

# Department of Surgery

## Division of Thoracic Surgery

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### Head of Division

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### Research focus

- Surgical therapy of hyperhidrosis – a prospective quality control study
- Surgical management of pulmonary metastases from colorectal cancer
- Deep intrathoracic vacuum therapy in septic thoracic surgery
- Immunological and molecular characterization of malignant lung tumors
- Neoadjuvant therapy of locally advanced non-small cell lung carcinoma IIIA; simultaneous radiochemotherapy followed by surgery
- The impact of patho-histologic response following neo-adjuvant radiochemotherapy in locally advanced non-small cell lung cancer
- Prognostic effect of „Salvage“-resection in locally advanced non-small cell lung cancer
- The value of the systematic extensive lymph node dissection in the operative treatment in non-small cell lung cancer
- Pulmonary resection with parietal pleurectomy (WRPP) versus parietal pleurectomy (PP) for the treatment of primary pneumothorax
- Functional analysis of human dendritic cell subpopulations

### Structure of the Division

Professorship: 1

Personnel: 9

- Doctors (of Medicine): 6
- Scientists: 6 (therof funded externally: 0)
- Graduate students: 3

### Clinical focus areas

- Gentle surgical techniques for lung cancer, lung tumors
- Successful treatment of pathological sweating (hyperhidrosis)
- Video-assisted correction of chest deformations, e.g. pectus excavatum

### Research

The research focus of the Division of Thoracic Surgery is to research innovative therapies for operative pulmonary and thoracic diseases to develop new clinical treatment concepts. Furthermore, experimental immunological projects with samples from the lung and human lymphoid organs are carried out within the framework of the cooperation with other divisions and departments.

#### Surgical therapy of hyperhidrosis – a prospective quality control study

PI: Dr. W. Schreiner, Prof. Dr. H. Sirbu, I. Mykoliuk

Videoscopic assisted thoracic sympathectomy is a widely accepted approach in the therapy of palmar and axillary hyperhidrosis. Long term post-operative results are very heterogeneous. In this trial, we analyze the long term patient satisfaction with a questionnaire specially designed by the Division of Psychosomatics and Psychotherapy.

#### Surgical management of pulmonary metastases from colorectal cancer

PI: Prof. Dr. H. Sirbu, PD Dr. W. Schreiner, W. Dudek

Although resection of solitary lung metastases is widely accepted, pulmonary resection for multiple or bilateral metastases is still under discussion. This monocentric, retrospective study analyzes clinical data, prognostic factors, and long term follow-ups after surgical treatment of pulmonary metastases from colorectal cancer.

#### Deep intrathoracic vacuum therapy in septic thoracic surgery

PI: PD Dr. W. Schreiner, Prof. Dr. H. Sirbu

Vacuum therapy leads to a significant improvement in the local therapy of infected wounds. The aim of this study is to examine the clinical short and long time results of this therapeutic method in deep infected wounds, e.g. pleural empyema.

#### Immunological and molecular characterization of malignant lung tumors

PI: Prof. Dr. S. Finotto (Division of Molecular Pneumology), Dr. D.I. Trufa, Prof. Dr. H. Sirbu

The aim of this research project is to investigate the immunological and molecular basis. The focus within this project are the malignancies that become visible in the lung, especially non-small cell lung cancer (NSCLC). These parameters are then correlated with the clinical findings. Before the surgery, the clinical data (age, height, weight, sex, nutritional status, smoking and occupational history, family history, etc.) are acquired. After the surgery, some samples

from resected lung tissue and from removed lymph nodes are analyzed in the laboratory. From the single cell suspension, various cell subpopulations, such as isolated CD4 + or CD8 + T cells, are taken in culture. The cultured cells are then analyzed in different ways (e.g. FACS analysis, ELISA, PCR, etc.). RNA and DNA are isolated, too, which can then be used for epigenetic studies, microarray analysis, and RNA expression analysis. Finally, the proteins can be isolated and analyzed.

#### Neoadjuvant therapy of locally advanced non-small cell lung carcinoma IIIA; simultaneous radiochemotherapy followed by surgery

PI: Prof. Dr. H. Sirbu, Prof. Dr. R. Fietkau, PD Dr. W. Schreiner

In this trial, we compare the therapy concept of neoadjuvant radiochemotherapy (45Gy/Cisplatin, Etoposide), followed by surgery, with the concept of definitive radiochemotherapy in patients with locally advanced, non-small cell lung carcinoma stadium IIIA.

#### The impact of patho-histologic response following neo-adjuvant radiochemotherapy in locally advanced non-small cell lung cancer

PI: PD Dr. W. Schreiner, Prof. Dr. R. J. Rieker (Institute of Pathology)

The purpose of the study is the analysis of patho-histologic response of the primary tumor following neo-adjuvant chemoradiation therapy and the long-term impact on survival in order to identify the predisposing factors for survival improvement in patients with locally advanced non-small cell lung cancer.

