Microtubules (MTs) are central to the organization of the eukaryotic intracellular space and are involved in the control of cell morphology. In fission yeast cells MTs transport polarity factors to poles where growth is located, thus ensuring the establishment and maintenance of the characteristic spherocylindrical shape. For this purpose, MT polymerization dynamics is tightly regulated. Using home-made automated image analysis software, we can measure the spatial dependence of MT dynamics in interphase fission yeast cells [1]. This systematic and quantitative analysis provides a tool to study the role of MT regulators. In combination with genetic modifications we aim to understand the function of +TIPs (plus-end tracking proteins) in the spatial regulation of MT dynamics. We analyze MT dynamics in round fission yeasts in order to observe the role of Tip1 during cortical contact of MT tips. In these mutated cells it is possible to resolve such contacts, while one cannot exclude the possibility of a contact in spherocylindrical cells [2]. Furthermore we try to decipher how the linear transport by MT interferes with the feedback circuitry that assures the correct spatial distribution of Tea1, the main polarity factor in fission yeast cells. Tea1 is delivered as packets of molecules at growing MT tips and is anchored at the membrane via a mechanism involving interaction with the membrane protein Mod5. This protein acts as a catalyst for the incorporation of Tea1 in a bipolar cluster [3]. In order to bypass this mechanism we tagged Tea1 with a modified GFP allowing its attachment to the plasma membrane. The localization of the polarity factor at the cell pole is then expected to be due to MT-based transport only.

[1] Tischer C & al, *Force- and kinesin-8-dependent effects in the spatial regulation of fission yeast microtubule dynamics*, Molecular Systems Biology (2009) 5:250

[2] Brunner D and Nurse P, *CLIP170-like tip1p Spatially Organizes Microtubular Dynamics in Fission Yeast*, Cell (2000), Vol. 102, 695–704

[3] Bicho et al., *A Catalytic Role for Mod5 in the Formation of the Tea1 Cell Polarity Landmark*, Current Biology (2010), doi:10.1016/j.cub.2010.08.035