



BeQuanti

The automated tool for cell Behavior Quantification

WHAT IS BEQUANTI?

BeQuanti is a bioinformatics tool for automated analysis of cell behavior under-flow:

- It provides a collection of automated methods of frame-by-frame cell classification, tracking and trajectory analysis
- It is the ideal tool for research laboratories working on cell trafficking for basic research and drug discovery



WHY CHOOSING BEQUANTI?

- BeQuanti dramatically speeds up the analysis of experiments (> 50x)
- It increases accuracy
- it allows gathering data otherwise impossible by manual procedures

Our lab collaborated to the development of BeQuanti to realize a novel bioinformatic tool useful to the leukocyte trafficking community. BeQuanti is implemented according to modern parameters of cell recognition and characterization. The result is an integrated, easy to use, yet highly flexible bioinformatic environment allowing automatic comprehensive quantification of cell behavior under flow.

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THE TECHNOLOGY BOTTLENECK

Modern experimental approaches to cell trafficking analysis include high-speed digital recording of cellular events under-flow conditions. Captured movies are then analyzed frame-by-frame to collect quantitative data of cell behavior according to specific metrics.

Bottleneck of these approaches is the digital movie analysis, normally done manually by highly trained personnel. Manual analysis is very time consuming, tedious and errors prone. Furthermore, it cannot cope either with fine details or with the huge variability of events occurring in these kind of assays.

THE ADVANTAGE OF BEQUANTI

BeQuanti overcomes these technology limitations providing::

- Automatic, repeatable and standardized video analysis,
- Speed up of the analysis,
- No errors or loss of information, intrinsically dependent on human intervention,
- Detection and quantification of fine detailed cell state transitions, and
- High flexibility thanks to adjustable settings of behavior parameters.

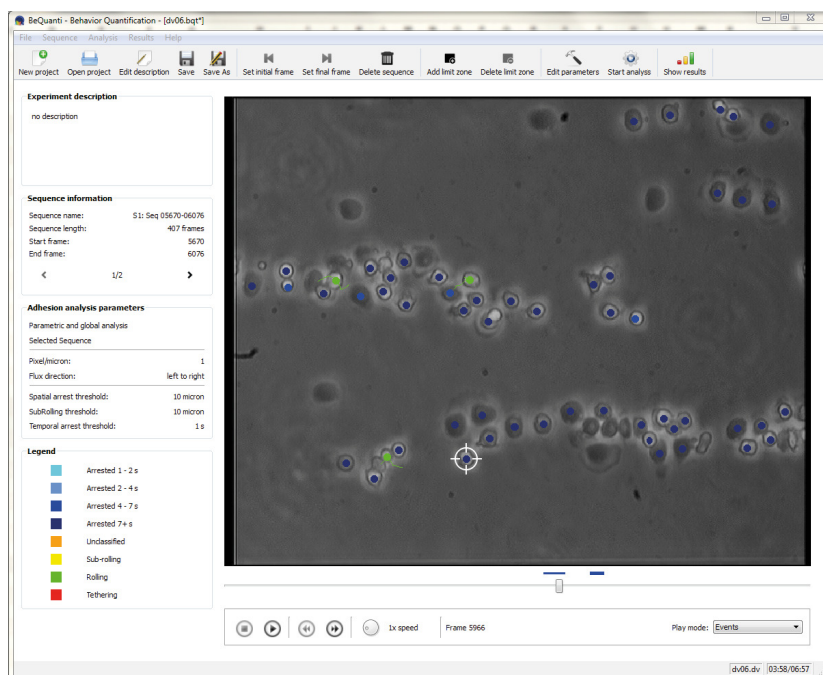


APPLICATIONS

BeQuanti is designed to assist laboratories of pharmaceutical and biotechnology industries and government research institutions in the study of cell trafficking and, in particular, phenomena related to the leukocyte recruitment.

Here are some application examples:

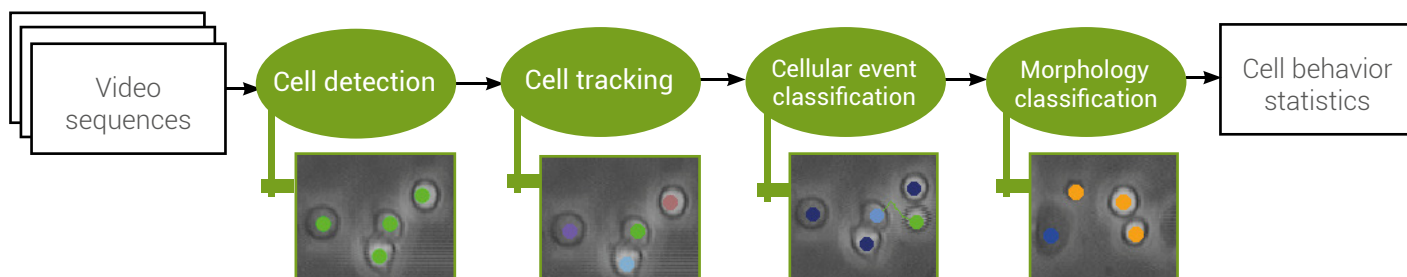
- Quantitative analysis of cell adhesion under-flow, including characterization of:
 - selecting-mediated tethering and rolling adhesions,
 - integrin-mediated arrest,
 - post-arrest adhesion stabilization,
 - morphology of adherent cells.
- Screening of adhesive compounds,
- Quantitative analysis of pro-adhesive signal transduction mechanisms,
- Quantitative analysis of migration under-flow.



