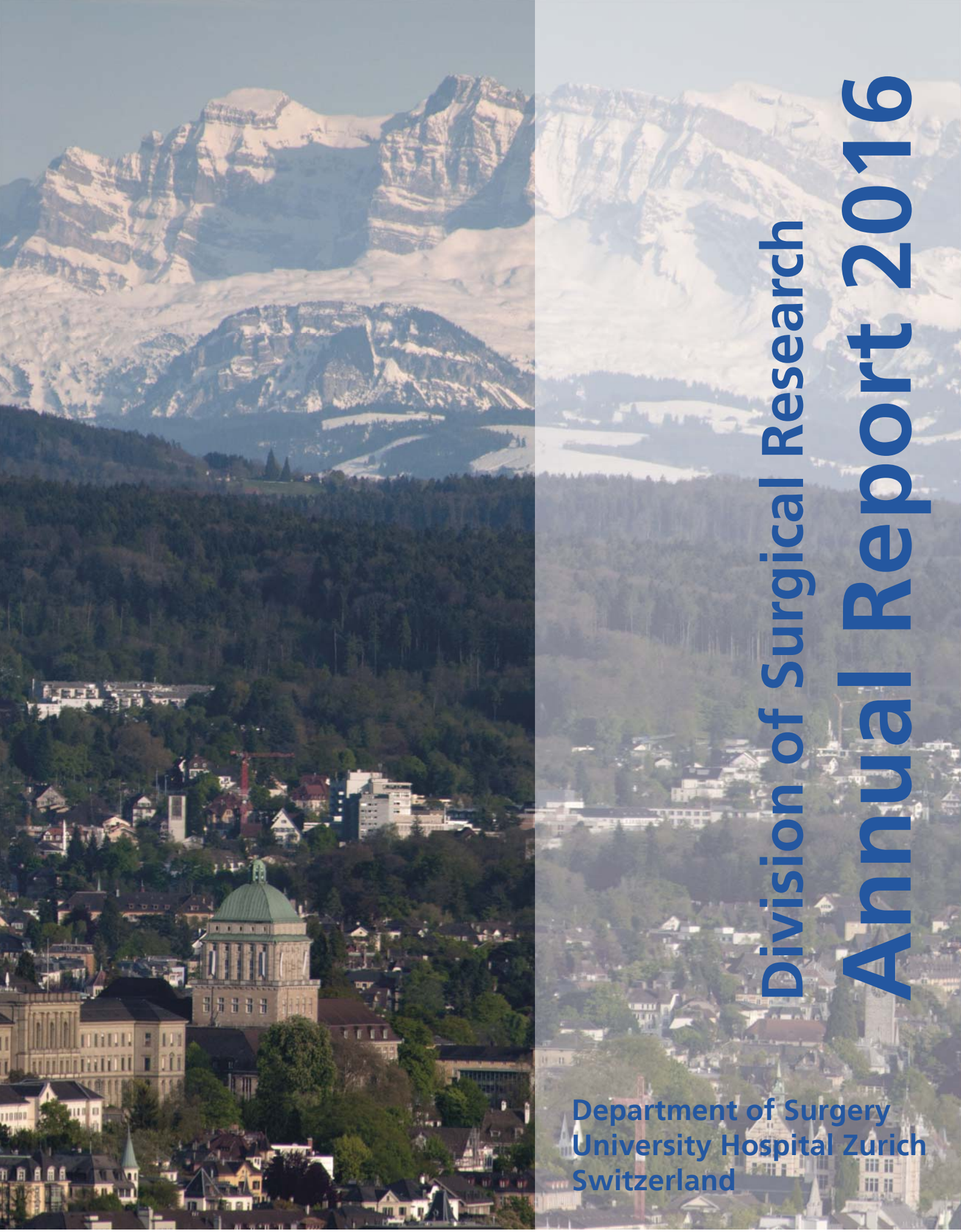


Division of Surgical Research

Annual Report 2016

Department of Surgery
University Hospital Zurich
Switzerland

University of Zurich[UZH]

UniversityHospital Zurich

Content

Preface

Dear Colleagues

The year 2016 was a very productive year with many highlights. Besides the numerous publications from the Division of Surgical Research / Zentrum Chirurgie, there were many Symposia integrating basic and clinical science to inform both specialists and laypersons.

Prof. Dr.
Rolf Graf,
Head Division of
Surgical Research

Prof. Dr. med.
Gregor Zünd,
Head Division of
Surgical Research
(until March 2016)

Our central services, histology and immunohistochemistry labs, small and large animal labs and photography/graphics services provided a tremendous support without which our Division could never build up the reputation, visibility and recognition by our peers.

Special thanks go to the former head of the Division of Surgical Research, Prof. Dr. med. Gregor Zünd, who led the division since 2001. He was instrumental in building modern laboratory infrastructure and state of the art animal operating facilities. We are happy and proud to congratulate Prof. Zünd for his election as CEO of the hospital.

To ensure continuity of the Divisions' profile, the Zentrum Chirurgie elected me as head of the Division, supported by two new co-heads, Prof. Dr. med.vet. Margarete Arras and PD Dr. sc.nat. Paolo Cinelli. Our team faces a number of challenges, including limited lab space in spite of expanding research groups, and the planned migration of the central animal facility (BZL) in 2020 to Schlieren.

Last but not least, we would like to thank Ms Susanne Frehner for her dedication to our Division and outstanding administrative support. We wish her an enjoyable retirement.

Our new team wishes a successful 2017!

