

## SHALLOW TOPOGRAPHICAL NANOPATTERNS IN POLYMERS INFLUENCE THE MOTILITY OF MAMMALIAN CELLS

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**INTRODUCTION:** The time course of cell-substratum adhesion events markedly reflects the cytocompatibility of a solid surface. Direct comparison of differing surface samples under equal culture conditions and quantitation of the observed cellular responses are highly desirable for the evaluation of surface engineering approaches.

Accordingly, we constructed a phase contrast microscope-based setup which is capable of imaging several samples in parallel. The microscope is equipped with a digital camera, motorized focussing and a temperature-controlled, humidified chamber, which is mounted to a computer-controlled translation stage.

**METHODS:** Prior to an experiment, samples are immobilized in a culture dish and covered with cells suspended in CO<sub>2</sub>-independent medium. After placement in the chamber, sites of interest and a suitable time interval are programmed for automatic image acquisition in autofocus mode. Images are saved in site-specific files. Subsequent image processing yields quantitative data, preferably the time course of cell spreading, average cell area and proliferation.

**RESULTS:** As an example, the comparison of four different commercial culture surfaces is presented in our poster, a bacteriological and two tissue culture grade polystyrenes as well as a collagen-coated glass, seeded with MDCK epithelials. The results from two of the culture dishes are shown in Fig. 1 and 2. The revealed difference of all samples proves this set-up to be a powerful tool for the evaluation of cell adhesiveness of engineered surfaces at small material consumption.

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Fig. 1: Time lapse snapshots of MDCK cells cultured on two different brands of culture dishes. The number of cells after 60 hours is notably larger on the Brand 1 culture dish.

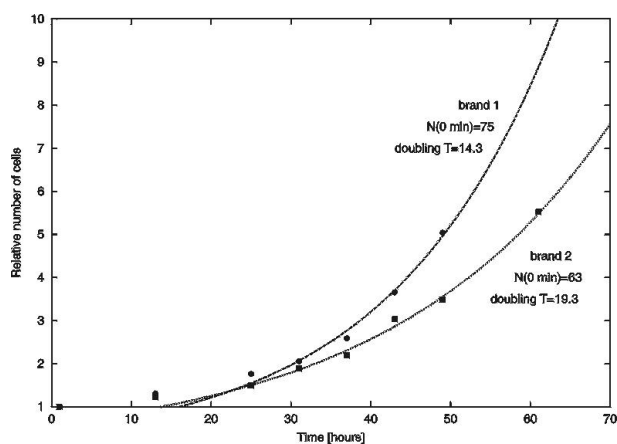


Fig. 2: Quantitative measure of the number of cells based on time lapse video sequences of MDCK cells cultured on two different brands of culture dishes. The doubling time on Brand 1 dishes is 14.3h compared to 19.3h on Brand 2 dishes.