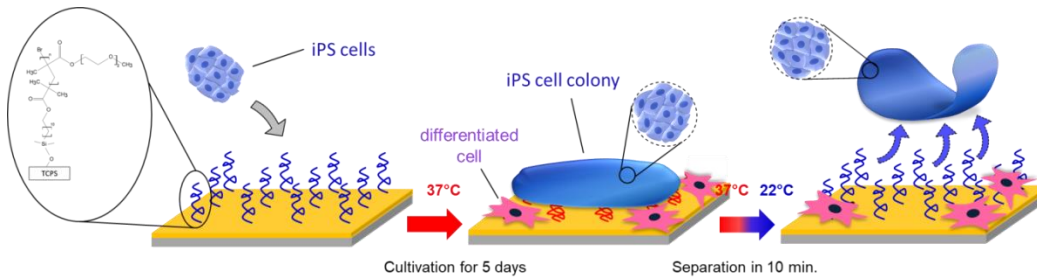


SelectCells

Extremely mild, selective and efficient technique for separating cells

Invention

For many applications within the life sciences a cell separation or cell purification step is needed. Most techniques are based on binding cells to a substrate surface and then detaching selected cells, e.g. by protein-digesting enzymes. However, these techniques can damage the cells or lead to the spontaneous alteration of cells, such as differentiation of undifferentiated cells.



Schematic illustration of inventive technology

Further techniques for cell separation or purification, especially in the field of stem cell cultivation, are based on magnetic particles or include chemical agents. However, each of these methods have their own disadvantages, e.g. being complex/expensive and/or being harmful to the cells.

In the last years, polymer-based coatings have come into focus. However, these methods do not provide for separation of cells at different stages, or, if they do, cell separation is not sufficiently selective or only feasible with time-consuming, expensive or cell damaging methods. In addition, these polymer-based methods may rely on monomers, which are not sufficiently biocompatible, even toxic.

The present technology overcomes these limitations and provides an extremely mild, non-invasive, highly selective, straightforward and cost-effective tool to not only separate different cell types, but also cells at various differentiation stages.

The technology is based on a biocompatible stimulus-responsive polymer layer. By applying a temperature shift, different cell populations bound to that layer are selectively separated depending on their specific binding properties during the different phases of the method. The method is inter alia highly suited for isolating iPS cells and stem cells at different stages.

Commercial Opportunities

The technology allows for a superior separation of cells of different types and stages, including iPS and stem cells, in a broad range of pharmaceutical and biotechnological applications. The technology is ready for licensing e.g. for in house use in biotech-/pharmaceutical companies as well as for commercialization as a research tool/device.

Current Status

A prototyp has been developed and tested successfully in a relevant setting. Patent applications are pending in US and the EP-states with a prospect of granting in EP.

Relevant Publications

Schulte A. et al. (2024) Thermo-responsive poly(di(ethylene glycol) methyl ether methacrylate) brushes as substrate-independent release coatings for cell culture and selective cell separation and purification. Pure and Appl. Chem. Doi: 10.1515/pac-2023-1007

An invention of the University of Siegen.

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Competitive Advantages

- Extremely mild, non-invasive separation technique
- Highly selective
- Fast, straightforward, reliable, thus cost-efficient

Technology Readiness Level

1 2 3 4 5 6 7 8 9

Technology validated in relevant environment

Industries

- Pharmaceutical industry
- Life Science research

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