Prof. Dr. Rolf Graf
Head Division of Surgical Research

1. Organisation

Prof. Dr. med.
Pierre-Alain Clavien, PhD
Director Clinic of Visceral & Transpl. Surgery

Prof. Dr. med.
Hans-Peter Simmen,
Director Clinic of Trauma Surgery

Prof. Dr. med.
Walter Weder,
Director Clinic of Thoracic Surgery

Prof. Dr. med.
Francesco Maisano,
Director Clinic of Cardiovascular Surgery

Prof. Dr. med.
Pietro Giovanoli,
Director Clinic of Plastic - Hand & Reconstr. Surgery

Prof. Dr. med.
Tullio Sulser,
Director Clinic of Urology

Prof. Dr. med. dent.
Martin Rücker,
Director Clinic of Cranio-Maxillo-facial Surgery

Dr. med.
Peter Steiger,
Head of Intensive Care Unit

Prof. Dr. med.
Gregor Zünd,
Head Division of Surgical Research
(until March 2016)

Prof. Dr.
Rolf Graf,
Head Division of Surgical Research
(from March 2016)

Prof. Margarete Arras, DVM
Co-Head Division of Surgical Research
(from March 2016)

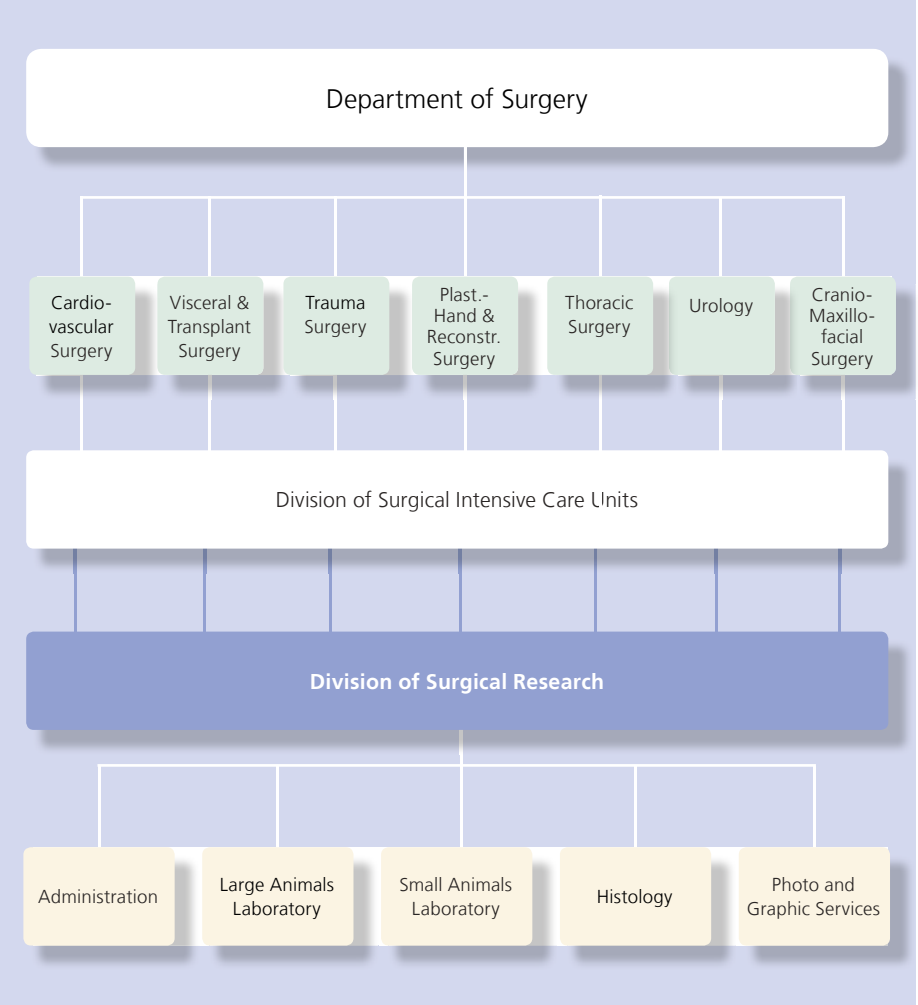
PD Paolo Cinelli, PhD
Co-Head Division of Surgical Research
(from March 2016)

Susanne Frehner
Administration
Division of Surgical Research

Tina Wentz
Administration
Division of Surgical Research

Donata Gröflin
Teaching Coord.
Division of Surg. Research

Position of the Division of Surgical Research within the Department of Surgery

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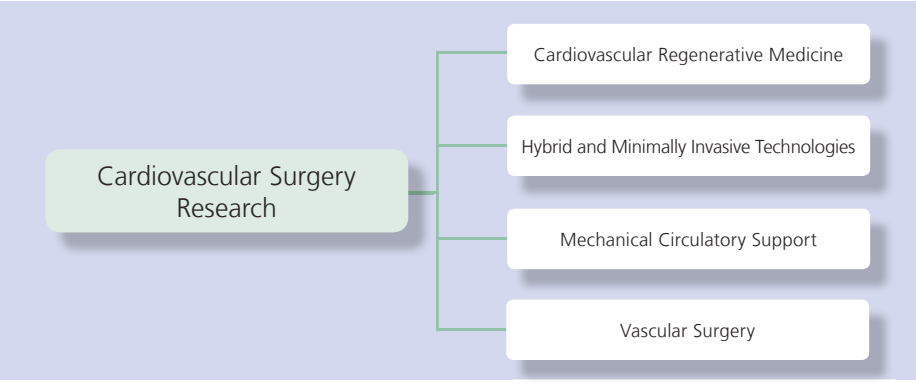
Cardiovascular Surgery Research

Prof. Dr. med.
Francesco Maisano,
Director

PD Dr. med.
Evelyn Regar, PhD



Valvular heart-disease (VHD) and heart failure represent a major cause of mortality around the globe. Both entities are interdependent. The therapy options for affected patients with valvular heart disease are currently undergoing rapid changes and in addition to conventional, surgical valve replacement representing the standard of care since several decades, transcatheter techniques have entered the clinical-routine representing an efficient alternative for the treatment of elderly high-risk patients. Given sufficient long-term safety, it can be predicted that these minimally-invasive techniques may have a major impact on the treatment strategy of patients with VHD and will further be expanded to a broader and younger patient population.

