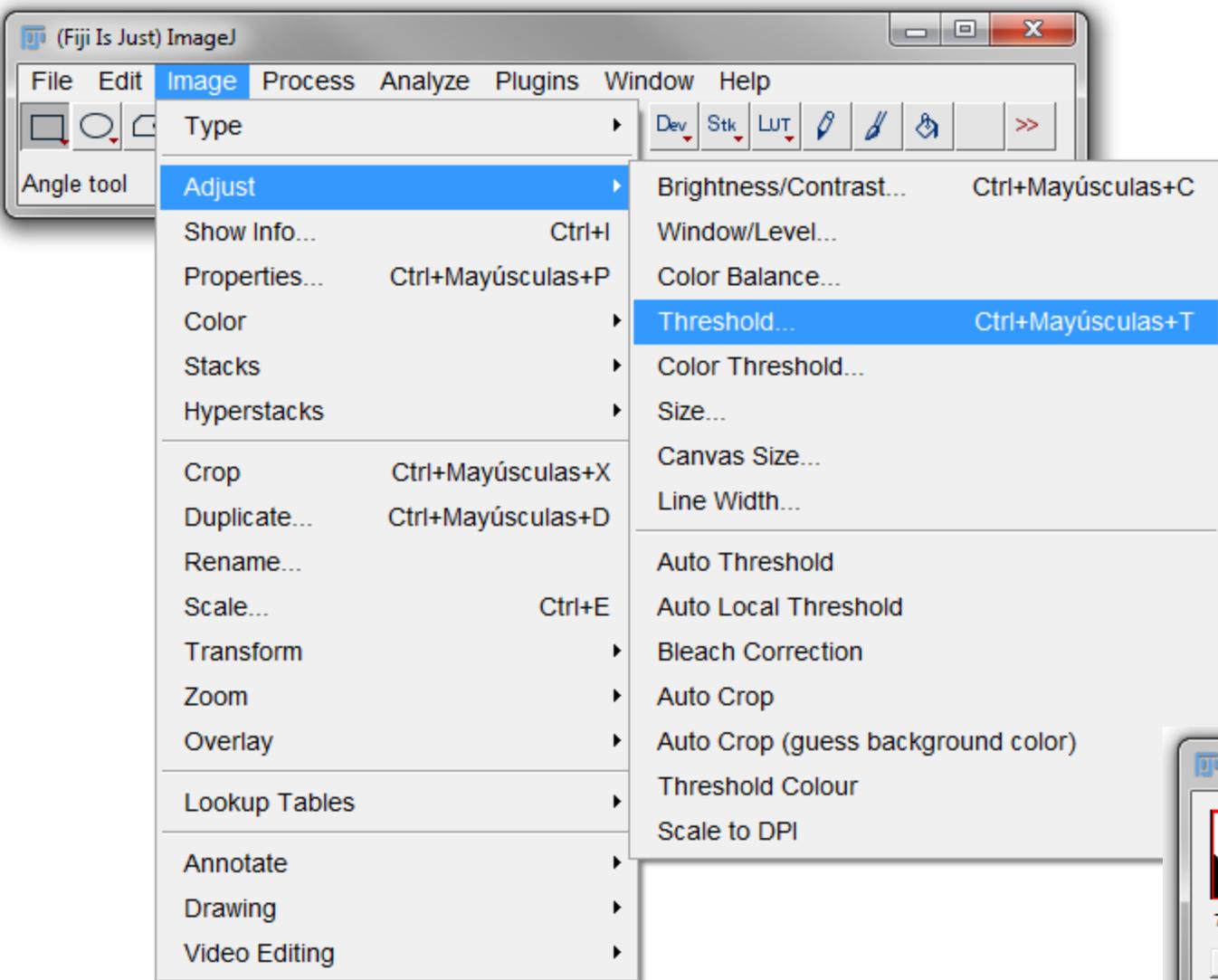


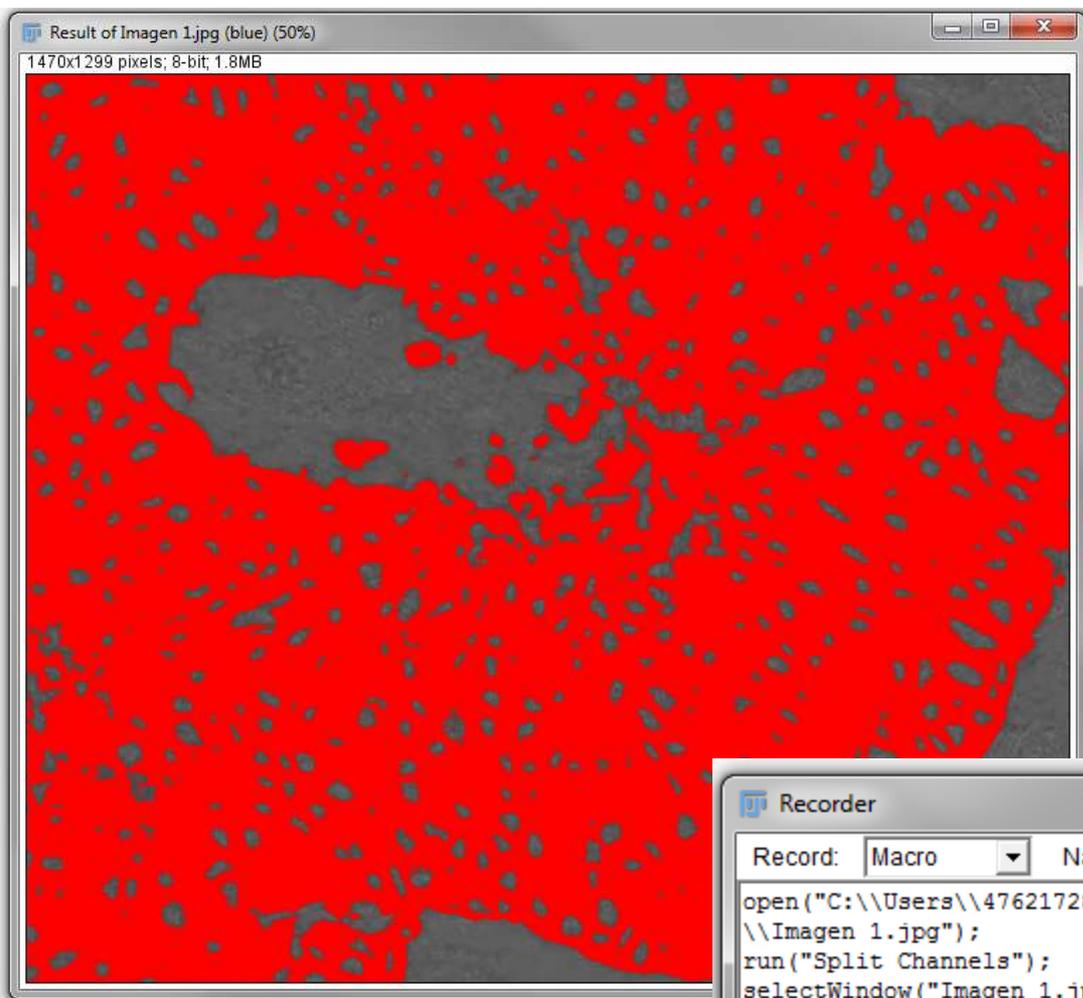
$$\underbrace{B}_{\text{Imagen 1.jpg(blue)}} - \underbrace{\left(R + G \right)}_{\text{Imagen Result}} \times 0.3$$



```
Recorder
Record: Macro Name: Macro.ijm Create ?
