

Chapter 13¹

Mining Images of Cell-Based Assays

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Abstract: In the rapidly expanding fields of cellular and molecular biology, fluorescence illumination and observation is becoming one of the techniques of choice to study the localization and dynamics of proteins, organelles, and other cellular compartments, as well as a tracer of intracellular protein trafficking. The automatic analysis of these images and signals in medicine, biotechnology, and chemistry is a challenging and demanding field. Signal-producing procedures by microscopes, spectrometers and other sensors have found their way into wide fields of medicine, biotechnology, economy and environmental analysis. With this arises the problem of the automatic mass analysis of signal information. Signal-interpreting systems which automatically generate the desired target statements from the signals are therefore of compelling necessity. The continuation of mass analyses on the basis of the classical procedures leads to investments of proportions that are not feasible. New procedures and system architectures are therefore required. We will present, based on our flexible image analysis and interpretation system *Cell_Interpret*, new intelligent and automatic image analysis and interpretation procedures. We will demonstrate it in the application of the HEP-2 cell pattern analysis.

Key Words: Image analysis and interpretation, High-content analysis of images, Automation and standardization of visual inspection tasks, Image-mining, Systems for knowledge discovery and interpretation, Microscopic cell image analysis.

¹ Liao, T.W. and E. Triantaphyllou, (Eds.), **Recent Advances in Data Mining of Enterprise Data**, *World Scientific*, Singapore, pp. 577-641, 2007.