On this background, the research of the department of cardiovascular surgery has a broad translational and multidisciplinary approach covering the ground from cellular and molecular biology to preclinical research to first in man and large scale clinical studies. Conceptually, we develop novel minimally invasive or transcatheter devices and treatment strategies for patients with valve and heart failure. To that end, our experimental research lines are as follows:

Novel Models for Heart Failure

Valve regurgitation is a pathological state where a unidirectional heart valve has become insufficient in its function and alous blood to leak back. In consequence, the downstream blood ejection volume decreases, while the regurgitant blood volume causes overload in the upstream heart chamber. The upstream heart chamber undergoes morphological and cellular changes which can cause dysfunction and heart failure. The left ventricle undergoes thinning of the ventricular wall and remodeling of cardiac cellular structures attributed to prolonged stress caused by volume overload. These changes are believed to be irreversible and are involved in several features of heart failure. However, the exact mechanisms behind these adaptive phenomena of the left ventricle are still poorly understood. On this background, we develop and validate a novel murine animal model to study morphological and cellular changes in subacute left ventricular volume overload and afterload mismatch. This model allows to identify functional parameters and early biomarkers specific to left ventricular volume overload and remodeling; to investigate blood and tissue biomarkers known to be elevated in chronic left ventricular remodeling at early stages of left ventricular volume overload; to investigate early changes in myocardial fiber architecture as well as myocardial metabolism by means of Dynamic Nuclear Polarization and Diffusion Tension Imaging, to study cellular, subcellular and metabolic characteristics of early signaling and response.

Heart Valve Tissue Engineering

Despite this rapid technical progress, the currently available prostheses for transcatheter-approaches are still bio-prosthetic associated with the known disadvantages comprising progressive calcification and degeneration. Furthermore, recent evidence suggests even accelerated degeneration resulting from structural-damage due to the crimping-procedures. Therefore, so far, the clinical indication for transcatheter valves is limited primarily to the elderly, high-risk patients. A heart-valve prosthesis created by tissue-engineering technologies with regeneration and repair capacities would overcome such limitations, and may have particularly impact in the congenital setting. Recently we developed a new clinically relevant off-the-shelf heart-valve tissue-engineering (HVTE) concept by decellualrization of the in-vitro grown tissue engineered heart valves (TEHVs). Moreover, it was demonstrated that this off-the-shelf HVTE concept could be perfectly combined with minimally-invasive valve-implantation techniques. The aim of this research is to develop homologous “off-the-shelf” tissue engineered heart valves for implantation into the aortic-valve position using a state-of-the-art anatomically orienting transcatheter delivery system.

Development of Novel Devices

Development of novel devices is frequently performed in collaboration with industry partners and often based on own intellectual property. We investigate feasibility and safety in the porcine model, and work towards optimization of device characteristics, investigating hemodynamics, ventricular and device function in detail and assessing long-term effects in order to prepare for

Figure 1: The off-the-shelf issue-engineered heart valve prior to (right) and after (left) in-vivo evaluation in the sheep model (Driessen, Emmert, Dijkman, et al. JACC 2014).

Figure 2: Multidisciplinary team during an experiment requiring open-chest heart surgery with heart-lung machine in the animal hybrid operation room, including cardiac surgeons, cardiac perfusionist, echocardiographer, veterinarian anesthesiologist, veterinarian specialized in porcine cardiac interventions and biomedical engineer.

translation into clinical application. Various devices designed to allow for minimally invasive or percutaneous treatment of mitral valve regurgitation, tricuspid valve regurgitation, chorda replacement and ventricular aneurysm were evaluated.

Development of novel strategies for procedural planning and guidance

A novel minimally invasive device typically asks for specific procedural planning and intra-operative, imaging based guidance. This is especially true as the heart is a 3D moving structure and many technologies,that allow for real-time imaging are restricted to 2D visualization, while others, such as MRI and CT are not availab le for the operator in the hybrid operation room and/or not suited to allow for direct manipulation with therapeutic devices. We focus on developing new approaches for the fusion of several imaging techniques, such as MRI, CT and echocardiography with fluoroscopy in real time in order to optimize catheter based procedures, to reduce X-ray contrast volume and radiation exposure.

Collaborations:

- Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, USA
- Department of Biomedical Engineering, Technical University Eindhoven, The Netherlands
- Center for Integrative Human Physiology, University of Zurich, Switzerland
- Department of Materials, Federal Institute of Technology, Zurich, Switzerland
- Department of Biochemistry, University of Zurich, Switzerland
- Department of Mathematics, Federal Institute of Technology, Zurich, Switzerland
- Department of Computational Science, Federal Institute of Technology, Zurich, Switzerland
- Department of Veterinary Surgery, MSRU Vetclinics, University of Zurich, Switzerland
- Department of Cardiac Surgery, Children‘s Hospital, Harvard Medical School, Boston, MA, USA
- Department of Pathology, Brigham and Women‘s Hospital, Harvard Medical School, Boston, MA, USA
- Massachusetts Institute of Technology (MIT), Cambridge, MA, USA
- Laboratory for Tissue Engineering, German Heart Centre, Berlin, Germany
- Department of Cardiology, Medical University of Vienna, Austria
- Institute of Nuclear Medicine, University of Debrecen, Hungary
- Institute of Chemistry and Applied Biosciences, Federal Institute of Technology Zurich, Switzerland
- Institute of Anatomy, University of Bern, Switzerland
- Human Genetics Laboratory, Genetica AG, Zurich, Switzerland
- Departments of Pathology, Neurosurgery, Cardiology, and Laboratory for Transplantation Immunology, UniversityHospital, Zurich, Switzerland
- Randall Division of Cell and Molecular Biophysics, King’s College London, UK
- Embryonic Stem Cell Laboratory, Fraunhofer Institute for Biomedical Engineering IBMT, St. Ingbert, Germany
- Department of Pathology and Immunology, Geneva University, Switzerland
- Experimental Cardiology Unit, Department of Medicine, University of Lausanne Medical School, Switzerland
- Philips Healthcare (Best, Netherlands)
- Swiss Federal Institute of Technology (ETH) Zürich, Computer Vision Laboratory (Zürich)
- Swiss Federal Institute of Technology (ETH) Zürich, Centre for Mechanics (Zürich)
- Lenox Hill Heart and Vascular Institute (New York, USA)

