MetaXpress® 6 Software Guide

Using Find Objects Tools in CME

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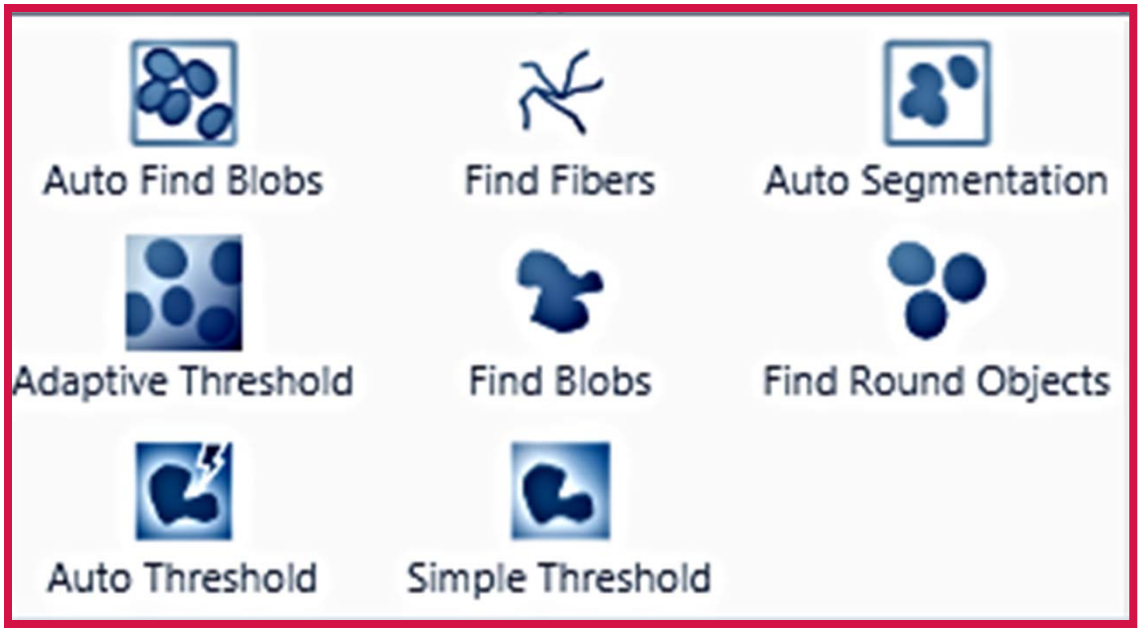
Chapter Purpose

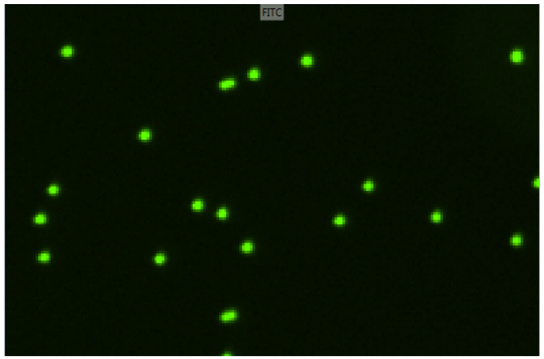
The purpose of this chapter is to describe the **Find Objects** tools available in the **Custom Module Editor** (CME) plugin.

Find Objects tools analyze grayscale (8 or 16-Bit) images and generate a segmentation (1-bit binary) mask. The segmentation mask can then be used to make measurements or it can be modified further using tools available in CME.

