

On-Chip Single Cell Analysis for PALM MicroBeam

Contemporary techniques in molecular biology have begun to solve a vast number of previously unanswered questions. However, the inherent reliability of an analytical method is always limited by the quality of the available starting material.



PURITY

PALM MicroBeam from Carl Zeiss enables recovery of ultrapure starting material from tissue preparations as well as from cell cultures in vitro (first step). Using the PALM RoboMover high-throughput capture device in unique conjunction with the AmpliGrid slide it is possible to control up to 48 discrete reaction sites.

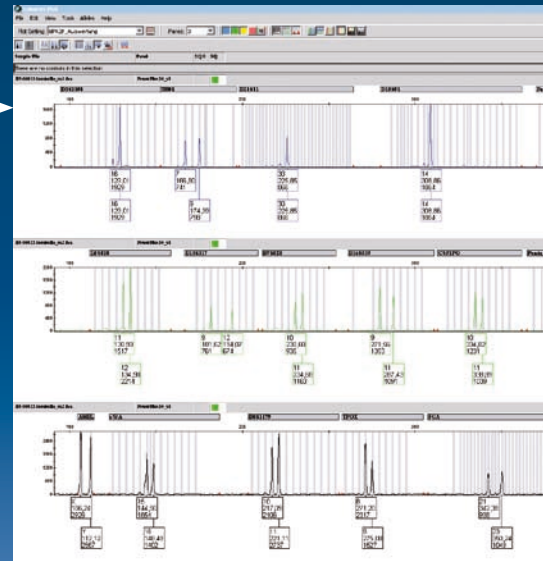
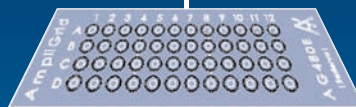
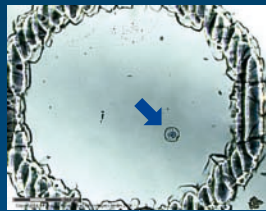
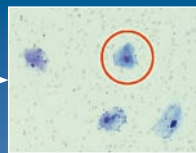
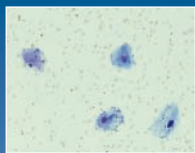
LOW VOLUME

With the AmpliGrid technology from Advalytix, DNA amplification and cycle sequencing are possible in an extremely low volume reaction format. The reaction is carried out on-chip by using single cells as the template source (second step).

The combination of both technologies opens new doors to the study of genomics.

- No elaborate template preparation.
- Accurate to a single cell.
- Pooling of cells not necessary.
- Pool the results of up to 48 individual cell reactions.

Single cells were catapulted onto AmpliGrid AG480F microliter reaction slides (Advalytix AG). For the STR-typing the PowerPlex16 (Promega) kit was used. Samples were analyzed on a Genetic Analyzer ABI Prism GA 3100 (Applied Biosystems).

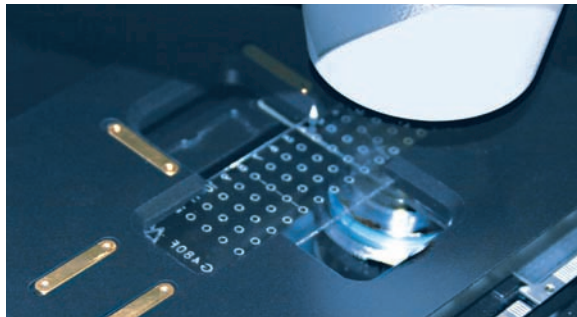


**For Single Cell Genotyping,
Sequencing and Expression Analysis:
Reliable, Safe, Reproducible**

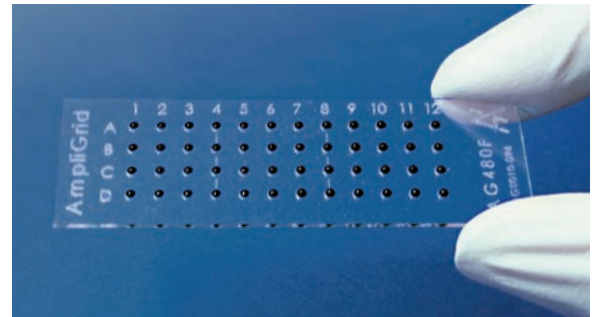


We make it visible.

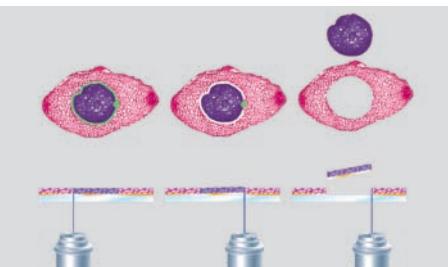
Excellent Results in Single Cell Analysis



Non-contact Laser Capture Microdissection (LCM)
Highest purity of individual cell collection



AmpliGrid
Highest sensitivity down to one single cell



The combination of non-contact LCM and the AmpliGrid technology enables excellent results in single cell analysis.

Example

In the field of forensic genetics, laser microdissection is an important tool for the investigation of samples collected from a scene of crime. Non-contact LCM is the ideal approach for pure sample collection whilst avoiding contamination.

Special methods are needed that allow the identification, isolation and subsequent genotyping of individual cells from various sources for assignment of genetic profiles in a fast and convenient manner. Working with low reaction volumes means reduced analytical reagent costs in the longer term.

For convenient selection and catapulting of cells, the PALM RoboMover is used. This device enables automated high-throughput LCM for fast and reproducible results.

Applications

- Genetic typing of single cells (medical diagnosis, SNPs, fetal cells in maternal blood, forensics)
- Single cell sequencing (all fields of biomedical research, immunology, population genetics)
- Detection of copy number variations in single cells
- Single cell expression analysis
- Combined immunophenotyping and single cell expression analysis

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