



Lumetics LINK™ is an end-to-end fully automated data management and analysis solution for managing laboratory test and measurement results. Its principle components include; locating measurement data files on the network, parsing out all useful data (including calculated parameters, curve data, images, and instrument settings), copying this data to a centralized database, processing data to average/overlay results and calculate critical quality attributes, and producing sophisticated visualizations utilized in report generation.

The platform is ideal in multi-user, multi-instrument environments where automated processing and amalgamation of hundreds to thousands of sample test results is required.

The LINK platform now supports particle classification based on machine learning methods. Please contact Lumetics to help develop a customized, fully end-user owned, machine learning particle classification model based on your data, or to deploy an existing machine learning model already in use.

\* Complement to LIMS & ELN  
 \* 21CFR Part 11 Compliance



# Lumetics LINK™ Machine Learning



## LINK Platform Fundamentals:

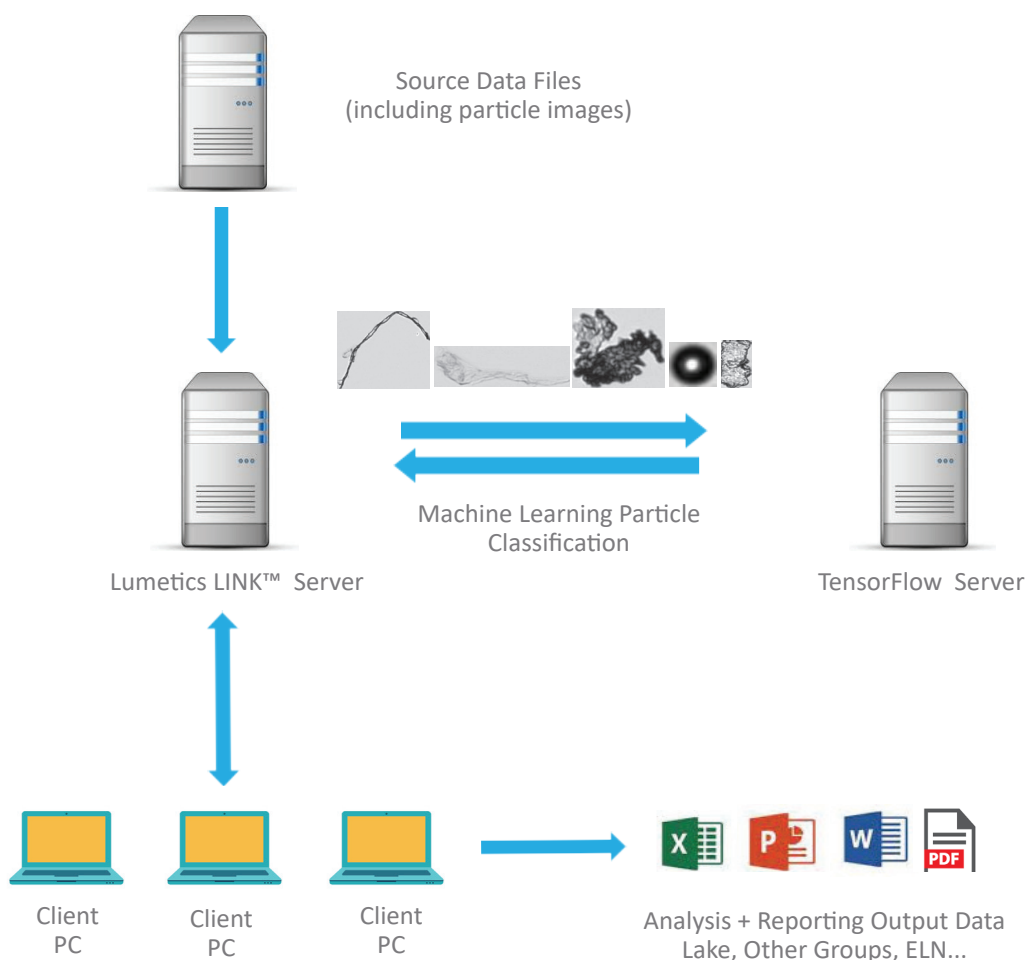
Full suite of existing capabilities for automated:

- Measurement Data Search/Retrieval
- Data Parsing (including particle image cropping)
- Data Processing (including sub-population generation)
- Data Visualization
- Assay/Study Report Generation
- 21 CFR Part11 Compliance

## Machine Learning Particle Classification Using LINK:

Perfect tool for preparing Machine Learning training datasets from control samples, necessary for model development.