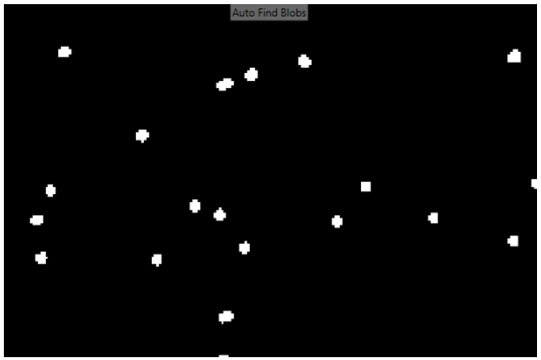
Find Objects Tools: Overview



16-Bit Image

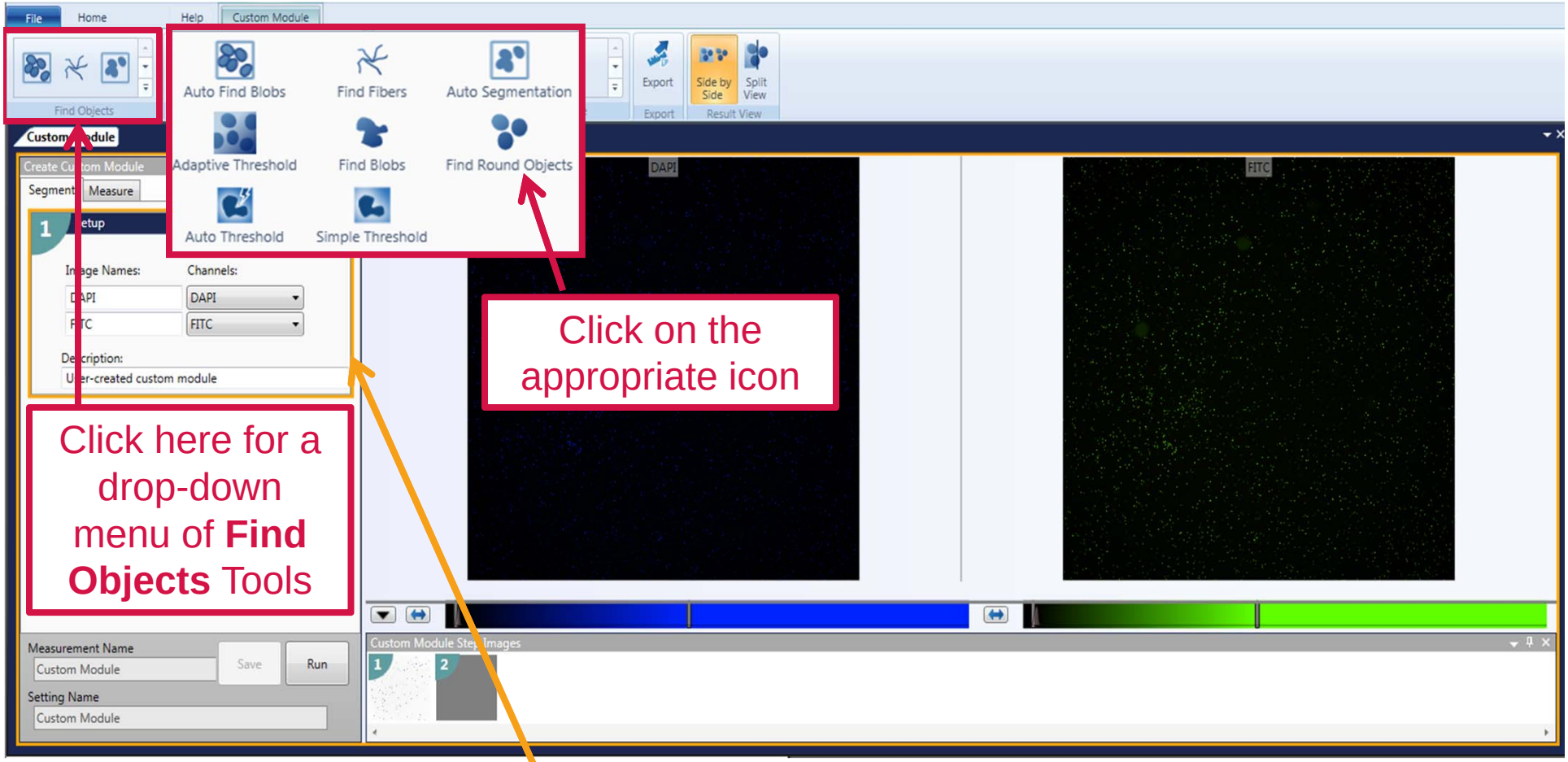


Segmentation Mask



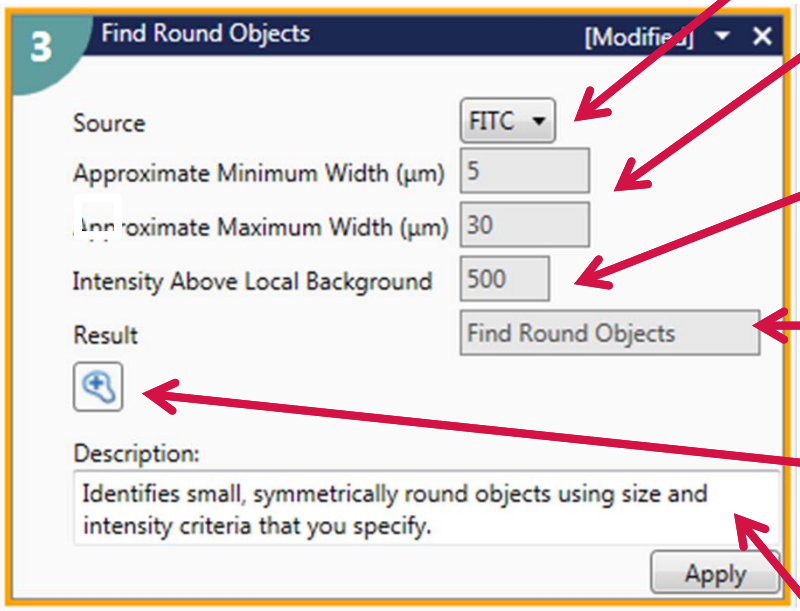
- **Find Objects** tools can be used to find objects in one source (wavelength) image
- Objects are identified by pixel intensity and, in some cases, by size
- Source image must be grayscale
- Result image is a segmentation (1-bit binary image) that can be used to make measurements with or can be modified further

Ribbon: Find Objects Tools