- Erasmus Universiteit - Thorax Center (Rotterdam, Netherlands)
- Experimental Cardiology Unit, Department of Medicine, University of Lausanne Medical School, Switzerland
- pd|z Product Development Group Zurich, Department of Mechanical and Process Engineering, ETH Zürich (Prof. M. Meboldt)
- Wyss Translational Center Zurich, Swiss Federal Institute of Technology (ETH) Zurich, Center for Mechanics (Zürich)
- Institute for Dynamic Systems and Control, Department of Mechanical and Process Engineering, ETH Zürich (Prof. C. Onder, Prof. L. Guzzella)
- Micro- and Nanosystems, Department of Mechanical and Process Engineering, ETH Zürich (Prof. C. Hierold)
- Professor Dr. Isabelle Van Herzeele, Ghent University Hospital (Gent, Belgium) and Sint - Maarten Hospital (Duffel, Belgium)
- Division of Cardiology, University Hospital Zurich
- Philips Healthcare (Netherlands)
- Division of Urology and Division of Visceral and Transplant Surgery, University Hospital Zurich
- Endospan Ltd. (Herzliya, Israel)

Awards:

H. Rodriguez
Research Award Swiss Transplantation Society, 1st Place

M. Emmert
Walter und Gertrud Siegenthaler Stiftung, Science Award

Prof. Dr. med.
Francesco
Maisano,
Director

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Evelyn Regar, PhD
Director of Research

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Mario Lachat

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PD Dr. med.
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Dr. med.
Stefano Benussi

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Alberto Weber

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Melanie Generali,
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Agnieszka
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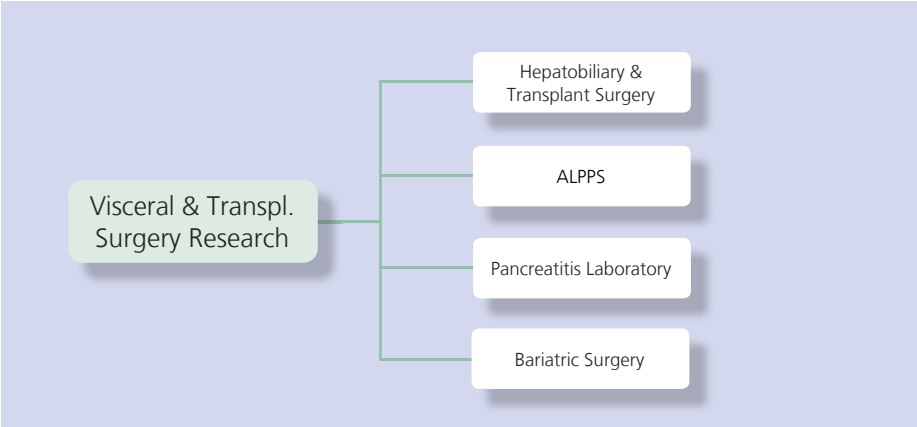
Student vet.med.

Visceral & Transplant Surgery Research



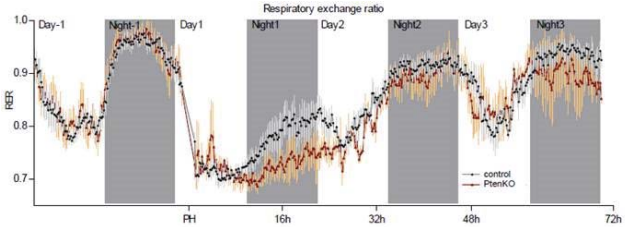
Prof. Dr. med. Pierre-Alain Clavien, PhD, Director

Prof. Dr. Rolf Graf

The research within the department of Visceral & Transplant Surgery has a long-standing focus on two organs, the Liver and the Pancreas.

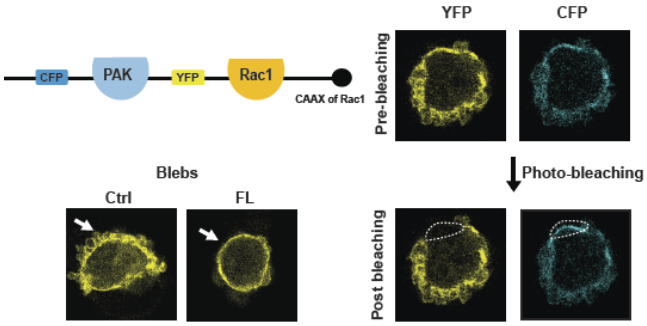
On the liver-side research is concentrated on three topics;
1) molecular pathways involved in liver regeneration in the setting of normal liver resection or after novel surgical methods
2) development of strategies in liver transplantation through improvement of donor organs and
3) developing innovative strategies that may ultimately help to expand the treatment of liver tumors through surgery.

The unique combination of clinical and basic scientists in the laboratory has helped in designing clinically relevant translational studies such as the role of serotonin in liver regeneration and growth of tumors; treatment of colorectal metastasis using ITPP (an anti-hypoxic compound) and enhanced liver regeneration after ALPPS surgery. These studies were instrumental in initiation of ongoing clinical trials & outcome studies.



Energy consumption and respiratory exchange rate in animals with and without PTEN in the liver. Night1 demonstrates changes in metabolic energy conversion in animals having undergone a partial liver resection.

The success of previous and current research is made possible by developing novel animal (mouse and rat) models for arterialized orthotopic liver transplantation, transplantation of critically small grafts, normal (68%) and extended (86%) hepatectomies leading to critically small future remnants, or models of liver regeneration induced by PVE, PVL and ALPPS. Likewise, recently established syngeneic mouse models of liver cancer and colorectal liver metastasis via portal vein injection have opened new avenues to treat liver metastasis.



Inhibition of 5-HT uptake prevents Rac1 activation in pancreatic acinar cell. Schematic representation of FRET analysis. FRET was performed using the donor recovery after acceptor photo-bleaching method. Acceptor (yellow fluorescent protein) was bleached at 100% laser intensity Confocal imaging showed that 20 µM FL pretreatment inhibited bleb formation upon 10nM Cerulein stimulation.

