

# Repolarization of cells

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The presented project will be my master project carried out in the AG Lautenschläger (A8) and AG Kruse (A1).

Cell polarization is important in many physiological fields, e.g. migration. I want to investigate how the cell changes its polarization, if it can only migrate on one axis (forwards or backwards). I aim to understand the question how the front of a migrating cell becomes the rear of this cell in a short time and lack of space.

For this purpose short one dimensional microfluidic channels or PDMS patterns (see attached figure) will be fabricated in order to confine cell migration. The direction of the migration can be controlled by chemoattractants (e.g. chemokines) which are applied at the two ends of the channels and can be changed arbitrarily. I will quantify the frequency of directional change and will further investigate cytoskeletal dynamics during this repolarization.

The results will be compared to the two-dimensional migration case where the cell has enough space to turn.

Mathematical modelling will be done in order to quantify and understand this repolarization behavior.

