



Cedex

**Sometimes
it's hard
to be first.**

**Sometimes
it's easy.**



The automation of the manual Trypan blue dye method



Never count manually again

Routine tasks like sample staining and handling, cell counting and graphical charting of the results as well as archiving the result data are performed automatically. Hence the Cedex technology guarantees exceptionally precise and user-independent data about the viability and cell density of suspension cell cultures as well as an unrivalled ease of use of the system.

The optional Automatic Sampler AS20 allows for up to twenty cell suspension samples to be automatically conveyed to the Cedex system where they are analysed and archived without further user intervention.

Further on the Cedex technology has proven to fit into GMP-processes and complies with the requirements of the 21 CFR Part 11.

The Cedex hardware can easily be integrated into existing networks. Even an integration of the Cedex technology into automated process lines can be achieved via a Telnet port (TCP/IP Protocol) based "Remote Control" software feature.

Standardize your process control!

... cedex your cells instead.

- Precise and user-independent viability and cell density determination
- The first industrial standard based on the established Trypan blue method
- First choice and proven technology at the top 25 big pharma process development and production sites
- First and only detection of individual cells within cell aggregates
- Self explanatory results
- Configurable data export into a wide range of standard applications
- GMP validated and 21 CFR Part 11 compliant

Increase the efficiency in your lab!

Cedex has set the first indu in quantitative cell analysis

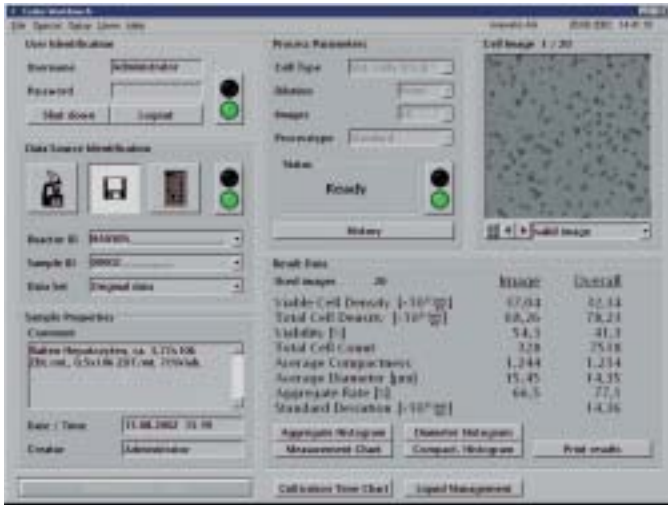


Fig. 1: Graphical Userinterface

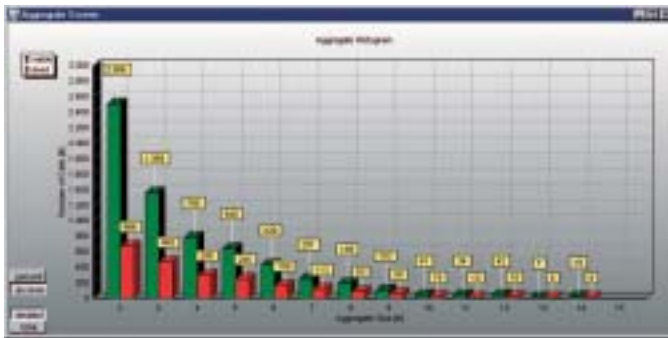


Fig. 2: Aggregate Histogram

The Cedex technology is comfortably operated by means of an intuitive graphical user interface. All features needed in routine operation such as the determination of operation mode and measurement conditions, as well as the display of the results, are arranged in logical order and instantly accessible on the graphical user interface. All relevant information can be monitored at a glance.

The "IP Result Viewer" shows the results of the image processing module for the acquired images (Fig. 3a). Viable cells are marked with yellow circles and dead cells with red crosses. Hereby the user can actually test for the results.

The powerful image recognition software detects individual cells, even within cell aggregates, reliably (Fig. 3b).

Detailed information about cell aggregates are displayed in the "Aggregate Histogram". The number of cells found in aggregates of two, three, four or up to 15 cells are represented by bars either combined or separated into dead and viable cells vs. the cells per aggregate (Fig. 2). In addition, the display can be switched to show the number of cells in proportion to the total cell count.

Additional information about cell geometry is represented in the "Diameter Histogram". The user can freely set diameter intervals to estimate the respective number of cells within that range.

The "Compactness Histogram" gives additional information about the morphology of viable cells.