For a long time, the pancreas research laboratory has mostly focused on molecular events that are essential for the pathogenesis of pancreatitis. Recent research has defined that changes in inflammatory signatures within pancreas play a major role in the pathogenesis of pancreatitis. In addition to that the laboratory has well-established mouse models to study chronic, acute and autoimmune pancreatitis. These interesting models also serve as a great tool to study regeneration of the pancreas upon acute injury. The pancreas research laboratory has been a key player in establishing pancreatic stone protein (PSP) as a biomarker for many infectious & inflammatory diseases that include sepsis, peritonitis, acute appendicitis and chronic pancreatitis. Since pancreatic inflammation is a well-known risk factor the development of pancreatic cancer; recent studies in the laboratory have identified gastrokines (gastric tumor suppressor proteins) in premalignant lesions of a genetically engineered mouse, where inflammation drives/accelerates development of pancreatic ductal adenocarcinoma (PDAC).

Bariatric surgery received a lot of attention since its indication has been expanded to patients with type 2 diabetes with a BMI above 30. This so-called metabolic surgery was spawned by new techniques, including gastric bypass and sleeve gastrectomy. Interestingly, changes in eating behavior, nutrient absorption and other metabolic normalization have raised many questions of which most are still unanswered.

In our group, we have established animal models of bariatric surgery and are currently interested in further exploring changes in appetite, eating behavior, food preferences, and normalization of diabetic symptoms.

Liver Perfusion Machine

Collaborations / Sponsors:

- Prof. Michelangelo Foti (University of Geneva)
- Prof. Jean-Francois Dufour (University of Bern)
- Prof. Gerald Schwank (ETH Zurich)
- Prof. Sabine Werner (ETH Zurich)
- Prof. Jean-Marie Lehn (University of Strasbourg)
- PD Dr. Andreas Boss, Department of Radiology, University Hospital Zurich
- Prof. Dr. Mathias Heikenwälder, PhD, (TUM Munich)
- Prof. Dr. Adrian Hehl, MD, (University of Zurich)
- Prof. Dr. Achim Weber, MD, (University Hospital Zurich)
- Prof. Aurel Perren (Universität Bern)
- Prof. Arnold von Eckardstein (University Hospital Zurich)
- Prof. Thorsten Hornemann (University Hospital Zurich)
- Prof. Martin Pruschy, (University of Zurich)
- Dr. Daniela Lenggenhager, (University of Zurich)
- Prof. Philipp Rudolf von Rohr (ETH Zurich)
- Various clinical collaborations

Prof. Dr. med.
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PhD, Director

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Rolf Graf

Prof. Dr. med.
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Prof. Dr. med.
Mickael Lesurtel,
PhD

Prof. Dr. med.
Yinghua Tian

PD Sabrina Sonda,
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Dipl. phil. II
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Dr. med. pract.
Dilmurodjon
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Dr. med.
Patryk
Kambakamba,
Research Fellow

Dr. med.
Philippe Kron,
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Conny Waschkies,
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Marta Bombardo
Ayats,
PhD Student

Katja Kachaylo,
PhD Student

Enrica Saponara,
PhD Student

Zhuolun Song,
PhD Student

Nathalie Borgeaud,
PhD Student

Magda Langiewicz,
PhD Student

Dr. med.
Marcel Schneider,
PhD Student

Rong Chen,
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Leandro Mancina,
Trainee

Ermanno Malagola,
PhD Student

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Dr. med.
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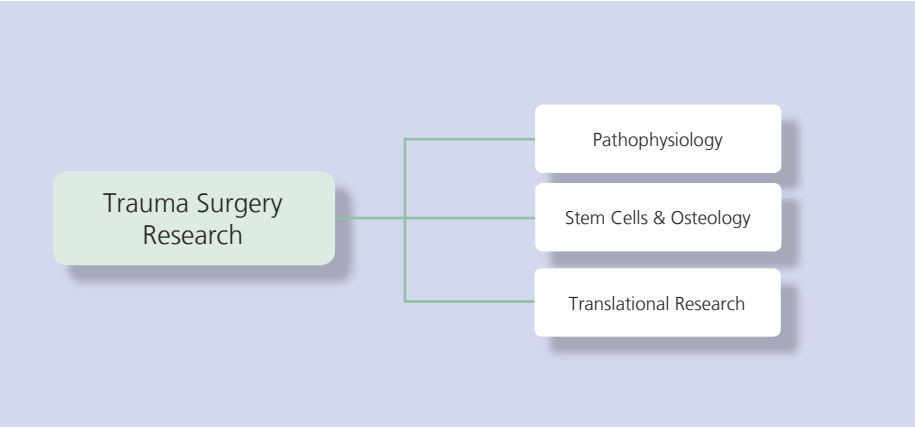
Eleonora Maurizio
Lab. Technician

Nadja Bain, M.Sc.,
Lab. Technician

Raphael Buzzi,
cand. med.

Trauma Surgery Research



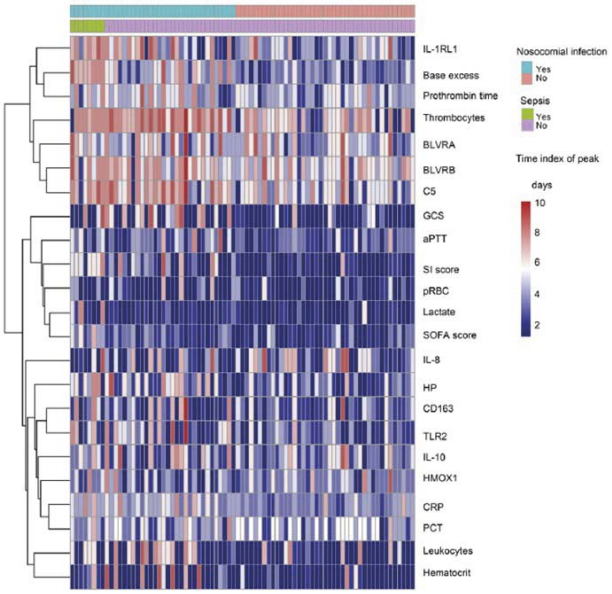
Prof. Dr. med.
Hans-Peter Simmen,
Director

PD
Paolo Cinelli,
PhD

We are interested in all aspects of research that can improve treatment of severely injured patients at basic, translational and clinical levels. Our main interests are the study of the pathophysiology of trauma and the development of regenerative approaches for improving bone healing.

Pathophysiology of trauma

Traumatic injuries induce a complex host response that disrupts immune system homeostasis and triggers a systemic inflammatory response that predisposes patients to opportunistic infections and inflammatory complications leading to secondary complications, such as nosocomial infections, sepsis or multi-organ failure.