open("C:\\Users\\47621728K\\Dropbox\\Taller Jerez FIJI\\Imagenes ejercicios
\\Imagen 1.jpg");
run("Split Channels");
selectWindow("Imagen 1.jpg (green)");
selectWindow("Imagen 1.jpg (blue)");
run("Calculator Plus", "i1=[Imagen 1.jpg (red)] i2=[Imagen 1.jpg (green)]
operation=[Add: i2 = (i1+i2) * k1 + k2] k1=0.3 k2=0 create");
imageCalculator("Subtract create", "Imagen 1.jpg (blue)", "Result");
selectWindow("Result of Imagen 1.jpg (blue)");
```





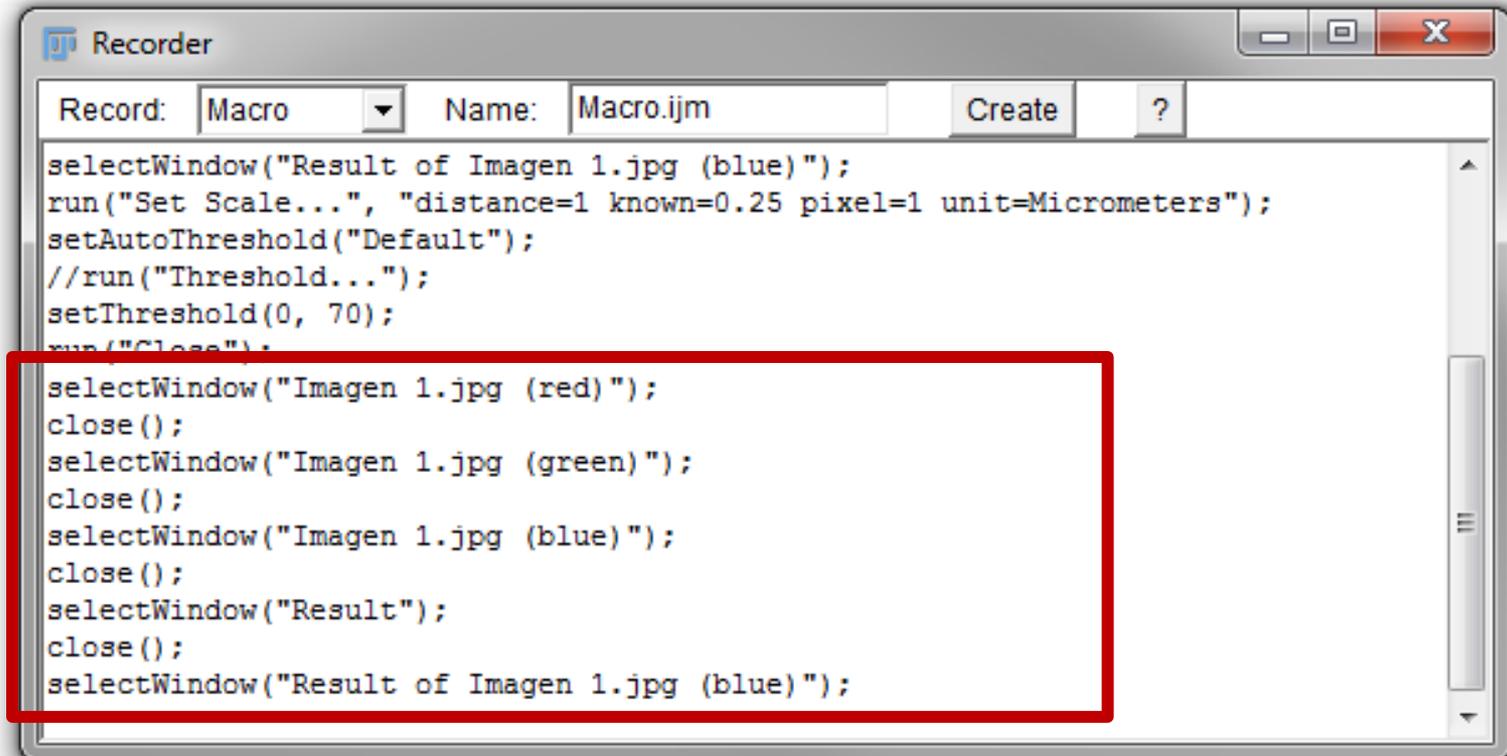


Recorder

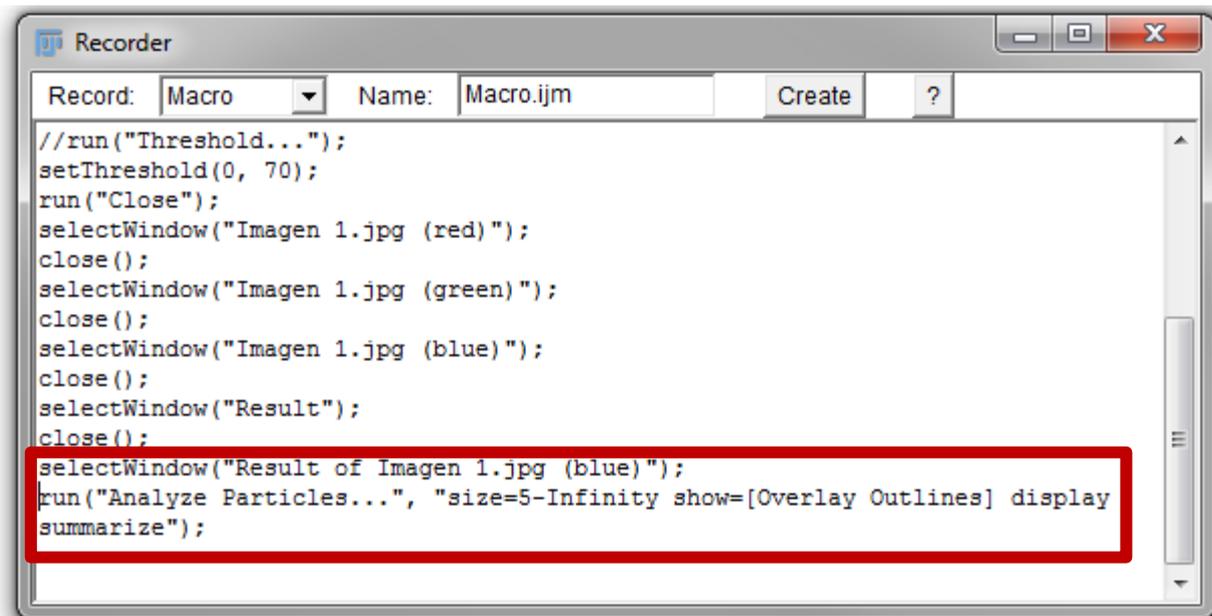
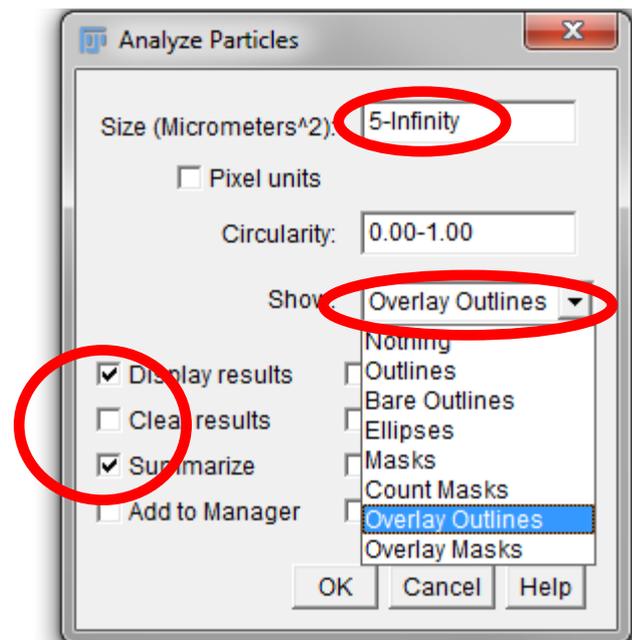
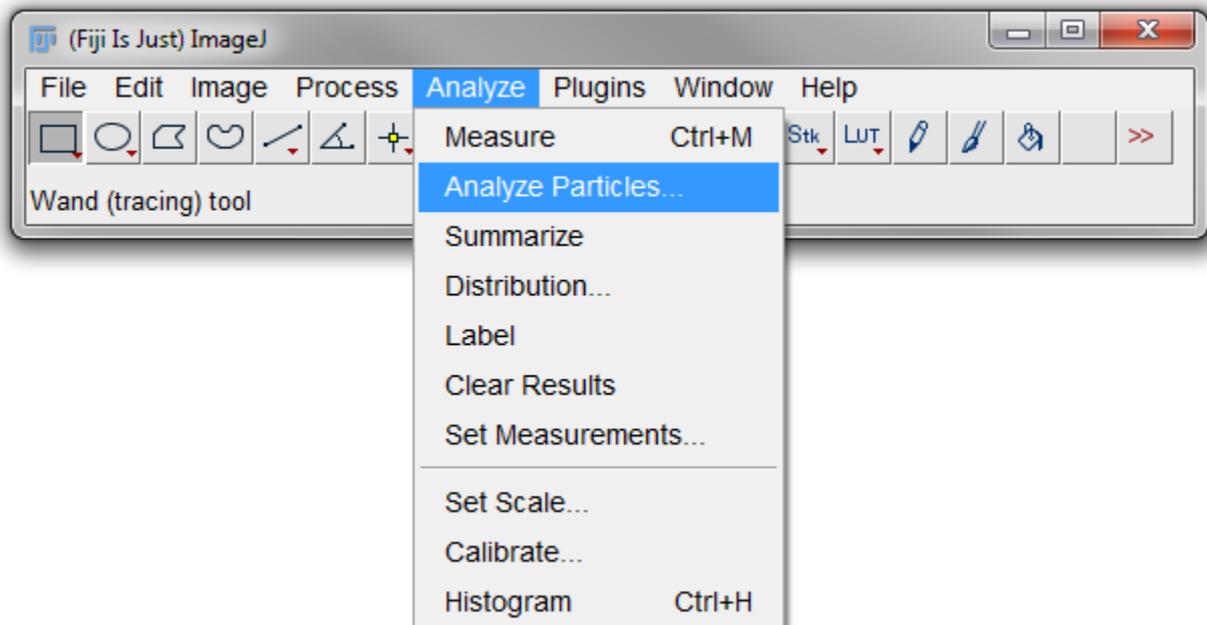
Record: Macro Name: Macro.ijm Create ?

```
open("C:\\Users\\47621728K\\Dropbox\\Taller Jerez FIJI\\Imagenes ejercicios\\Imagen 1.jpg");
run("Split Channels");
selectWindow("Imagen 1.jpg (green)");
selectWindow("Imagen 1.jpg (blue)");
