

Shedding light on a Picasso Graph of intensity

Following the next steps, you can construct a graph of the average value of intensity per wavelength for specific areas of the painting. Bear in mind that you should have the normalized images to follow these steps.

Procedure

Step 1

Drag and drop the normalized images into ImageJ.





Note: the images should be arranged from the smallest wavelength (bottom) to the largest wavelength (top windows). If the images are not in that order, you can change their order by clicking on them one by one.



Step 2

To combine all these images into one 'stack' go to Image–Stacks–Images to Stack. A small window will pop up. Choose a name and click OK.

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Name: Title contains: Fill color:								
I Use titles as labels I Keep source images								
	OK Cancel							



You will get something like that. All images are now in one window. You can see all images by moving the horizontal bar at the bottom of the window.





Step 3

Now we choose the type of calculations that we want to get. Go to Analyze→Set Measurements. A new window will pop up. Choose "Mean gray value" as only the option and click OK.

🛃 Set Measurements		×
□ Area	🔽 Mean gray value	
Standard deviation	🗌 Modal gray value	
🔲 Min & max gray value	Centroid	
Center of mass	Perimeter	
Bounding rectangle	🔲 Fit ellipse	
Shape descriptors	🗌 Feret's diameter	
Integrated density	🗌 Median	
Skewness	🗆 Kurtosis	
Area fraction	Stack position	
🗆 Limit to threshold	🗌 Display label	
Invert Y coordinates	Scientific notation	
Add to overlay	🗌 NaN empty cells	
Redirect to: Decimal places (0-9):	None -	
	OK Cancel Hel	p

Step 4

Now we choose the areas that we want to analyze.

Select again Analyze→Tools→ROI Manager. A small window will pop up. Select an area on the image (with the rectangle) and click "Add". You can add as many areas as you want. You can see all areas together by selecting the "Show All" option in that window. You can delete an area by selecting it and clicking the "Delete" button.











Step 5

Select Measure-Multimeasure. In the new window, select "Measure all x slices" and click OK.



A new window with the results will pop up. The first column is the number of the image, while the other columns are for the areas that you selected.

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2	85. 897	151.152							
3	92.723	107.056							
4	137.454	1 1 0. 4 08							
5	160.832	108.924							
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Step 6

You can use the data to draw a graph. Here, we paste the data into Excel. We change the numbers 1 to 5 to the wavelength, and then we draw the graph for the data. You might have to change the dots to commas.

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