

In vitro cell migration quantification application using Labview for scratch assays.

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Abstract

In vitro assays are essential for the study of cell migration since they allow to quantify cell migratory capacity under controlled experimental conditions. The scratch or wound healing assay is the method of choice for studying cell migration due to the low cost and simplicity of its experimental design. The scratch assay is the technique used to assess the contribution of molecular and cellular mechanisms to cell migration including cell signaling studies. The assay can also be used to evaluate therapeutic compounds before clinical use. Current quantification methods of scratch assays deal poorly with irregular cell-free areas and crooked leading edges which are features typically present in the experimental images. Obtaining statistically significant results on cell migration requires time-consuming analysis of hundreds of images. Different software tools increasing quantitative output through automated image segmentation have been developed, but up to date, none of them becomes widely used for high-throughput study of wound healing due to the necessity to adjust parameters manually. In the current study, we developed a software application based on labview for automated image segmentation with a minimal set of adjustable parameters. It was tested for the accuracy and reproducibility and then used to analyze hundreds of images from scratch assays. In summary, we have introduced a new method for migration quantification of typical scratch assay data.

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