#### Prognostic effect of „Salvage“-resection in locally advanced non-small cell lung cancer

PI: PD Dr. W. Schreiner, Prof. Dr. H. Sirbu, Prof. R. Fietkau (Department of Radiation Oncology)

The study purpose is the prognostic effect and impact on local tumor control due to the „Salvage“-surgery for local recurrence and/or persisted primary tumor despite definitive radiochemotherapy in patients with primary inoperable locally advanced non-small cell lung cancer.

#### The value of the systematic extensive lymph node dissection in the operative treatment in non-small cell lung cancer

PI: PD Dr. W. Schreiner, Prof. Dr. H. Sirbu, Dr. D. I. Trufa

The purpose of the study is the investigation of the extensive lymph node dissection under consideration of the lymphatic metastasis pathways and the improvement of the lymph node staging.

### **Pulmonary resection with parietal pleurectomy (WRPP) versus parietal pleurectomy (PP) for the treatment of primary pneumothorax**

PI: Prof. Dr. H. Sirbu, Dr. W. Dudek

Prospective randomized multicenter clinical trial which compares two established surgical procedures (WOPP-study). The aim of the study is to analyze the pneumothorax recurrence rate within the first 24 months after surgical procedure: Parietal pleurectomy with apical lung resection (WRPP) or parietal pleurectomy (PP).

Funding: DFG

### **Functional analysis of human dendritic cell subpopulations**

PI: Prof. Dr. D. Dudziak (Department of Dermatology), Prof. Dr. H. Sirbu

The main scientific focus of the research group of Prof. Dr. D. Dudziak is the characterization of Dendritic cells (DCs) and the initiation of specific T cell immune responses. These studies are being conducted both in the murine and the human setting. First detailed phenotypic and functional analyses of DC subpopulations have been performed with various human lymphoid tissues (spleen, blood, thymus, bone marrow, cord blood, tonsils) and were recently published). In a collaborative research project with Prof. Dr. H. Sirbu, comparative analyses of the development of different immune cells were extended to other human organs, such as lymph nodes, blood, lungs, and adult thymus. The latter shows residual activity of T cell development, despite a progressed thymic involution. Of note, the analysis of the phenotype and function of the DC subpopulations in various human tissues of the very same donor is of high value, in order to account for the high degree of inter-individual variance.

### **Teaching**

For medical students, the Division of Thoracic Surgery offers current lectures on relevant topics (malignant pulmonary disease, pneumothorax, pulmonary emphysema, pleural empyema, trauma, etc.), an interactive EKM course (introduction into clinical medicine) and offers the possibility of hospitalization on the ward, in the ambulance, and in the operation room of thoracic surgery. The applicants for the practical year in thoracic surgery are given special knowledge (participation to medical thoracic conferences/boards, conduct an interview, preparation of a treatment plan and discussion with the tutor, learning of special aspects of risk medical informing, presentation of the patient during

the medical visit, active participation in the operating room).

Furthermore, in the Division of Thoracic Surgery supervises Bachelor's, Master's as well as MD theses.

### **Selected publications**

Dudek W, Schreiner W, Hohenberger W, Klein P, Sirbu H. Forty-Two Years' Experience with Pulmonary Resections of Metastases from Colorectal Cancer. *Thorac Cardiovasc Surg.* 2017 Oct;65(7):560-566

Dudek W, Schreiner W, Stapel P, Vassos N, Grützmann R, Sirbu H. Surgery of colorectal lung metastases: Results of a survey in Germany. *Chirurg.* 2017 Jun;88(6):512-517

Dudek W, Schreiner W, Horch RE, Sirbu H. Sternal resection and reconstruction for secondary malignancies. *J Thorac Dis.* 2018 Jul;10(7):4230-4235

Schreiner W, Dudek W, Lettmaier S, Fietkau R, Sirbu H. Long-Term Survival after Salvage Surgery for Local Failure after Definitive Chemoradiation Therapy for Locally Advanced Non-small Cell Lung Cancer. *Thorac Cardiovasc Surg.* 2018 Mar;66(2):135-141

Schreiner W, Gavrychenkova S, Dudek W, Rieker RJ, Lettmaier S, Fietkau R, Sirbu H. Pathologic complete response after induction therapy-the role of surgery in stage IIIA/B locally advanced non-small cell lung cancer. *J Thorac Dis.* 2018 May;10(5):2795-2803

Schreiner W, Gavrychenkova S, Dudek W, Lettmaier S, Rieker R, Fietkau R, Sirbu H. Lung Resection after Definitive and Neo-Adjuvant Chemoradiation for Stage IIIA/B Locally Advanced Non-Small Cell Lung Cancer: a Retrospective Analysis. *Zentralbl Chir.* 2018 Jun;143(3):307-315