Protocol to measure sealer penetration into dentinal tubules of the root canal and sealer penetration into the perimeter of the root canal walls, by mean of ImageJ program (version 1.51j8) in samples obtained by means of confocal microscopy.

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Abstract

This protocol was used to measure sealer penetration into dentinal tubules of the root canal and sealer penetration into the perimeter of the root canal walls, by mean of ImageJ program (version 1.51j8) in image samples obtained by means of confocal microscopy.

Citation: RODRIGO JARDIM DEL MONACO Protocol to measure sealer penetration into dentinal tubules of the root canal and sealer penetration into the perimeter of the root canal walls, by mean of ImageJ program (version 1.51j8) in samples obtained by means of confocal microscopy.. **protocols.io**

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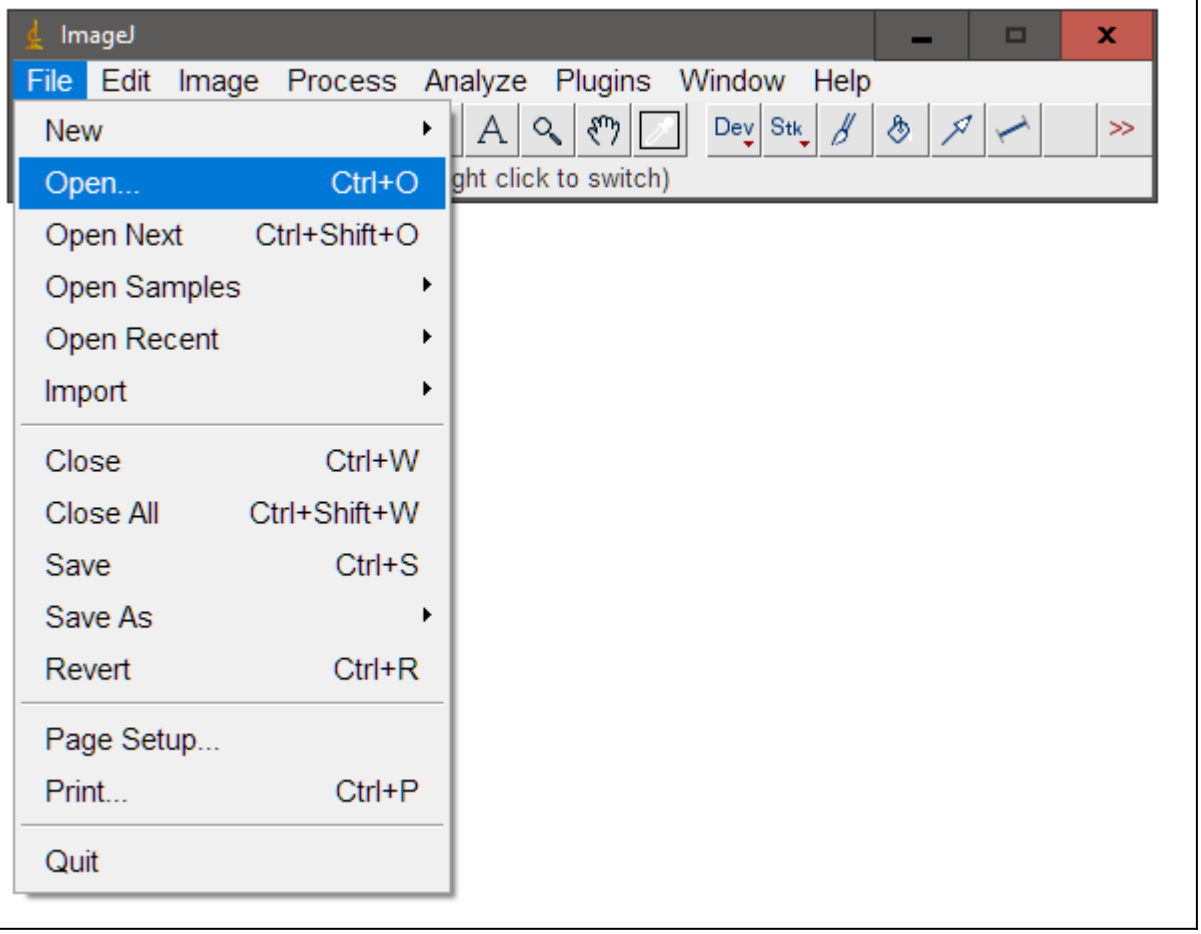
Protocol