Clicking on a **Find Objects** tool icon will add a step card on the panel to the left

General Workflow of a Find Objects Card



Select image to use for finding objects of interest

Define the size of objects

Set intensity threshold for identifying objects

Specify the name of the resulting image so that you may reference it later

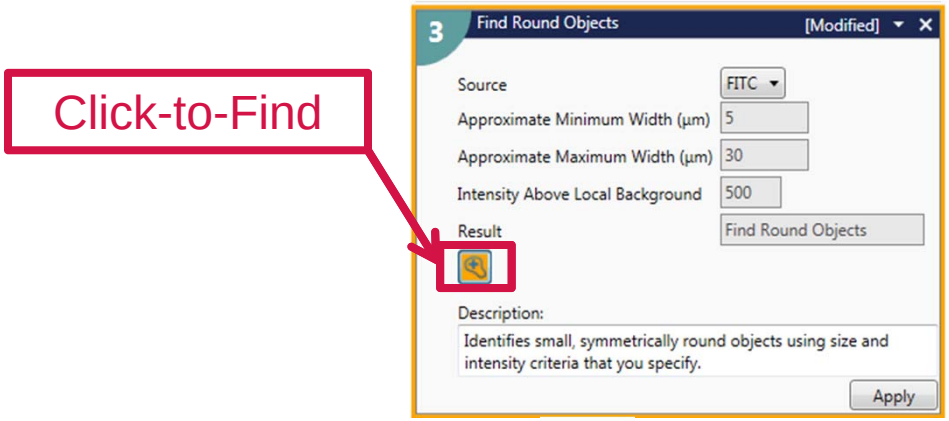
Click-to-Find tool: see next section

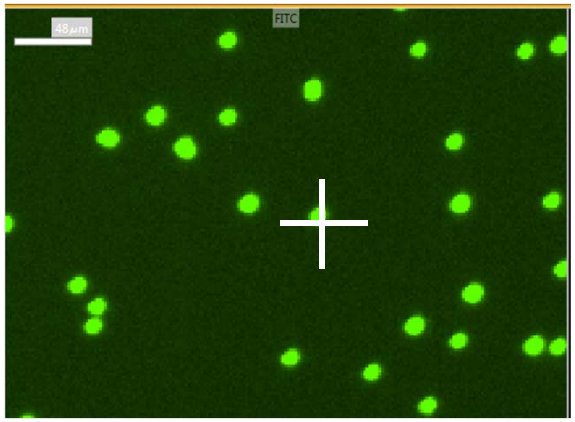
If desired, enter a note on the step. Default text is a description of the step.

