Software Package Celldataminer for Processing Luminescence Microscopy Images of Cancer Cells

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A new object-oriented image analysis methodology, data mining methods, and simulation model for processing luminescence microscopy images of live cancer cells have been developed and integrated into the software package CellDataMiner. Scientific idea of the developed research methodology is in cooperation of the object-oriented image processing and data mining approaches for the analysis of biomedical experimental data. On the basis of the methodology, sets of fluorescent images are analyzed automatically and without human intervention, that greatly improves the accuracy of measurements and at the same time reduces the cost of research. Analysis mining system considers information about biological objects (nuclei, membranes, cells, etc) at the pixel level in image. Data mining methods have been applied for selection of cancer cells and diseases growth stages. The coupled object-oriented and data mining methodology enables complete automation of image processing, which greatly simplifies the analysis and interpretation of biomedical data. Simulation model is integrated for calibrating the parameters of the segmentation algorithms. CellDataMiner may have important theoretical and practical significance for the study of colonies of live cancer cells, forecasting cancer development stages and diseases.

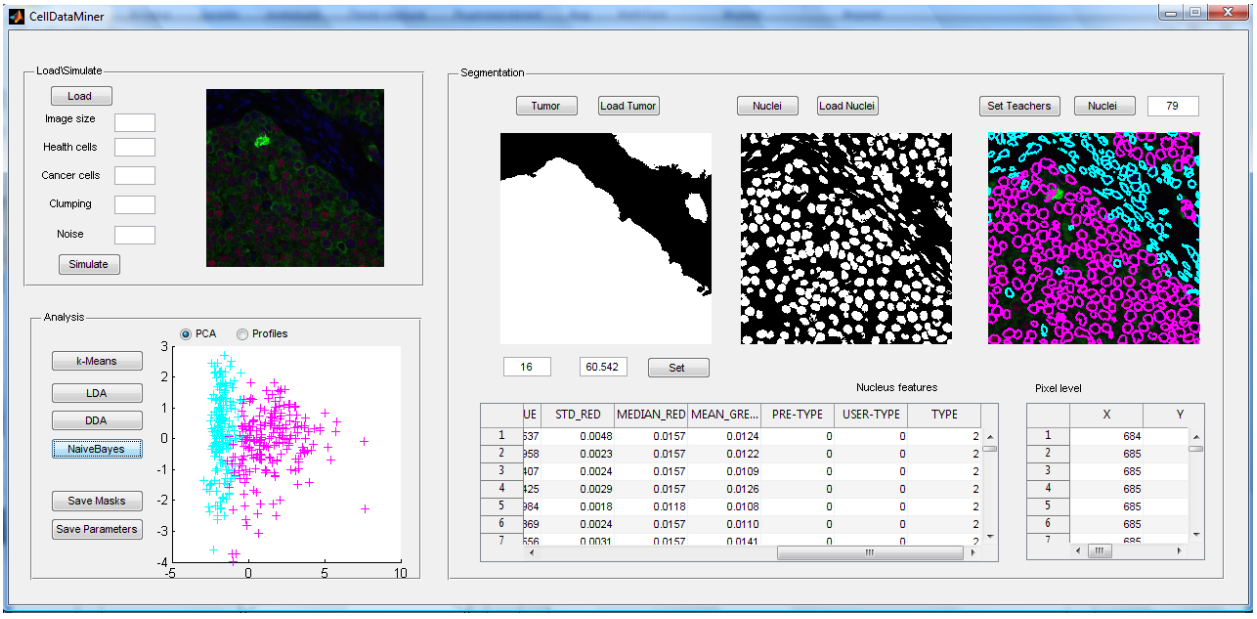

Fig 1. The main window of CellDataMiner and visualization of processing one luminescence microscopy image of cancer cells