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PRINCIPLE OF OPERATION

BeQuanti is based on the latest state of the art techniques for video analysis and machine learning. An advanced pattern recognition engine is trained to detect, track and classify cells as efficiently as the human eye, in a context of continuous shape and position variation.

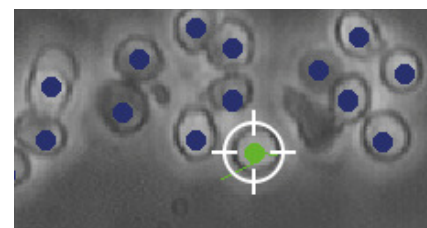
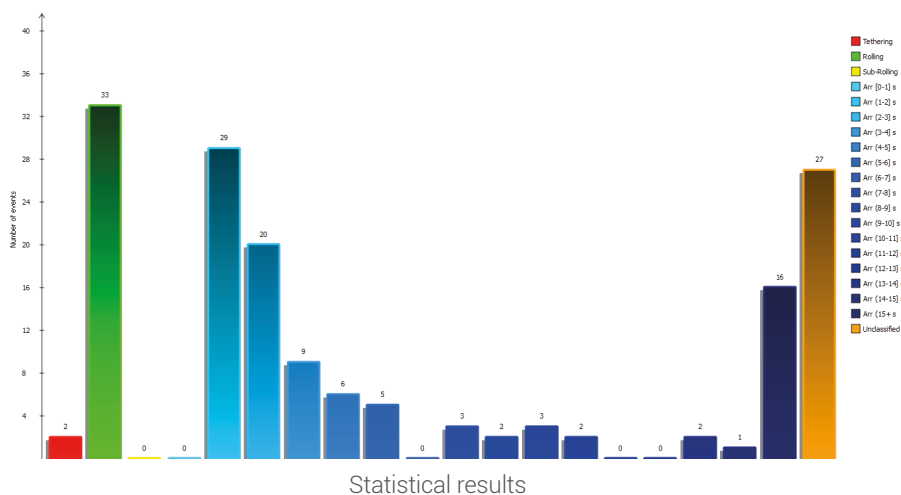


ADHESION ANALYSIS TOOLS

BeQuanti provides automatic tools for:

Global adhesion analysis. Simultaneous analysis of events classification using multiple temporal arrest thresholds. It collects statistical information that allows choosing the most significant parameterization.

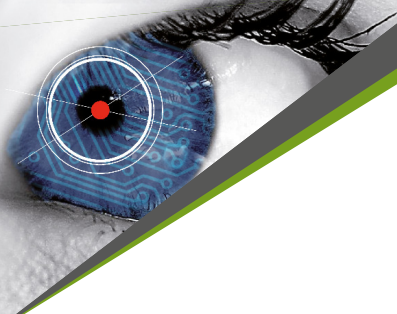
Parametric adhesion analysis. Cell by cell event classification on a fixed temporal arrest threshold and morphology analysis. It produces both statistical data and cell-by-cell results, which can be inspected directly on video.



Inspection of results on video

OPTIMAL CONDITIONS

BeQuanti is optimized for parallel chamber under-flow settings and for phase contrast microscopy, independently from the flow direction. It is ideally suitable for multiple microfluidic under-flow experimental settings, such as BioFlux™ Live Cell Imaging Systems. Capillary tube-derived data can also be analyzed.



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SOFTWARE FEATURES

Supported Operating Systems	Window XP/Vista/7/8, Windows 8.1, Mac OS
Classification	Events: tethering, rolling, sub-rolling, arrest for x seconds Morphology: round, polarized, spread
Quantification	Cells and events counting Speed and duration of rolling and sub-rolling
Flaxible configuration	All behavior can be set and modified by user
Statistics and inspection results	Graphs, tables and statistics show the results at different level of abstraction Specific results can be analyzed and verified through overlay on the original video
Error estimation	Each phase of the processing provides a reliability measure
Batch mode	Multiple movies analysis can be done in batch mode
Speed	Processing supports multiprocessor and multi-cores architectures
Video input formats	Different input video AVI, DVI, MOV are supported with no restrictions on resolution and frame rate
Data export	The results can be exported as CSV files

**BeQuanti is modular and customizable.
Contact us for any specific requirements.**

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