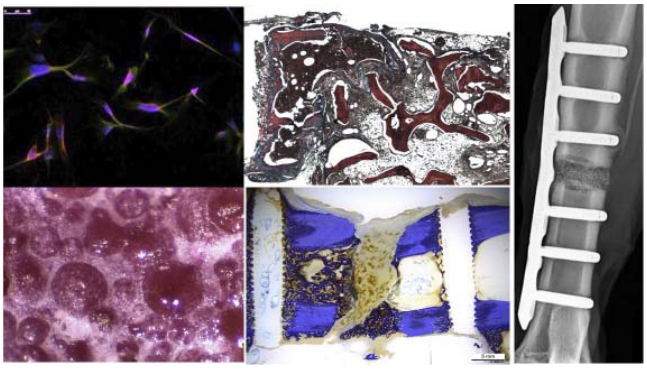


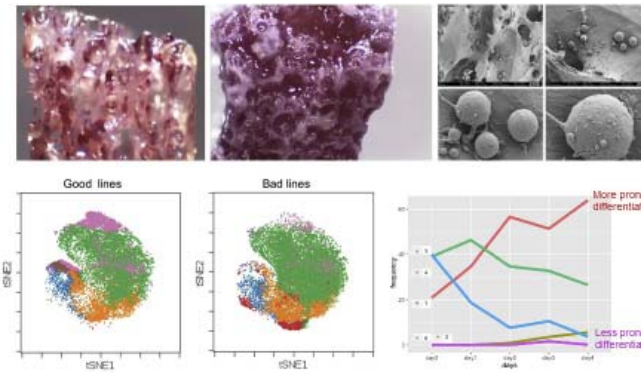
Our studies aim at the identification of mechanisms linked to complicated courses after severe trauma by a systems biology approach. We perform prospective studies by using RNA samples from circulating leukocytes from patients with multiple injuries and analyze the dynamic changes in gene expression. Transcriptome profiling is combined with an extensive clinical data analysis in order to identify prognostic markers characteristic for systemic inflammation and sepsis. The data obtained is not only of great importance for defining the appropriate treatment of the patients but allows the identification of the mechanisms underlying the regulation of the immune system upon severe trauma. We found for example strongest changes between patients with either systemic inflammation or sepsis in gene expression of the heme degradation pathway. Analyses of the key components haptoglobin (HP), cluster of differentiation (CD) 163, heme oxygenase-1 (HMOX1), and biliverdin reductase A (BLVRA) showed robust changes following trauma. Upregulation of HP was associated with the severity of systemic inflammation and the development of sepsis. Patients who received allogeneic blood transfusions had a higher incidence of nosocomial infections and sepsis, and the amount of blood transfusion as source of free heme correlated with the expression pattern of HP. These findings indicate that the heme degradation pathway is associated with increased susceptibility to septic complications after trauma.

Stem Cells & Osteology

Tissue engineering research has endeavored to search for novel sources of stem cells other than bone marrow mesenchymal stem cells (MSCs) for bone regeneration and repair. Fractures with a critical size bone defect (e.g. open fracture with segmental bone loss) are associated with high rates of delayed- and non-union. The prevention and treatment of these complications remain a serious issue in trauma and orthopaedic surgery. Autologous cancellous bone grafting is a well-established and widely used technique. However, it has some drawbacks related to availability, increased morbidity and insufficient efficacy. Mesenchymal stem cells (MSCs) can potentially be used to improve fracture healing. Particularly human fat tissue has been identified as a good

source of multilineage adipose derived stem cells (ASCs), which can be differentiated into osteoblasts. The main issue is that MSCs are a heterogeneous population of progenitors and lineage-committed cells harboring a broad range of regenerative properties. This heterogeneity is also mirrored in the differentiation potential of these cells.
In our studies we test the possibility to enrich defined subpopulations of stem/progenitor cells for direct therapeutic application without requiring an *in vitro* expansion. The most promising enriched stem cells populations are tested for their regeneration capacity in mouse models. We enriched a defined populations obtained from the stromal vascular fraction of fat tissue, characterize these cells and test their osteogenic differentiation capacity *in vitro* and *in vivo* in a mouse model for critical size bone injury. Our results confirmed for example the ability of enriched CD146+NG2+CD45– pericytes to efficiently generate osteoblasts *in vitro*, to colonize cancellous bone scaffolds and to successfully contribute to regeneration of large bone defects *in vivo*. This study represents proof of principle for the direct use of enriched populations of cells with stem/progenitor identity for therapeutic applications.
For the identification of new cell subpopulations we employ modern technologies like Cytometry by time-of-flight (CyTOF) allowing the real-time analysis of single cells in complex populations. Single cells, labelled with stable heavy metal isotopes are analyzed by a combination of classical flow cytometry and mass spectrometry analysis. With the aim to analyze the heterogeneous composition of adipose derived stem cells (ASCs) we designed a panel of markers for labeling of the cells which would allow dissecting the population composition of ASCs and following their path of differentiation towards bone. We investigated undifferentiated ASCs lines obtained from different patients. This strategy allowed us to confirm for the first time, that indeed ASCs consist of mixed (progenitor/stem cells) populations of cells, but also that striking differences are present between ASCs preparations from different patients.





Collaborations/Sponsors:

- Clinical Trials Center, University Hospital Zurich
- Orthopedic Research Laboratory, Biomechanics, UniversityHospital Balgrist, Zurich
- Michael Bauer, Institute for Anesthesiology and Intensive Care Medicine, University Hospital Jena, Germany
- Jan Schwab, Klinik und Poliklinik für Neurologie & Experimentelle Neurologie, Charité Universitätsmedizin Berlin
- Institute for Biomechanics, ETH, Zurich
- Center for Applied Biotechnology and Molecular Medicine (CABMM), University of Zurich
- Brigitte von Rechenberg, Musculoskeletal Research Unit, Vetsuisse Faculty, University of Zurich
- Markus Huber-Lang, Dept. of Traumatology, Hand-, Plastic and Reconstructive Surgery, University Hospital Ulm, Germany
- Armin Curt, Spinal Cord Injury Center, University of Zurich and University Hospital Balgrist
- Peter A. Ward, Dept. of Pathology, University of Michigan Medical School, Ann Arbor, USA
- Alessio Fasano, Mucosal Biology Research Center, University of Maryland, Baltimore, USA
- Michael Flierl, Philip Stahel, Dept. of Orthopaedic Surgery, Denver Health Medical Center, USA

Awards:

Daisy Canepa
Special Prize from the Faculty of Science of the University of Zurich for the Master Thesis “Identification of adipose derived stem cell subpopulations for bone regeneration“.

