FASSBERG SEMINAR SERIES

©photo: IST Austria

online

Michael Sixt
Institute of Science and Technology, Austria

Guidance and locomotion principles of rapidly migrating cells

During metazoan development, immune surveillance and cancer dissemination, cells migrate in complex three-dimensional microenvironments. These are crowded by cells and extracellular matrix, generating mazes of differently sized spaces typically smaller than the diameter of the migrating cell. Most mesenchymal and epithelial cells actively generate their migratory path using pericellular tissue proteolysis and transmit traction forces via specific adhesion receptors. On the contrary, amoeboid cells such as leukocytes and some metastatic cancers employ non-destructive strategies of locomotion and do not hold on to extracellular substrates. This raises the question how these usually extremely fast cells negotiate dense tissues. We find that amoeboid cells are able to migrate in the total absence of transmembrane force coupling, making the cell entirely autonomous and independent of the composition of the extracellular environment. Instead, active deformations of the cell body can impose normal forces on the substrate and thereby generate propulsion. Whenever the cell has to passage through areas that are too narrow to allow unrestricted passage, they respond generate pushing forces that dilate the local microenvironment. We investigate the molecular mechanisms triggering such cytoskeletal responses.

Host: Marina Rodnina

Tuesday / 23.02.2021 / 11:00

zoom access data will be mailed before the seminar!