You’re in the right place.

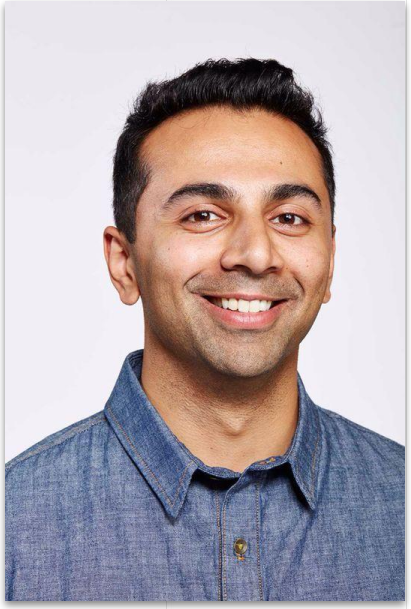
Read more about Teiko’s spectral flow service @
teiko.bio/spectral-flow-cytometry

Teiko.bio

Spectral vs conventional flow basics series

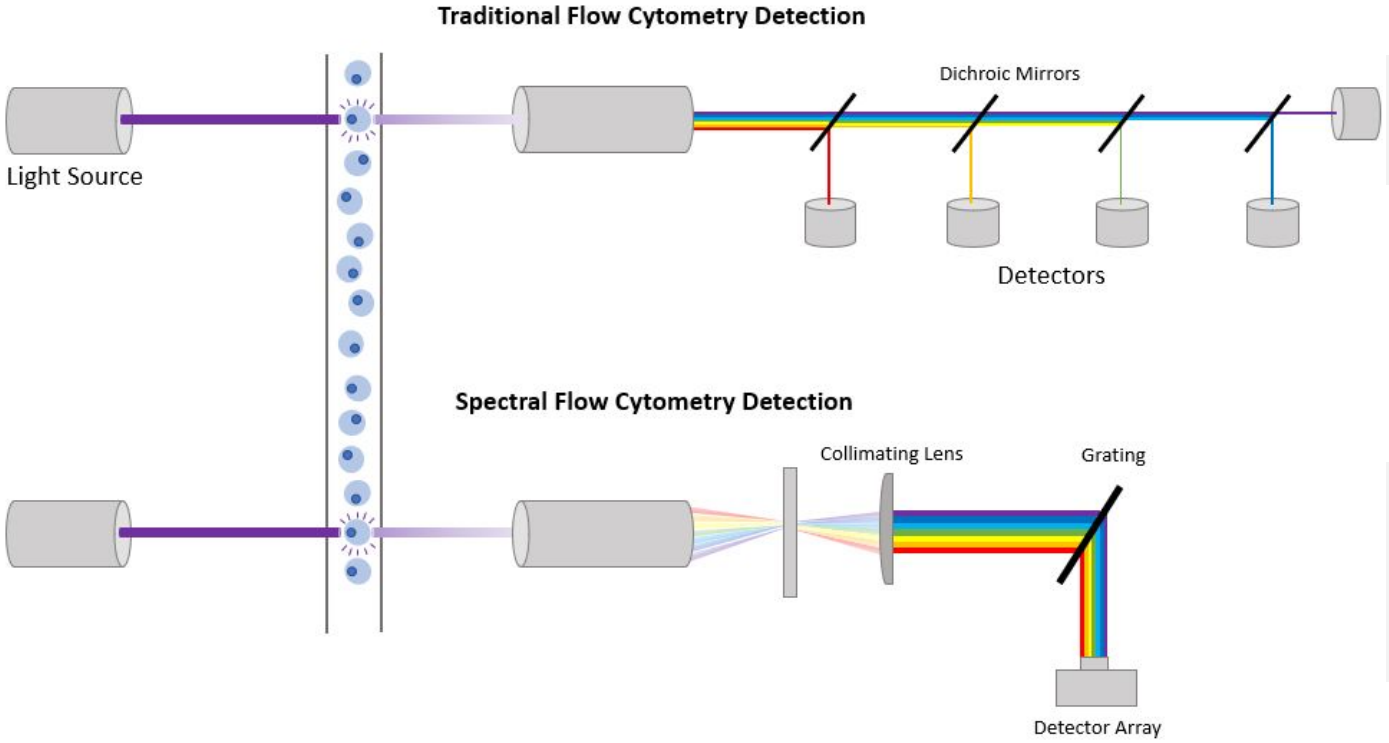
How spectral allows higher-parameter analysis

