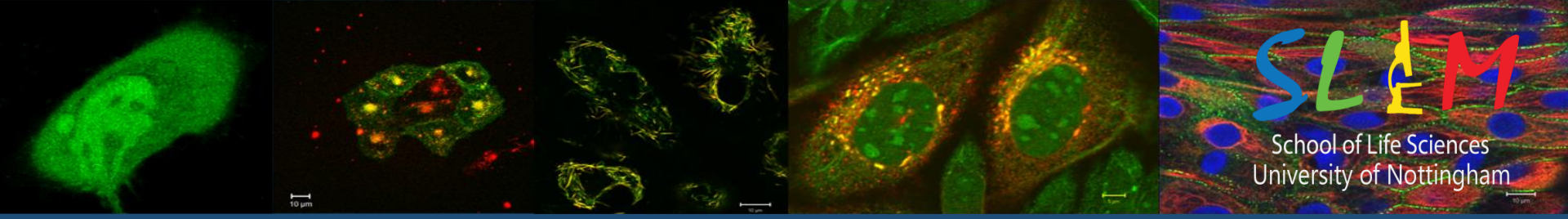


Cell Profiler (Alan Huett)

CellProfiler™
cell image analysis software

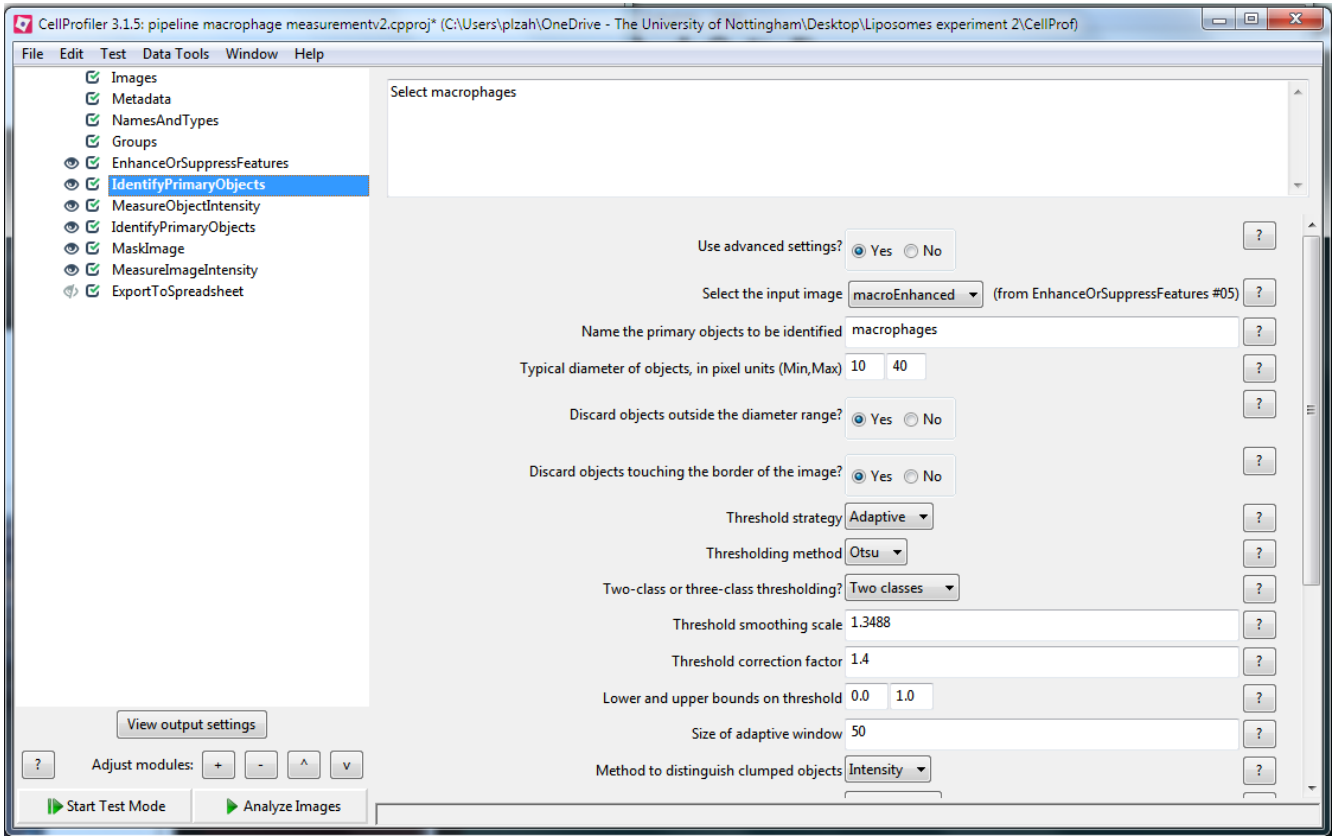
Cell Profiler – key features

- Designed specifically for high-throughput analysis
  - Handles 10 000s of images
- Works best on fluorescent images
  - Wide-field or confocal
  - Multiple channels