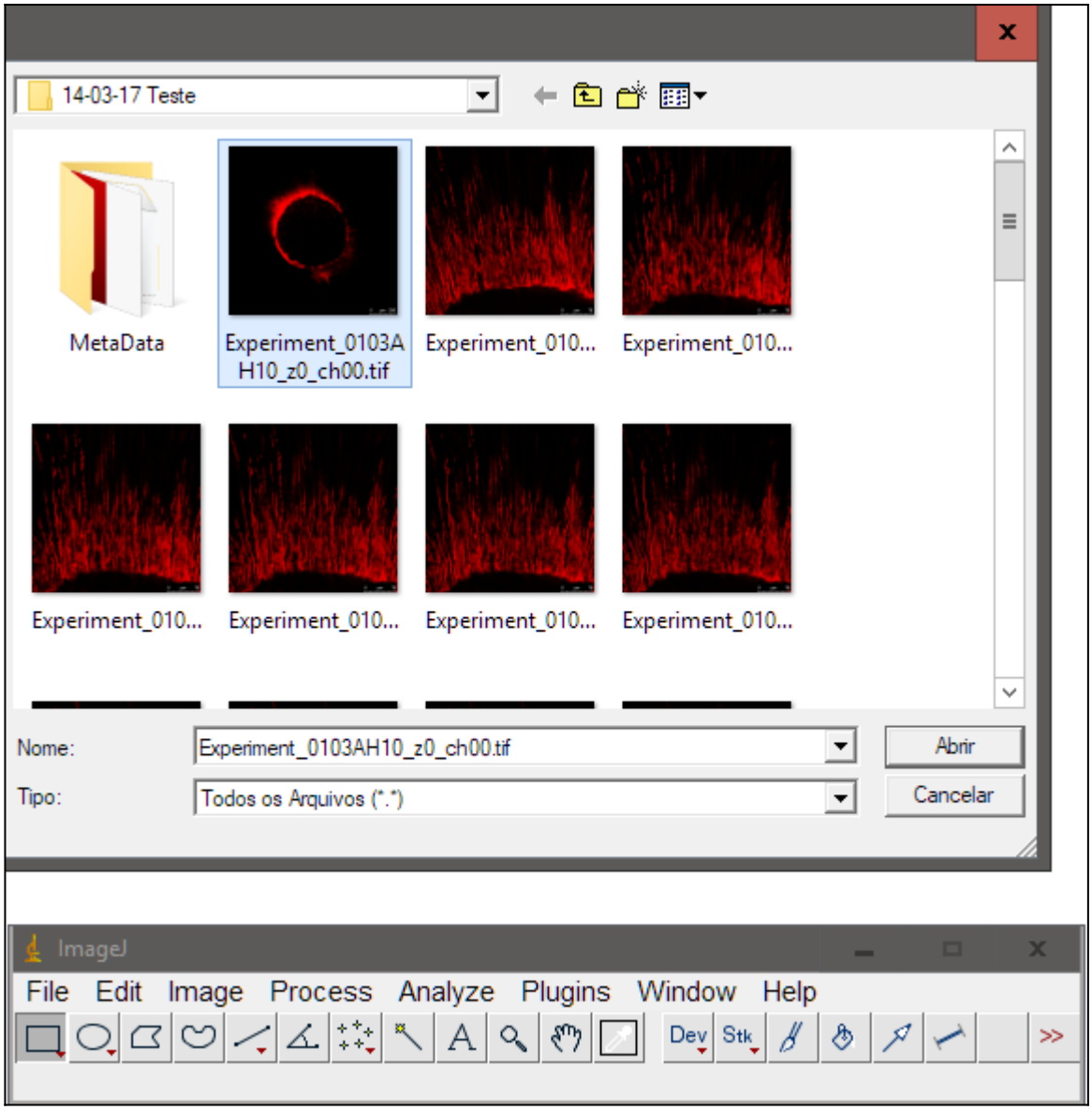
Open the ImageJ software and in the menu bar click on "File". Then, select "Open".

Step 1.



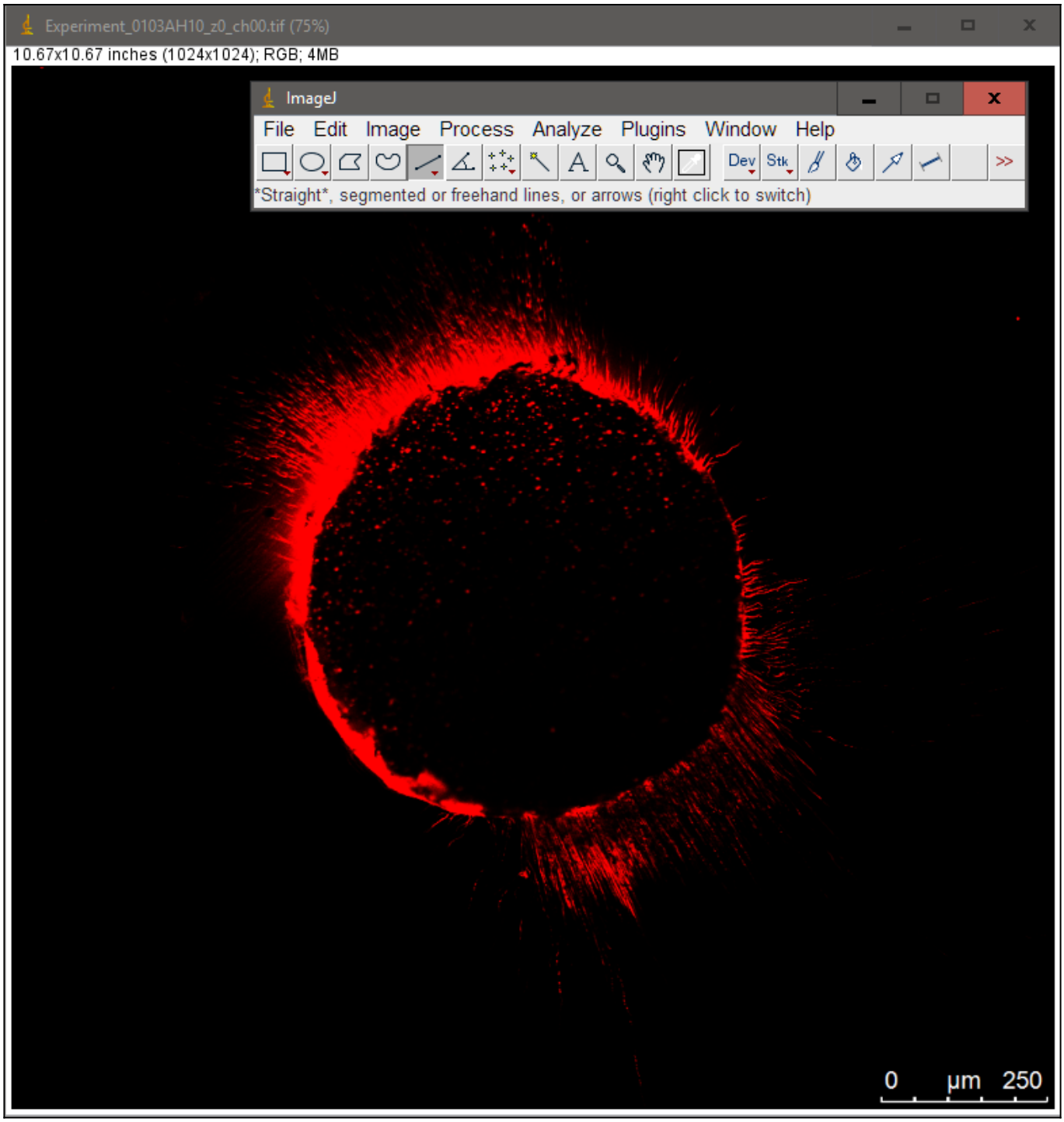
Select the folder where the images are. Choose the sample image to measure and click “Open”.

Step 2.