High-parameter cytometry for clinical trials



Ramji Srinivasan
Teiko CEO

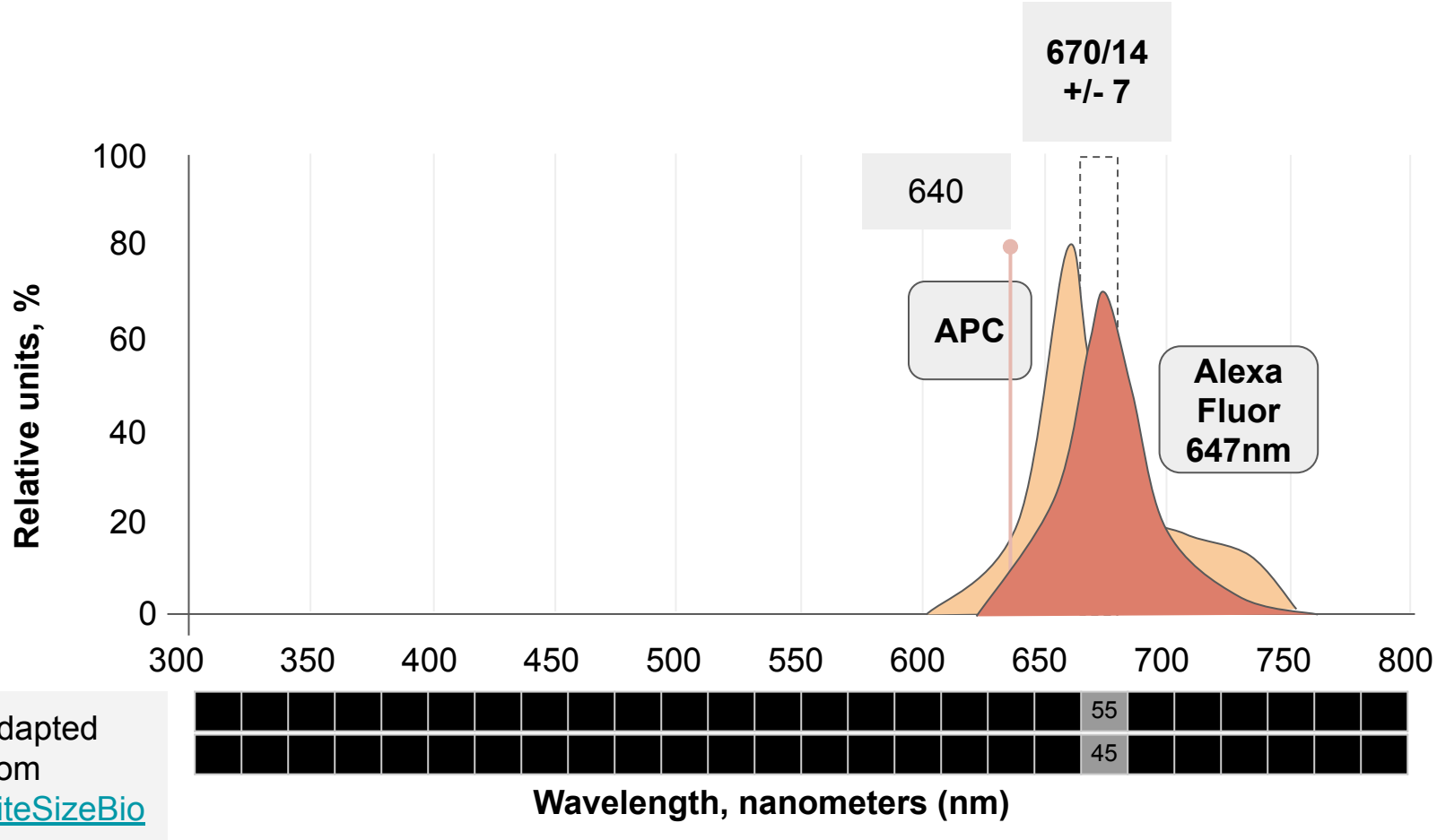
Problem



Records a snippet

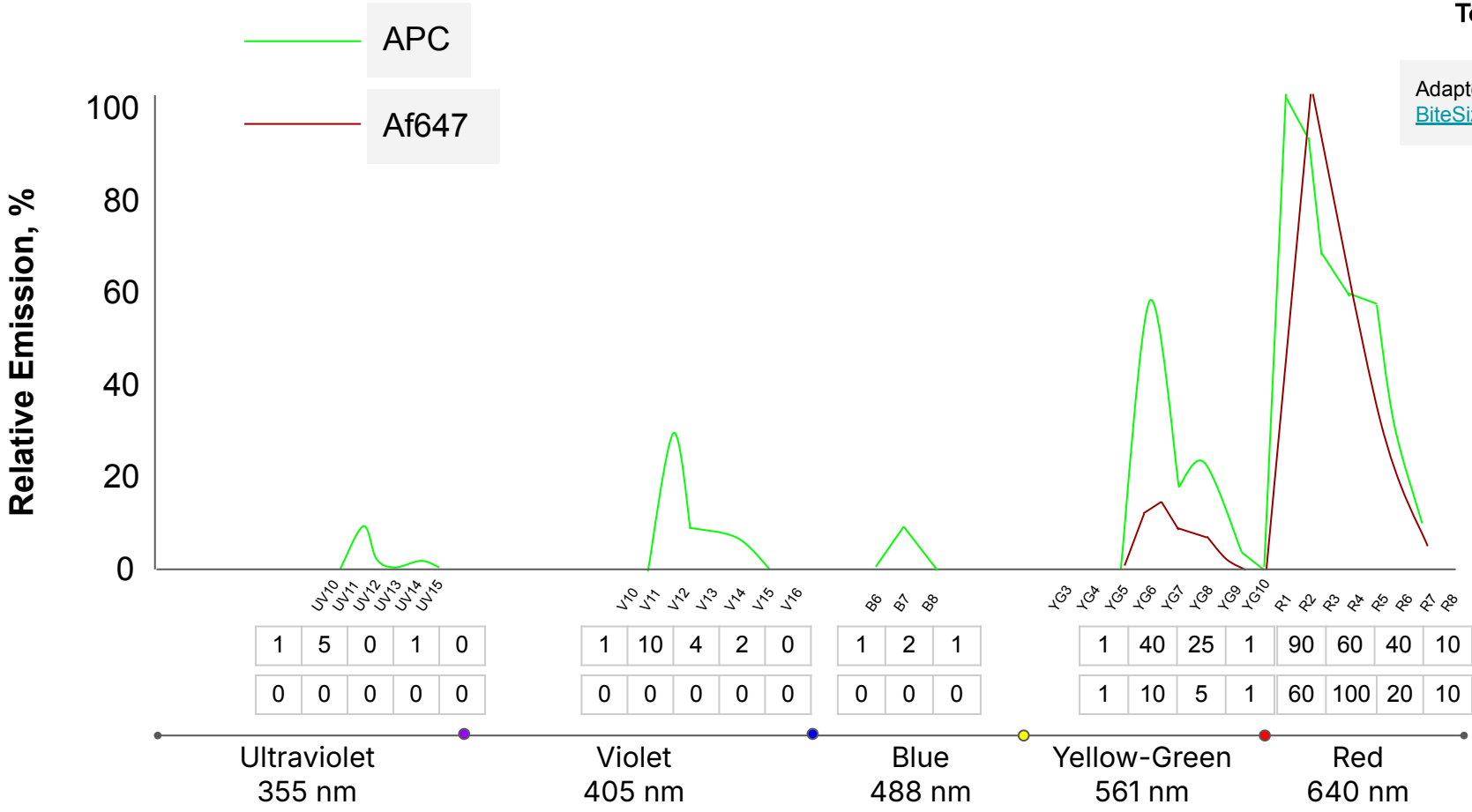
Records an entire emission spectrum