  - 3D or 4D datasets
- Integrates with databases (SQL/SQLite)
  - CellProfiler Analyst allows views across plates
  - Can still drill down to individual images
- Can measure almost anything that you can see
  - Cell size/shape, granularity, intensity, co-localisation, cytoskeleton

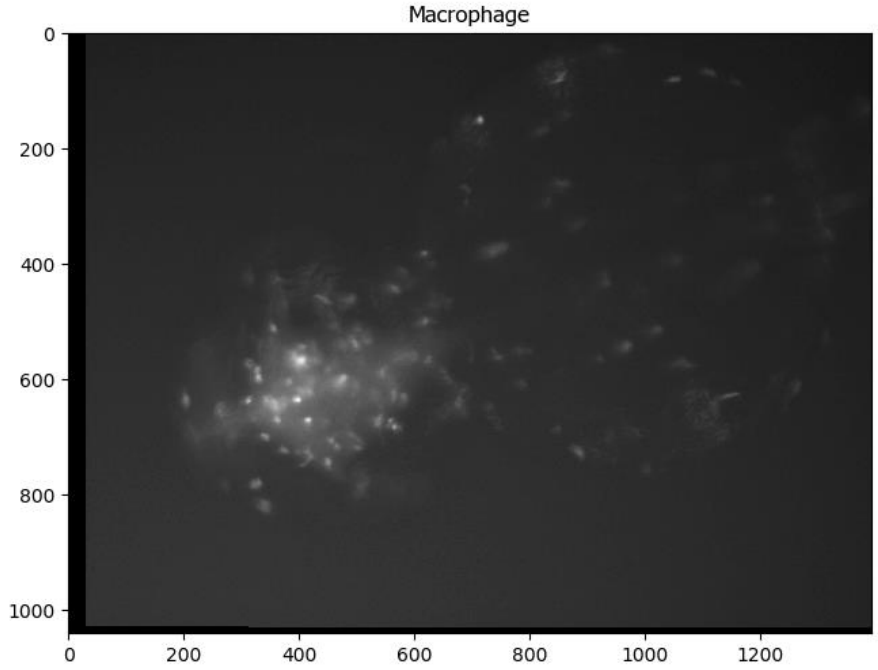
Cell Profiler – measuring macrophages in fish