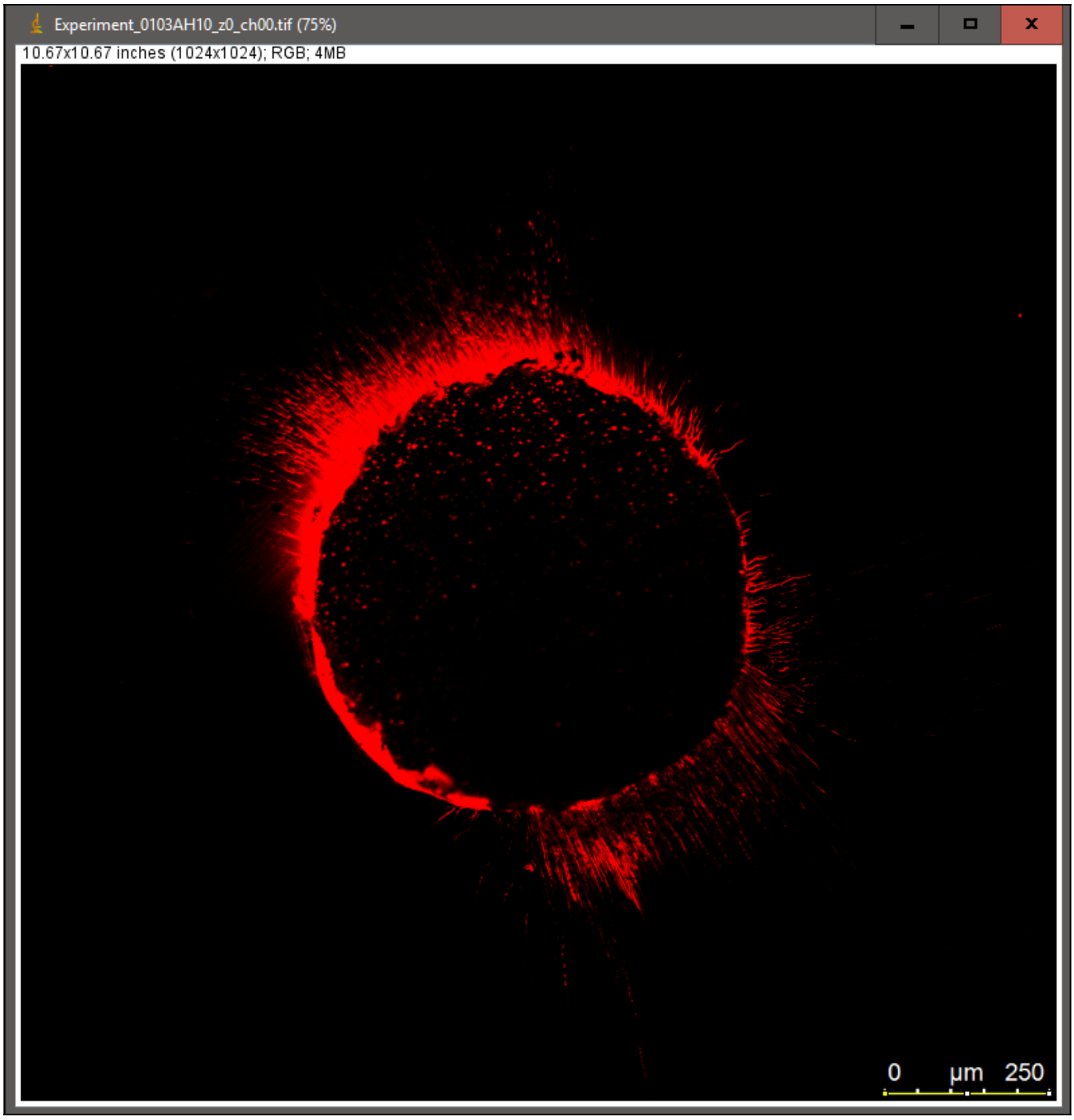
Set the scale to obtain the measurements of the image. In the menu bar, select the "Straight" checkbox.

Step 3.



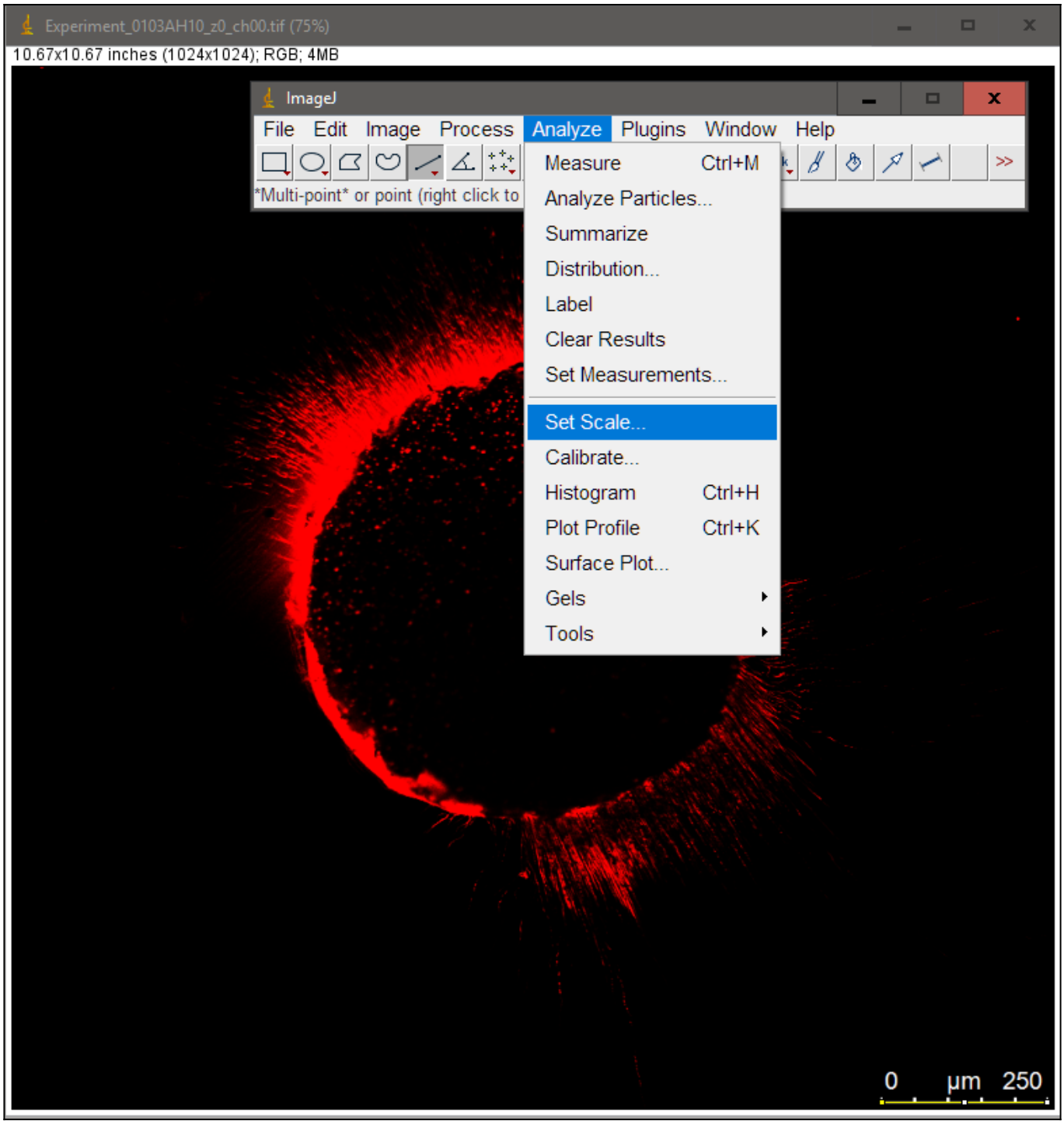
Holding the left mouse button, draw a straight line directly above the scale bar present in the image, going from the beginning to the end of the scale bar. Release the mouse button when you finish drawing the line.

