

2 Aim of this thesis

One goal of this thesis was the crystallization of the biologically important AAA⁺ proteins RuvBL1, RuvBL2 and their complex in order to solve their crystal structures. The knowledge of the three-dimensional structure of a protein is necessary for the understanding of its organisation and function. In order to achieve this, purification strategies for the recombinant proteins expressed in *E. coli* and in insect cells had to be established first. Then, RuvBL1, RuvBL2 and their complex were analysed using SDS-PAGE, Western blotting, DLS and gel filtration experiments. The highly purified proteins were used for crystallization trials.

An additional aim of this thesis was the biochemical characterisation of the purified proteins. Due to their high homology to the bacterial DNA-dependent ATPase and helicase RuvB, RuvBL1 and RuvBL2 have been suggested to possess similar enzymatic activities. It was therefore highly interesting to find out whether these proteins were indeed ATPases and helicases. Various groups have shown that *in vivo* ATPase activity of RuvBL1 and RuvBL2 is needed for several of their biological functions. The ATPase and helicase activities of the purified RuvBL1 and RuvBL2 proteins were therefore studied in detail.

RuvBL1 and RuvBL2 are involved in cellular processes that require transient interactions with nucleic acids, like chromatin remodelling and transcriptional regulation. It was therefore an interesting question whether these proteins directly bind to DNA or RNA.