Adapted from [FluoroFinder]



Adapted from [BiteSizeBio]

Teiko.bio

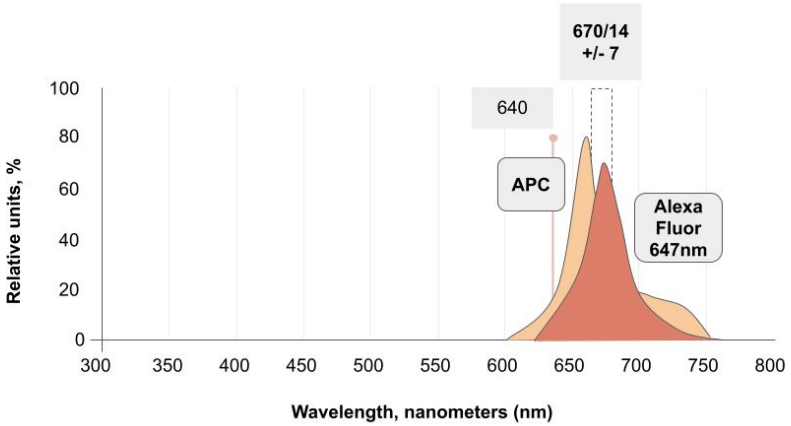


Adapted from
BiteSizeBio

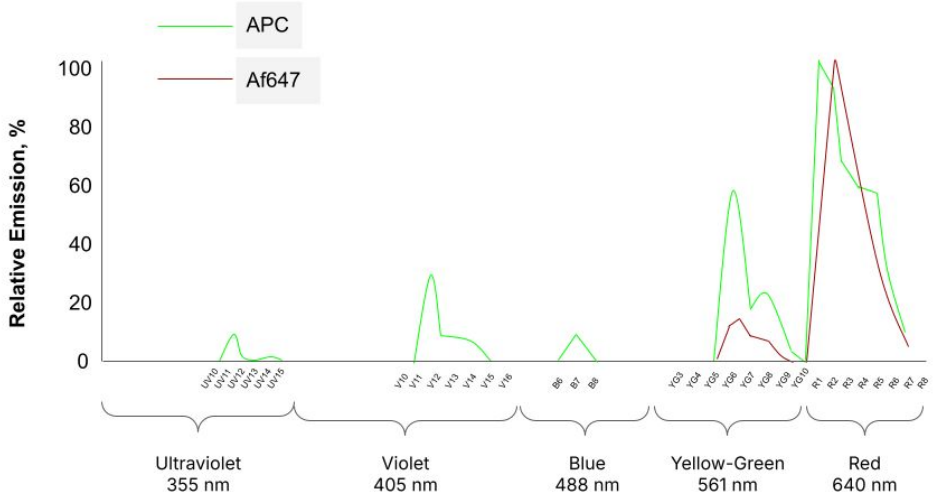
So what?

