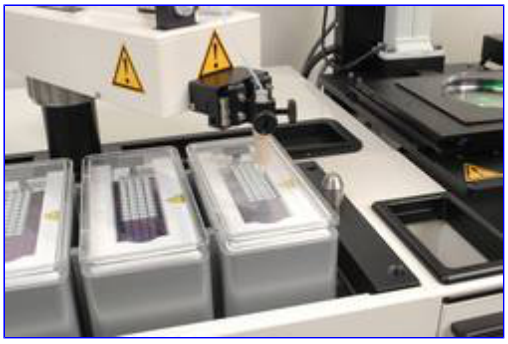
New tools for cancer research: Automated selection, isolation and Single Cell PCR Analysis of circulating tumor cells utilizing the AVISO CellCelector of ALS Automated Lab Solutions GmbH and Beckman Coulter's AmpliGrid technology

The molecular genetic analysis of single cells is becoming increasingly important in Biology, Medicine and Forensic. Especially within the field of Oncology (where only very limited amounts of cell material is available for research) new tools are becoming necessary. By combining the successful cell selection and isolation technology of ALS Automated Lab Solutions GmbH's CellCelector and the sensitive AmpliGrid technology of Beckman Coulter the preparation of a Single Cell PCR Analysis of circulating tumor cells (CTCs) is becoming one fully automated process from detection and picking of cells to the start of the analysis.



The AmpliGrid is a glass slide developed to perform low volume Single Cell PCR Analysis. These low reaction volumes enable the PCR Analysis of single cells like circulating tumor cells (CTCs), the analysis of some few RNA Molecules as well as performing µl Analysis. Evaporation of reaction liquids is reliably avoided by covering it with a specifically developed mineral oil. The AmpliGrid substrate is made from glass and offers the unique possibility of a 100% online control of the cells at the target destination.

The well-proven CellCelector technology for **automatic detection and selection of single circulating tumor cells (CTCs)** from within a sample vessel utilizing morphological and fluorescence features of the cells has been extended by an automated picking process including the addition of the Single Cell PCR reaction mix.
In this **patent-pending picking process** cover oil, PCR reaction mix and a single circulating tumor cell are taken up sequentially in a glass capillary and are delivered in one step at the AmpliGrid reaction plate.
By this, **changes** in sample or reaction mix **volume** through evaporation effects are **almost completely eliminated** which creates a superior reproducibility of the reaction conditions. Now one **fully automated**

working process incorporates detection, selection, isolation and therefore the transfer of single circulating tumor cells whilst adding PCR reaction mix and the start of the subsequent Single Cell PCR analysis on individual tumor cells.
For quality management all parameters and images taken during cell isolation are recorded delivering the user a traceable documentation of the process.

Beyond time savings and a higher level of automation this creates valuable possibilities of standardization (GMP).

This comprehensive automation process is unique and provides an additional, invaluable tool for cancer research.

Application Note - Automated Single Cell PCR Preparation