



Technology Offer

Ref.-No. M16/11

A method of gentle enriching and/or isolating a target cell population from a suspension of cells

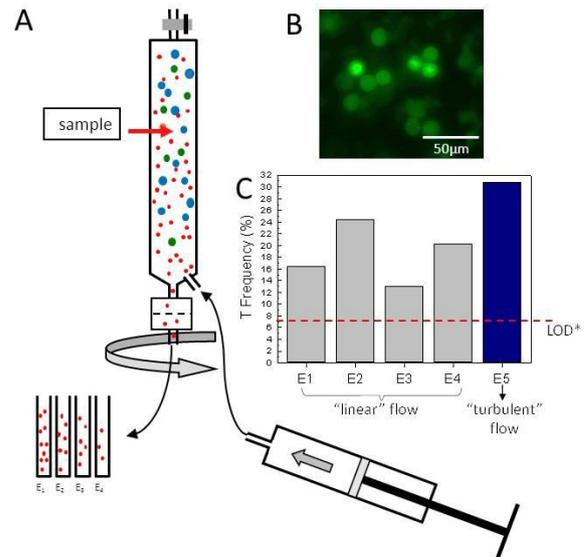
Introduction

Human blood is a complex mixture with high diagnostic potential. Next to the analysis of characteristic blood cells and the determination and monitoring of molecular biomarkers, the isolation of cellular subpopulations from blood is of high importance. Especially circulating tumor cells are of great interest for early cancer recognition and clinical monitoring. Because of the very low concentrations of those tumor cells direct detection from blood is impossible. Thus, an isolation and/or enrichment of cells contained in blood needs to be performed, prior to the analysis of said cells.

Invention

The invention combines cell size- and cell density-dependent separation methods for the isolation and/or enrichment of target cells in fluid samples such as circulating tumor cells in blood and allows the enrichment of cellular subpopulations in high quantity and quality.

In a column with a linear or turbulent/counter-flow of buffer solution the outflow of tumor cells is prevented by a porous membrane with a specific pore size. Blood cells with lower size are completely washed through the porous membrane filter. At the same time, the linear or turbulent flow of buffer serves as upward force for the cells which are kept at a specific spatial position within the column, in dependency from their cell density. The density of tumor cells is lower than that of blood cells. After successful removal of useless blood components, the liquid level in the separation column is lowered to such an extent that the remaining cells are collected on the membrane from where they can be isolated. In contrast to usual filtration methods, the cells of interest are kept in a constant flow without damage by increased pressure or filter contact.



A: illustrates a setup of enriching a target cell population using a cell size- and cell density-dependent separation method; **B:** depicts the collected target cell population, the green dye inside the cells indicating the healthy state; **C:** shows the enrichment of tumour cells (PaTu 8988T) by means of mutation analysis (KRAS test), *LOD: limit of detection as indicated by the supplier.

Advantages of the invention

- Detection and isolation of various tumor cell populations even at low concentrations
- Lower detection limit of specific mutations because of enrichment of the target cell population and less background DNA
- Increased retrieval of target cell population
- Gentle treatment provides isolated (living) cells of higher quality

Patent situation

A European Patent application has been filed.

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