**Abstract**

**Background**

Endometrial cancer is the most common gynecological malignancy in the Western world and the incidence is increasing. The cornerstone of treatment is hysterectomy with bilateral salpingo-oophorectomy, with or without lymphadenectomy. Even though the overall prognosis is good, 15-20 % of patients experience recurrence. To date there are no prognostic biomarkers available for widespread clinical use. Thus, novel biomarkers are necessary to better predict prognosis and tailor therapy.

**Aims**

The overall aim is to investigate biomarkers in order to better predict prognosis and to individualize therapy and follow-up.

**Methods**

Immunohistochemistry (IHC) on tissue microarrays are used for protein expression of heat shock factor 1 (HSF1). Genetic alterations related to HSF1 are explored in transcriptional data from overlapping samples (Paper I). An enzyme-linked immunosorbent assay (ELISA) is used for protein expression of growth differentiation factor -15 (GDF-15) in plasma (Paper II).

**Results**

High expression of HSF1 is associated with aggressive disease and poor survival (all p-values≤0.02). Gene expression analyses identified HSP90 inhibition as a potential novel therapeutic approach for cases with high protein expression of HSF1 (Paper I). High plasma level of GDF-15 is associated with poor survival (p-value=0.001). High plasma level of GDF-15 independently predicts recurrent disease (OR=3.14; 95% CI 2.10-4.76) adjusted for age, histological type and myometrial infiltration. High plasma level of GDF-15 is an independent marker for lymph node metastases (OR=2.64; 95% CI 1.52-4.61) adjusted for preoperative histology (Paper II).

**Future plans**

The potential biomarker protein kinase, DNA-activated, catalytic polypeptide (PRKDC) will be studied in tumor tissue using IHC (Paper III). Transcriptional data from overlapping samples will be investigated in parallel for gene expression alterations. The results will be related to clinical data and established markers for aggressive disease and survival.