

Initial Screening

Spike AOI to single harvest

Spiking Analysis

- Spikes detectable by PCA?
- PLS modeling possible?

no

Calibration not possible

- AOI not Raman active
- Concentration too low
- Culture matrix not favourable

yes

Model Calibration

Spike AOI to harvest library

Regression Modeling

- Model criteria acceptable?

no

Increase Calibration Data

yes

Model Verification

Online-monitoring bioreactor

- AOI spikes into bioreactor
- Sampling for reference analytics

Reference Analytics

- Model prediction acceptable?

no

Increase Calibration Data

yes

Model verified

- Monitor bioreactor runs
- Realize Feedback Loops