*IRTG 914 - Advanced Methods Course – winter semester 2019*

# "Movement in 3D: reductionistic micro-engineered assays to study the mechanisms of leukocyte migration"

Reductionist i*n vitro* assays complement *in vivo* approaches to unravel the molecular principles of leukocyte trafficking. Whereas cell migration has been traditionally studied *in vitro* on 2D surfaces, the ability to mimic physiological 3D microenvironments by vitro collagen matrices spurred the discoveries on physiologically relevant molecular mechanisms[1-3]. This development was further boosted by advances in photo-lithography, enabling micro-engineering of 3D microenvironments with defined parameters such as pore sizes and topographies. Importantly, these approaches did not only advanced our mechanistic knowledge on mesenchymal, epithelial or tumor cell migration[4-6], but also substantially advanced the mechanistic discoveries on leukocyte trafficking - revealing molecular factors and principles of microenvironmental exploration[7,8], cellular persistence[9], and pore passage[10,11] of migratory leukocytes.

The aim of the Advanced Method Course is to give the students a general overview on micro-engineered assays and their advantages/disadvantages in answering diverse scientific questions. We will study cell migration in 3D collagen networks, maze-like'pillar-forests' and micro channels[12-14] , using dendritic cells and macrophages as cellular models.

**Speaker/Supervisor: Jörg Renkawitz (Project A12)**

**Literature:**


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