run("Calculator Plus", "i1=[Imagen 1.jpg (red)] i2=[Imagen 1.jpg (green)]
operation=[Add: i2 = (i1+i2) x k1 + k2] k1=0.3 k2=0 create");
imageCalculator("Subtract create", "Imagen 1.jpg (blue)", "Result");
selectWindow("Result of Imagen 1.jpg (blue)");
run("Set Scale...", "distance=1 known=0.25 pixel=1 unit=Micrometers");
setAutoThreshold("Default");
//run("Threshold...");
setThreshold(0, 70);
run("Close");|
```

Cierra de imágenes innecesarias



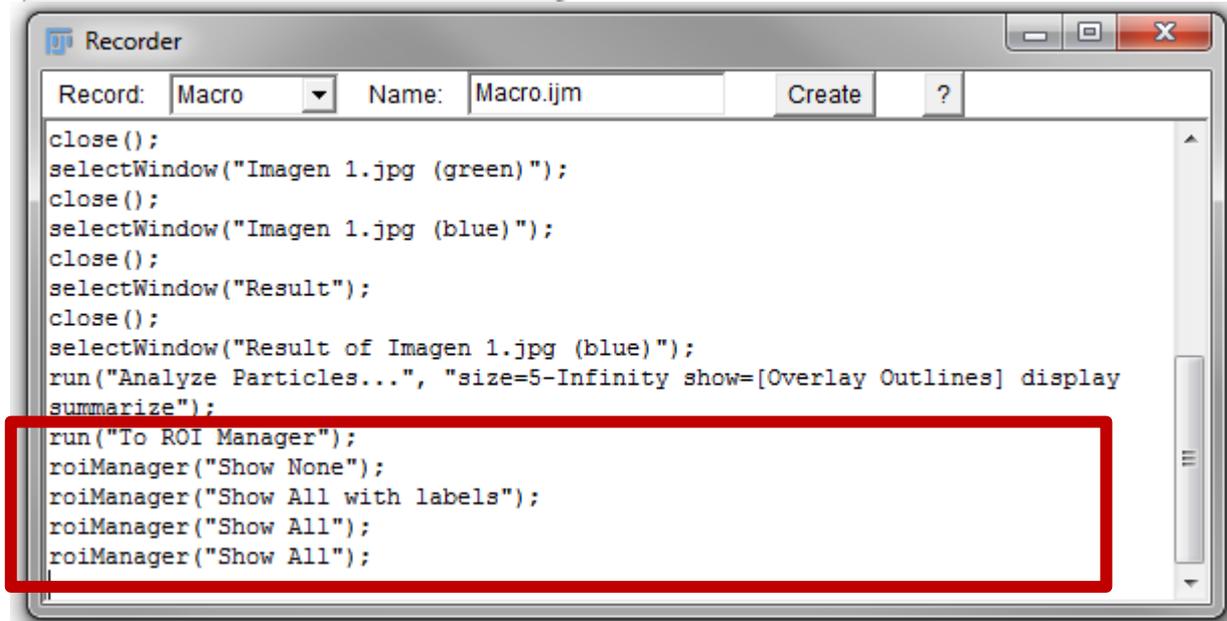
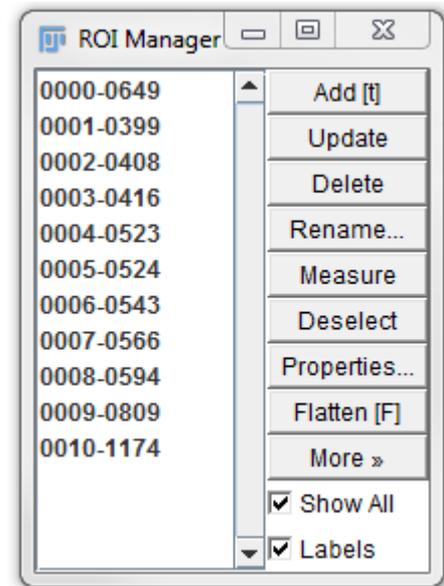
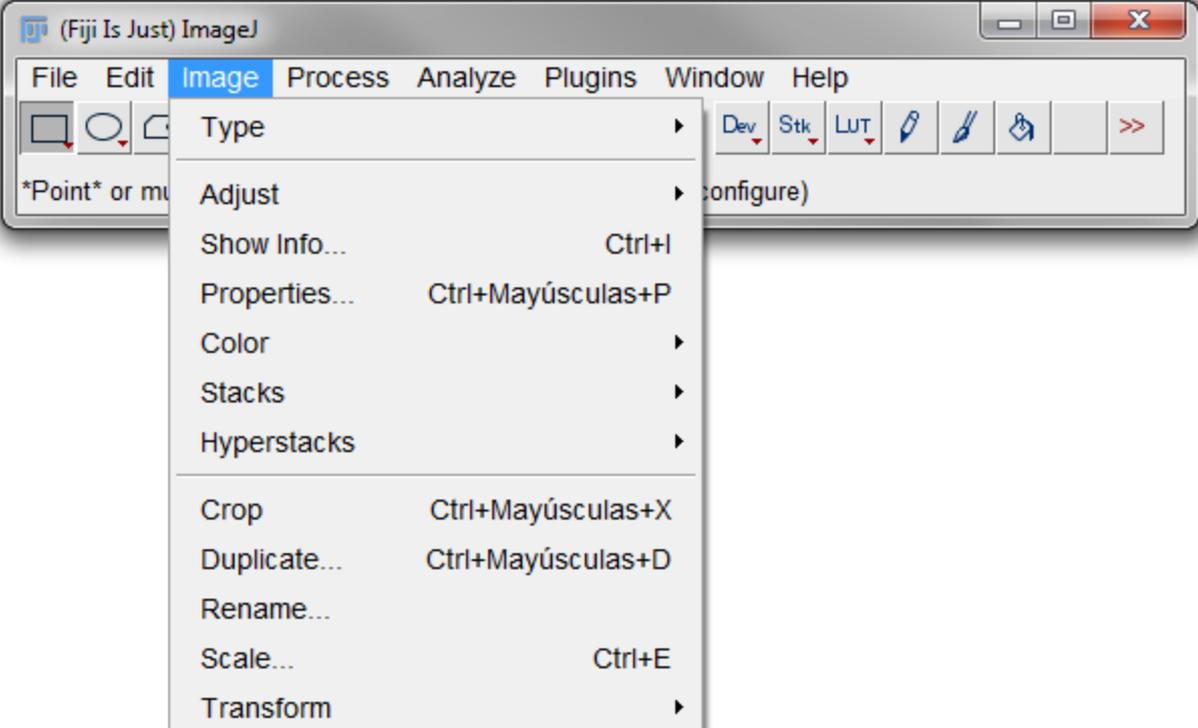
```
Recorder
Record: Macro Name: Macro.ijm Create ?
selectWindow("Result of Imagen 1.jpg (blue)");
run("Set Scale...", "distance=1 known=0.25 pixel=1 unit=Micrometers");
setAutoThreshold("Default");
//run("Threshold...");
setThreshold(0, 70);
run("Close");
selectWindow("Imagen 1.jpg (red)");
close();
selectWindow("Imagen 1.jpg (green)");