Prof. Dr. med.
Hans-Peter Simmen,
Director

PD Dr. sc.nat.
Paolo Cinelli

Prof. Dr. med.
Clément Werner

Prof. Dr. med.
Guido A. Wanner

Dr. sc.nat.
Elisa Casanova
Zimmermann

Daisy Canepa
Master Student

Dr. sc.nat.
Urs Graf

Dr. med.
Kai Sprengel

PD Dr. med.
Georg Osterhoff

Dr. med.
Elisabeth Wanner

Dr. med.
Sebastian Günkel

Dr. med.
Michael Plecko

Dr. med.
Simon Tiziani

Dr. med.
Stefan Zimmermann

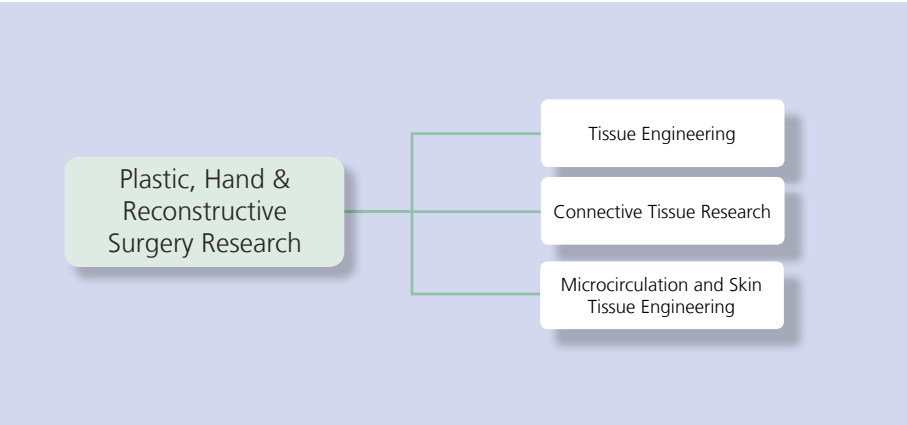
Dr. med.
Thorsten Jentzsch

Dr. med.
Sacha
Halvachizadeh

Sonja Hemmi,
Lab. Technician

Sonja Märsmann,
Lab. Technician

Plastic, Hand & Reconstructive Surgery Research



Prof. Dr. med. Pietro Giovanoli, Director

PD Dr. med. Maurizio Calcagni

Research activities in the Plastic Surgery and Hand Surgery lie in the fields of microcirculation, connective tissue research, skin grafts, motion analysis and allotransplantation:

Microcirculation and Wound Healing
For 2016, PCH's microcirculation and tissue engineering group lead by Prof. Lindenblatt has taken on new applications of the dorsal skinfold chamber mouse model. From the vascularization of biomaterials, to wound healing, and pre-clinical proof-of-concept of pharmaceuticals, they have shown that this classical model can be utilized for more than its traditional use. Additionally, based on the success of the use of bacterial cellulose in a collaborative wound healing project (*Bottan et al 2015, Hylomorph AG*), large animal studies for the prevention of fibrosis and hard tissue formation in transplants has been investigated with clinical trials planned for the near future. The outlook for 2017 includes new endeavors in a multidisciplinary collaboration for the HMZ Flaghip 2016 Project "Skintegrity", where innovative approaches for diagnosis and therapy of skin diseases and of wound healing will be investigated.

Connective Tissue Research and Tissue Engineering
In collaboration with the ETH Zurich (Prof. Vogel) and the company *ab medica*, Italy, tendon rupture repair by an implant has been optimized: an emulsion electrospun and a coaxially electrospun DegraPol® tube that is biocompatible, biodegradable and very elastic, enabling the surgeon an easy handling during implantation has been developed and tested in the full transection rabbit Achilles tendon model. Biomechanical results are promising and further pre-clinical experiments are planned.
Furthermore, bone tissue engineering *in vitro* is being performed and several new approaches including bioreactors are conducted (collaboration with Prof. Stark ETH Zürich). Different compression and perfusion regimen enable to trigger intended stem cell differentiation.

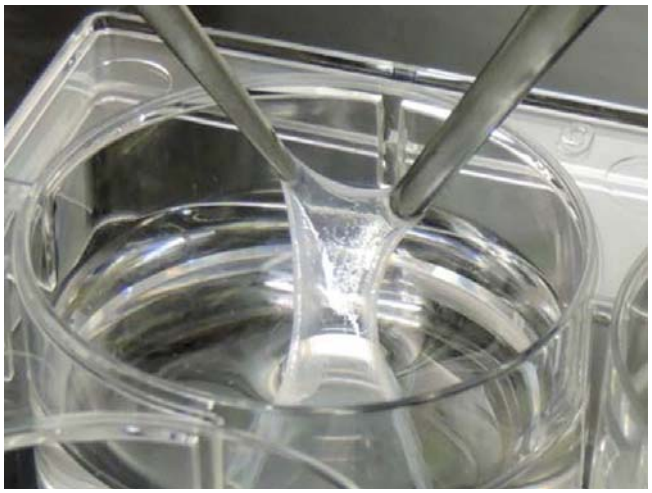


Figure 1 Skin graft

Kera-Sheet Innovation Project
Within the framework of the Kera-Sheet Innovation Project, the production of autologous keratinocyte sheets (Figure 1), so-called Cultured Epithelial Autografts (CEAs), will be established for the treatment of patients with severe burns. In compliance with the highest quality and safety guidelines, the cultured skin grafts will be produced in-house at the University Hospital of Zurich, ensuring a seamless contact between manufacturing and the clinical team. The aim is to enhance the safety and potency of these grafts and define a transplantation window with the highest efficiency. As such, the successful treatment of major burns can save many lives, all the while adhering to the highest standard of safety.