Spectral Flow can distinguish overlapping signals that would stump conventional flow

Conventional Flow



Spectral Flow



Adapted from
BiteSizeBio

That means more markers, and finer resolution

	Classical Flow	Spectral
Markers	6-8	25
Possible subtypes	~52	298
% of Cells Recovered	95%+	95%+
Days to run 300 samples at a target of 1M events per sample	~1 day	~1 day
Value	Speed, cost	Tighter variation

Sources: Teiko estimates, research.

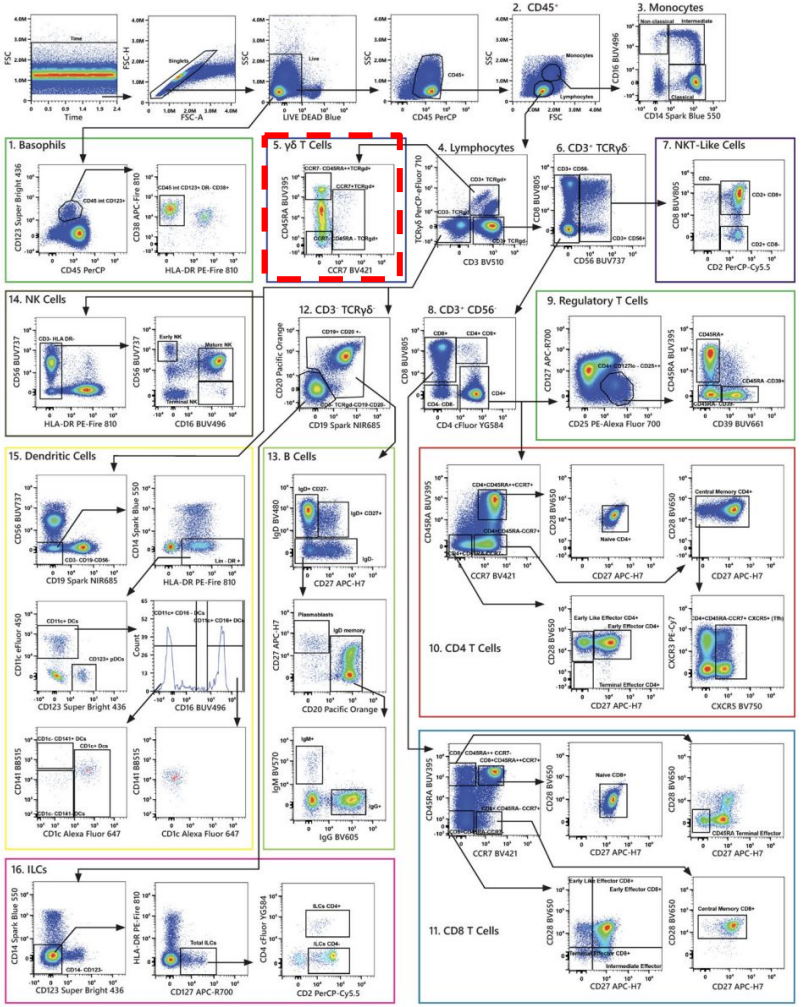
In action

Teiko.bio