The **Approximate Minimum** / **Maximum Width** and **Intensity Above Local Background** can be determined

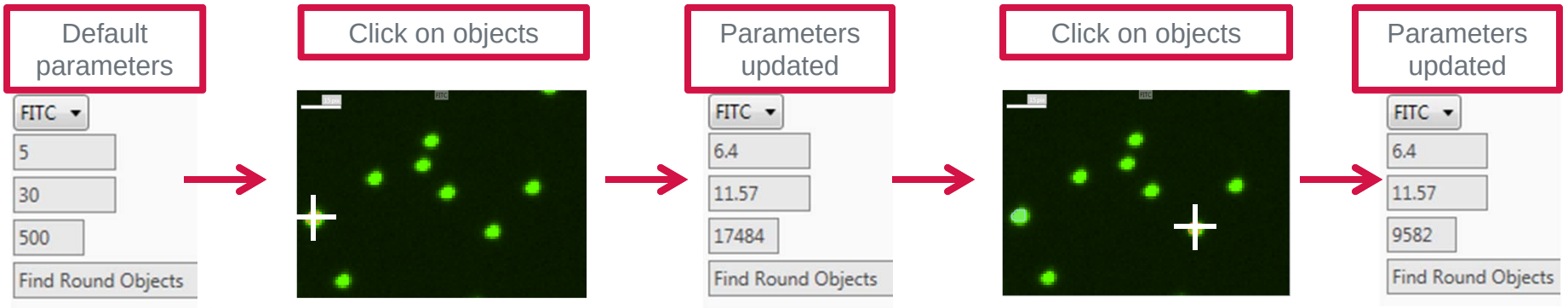
- Using the **Click-to-Find** tool
- Line Scan (right-click on image and enable **Show Line Scan)**
- Manually

Click-to-Find Tool





- **Click-to-Find** is enabled when  is highlighted orange
- Use crosshairs to click on objects of interest in the source image
- To delete selected objects, deselect the **Click-to-Find** tool and use the mouse to highlight the object in orange and press the **Delete** key on the keyboard
- Size and intensity parameters in the step card will be updated (see below).
- Select 5-7 objects then click **Apply**.
- Examine the results. If necessary, adjust numbers manually or use **Click-to-Find** tool to select more objects.



Find Object Tools Basic Descriptions

- Automatically identifies relatively uniformly sized objects. Separates objects that are touching.

- Identifies objects based on size and intensity criteria

- Automatically apply a threshold on the image to help segment features from the background.

- Identifies four elements (fibers, non-fibrous objects, segments, and branch points) using size and intensity criteria

