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Surface immobilization of a helicase and investigation of conformational changes in its catalytic cycle in TIR experiments

Protein purification from *E. coli* bacteria
Comparison of different surface coupling techniques
Labeling of the helicase with donor- and acceptor fluorophores
Investigation of the kinetics of conformational changes in the catalytic cycle in single molecule experiments (Total internal reflection microscope)

Investigation of DNA-induced conformational changes in a DNA topoisomerase

Protein purification from *E. coli* bacteria
Labeling of the helicase with different donor/acceptor pairs
Investigation of conformational changes in response to DNA and during the catalytic cycle in single molecule experiments in solution (confocal microscope)

Construction of a temperature- or photoswitchable enzyme

Protein purification from *E. coli* bacteria
Chemical modification of the enzyme: coupling of two protein domains *via* an artificial switchable linker (collaboration with the group of W. Meier)
Characterization of the artificial enzyme with respect to activity, switching, and conformational changes in single molecule experiments in solution (confocal microscope)