Step 4.



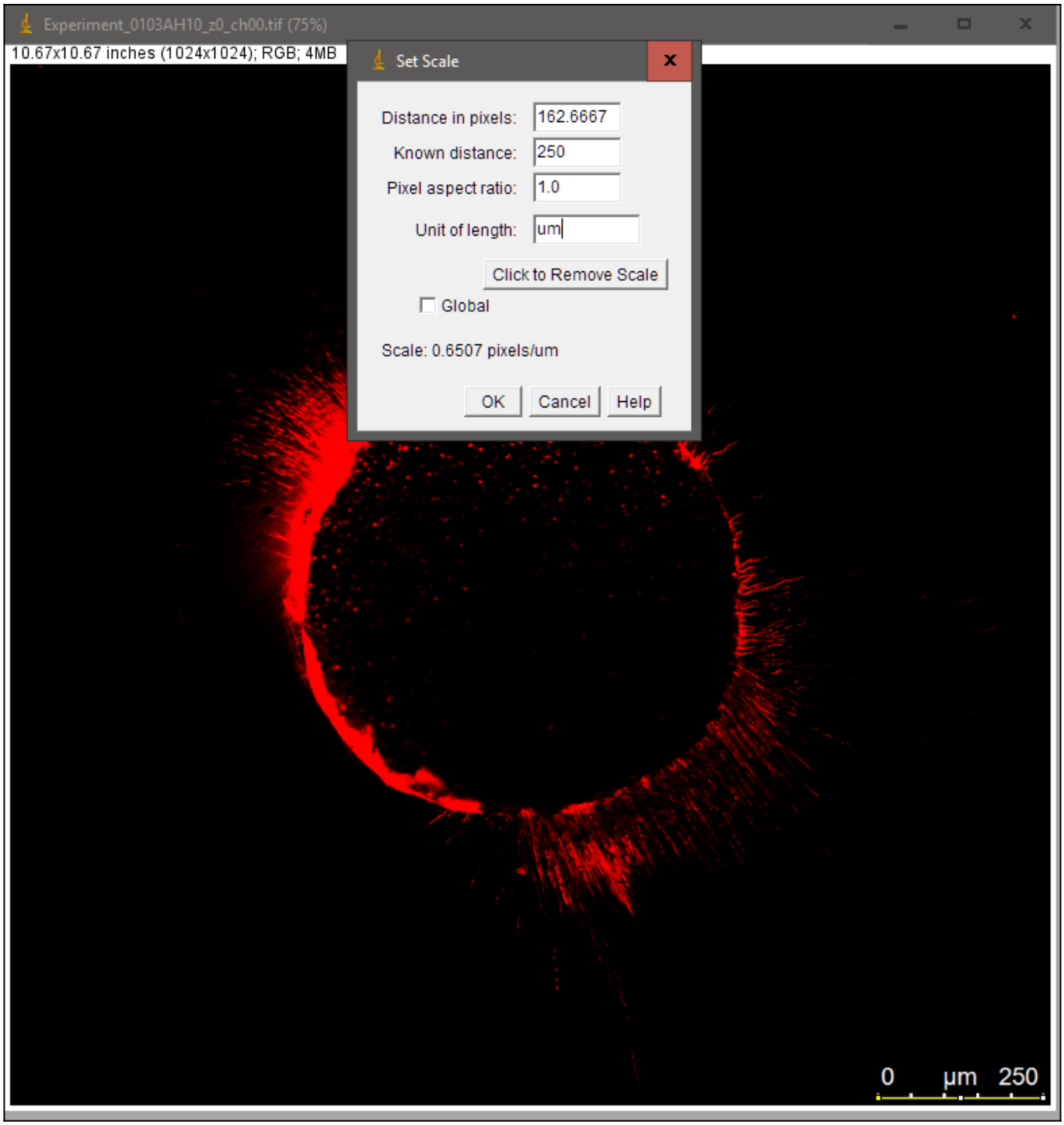
Select "Analyze" from the main menu and click on the "Set Scale" box.

Step 5.



