Each year, approximately 1400 new patients are diagnosed with rectal cancer (RC) in Denmark. In the interest of ensuring an optimal clinical outcome, accurate diagnostic and predictive information are essential to avoid overtreatment and, consequently, unnecessary side effects.

In paper I, the accuracy of preoperative diagnostic MRI staging of RC according to tumour height was assessed. The ability to accurately stage RC by MRI is not influenced by tumour height; however, staging is still uncertain in daily clinical practice, with many patients being over- or understaged, potentially leading to over- or undertreatment of RC.

In paper II, the value of gene expression for predicting resistance to long-course preoperative chemoradiation therapy was investigated in a strictly selected cohort of patients with advanced tumours (cT4). A total of 9 genes and 3 miRNAs were found and validated as predictors of chemoradiation therapy resistance. This result provides a foundation for further studies that would allow diagnostic biopsy to yield much more information that it currently does.

In paper III, the value of postoperative adjuvant chemotherapy for RC patients was assessed by means of a systematic review. In patients treated with surgery alone, a clear gain in disease-free survival was observed, whereas in patients treated with preoperative chemoradiation, no gain from postoperative adjuvant chemotherapy was identified. These findings have contributed to evidence that has led to an updated version of the Danish guidelines.

In paper IV, the impact of the strictly designed Danish selection of RC patients for preoperative chemoradiation on local recurrence and overall survival was evaluated in a national cohort. The local recurrence rate was equal to those reported in corresponding international studies. Given the results from other Nordic countries, supporting evidence continues to mount for a restrictive use of preoperative radiotherapy in RC patients.

In conclusion, this thesis provides indications that RC patients need better preoperative staging. Diagnostic imaging is still suboptimal and should be further improved. Prediction of response or resistance to preoperative chemoradiation therapy in RC patients may be possible using molecular genetic assessments. The low actual local recurrence rate of RC justifies restricted use of preoperative chemoradiation in Denmark, and the use of postoperative adjuvant chemotherapy may be recommended only for a subgroup of RC patients.
To fulfill the requirements for the PhD degree, Laurids Østergaard Poulsen has submitted the thesis: Diagnostic, Predictive and Therapeutic Aspects on Adenocarcinoma of the Rectum, to the Faculty Council of Medicine at Aalborg University.

The Faculty Council has appointed the following adjudication committee to evaluate the thesis and the associated lecture:

**PhD, Senior Consultant Morten Brændengen**
Department of Oncology
Oslo University Hospital
Norway

**Clinical Professor, Senior Consultant Lene Hjerrild Iversen**
Department of Surgery & Department of Clinical Medicine
Aarhus University Hospital
Denmark

**Chairman:**
Associate Professor, Senior Consultant Inge Thomsen Bernstein
Department of Surgery & Department of Clinical Medicine
Aalborg University Hospital
Denmark

**Moderator:**
Clinical Professor, Senior Consultant Ole Thorlacius-Ussing
Department of Surgery & Department of Clinical Medicine
Aalborg University Hospital
Denmark

The PhD lecture is public and will take place on:

**Friday 26 October 2018 at 13:00**
Aalborg University Hospital – Room: Auditoriet Afsnit Syd
Hobrovej 18-22
9000 Aalborg

**Program for PhD lecture on**

**Friday 26 October 2018**

by
Laurids Østergaard Poulsen

Diagnostic, Predictive and Therapeutic Aspects on Adenocarcinoma of the Rectum.

Chairman: Clinical Associate Professor Inge Thomsen Bernstein
Moderator: Clinical Professor Ole Thorlacius-Ussing

Opening by the Moderator

PhD lecture by Laurids Østergaard Poulsen

Break

Questions and comments from the Committee
Questions and comments from the audience at the Moderator’s discretion

Conclusion of the session by the Moderator