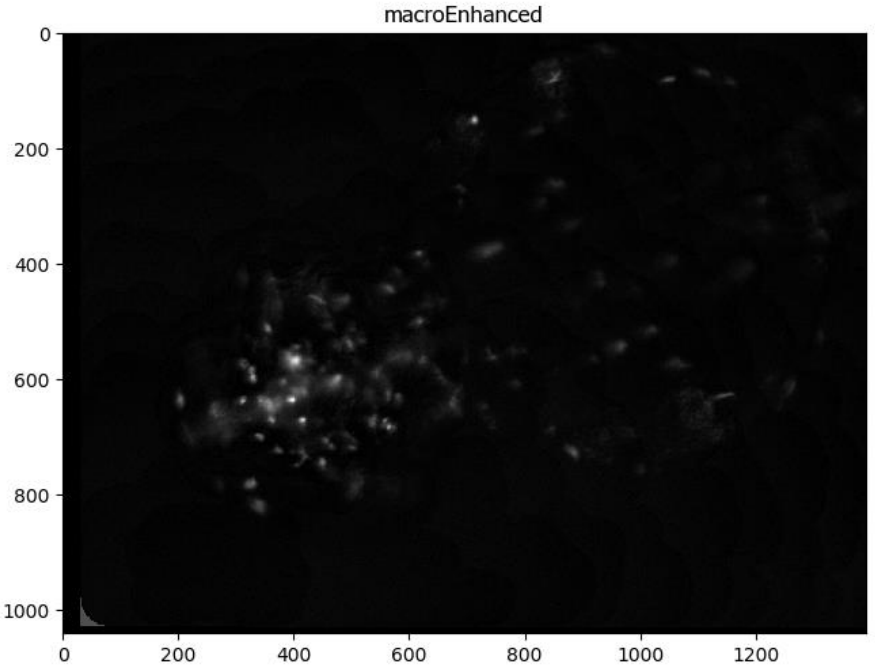
- 9 fish in timeseries
- 144 images per fish
- 10–200 macrophages per image

- Simple pipeline
- Find and measure macrophages
- Find and measure background
- Background subtract

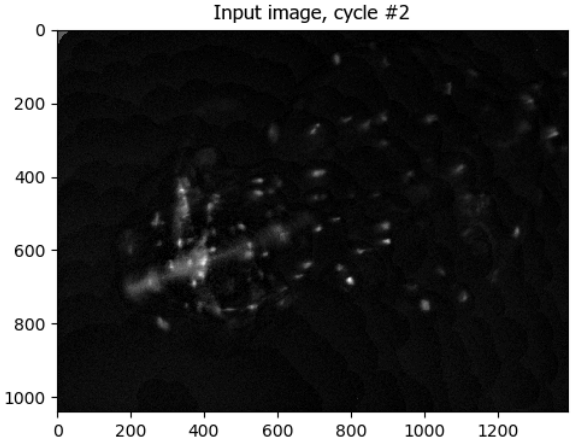


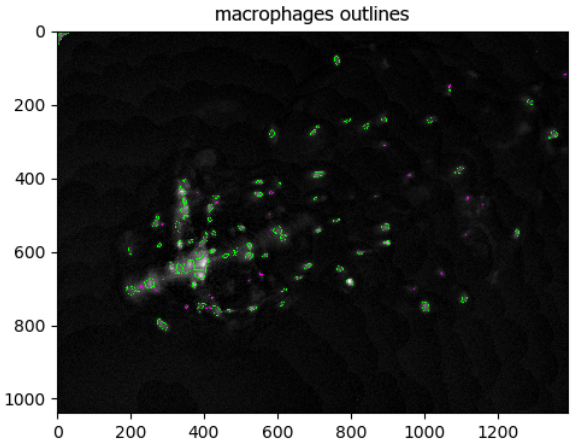
Finding macrophages (mCherry-labelled)

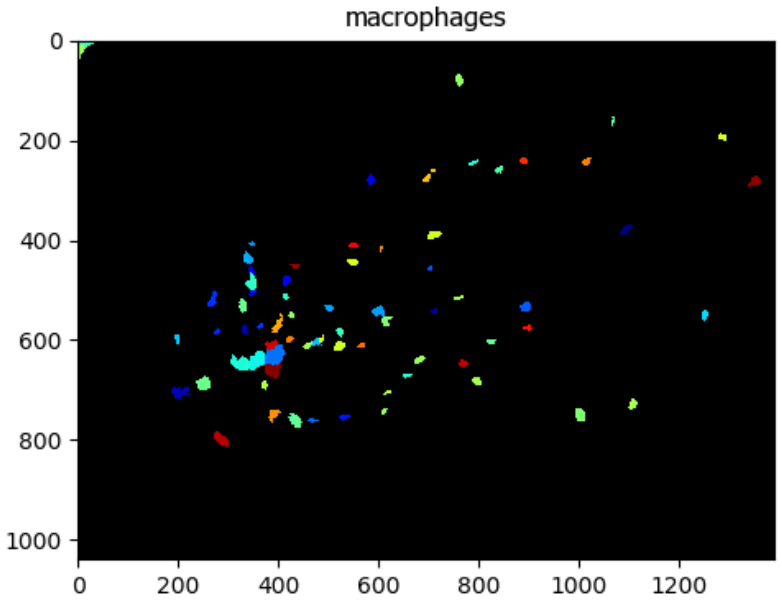




Finding macrophages (mCherry-labelled)