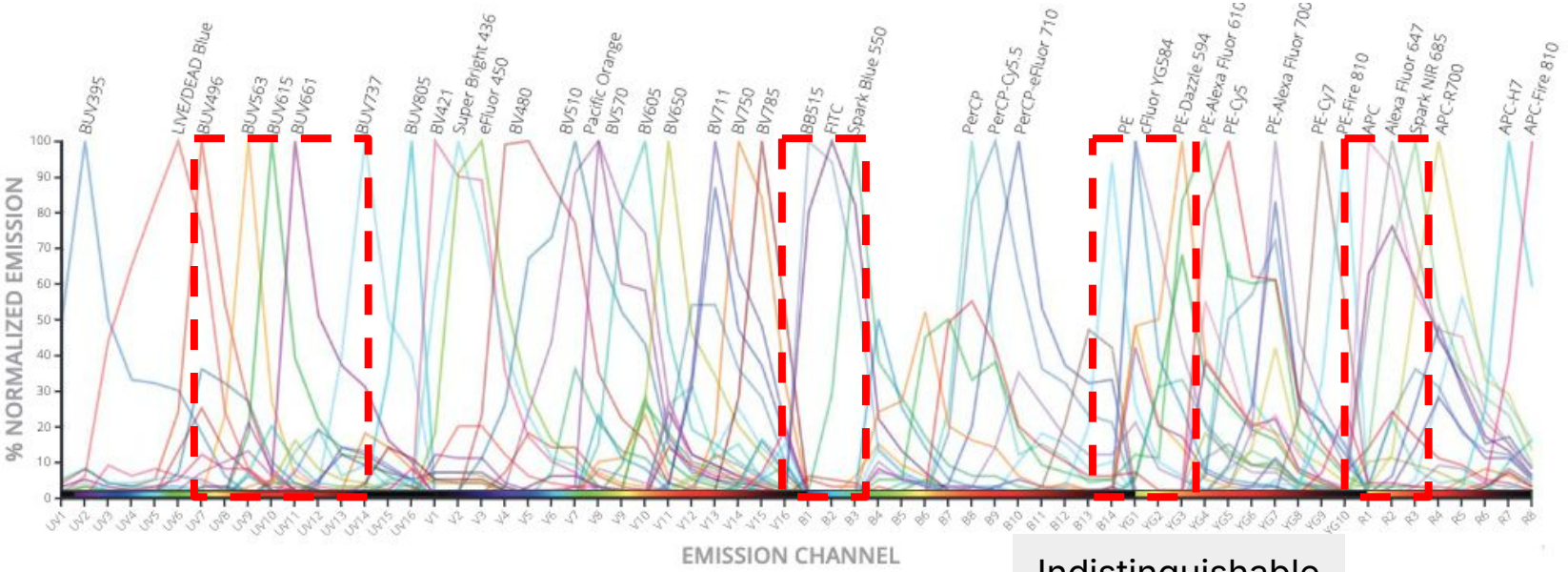
40 marker panel (OMIP-69)

γδ T cells also associated with “major autoimmune rheumatic diseases”... but take up a lot of channels to resolve

Markers	
Viability	CD2
CD45	CD56
CD3	CCR7
CD4	CD27
CD8	CD28
CD25	CD45RA
TCRγδ	CD95
CD14	CD127
CD16	CD337
CD11c	CCR6
CD19	CCR5
CD20	CXCR5
CD24	CXCR3
CD39	HLA-DR
IgD	CD38
IgG	CD57
IgM	PD-1
CD141	CD159a
CD1c	CD159c
CD123	CD314



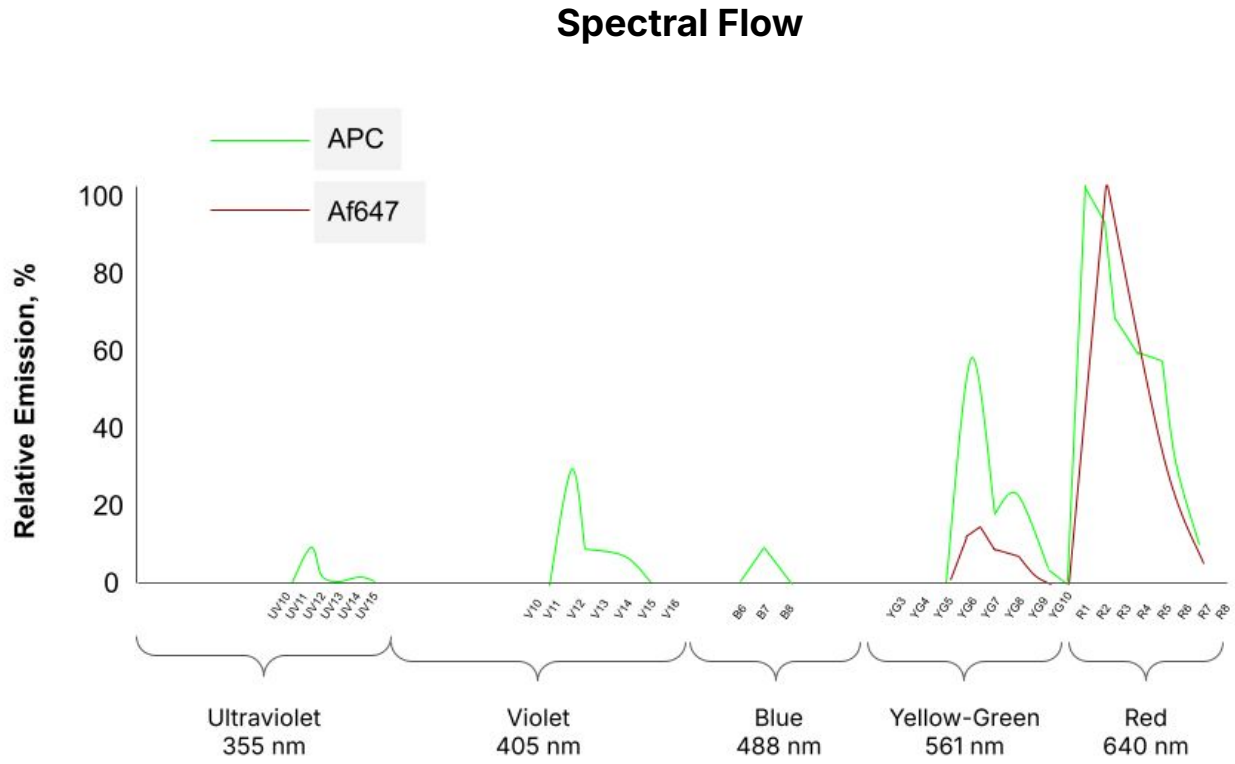
Emission spectrum for 40 marker panel (OMIP-69)