close();
selectWindow("Imagen 1.jpg (blue)");
close();
selectWindow("Result");
close();
selectWindow("Result of Imagen 1.jpg (blue)");
```

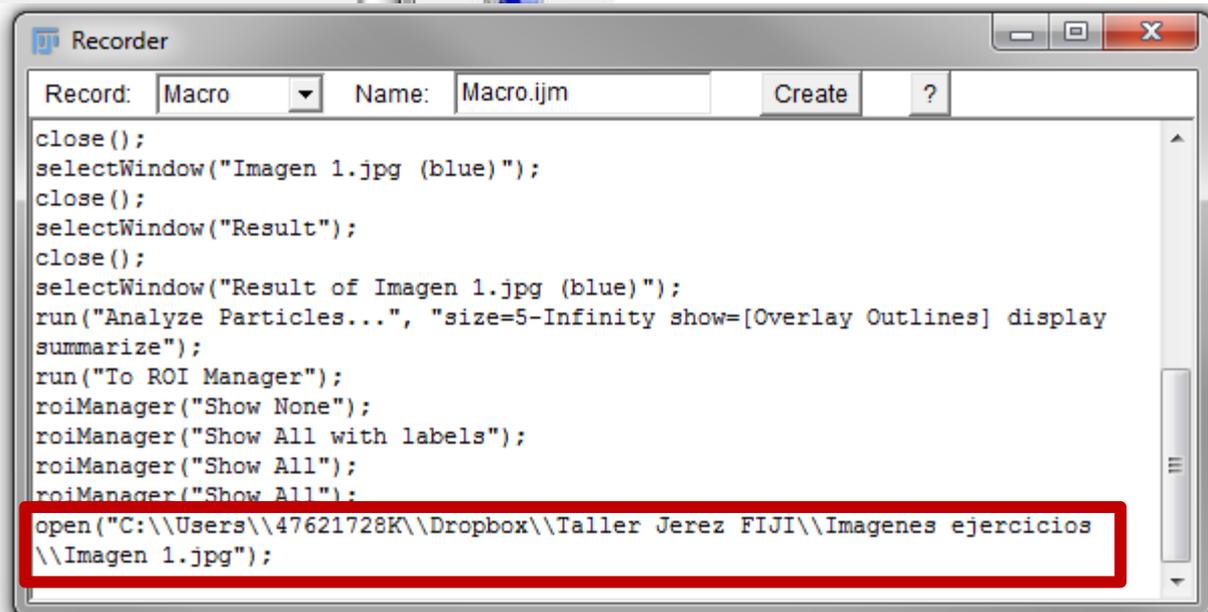
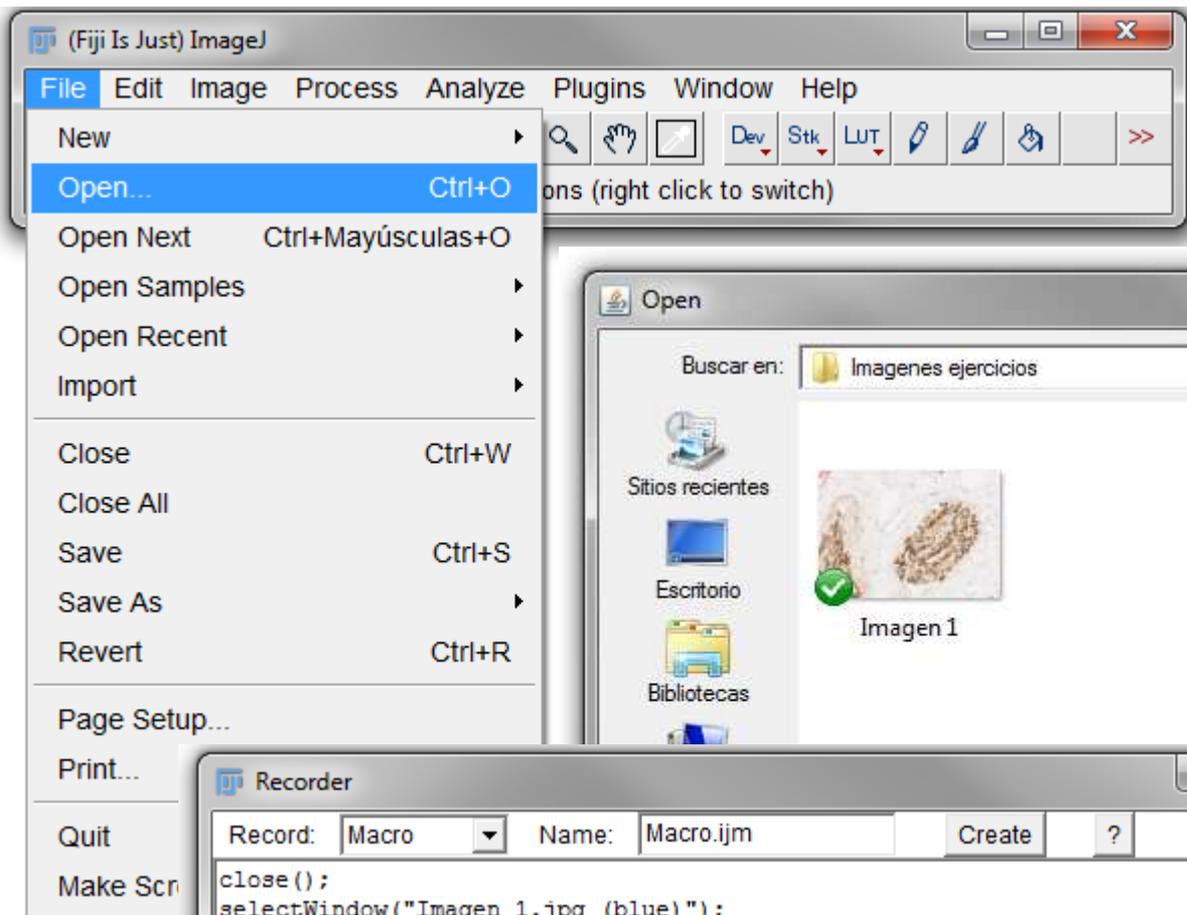


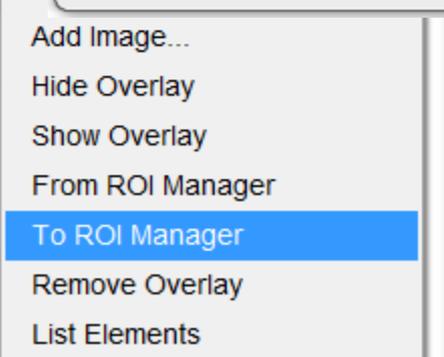
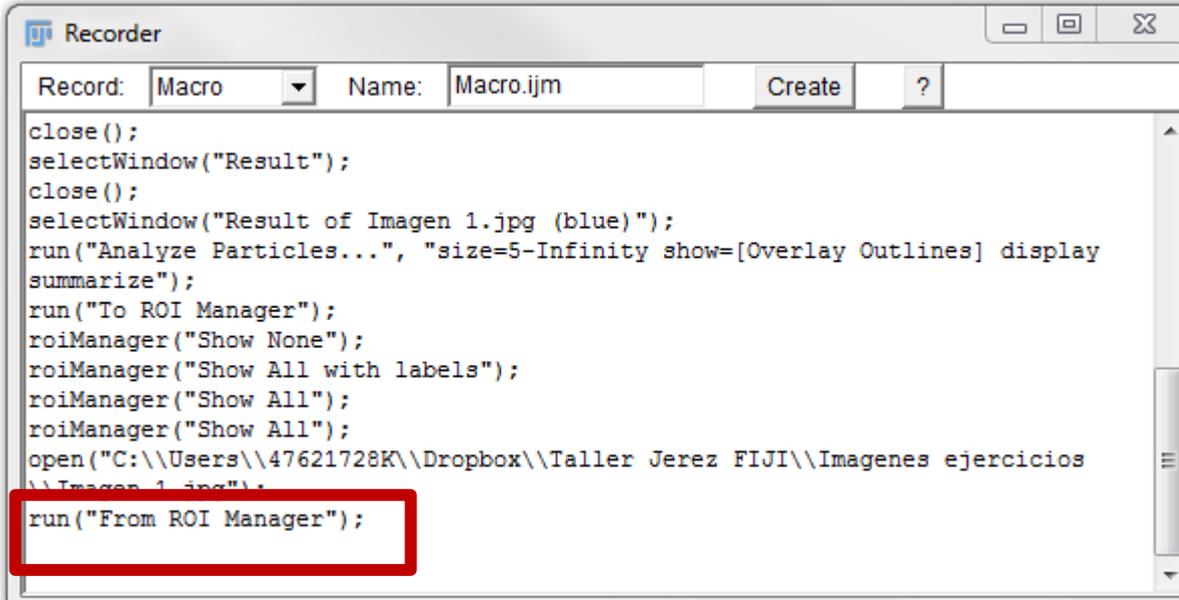
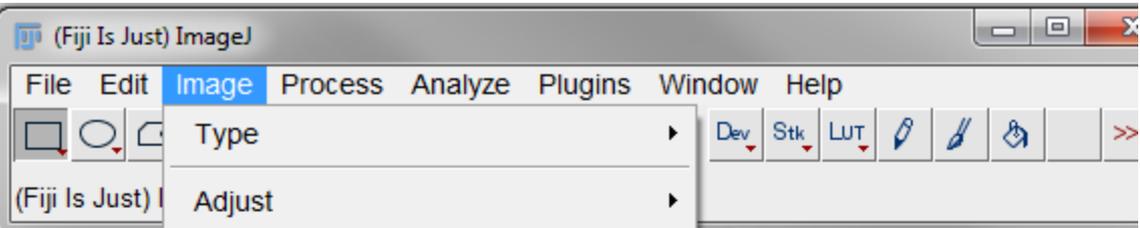


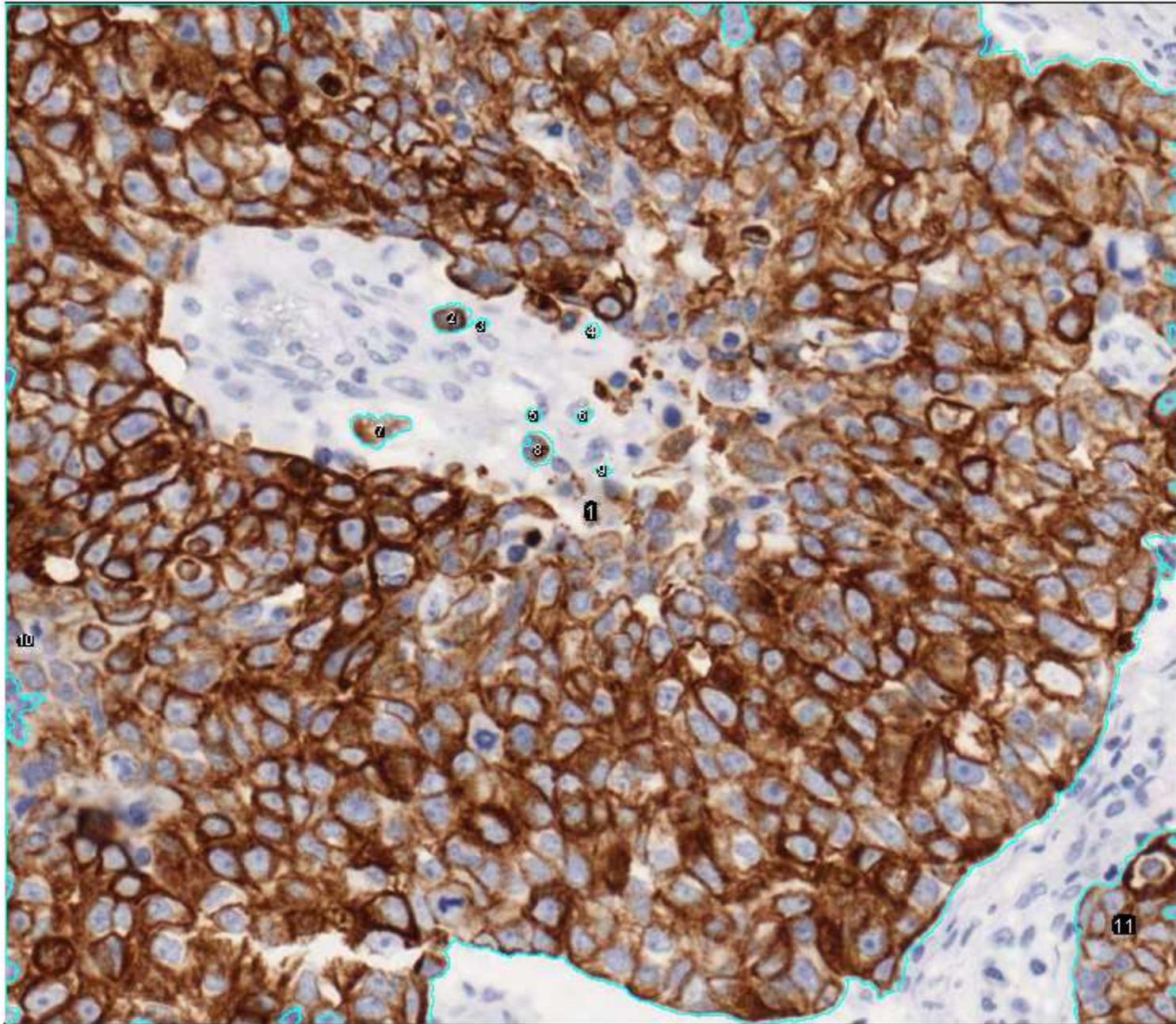
File	Area
1	88204.438
2	93.188
3	11.062