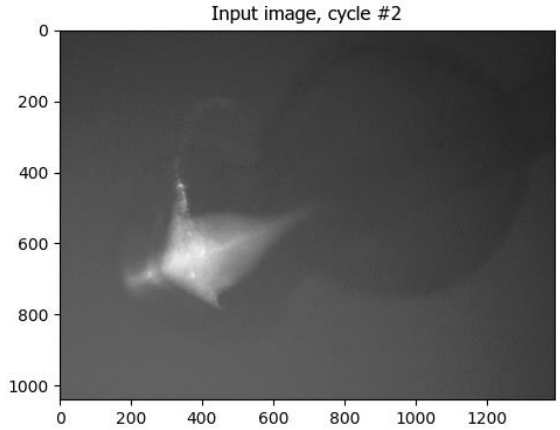


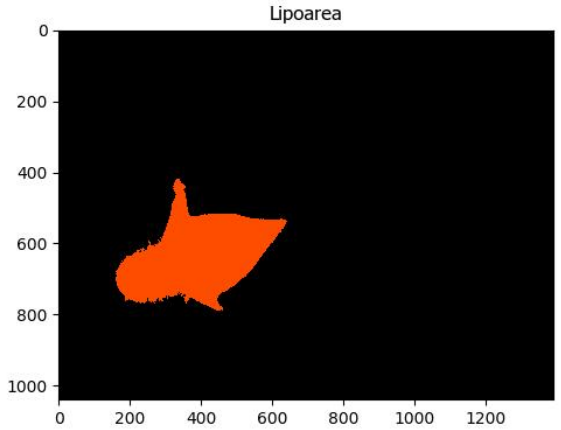


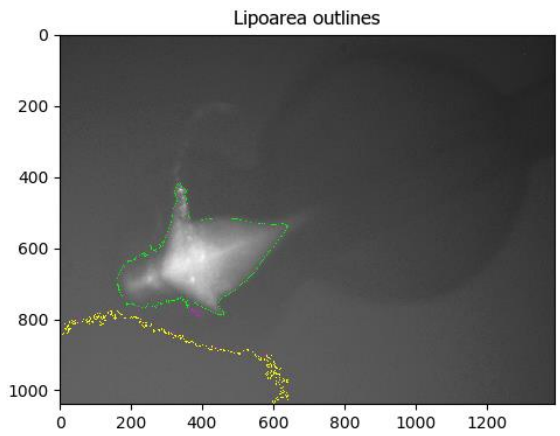


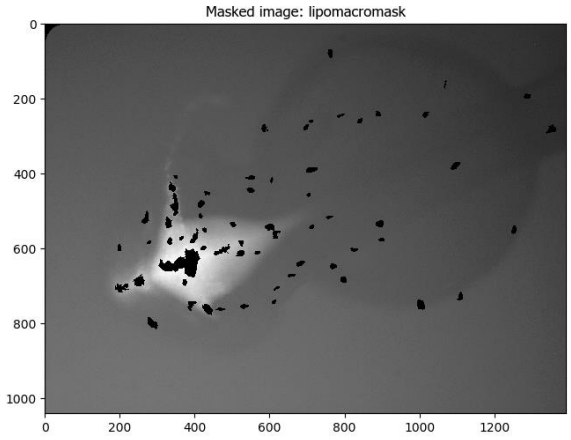
10th pctile diameter	11.2 pixels
Median diameter	16.5 pixels
90th pctile diameter	25.3 pixels
Area covered by objects	1.4 %
Thresholding filter size	1.0
Threshold	0.0381
Declumping smoothing filter size	6.7
Maxima suppression size	6.7

Background subtraction in Cy5 channel









Final comments

- Cell Profiler plays well with other software
  - ImageJ
  - Ilastik
- Data is easily exported to R or other platforms
- Supported and updated
- Currently no ML built-in, but this will be coming