Indistinguishable through a bandpass filter

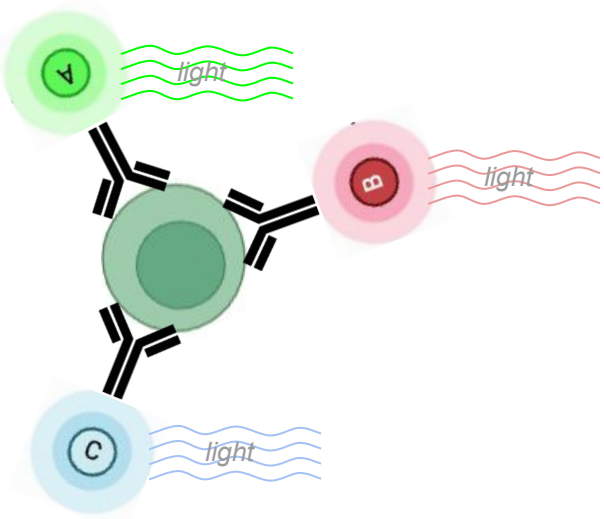
Unmixing preview

Remember this?

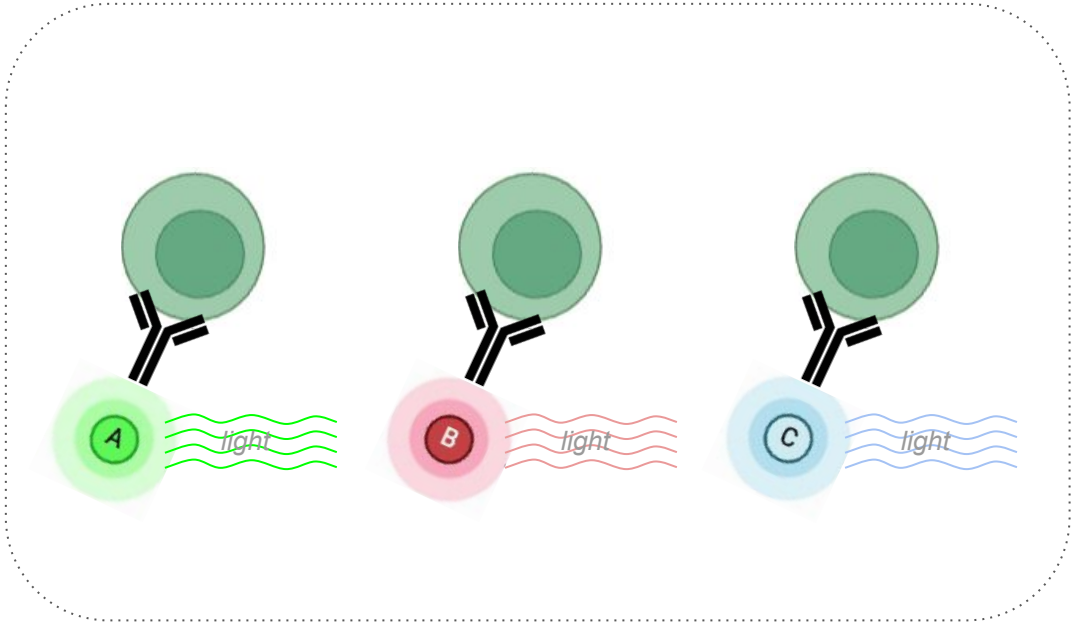


Experiment design before acquisition

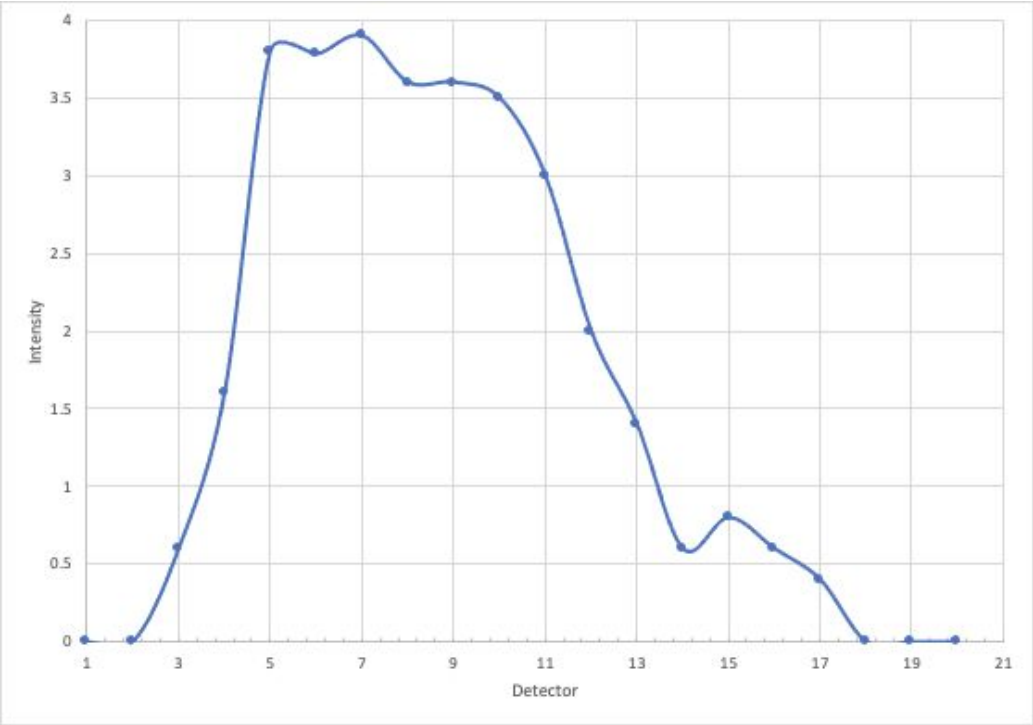
Combination of the light coming from A, B and C



Set of single color controls (A,B and C)

