

Summary Diploma Thesis - Christian Schuberth

The cytoskeleton and molecular motors play important roles during the life cycle of the corn smut fungus *Ustilago maydis*. In this study, a microtubule motor protein of the kinesin Kar3 superfamily, Kin4, of *U. maydis* has been investigated regarding possible functions in morphogenesis, karyogamie and mitosis. To this end, the *kin4* gene was cloned and $\Delta kin4$ knock-out mutants generated by reverse genetics. In addition, a strain harbouring a C-terminally GFP-tagged version of Kin4 was constructed and used for subcellular localization studies.

During interphase, Kin4-GFP was localized exclusively to the nucleus, indicating that Kin4 is not involved in vesicle transport or polarized growth. Consistent with this, $\Delta kin4$ deletion mutants displayed no differences to wild type strains concerning cell morphology, growth rate or the organization of the microtubule cytoskeleton. Surprisingly, Kin4 seems to be also not involved in karyogamie in *U. maydis*, contrary to the function of its homolog Kar3 of *S. cerevisiae*.

In mitosis, Kin4-GFP was detected at the mitotic spindle, the spindle poles and astral microtubules. In line with this localization, an influence of Kin4 on the dynamics of astral microtubules and, maybe connected to this, on the orientation of the mitotic spindle in the bud was found. Whether Kin4 plays a role during spindle assembly or chromosome segregation could not be analyzed in detail. However, since the deletion of *kin4* did not lead to a general defect in mitosis, the function of Kin4 in this process is at least not essential.