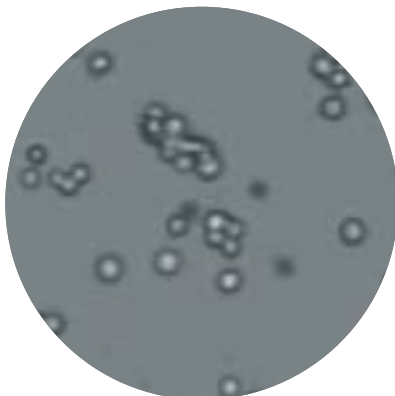


Fig. 3a: Result view of the image processing

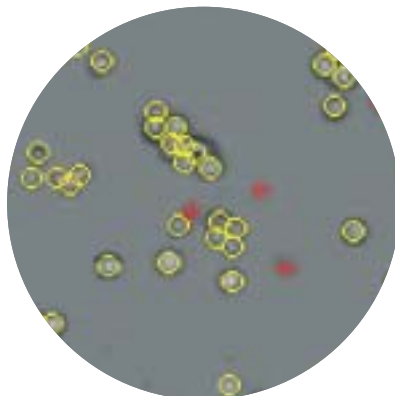


Fig. 3b: Marked viable and dead cells



Industrial standard

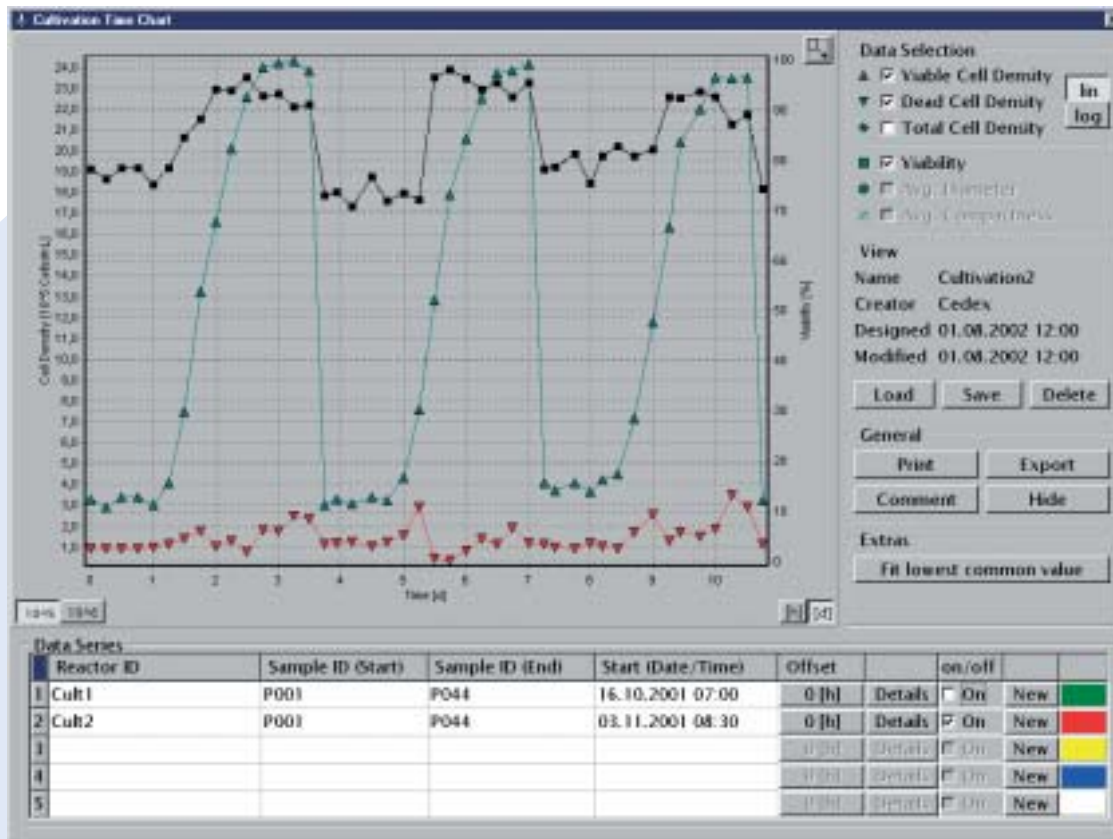


Fig. 4: Cultivation Time Chart

Results of single measurements can be combined using the "Cultivation Time Chart" (CTC) to create time course diagrams. Cell growth curves and additional parameters – like cell diameter – can easily be compared at a glance.

The extensive "Export Functionality" allows to integrate Cedex result data into a wide range of standard applications like Excel or Labview that support either the Excel DIF or the CSV format.



