

Cell culture: Separate adherent cells in their native environment

Live cell dissection and manipulation

Cell culture is a main source of life science knowledge. Researchers grow immortalized cell lines, primary cells, or stem cells to get insights into e.g. cell biology, immunology, or cancer development.

Primary cells or transfected cell lines can be heterogeneous in cell type and genetic background. Thus, their collective analysis can be misleading.

Separating the cells before your assay will increase the significance of your results, and allows the analysis of only the cells you are interested in their native habitat.

Laser Microdissection uses a Laser to cut a microscopic specimen on a cellular level. For this purpose, the cells are grown on special membrane cell culture containers which can be individually extracted by laser. After cutting, the Leica LMD systems use gravity to collect the dissectate. Collection containers are located directly below the samples and can be prefilled with culture media for re-cultivation or buffer for downstream analysis. With the help of this technique you can separate your cells with highest precision for cloning, to generate homogenous primary cultures, or for downstream molecular biology analysis to get deeper insights.



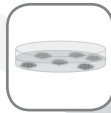
Typical fields of research

- Cell culture
- Cloning
- Primary cells
- Stem cells
- Manipulation and ablation

References

- André et al., PLOS ONE 2018
- Bellon et al., Cell Reports 2017, 1171-1186
- Omatsu-Kanbe, Scientific Reports 2017
- Podgorny OV, J Biomed Opt. 2013

Live Cell Cutting for Cell Separation and Cloning



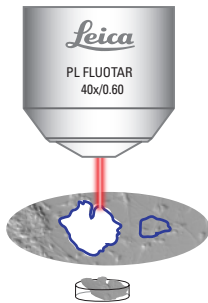
Cell Seeding

Cell biopsy resp. transfected cells are seeded on membrane petri dishes



Cell Growth

The cells grow and proliferate. According to the source there might be different cell types. In the case of a transfection, only a part of the cells is transfected.



Laser Microdissection
via gravity for Live Cell Cutting



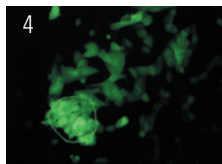
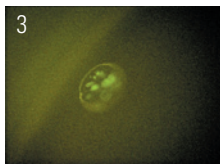
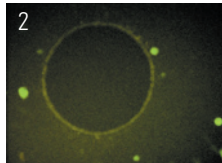
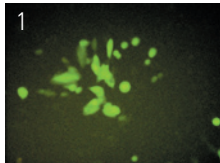
Microscopy

Identify your cells of interest with Phase Contrast, DIC, or fluorescence microscopy.



Leica provides: Separation of living cells under visual control.

Laser Microdissection (LMD) can be utilized to isolate cell clusters or single cells from an adherent cell culture, using Phase Contrast, DIC, or fluorescence illumination. The separated cells can be sub-cultured and used for downstream analysis e.g. fluorescence microscopy. They can also be collected and analyzed by molecular biology.



1: Before Microdissection | 2: After Microdissection |
3: Inspection of microdissected fibroblasts | 4: 4 days after recultivation

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Laser Microdissection

Mark your cells of interest and dissect them precisely and viable from the remaining cell culture.



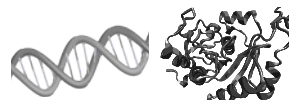
Re-cultivation

Recultivate the dissected cells in a separate cell culture dish or directly transfer to analysis



Analysis

Analyze the cells with your assay e.g. fluorescence microscopy, molecular biology, PCR, sequencing etc.



DEMO AND
DETAILS



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