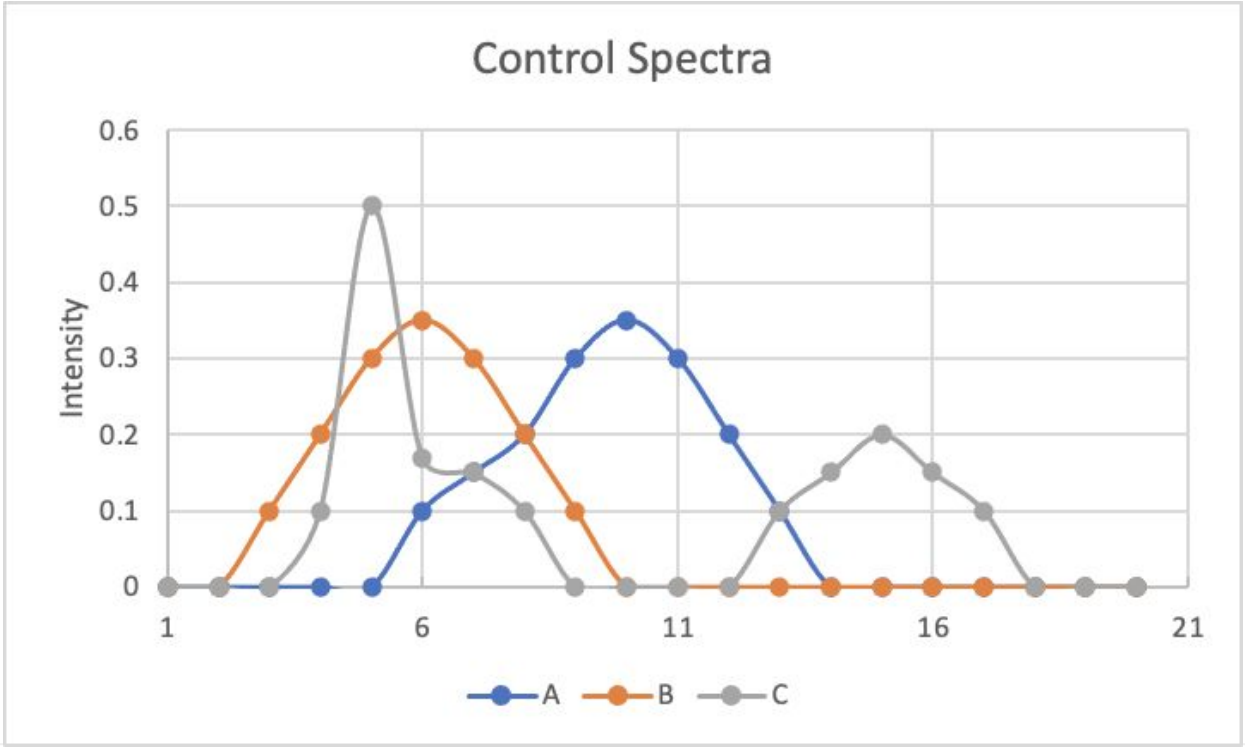


The cell with three fluorochromes: A,B and C



Adapted from CheekyScientist

We need single color controls to determine intensity of each fluorochrome



Adapted from [CheekyScientist]

How much of each of these fluorochromes is present on the cell?