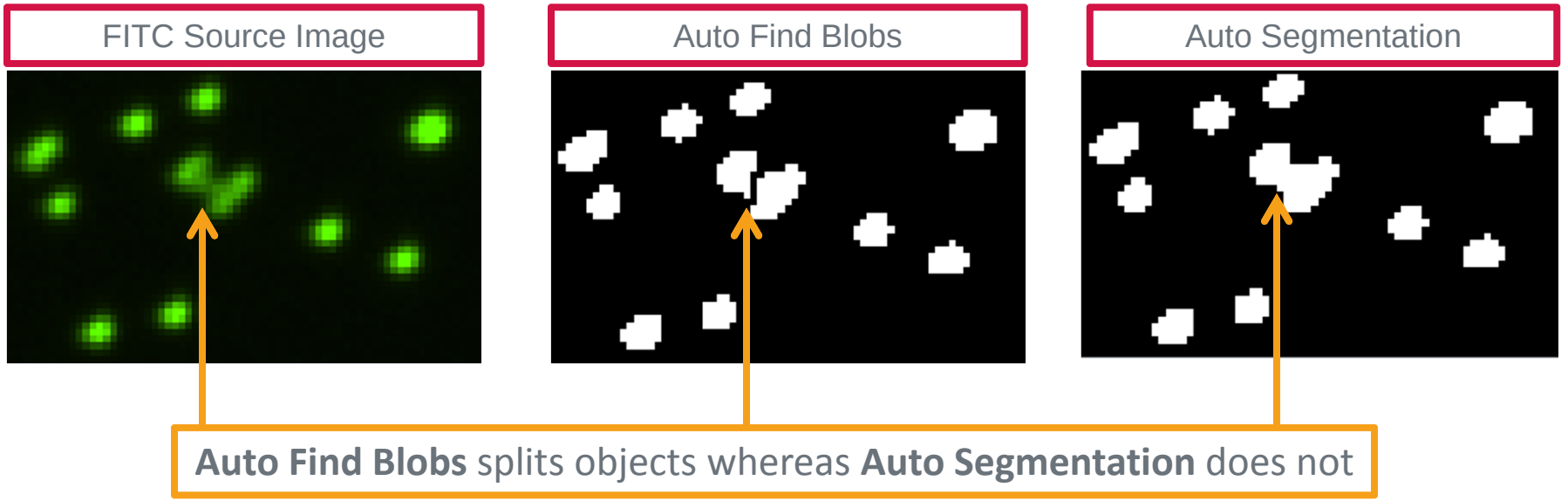
- Identifies irregularly shaped objects using size and intensity criteria. Does not separate objects that are touching.

- Enable and adjust the threshold of the image manually to help segment the features from the background.

- Automatically identifies objects of various shapes and sizes. Does not separate objects that are touching.

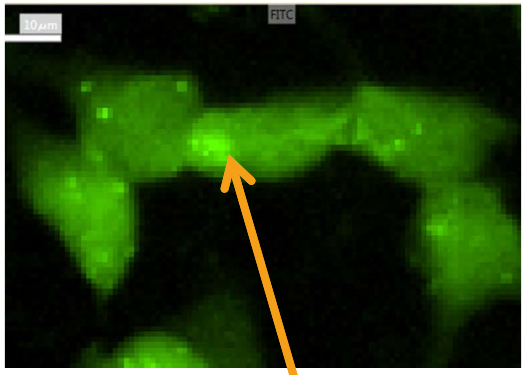
- Identifies small, symmetrically round objects using size and intensity criteria