4	16.875
5	16.375
6	17.625
7	136.188
8	77.250
9	11.375
10	7.250
11	1345.938

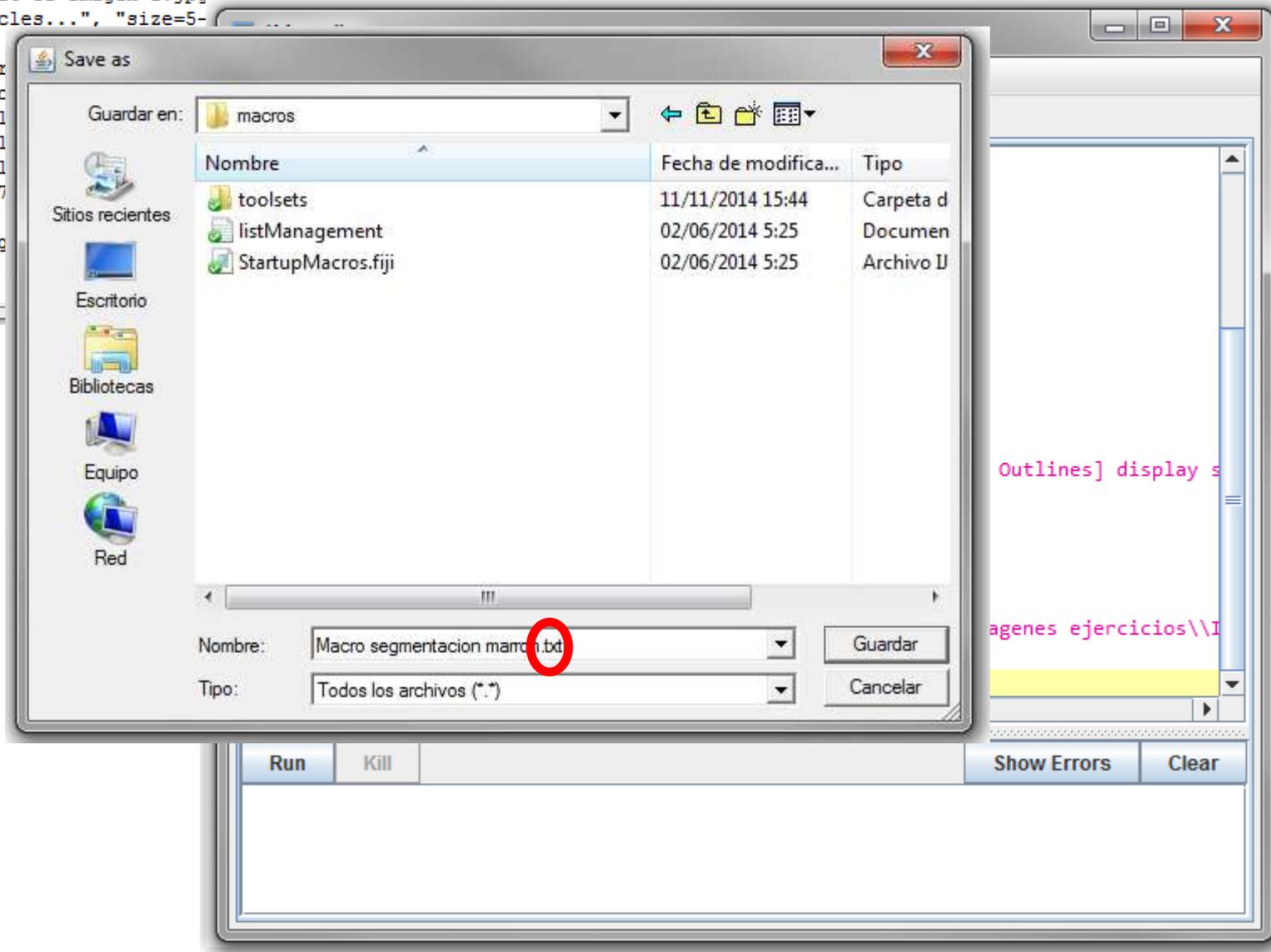
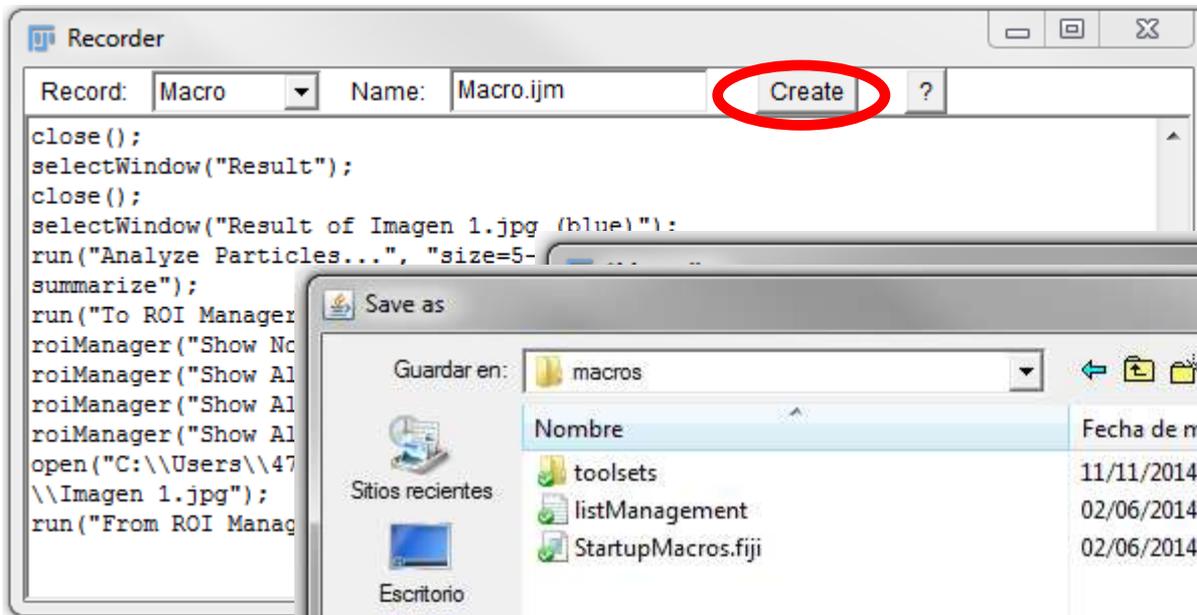
File	Count	Total Area	Average Size	%Area
Result of Imagen 1.jpg (blue)	11	89937.562	8176.142	75.359

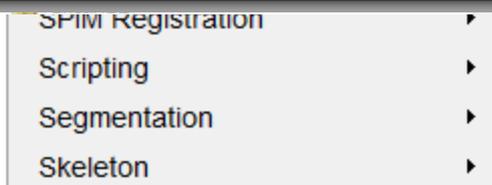
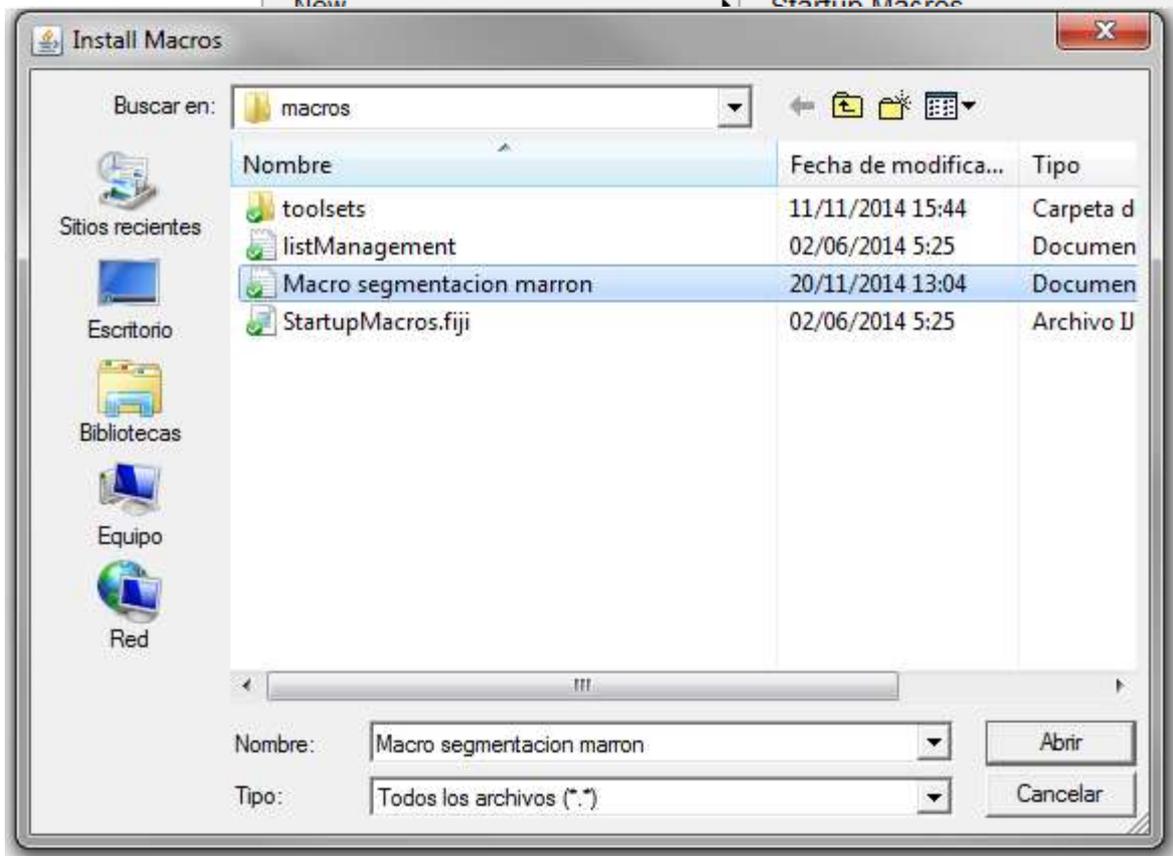
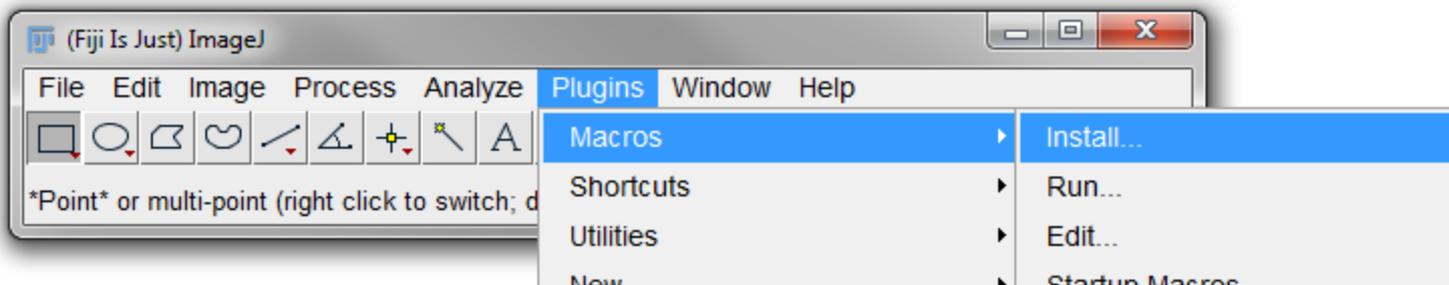


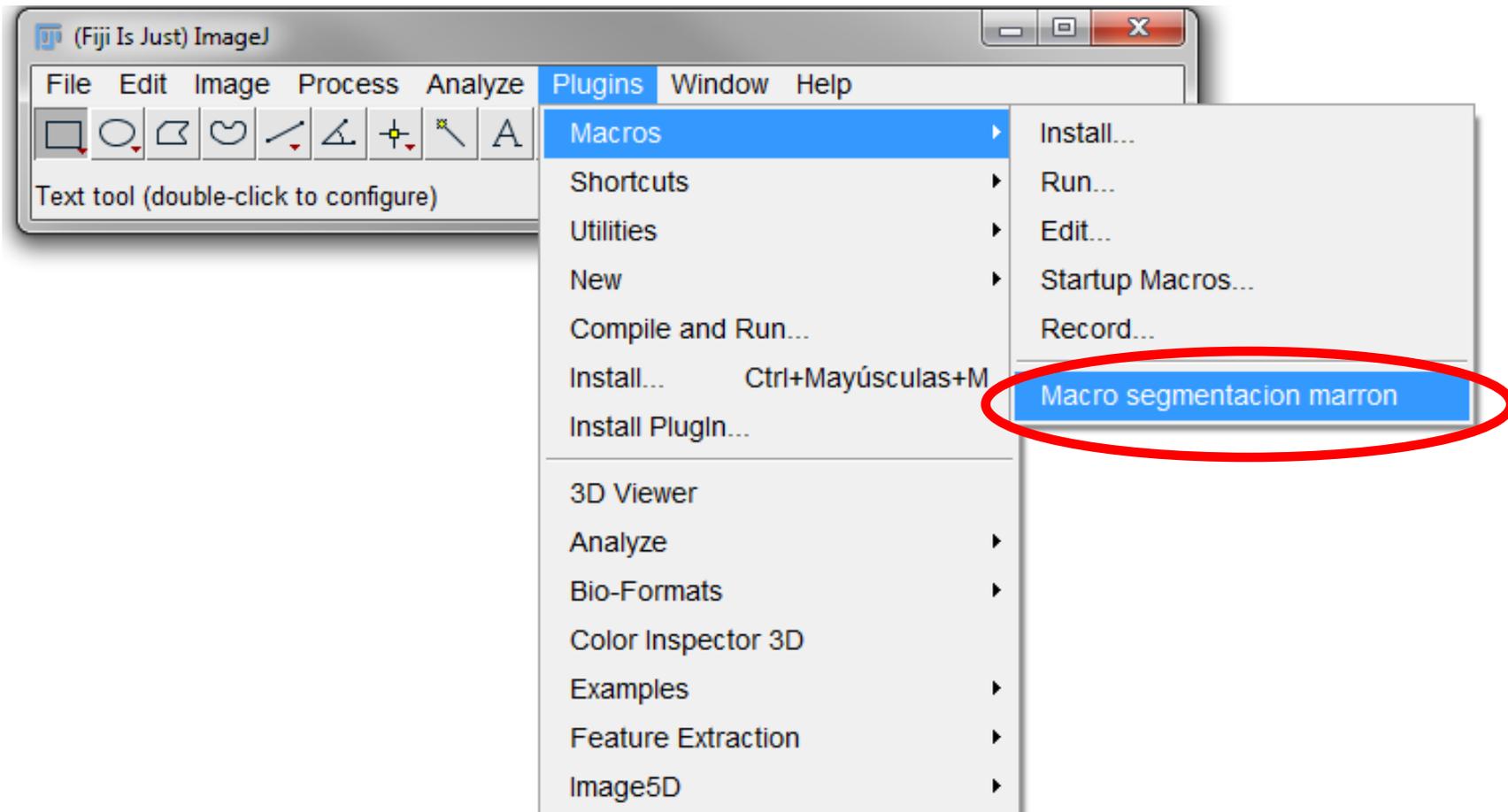












A nighttime photograph of a city river scene. The sky is a deep, dark blue with some lighter clouds. The water in the foreground is dark, reflecting the lights from the buildings and the bridge. On the left, there are stone buildings with lit windows. In the center, a bridge with several arches spans the river. On the right, a tall, thin tower with a clock face is visible against the sky. The overall atmosphere is serene and urban.

MUCHAS GRACIAS