Metal vs Fluorescence Tags for Antibodies

1. Interrogate >50 markers with fewer cells – no autofluorescence!
2. Combine phenotypic & functional analysis in one assay – easily expandable
3. Multiplex staining of 20 samples/tube – small cell numbers

Flow Cytometry:
Compensation limits dimensionality & resolution
Background from autofluorescence
>14 markers/tube is difficult
More Parameters >> More Biological Insight!

- Cell proliferation
- Transcription factors
- Cell phenotype
- Immune responses
- Apoptosis
- Cell cycle
- DNA content & cell viability
- Metabolism
- Cell motility & invasiveness
- Inflammation markers

Single-cell & multiparameter mass cytometry
CyTOF Workflow

- Antibodies labeled with elemental isotopes
- Quadrupole
- ICP
- Nebulizer

Integrate-per-cell

Heavy (>100 Da)
Reported atomic ions

Light (<100 Da)
Overly abundant ions

Cell 1
Cell 2
Cell 3

Element
A
B
C
D...
J

Cell 1: 3, 8, 9, 7...
Cell 2: 1, 8, 6, 5...
Cell 3: 9, 9, 4, 5...

.FCS file

Analysis

Element A

Element B