### Today

- **Flow Cytometry Overview**
  - Dataset description
- **Existing Visualizations Overview**
- **Data analysis**
  - **Current (FlowJo)**
  - **Proposed**
- **Prototype Progress**
- **Future Work**

### Data Analysis Process (FlowJo)

**Negative control**

- **Event Count**
  - 29,089
  - 18,029
  - 17,755

**Event Count** is a total number of cells passed through the laser beam.

**Important note:** sequence of actions is the same all the time for negative control!

### Flow Cytometry (FCM)

**Dataset Properties**

Typically for research at the TFL:

- **100,000+ events**
- **5-10 dimensions**

**Capability:**

- **1,000,000 events** (cells going through the laser beam) per **dataset**
- **Up to 20 dimensions**

### Dimensions (16 fluorescence intensities)

- **GFP intensity**
- **PI (Propidium Iodide)** dye intensity

**Aequorea Victoria** (natural owner of GFP)

- **Membrane potential**
- **Chromatin structure**
- **DNA synthesis**
- **DNA degradation**
- **Sulfhydryl groups/glutathione**
- **Lipids**
- **Membrane fluidity**
- **Chromatin structure**

**Green Fluorescent Protein intensity (GFP)**

**Iodide** dye intensity measures cells' viability (life cells expunge the dye)

### Dimensions (2 basic dimensions)

- **Green Fluorescent Protein intensity** & **PI**

**Aequorea Victoria** (natural owner of GFP)

**PI** (Propidium Iodide) dye intensity measures cells' viability (life cells expunge the dye)

### User requirements (based on user studies):

1. **See all dimensions at once**
2. **Improve analysis sequence**
3. **Leave scatterplots and histograms (scientists used in them)**
4. **Gating/Filering feature**
5. **Provide better usability than FlowJo**

### Proposal

User requirements (based on user studies):

1. See all dimensions at once.
2. Improve analysis sequence.
3. Leave scatterplots and histograms (scientists used in them).
5. Provide better usability than FlowJo.

**Solutions:**

1. Use Parallel Coordinates with Gating/Filering.
2. Implement data clustering throughout dimensions.
3. Include scatterplots and histograms in the interface.
4. Make effective, convenient and interactive interface.
Future Work

- Visualization of the real data
- Clustering
- Optimization
- User evaluation

Questions…