Malin Prenkert is a registered laboratory technician who specializes in clinical chemistry. She previously worked at the Department of Transfusion Medicine at Örebro University Hospital. There she was involved in the introduction and establishment of autologous bone marrow and peripheral stem cell transplantations, which introduced her to the area of acute myeloid leukemia (AML) and cytostatic drug resistance. In 1993 she joined a research group focusing on drug resistance in AML. During the last years she has combined her doctoral studies with laboratory work in various research projects at the Clinical Research Center at Örebro University Hospital, where she has been employed since 2009.

The term ‘leukemia’, stems from the Greek words ‘leukos’ and ‘heima’, which means ‘white blood’. It is a blood or bone marrow cancer that comprises a large spectrum of diseases all characterized by an abnormal growth of blood cells. Leukemia is treated with cytostatic drugs. However, a majority of the patients respond incompletely or not at all and few patients survive more than a couple of years. The central cause for this lack of response to cytostatic drugs is the development of drug resistance. This thesis investigates some of the key mechanisms involved in drug resistance and possible assays to predict drug resistance at diagnosis. The intracellular behavior of cytostatic drugs and their main metabolites and the cellular response to cytostatic drug exposure, were studied. A new flow cytometry in vitro chemosensitivity assay was developed that enables identification of viable myeloid cells and determination of drug sensitivity. Finally, new putative markers associated with drug resistance were investigated.