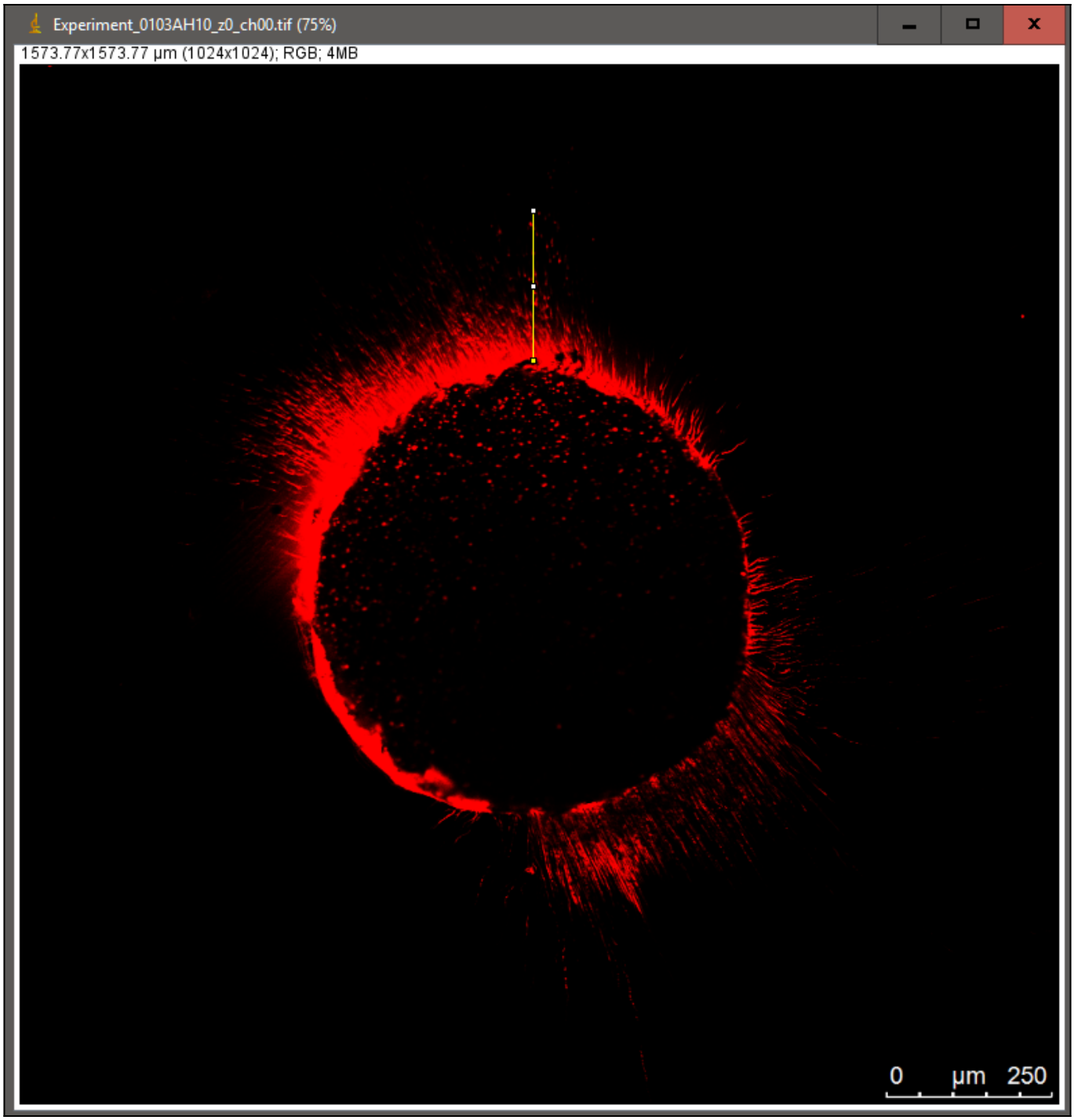
A box will open, and you must fill in the "Known distance" information with the scale bar measure of the figure (in the example, 250). Select "Unit of length" according to the measurement used (mm, cm, µm) [In the example, µm was used]. Click "OK" when you are done.

Step 6.



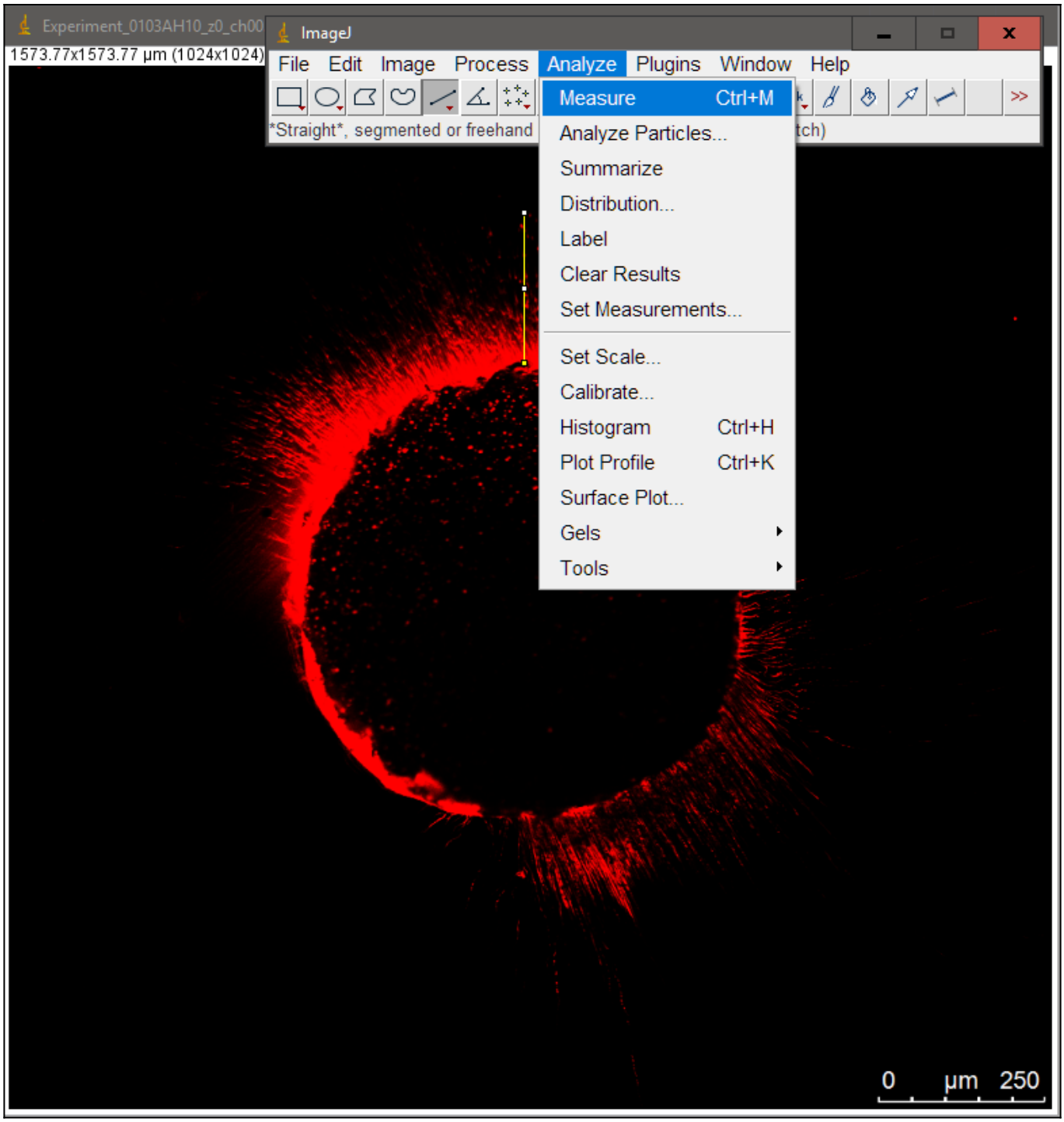
To perform measurements in the figure (in µm), we will use as an example the measure of sealer penetration in the canal, in the first octant 0º(N). First, place the mouse on the edge of the channel wall. Click and hold the left mouse button, creating a line as far as the sealer has penetrated. Release the mouse button.

