

Protein Slurry Analysis Image Analysis Report 352

Sample Description

A bottle of protein slurry was submitted for analysis. The slurry was mixed with some water and prepared on a slide.

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analyzer to discriminate protein fibers and to measure their real length.

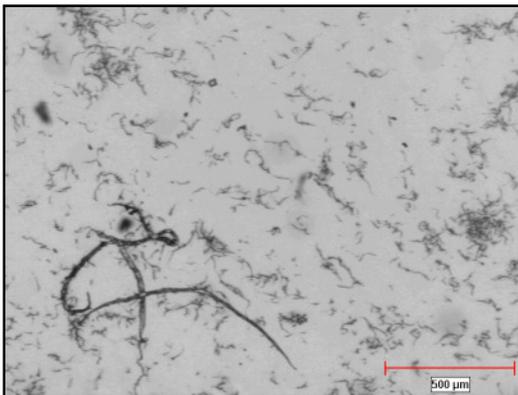


Figure 1: Typical image (40x – 2.67 $\mu\text{m}/\text{pixel}$).

Procedure

The dark protein fibers were isolated from the background using a gray filter (Top Hat). A Gray Threshold was then performed to binarize the fibers. They were Thinned down to 1 pixel. A special Pruning instruction removed all secondary branches keeping the longest part for each object. A Stage Pattern was set allowing fully automated analysis on 120 fields to cover the whole surface.

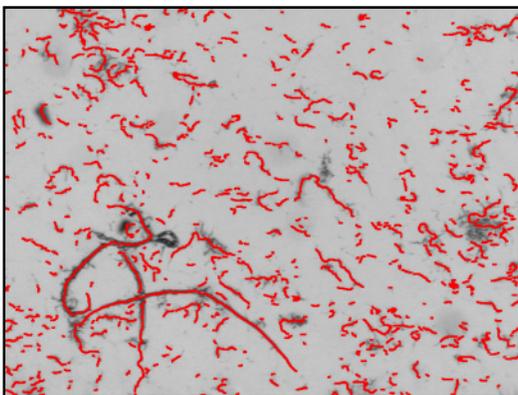


Figure 2: Final binarized fibers as measured and overlaid against the original image.

Results Summary

After binarization we were able to measure the binary objects representing particles. In this application, only the length was required. Because regular length is not significant String Length was used instead. It takes into account the curvature of the fibers. The complete analysis was achieved in 3 minutes. Using the Data Browser, we can go back to any data by simply clicking any object with the mouse. The stage moves to the corresponding field and the selected object is highlighted. This feature allows the validation of data by looking at the biggest objects.

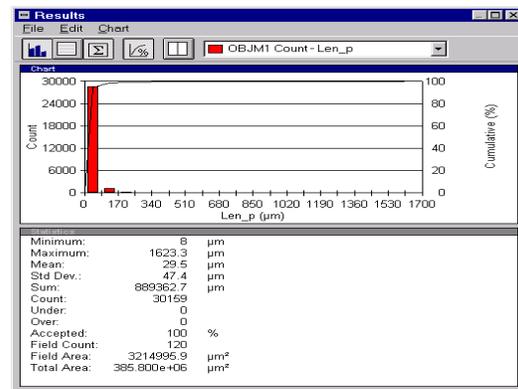


Figure 3: Length distribution of the protein fibers.

Using the Clemex image analysis system, it is possible to measure protein fiber length. The main difficulty resides in sample preparation. Once fibers are properly spread, the processing is simple. As far as overlapping fibers are concerned, the longest part of the detected object was measured. Results are repeatable.

Equipment

Image Analysis

System:	Clemex Vision SE
Camera:	Sony XC-77 CE
Microscope:	Nikon Optiphot 2
Objective:	Nikon 4x (2.67 μm / pixel)
Stage:	Motorized Marzhauser