Fully automated application of user-owned proprietary Machine Learning models for particle classification directly from within the LINK platform.



Contact us for a software demonstration or trial evaluation

[www.lumetics.com](http://www.lumetics.com) • [info@lumetics.com](mailto:info@lumetics.com)

## Application Areas

- Drug Discovery
- Drug Product Development
- Process & Formulation Development
- Analytical Development
- QA/QC, Lot Release
- Clinical Studies
- Post Marketing Surveillance

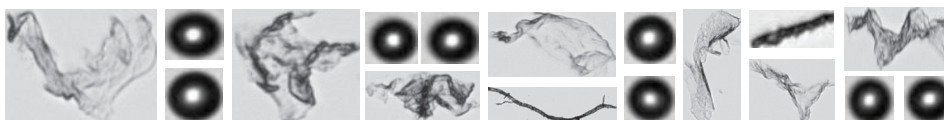
## Assay Area

- Particle Counting
- Particle Analysis/ID
- Separation Systems
- Spectroscopy
- Thermal Cycling
- Lyophilization
- Viscometry
- Nephelometry
- Dissolution
- Robotic Systems
- Offline Excel Workbooks

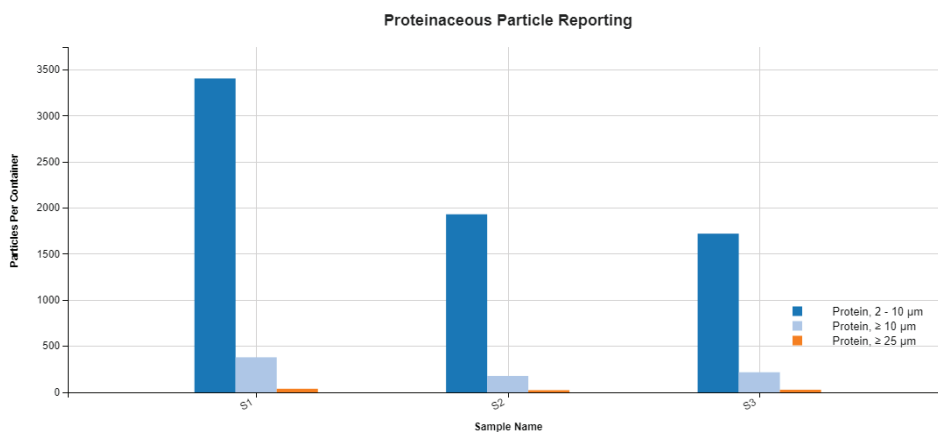
## Instrument Vendors

- Agilent Technologies
- Anton Paar
- Beckman Coulter
- Bruker
- C Technologies, INC
- Fluid Imaging Technologies
- Halo Labs
- JASCO
- Malvern Panalytical
- PerkinElmer
- ProteinSimple
- RheoSense
- Thermo Fisher Scientific
- Unchained Labs
- Waters
- Wyatt Technologies
- ... & many more

## Example LINK Input Particle Stream:



## Example LINK Output Protein Population



Sample Name	Sub-Population	# Meas	Container Vol	2-10µm AVG	2-10µm RSD	≥10µm AVG	≥10µm RSD	≥25µm AVG	≥25µm RSD
S1	Protein	2	5.00	3,408	0.66	381	1.15	39	1.01
S2	Protein	2	5.00	1,933	0.66	178	0.73	23	1.01
S3	Protein	2	5.00	1,723	0.23	218	0.44	28	0.58

Sample Name	Particles ≥1µm (#/ml)	Protein ≥1µm (#/ml)	Silicone Oil ≥1µm (#/ml)	Percent Protein	Percent Silicone
S1	3,862	2,988	873	76.9%	23.1%
S2	1,712	1,341	371	77.3%	22.7%
S3	1,551	1,231	319	78.6%	21.4%

ECD ≥10 AND ECD <25

ECD ≥25



## Machine Learning Model Development

Lumetics will develop and optimize a TensorFlow prediction model utilizing training and validation datasets provided by the end-user. Once complete, any models developed by Lumetics are fully owned by the end user.

## Machine Learning Deployment

Lumetics shall deploy and validate Machine Learning prediction models utilizing a high-performance production TensorFlow Server instance on the end-user LAN, for routine application directly from within the LINK software.