Step 7.



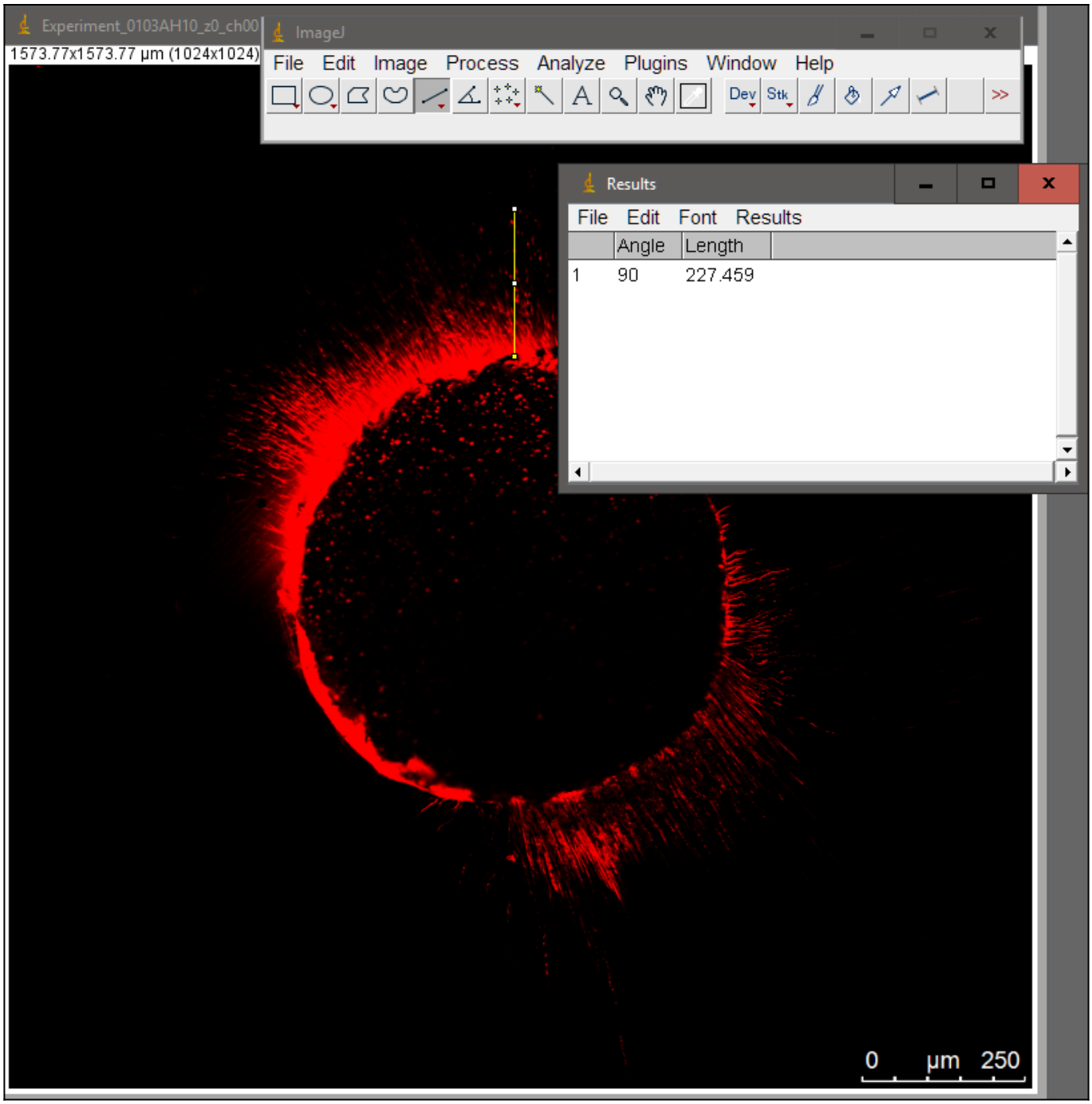
Go to the main menu and click on "Analyze". Select the "Measure" tool (to save time, you can use the shortcut with the "Ctrl + M" keys).

Step 8.