Mixing

	Individual Spectra		
Detector	**A**	**B**	**C**
1	0	0	0
2	0	0	0
3	0	0.1	0
4	0	0.2	0.1
5	0	0.3	0.5
6	0.1	0.35	0.17
7	0.15	0.3	0.15
8	0.2	0.2	0.1
9	0.3	0.1	0
10	0.35	0	0
11	0.3	0	0
12	0.2	0	0
13	0.1	0	0.1
14	0	0	0.15
15	0	0	0.2
16	0	0	0.15
17	0	0	0.1
18	0	0	0
19	0	0	0
20	0	0	0

X

Attribution

Channel	Attribution
A	?
B	?
C	?

=

Observed

Observed
0
0
0.6
1.6
3.8
3.78
3.9
3.6
3.6
3.5
3
2
1.4
0.6
0.8
0.6
0.4
0
0
0

Adapted from CheekyScientist

How much of each of these fluorochromes is present on the cell?

Mixing	Attribution	=	Observed
[20 X 3]	[3 X 1]	=	[20 X 1]

Channel	Attribution
A	10
B	6
C	4

Adapted from CheekyScientist

How much of each of these fluorochromes is present on the cell?

	Individual Spectra		
Detector	**A**	**B**	**C**
1	0	0	0
2	0	0	0
3	0	0.1	0
4	0	0.2	0.1
5	0	0.3	0.5
6	0.1	0.35	0.17
7	0.15	0.3	0.15
8	0.2	0.2	0.1
9	0.3	0.1	0
10	0.35	0	0
11	0.3	0	0
12	0.2	0	0
13	0.1	0	0.1
14	0	0	0.15
15	0	0	0.2
16	0	0	0.15
17	0	0	0.1
18	0	0	0
19	0	0	0
20	0	0	0

X

Channel	Attribution
A	10
B	6
C	4

=

Observed
0
0
0.6
1.6
3.8
3.78
3.9
3.6
3.6
3.5
3
2
1.4
0.6
0.8
0.6
0.4
0
0
0

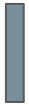
Adapted from [CheekyScientist]

In sum

Appendix

100 Low Pass

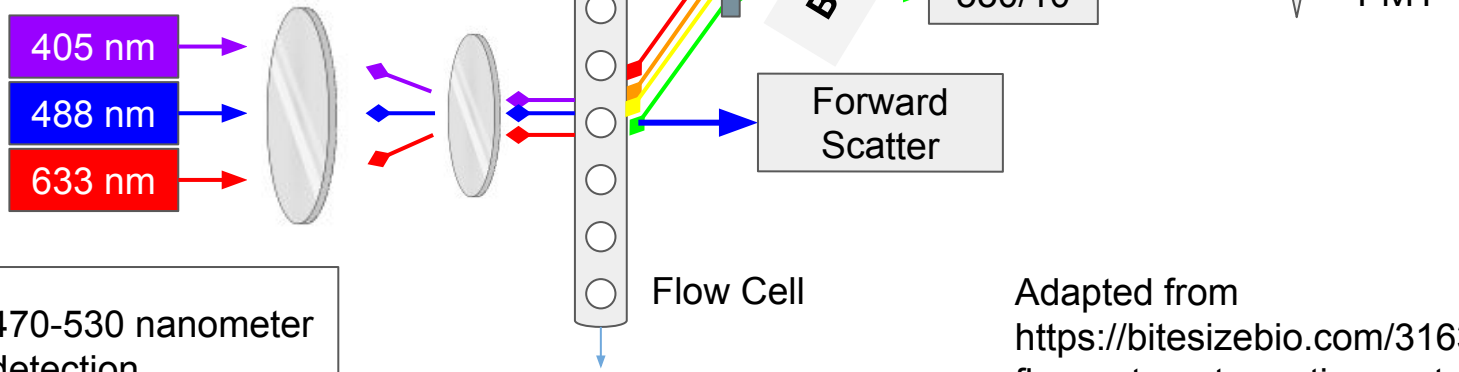
Wavelengths lower than 100 nanometers will be deflected



Excitation Lasers

Lenses and Prisms

Dichroic Mirrors



500/30

470-530 nanometer detection

Adapted from https://bitesizebio.com/31638/flow-cytometry-optics-system/