Focal adhesions and mitochondria in living cells visualized by PALM and dSTORM

X. Fan¹, S. Born², B. Hoffmann², A. Franzen¹, A. Baumann¹, J. Hendriks¹, T. Gensch¹*

Institute of Complex Systems 4 (ICS-4, Cellular Biophysics)

Institute of Complex Systems 7 (ICS-7, Biomechanics)

Forschungszentrum Jülich

52425 Jülich

Germany

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Technologies and assays based on the principle of high accuracy localization of individual fluorescent labels, give us the possibility to visualize cellular structures and organelles with a resolution below the diffraction limit. Zyxin is a protein that can be found in focal adhesions and along the actin filaments. With mechanosensitive Dendra2_Zyxin fusion proteins we visualized focal adhesions with photoactivated localization microscopy (PALM) in living HEK293 cells. We also visualized mitochondria in live HEK293 cells via different photoactivatable fluorescent proteins (paFPs)/ photoswitchable fluorescent proteins (psFPs) targeted to mitochondria (e.g. Dendra2-Mito) and synthetic fluorophores (e.g. MitoTracker DeepRed). The results achieved with the different fluorescent entities will be compared. The super-resolution measurements presented here will enable us in the future to investigate the migration and change of cell organelles and structures in real time in living cells.

Figure 1 Super-resolution images of focal adhesion observing Dendra2-Zyxin fusion proteins in live HEK293 cells. (A) Super-resolution image (pixel size: 15.6 nm) was calculated from a TIRF image stack (4000 images). (B) TIRF snapshot image.