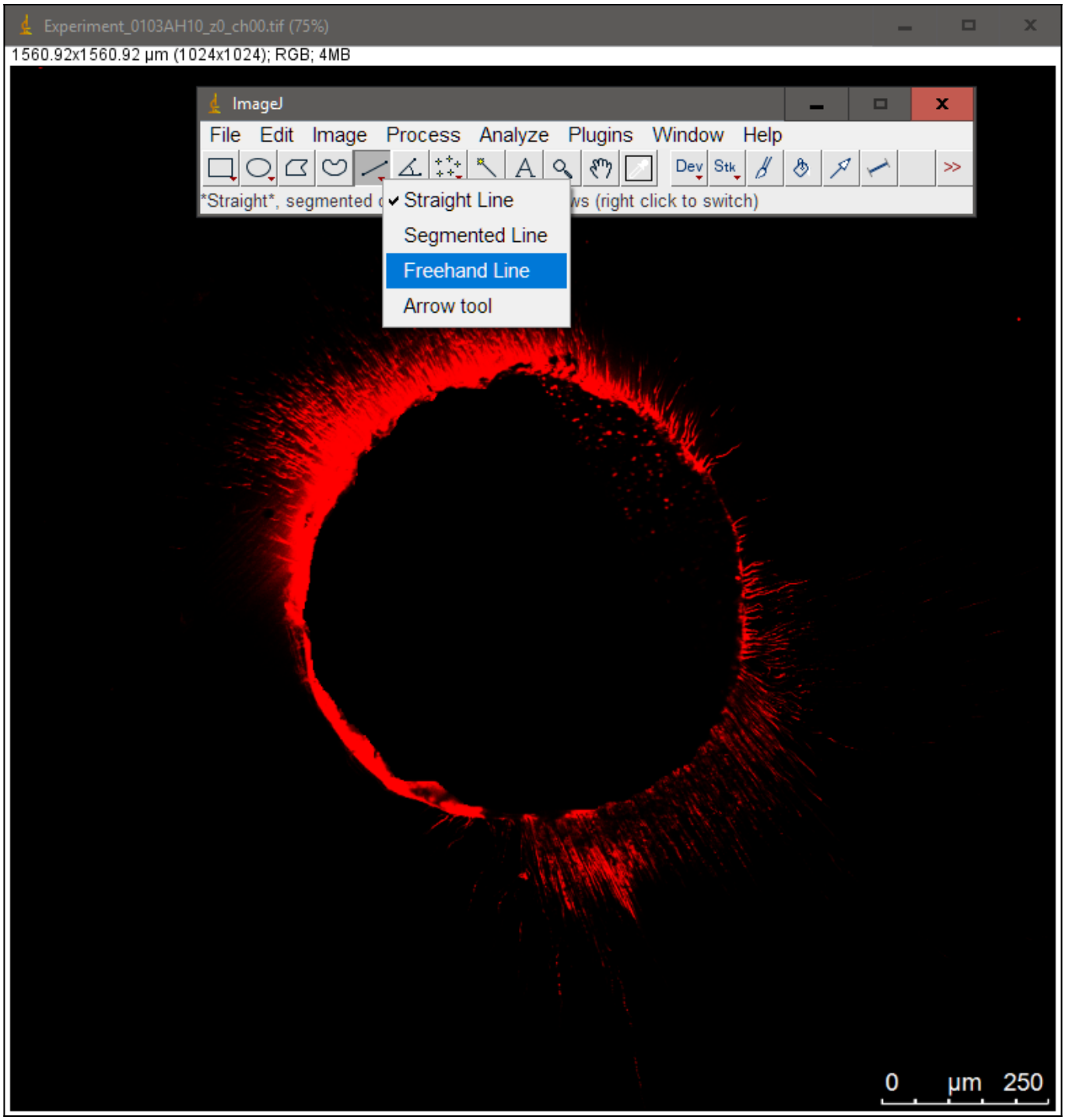
When selecting the "Measure" tool, a dialog box with the length of the drawn line will be opened (in the example, the penetration length of the sealer in the root canal is 227,459µm). Repeat procedure 7 and 8 for each octant. The results will appear in the results table and you can save these results by clicking "File" in the results box menu. Choose the destination of the file and name it according to your preference.

Step 9.



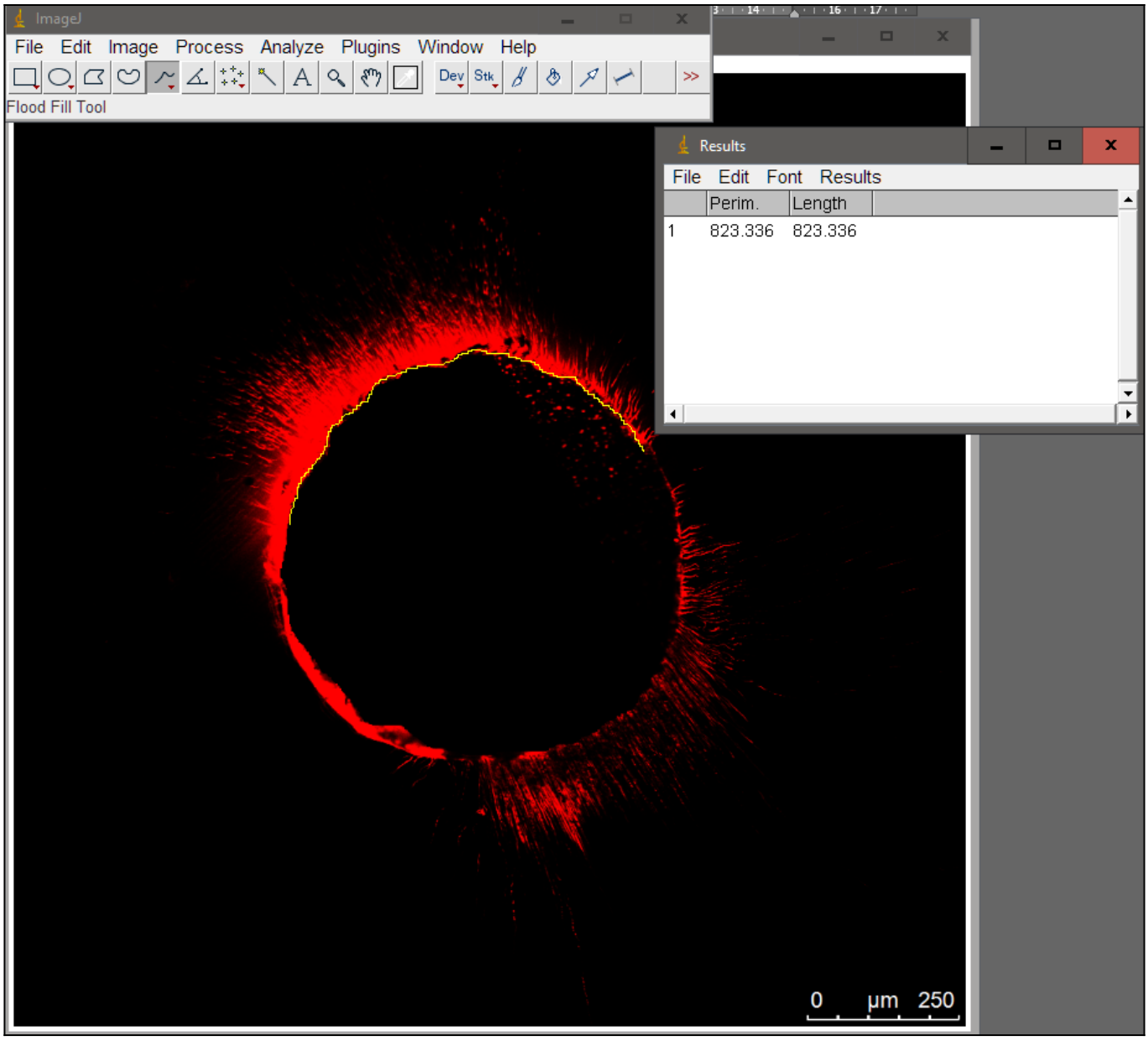
To draw and measure the perimeter, we perform the same steps as above to define the scale (steps 3, 4, 5, 6). Then click on the "Straight Line" tool with the right mouse button and select "Freehand Line".