Auto Find Blobs vs. Auto Segmentation

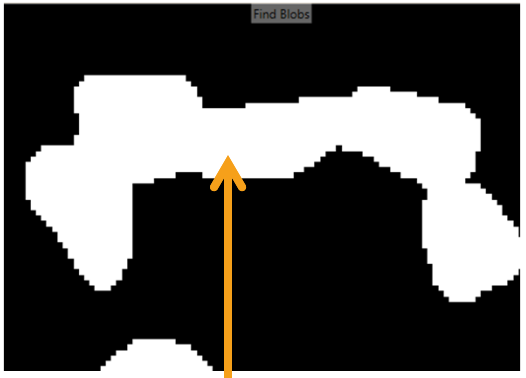


Find Blobs vs. Find Round Objects

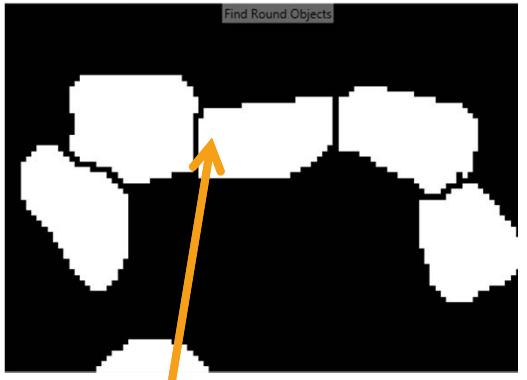
FITC Source Image



Find Blobs



Find Round Objects

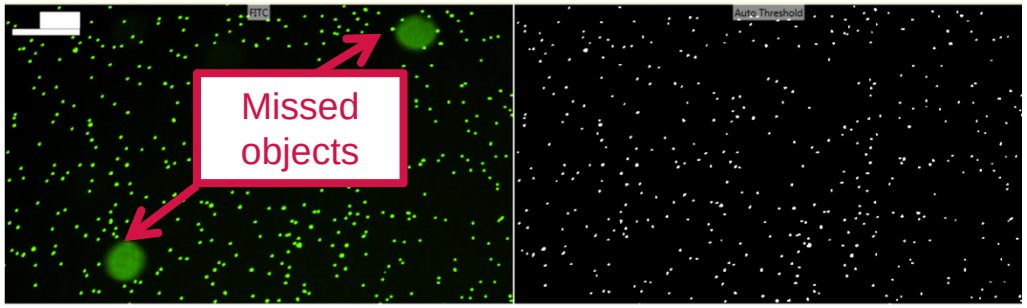


Find Round Objects splits objects whereas **Find Blobs** does not

Comparison of Threshold Tools

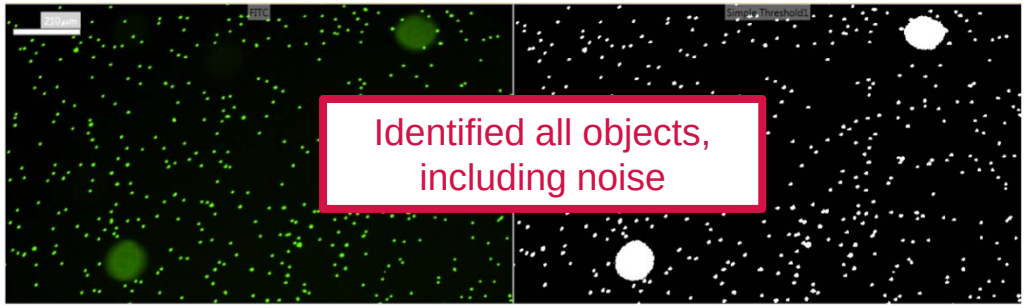
Auto Threshold

- Fast
- Identifies dark or bright objects compared to background
- Objects that vary in size may not be detected



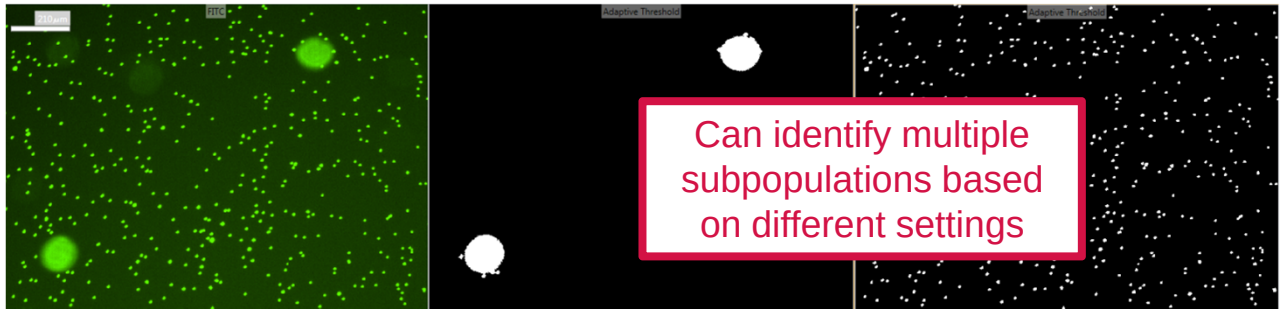
Simple Threshold

- Fast
- Uses absolute intensity value range for detection



Adaptive Threshold

- Slow
- Uses size and intensity values to identify objects
- Can be used multiple times to find different subpopulations



NOTE Molecular Devices recommends testing each tool to determine which works best for the analysis goal.

Support Resources

- F1 / HELP within MetaXpress® Software
- Support and Knowledge Base: http://mdc.custhelp.com/
- User Forum: http://metamorph.moleculardevices.com/forum/
- Request Support: http://mdc.custhelp.com/app/ask
- Technical Support can also be reached by telephone:
  - 1 (800) 635-5577
  - Select options for Tech Support → Cellular Imaging Products → ImageXpress Instruments