The analysis technology

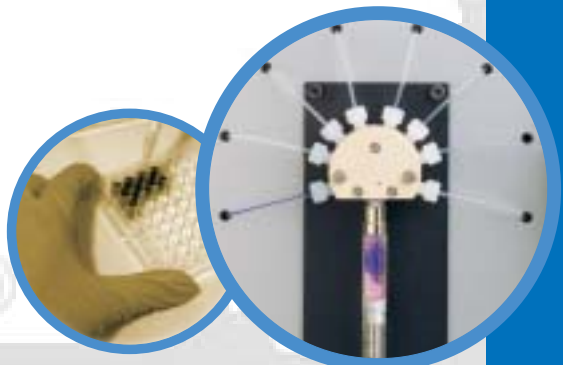
Sample handling

Instead of manually pipetting the cell suspension into a mixing vessel the sample can be single-handedly and securely attached in a single-use cup to the sample port of the system. The precision pump extracts a fixed quantity of the sample liquid for further processing.



Staining and mixing

Staining of the suspension cell sample with Trypan blue dye is fully automated. This way, the staining process can be executed with high precision and reproducibility. The automation of the sample preparation process eliminates human errors due to pipette handling.



Replacing the hemacytometer

The system channels the stained cell suspension sample through the specially developed and precisely manufactured Cedex flow cell, which is designed to equal a hemacytometer.

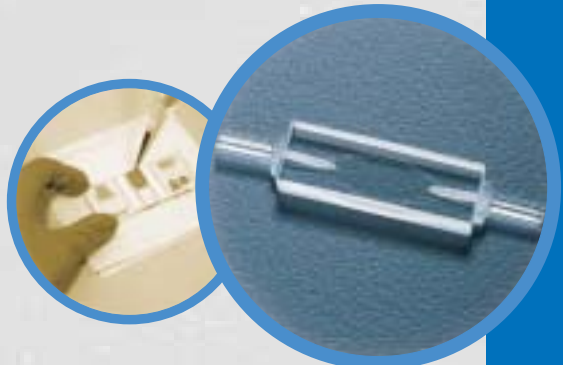


Image analysis automates the counting and viability determination

While the manual optical differentiation and counting is user dependent, tedious and time consuming the pattern recognition software in the Cedex detects and reliably counts all viable and dead cells in the image and differentiates them from debris, protein clumps and other pollutions. Furthermore, the system determines the average viable cell diameter as well as morphological changes of the cells automatically.

Cell aggregates are analysed by powerful, especially designed algorithms to detect all individual cells within cell aggregates.



Fully automated numerical and graphical result representation

The time consuming result calculation and documentation is replaced by extensive and self-explanatory measurement result data, which is graphically displayed in diagrams and numbers; all results, graphics and images can be printed out via local or network printer, stored on hard disk and CD ROM and exported to the user's own computer network.



Quality that counts

The innovatis company, based in Bielefeld, Germany, is specialized on developing laboratory technology for automated cell counting based on optical image analysis.

Cedex, innovatis' first product, is setting the industrial standard on the Biotechnology market for automation of the manual cell density and viability determination with the help of the trypan blue dye method. It is a proven technology since 1999.

What our customers say about Cedex:

"I predict that the Cedex system will become the most commonly used instrument in default cell counting throughout the Biotechnology industry."

Dr. Paul Sauer, Protein Design Labs Inc., Fremont, CA, USA

"Our highly qualified laboratory staff with years of professional experience is responsible for a wide range of cell lines. However, when it comes to determining cell concentration and viability, the Cedex technology offers more exact results than the manual counts of our employees."

Dr. Uwe Langer, Bayer AG, Wuppertal, Germany

"Cytos Biotechnology uses the Cedex technology in process development, to determine 30-60 cell densities and viabilities of up to 10 different cell lines each day. As a result of this intensive use, we save 6-7 hours of manual counting each day by using the Cedex technology and our staff can engage in other tasks in the meantime."

Dr. Marcel Emmerling, Cytos Biotechnology AG, Zürich-Schlieren, Switzerland



Cedex Customers

Amgen · Astra Zeneca · Aventis · BASF · Bayer · Biomarin · Boehringer Ingelheim · Bristol Myers Squibb · CAMR/ECACC · Cancer Vax · Centocor · Coulter Pharmaceuticals · Cytos Biotechnology · Dendreon · Eli Lilly · Genentech · Genetics Institute · GenVac · GlaxoSmithKline · Human Genome Sciences · ICOS · IDEC · Immunex

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