Step 10.



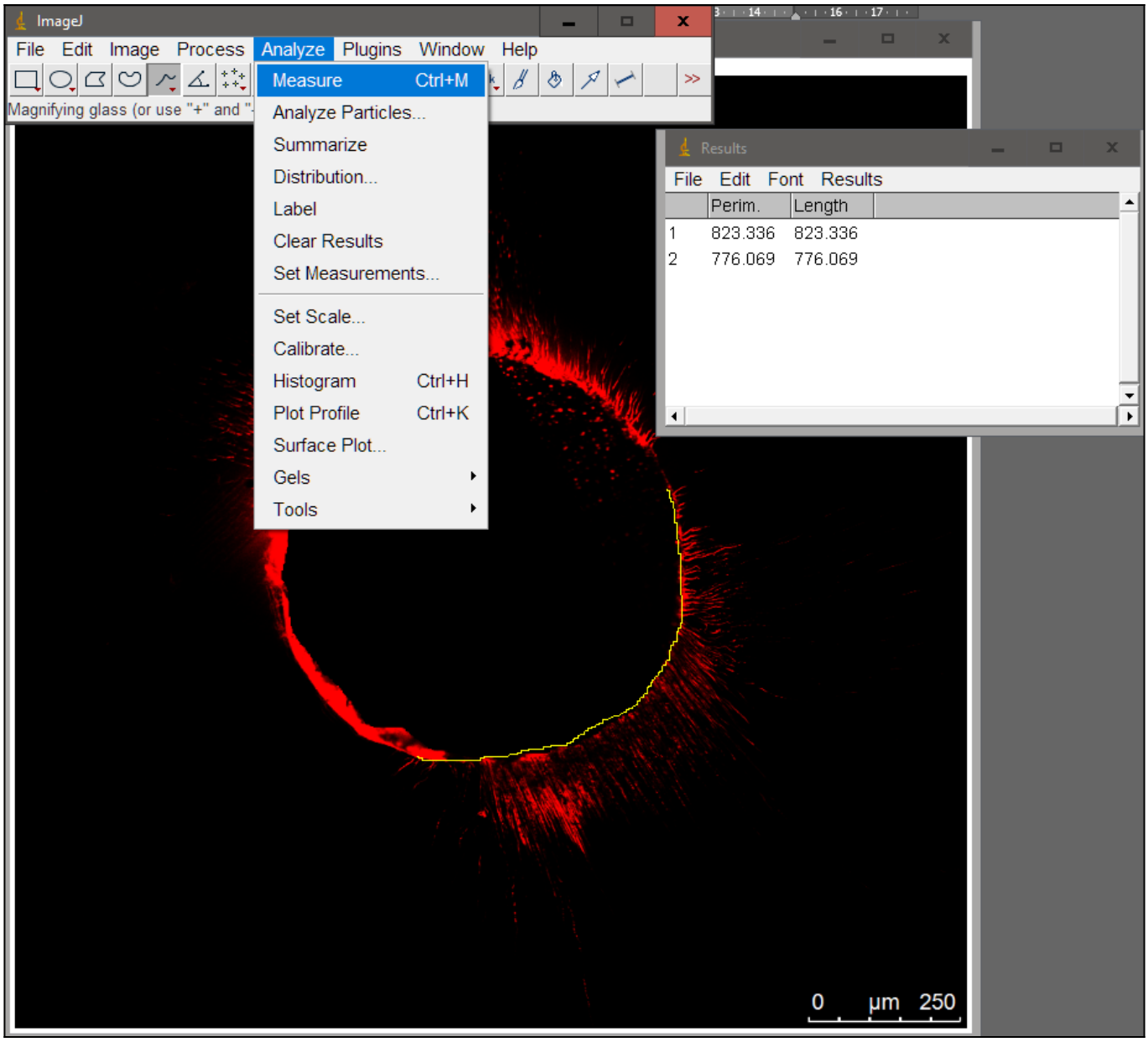
Put the cursor in the first place where you can see the sealer penetrated and, clicking and holding with the left mouse button, we go around all the perimeter where the sealer has penetrated. When you release the mouse button, use the shortcut "Ctrl + M" (or "Measure" on the toolbar) to measure the segment.

Step 11.



Repeat this procedure in all areas where sealer penetrates the perimeter of the canal wall. Make the measurement of each perimeter. Then contour the total perimeter of the channel and measure to obtain the total perimeter.

Step 12.



Step 13.