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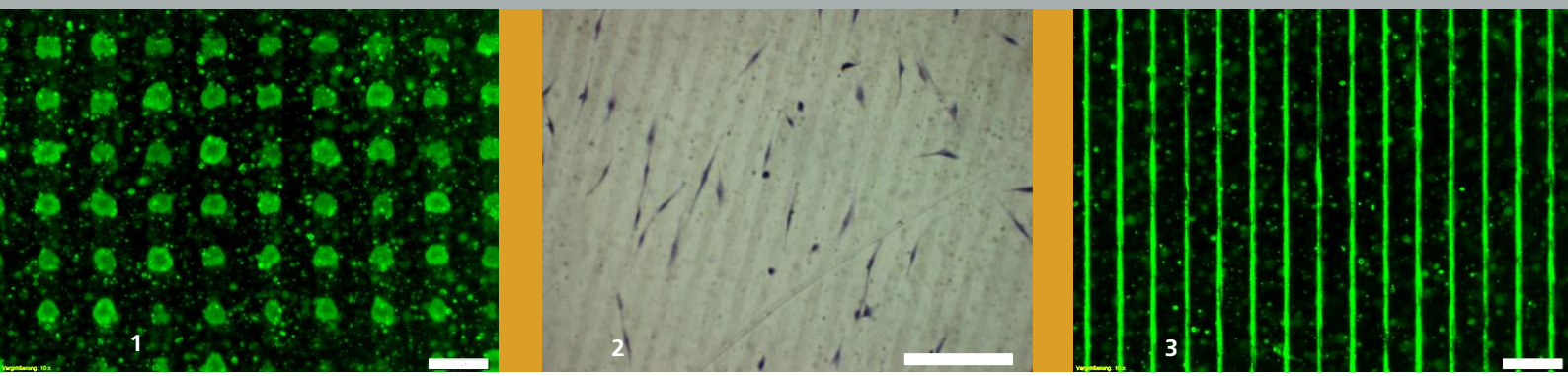
FRAUNHOFER-INSTITUT FÜR BIOMEDIZINISCHE TECHNIK IBMT



1 *Roll-to-roll printed dots of collagen IV (bar: 100 µm).*
2 *Adhered cells oriented along the printed lines (bar: 200 µm).*
3 *Roll-to-roll printed 10 µm wide lines of collagen IV (bar: 100 µm).*

Remark: Fluorescent spots between printed dots and lines are due to the autofluorescence of the polymer foil.

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MICRO PATTERNED SURFACE FUNCTIONALIZATION BY THE METRE

Description

IBMT has developed a method for functionalizing large-area foils by roll-to-roll printing of protein micro structures. Biocompatible basic inks are available for both flexo printing and rotogravure printing processes and can be employed in a customized lab printing machine available at IBMT. Proteins are added to the basic inks according to customer requirements. On request, surface activation of the polymer foil is possible inline by a corona treatment station.
Roll-to-roll printing is suited for functionalizing large areas within a short time at low costs. In contrast to e. g. spin-coating, our roll-to-roll printing process hardly wastes any (expensive) proteins. Depending on the application, printed protein micro patterns (dots, lines) may have the same effect as a continuous surface coating, while saving costs.

Advantages

- Low equipment costs
- Large-area surface functionalization
- Hardly any waste of proteins
- High throughput (mass production)
- Wide range of micro structures (10 µm – centimetres)
- Defined arrangement of components and patterns on a foil
  → further processing in batches

Example of Application

Cell cultures
Fraunhofer IBMT has successfully functionalized large area foils by protein micro structures for directed growth of cells or for influencing cell adhesion. The correspondingly functionalized foils can be applied in cell culture dishes or flasks. Furthermore, bigger protein spots can be used for selective cell adhesion at defined points on the substrate.

Technical Data

Typical foil thickness: 50 – 100 µm
Typical foil width: 0.3 m
Smallest printable structure: 10 µm
Max. speed: 20 m/min
Foil materials: PS, PP, PET

Our Offer

Printing of customized protein micro structures on foil substrates.

Development of customized printing processes suited for mass production.