Development of cervical cancer is preceded by well-defined premalignant lesions. These lesions are classified as cervical intraepithelial neoplasia (CIN). They are detectable by cervical cytology, which resulted in nationwide cervical cancer screening programs. Although these programs have led to a substantial reduction in mortality and morbidity of cervical cancer, there are many drawbacks including limited accuracy of cytology, unnecessary screening rounds, and over-treatment.

A persistent infection with high risk Human Papillomavirus (hrHPV) is an obligatory condition for the development, maintenance and progression of CIN lesions. HPV testing, as an adjunct to cytology, will lead to a better selection of women at risk for development of cervical cancer and consequently to more efficient cervical cancer screening strategies.

The fact that HPV testing can reduce the risk of detection failure in cervical screening is confirmed in clinically validated settings in the studies described in this thesis. New guidelines and recommendations are formulated.