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iGEM Calibration Protocol - Flow Cytometry Cell Size

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Jacob Beal[1], Cheryl Telmer[1], Richard Tennant[1], Paul Rutten[1]

[1]iGEM Measurement Committee

iGEM Measurement
Tech. support email: **pauljrutten@gmail.com**

Paul Rutten
The University of Oxford

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Abstract

Conversion from forward scatter to Eμm is not a linear function, so data cannot be converted simply by multiplying with a scaling factor. We thus recommend use of software tools for processing data with size calibration.

This protocol can be combined with bead-based fluorescence calibration.

Materials

MATERIALS

Size calibration beads **SpheroTech Catalog #**PPS-6K

- Experimental samples: transformed per your desired experimental procedure
- Flow cytometer with a forward scatter channel (typically a 488nm excitation and a 488nm/10nm emission filter). Measurements on this channel will be converted to equivalent μm diameter (Eμm).
- **TASBE Flow Analytics** - Analysis software

Before start

Read through this entire protocol carefully before you start your experiment and prepare any materials you may need. See the "Results" section for an example of a completed data analysis spreadsheet.

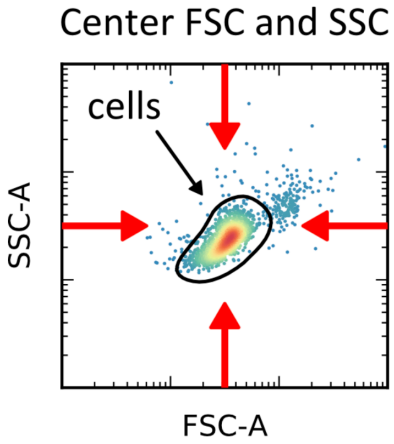
1 Prepare and culture experimental samples according to your desired experimental procedure.

2 Prepare experimental samples as needed for running through your flow cytometer.

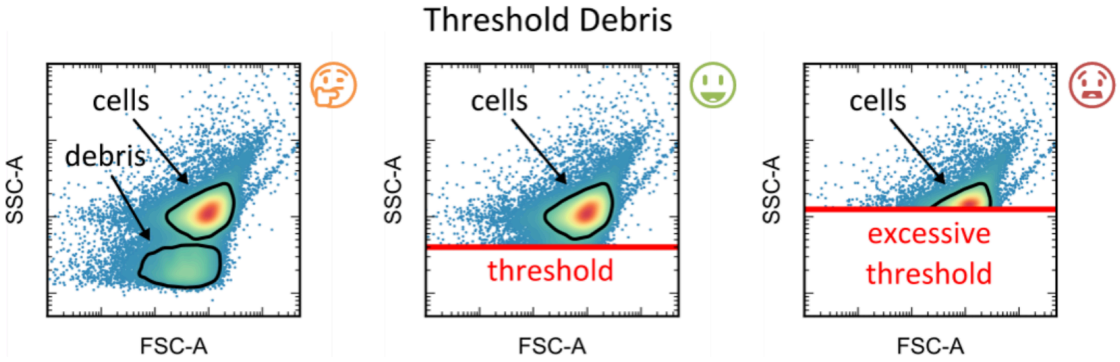
3 Follow SpheroTech directions for preparation for PPS-6K bead sample.

4 Measure all samples in flow cytometer

- Using the bead sample, adjust FSC channel voltage so that the top bead peak is below detector saturation.
- Using the negative process control sample, adjust forward-scatter and side-scatter voltages to place the strong cell peak as close to the center of the detector range as possible (see example illustrated below).



- Instrument gating should be set to ensure that no cell events are discarded (see example illustrated below).



- Collect at least 10,000 events per sample.

5 Compute the Eμm/a.u. scaling function from bead sample using **TASBE Flow Analytics** to create a TASBE color model.

6 Convert experimental data to Eμm using **TASBE Flow Analytics** analysis functions.