ELASTIC POLYMER SUBSTRATES FOR CELL MIGRATION RESEARCH

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Cell motility plays an important role both in normal and pathological biological processes. Migrating cells mechanically interact with the substrate – they transmit forces, generated by the active actomyosin system, through cell adhesions to the substrate. Recently, it was shown that migration parameters like cell velocity, directional persistence or even cell shape depend on the mechanical properties of the substrate. Especially, elasticity of the substrate is an important factor in defining the cellular response to the mechanical properties of the substrate [2, 3]. In this work we performed systematic studies on how migration parameters of fish epithelial keratocytes depend on the elasticity of the substrate.

The preparation of acrylamide substrates were based on the radical polymerization reaction, where acrylamide was a monomer and bis-acrylamide was a crosslinking agent and TEMED with APS were catalysts [1]. Epithelial fish keratocytes were prepared from single Molly fish scales, which were incubated sandwiched between two coverslips. After 48 hrs. migrating keratocytes were separated from the cell sheet by short incubation in the PBS buffer [4]. Afterwards, time lapses of single migrating cells were recorded and migration parameters were calculated from images.

There are clear differences between basic set of keratocyte migration parameters like migration velocity, directional persistence and cell shape depending on the mechanical properties of a substrate. Future works will determine the detailed biophysical mechanism of interactions between migrating cell and the substrate.

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