3-D motion analysis of the finger and wrist during activities of daily living

The constant strive to optimize surgical procedures to achieve better functional results and reduce the rate of complications is one of the most important goals for all surgeons. In the hand and wrist motility equals function, therefore, its quantitative, standardized, objective and reproducible measurement in standard movements and in the activities of daily living (ADL) is probably the most reliable mean to assess the real recovery of the hand after a medical treatment (*Metcalf et al., 2008*). We started the development of a new marker set (Figure 2) and data analysis routine which allows for a proper description of kinematics of the fingers, hand and wrist. In august 2016 20 healthy volunteers were included in the study. They performed a set of ROM (range of motion) trials and 10 ADL tasks recorded by 11 Vicon cameras on two different test days to assess repeatability.

The high repeatability of functional joint centres and axes are very promising preliminary results. The next steps are the identification of the most relevant motion parameters, the implementation on a larger scale in order to build a databank of normative values and to implement the 3-D motion analysis to study the outcome after major injuries to the hand.

Figure 2 Marker set

Allotransplantation

Current clinical studies include the investigation of infection and sepsis related biomarkers in severely burned patients aiming for a better understanding of inflammatory processes during the acute phase of injury. Additionally, the emergence of HLA antibodies when treating burn patients with allogeneic skin grafts and blood products represents another field of current research. Further clinical projects include the investigation long-term outcomes.

On the basic science level, the group of Prof. Jan Plock is investigating in the field of reconstructive transplantation, also known as vascularized composite allotransplantation (VCA), which includes anatomical and functional restauration of limb, face or other composite tissues with major defects. In rodent and porcine limb transplantation models, we set a special focus on the development of novel conditioning protocols to improve graft tolerance and possibly reduce the need for immunosuppressive drugs, combining transient therapy with modern immunosuppressants and tailored local or systemic cell therapy.

Further, we investigate the potential of stem cell administration and their mechanisms for reduction of graft vasculopathy in acute and chronic rejection. Chronic rejection is a serious issue in VCA, hampering optimal functional regeneration and jeopardizing graft survival.

To measure the long-term results of our novel therapies in terms of functional outcome, we are starting with dynamic tests by means of video-recorded swim tests of hind-limb transplanted rats, which allows for measurement of a variety of functional parameters.

Collaborations:

- Prof. V. Vogel, ETH Zürich
- Prof. J. Snedeker, ETH Zürich und Universität Zürich
- *ab medica*, Italy
- Prof. W.J. Stark, ETH Zürich
- Dr. Aldo Ferrari, PhD, Dr. Simone Bottan, PhD. Laboratory of Thermodynamics in Emerging Technologies. ETH Zurich
- Ast. Prof. Dr. Tomás Egaña, PhD, Pontificia Universidad Católica de Chile, Santiago, Chile, and TUM Munich, Germany
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- PD Dr. Christoph Starck MD, Department of Cardiovascular Surgery, Klinikum Charite Berlin, Germany
- Prof. Dr. Arnold von Eckardstein, Institut für klinische Chemie, Universitätsspital Zürich
- Dr. Christian A. Schmidt, MD, PhD, Clinic for Cardiovascular Surgery, University Hospital Zurich
- Prof. Dr. Deon Bezuidenhout, MD, Cardiovascular Research Unit, University of Cape Town, South Africa
- Prof. Dr. Simon P. Hoerstrup, MD, PhD, Department of Surgical Research and Clinic for Cardiovascular Surgery, University Hospital Zurich
- Dr. Katrin Kerl, Department of Dermatology, University Hospital Zürich
- Prof. Urs Ziegler, Claudia Domröse, Klaus Marquardt, Center for Microscopy and Image Analysis, University of Zurich
- Prof. Dr. Brigitte Vollmar, MD, Institute for Experimental Surgery, University of Rostock, Germany
- Prof. Dr. Martin Glocker, MD, Proteome Center, University of Rostock, Germany
- Prof. Dr. Michael D. Menger, MD, Institute for Clinical and Experimental Surgery, University of Saarland, Germany

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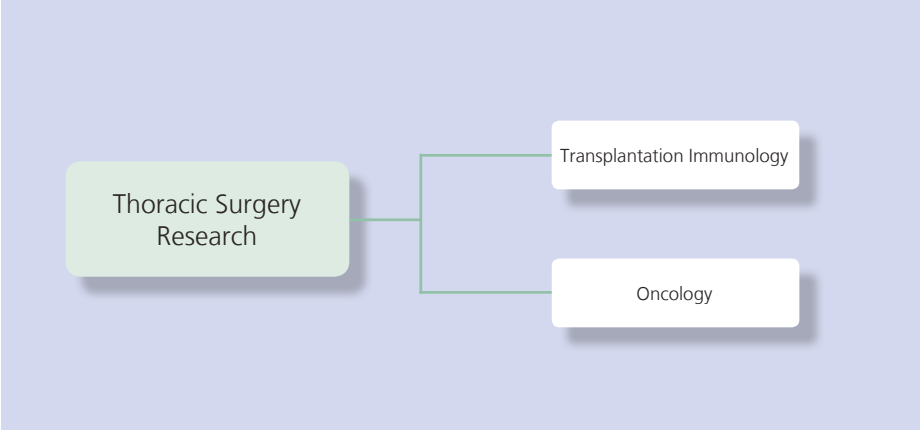
Thoracic Surgery Research



Prof. Dr. med. Walter Weder, Director

Prof. Dr. med. Isabelle Opitz

Research in thoracic surgery focuses on different areas, such as oncology and transplantation.

Mesothelioma

One of the topics in cancer research is the development of therapeutic strategies for malignant pleural mesothelioma (MPM), an incurable thoracic malignancy related to asbestos exposure. After several years of preclinical and early clinical trials, we currently apply intracavitarily cisplatin/fibrin after macroscopic complete resection in a phase II trial to prevent local tumor recurrence (NCT01644994) (Figure 1). Various tumor biomarkers that can be useful for the prediction of disease aggressiveness and response to treatment are assessed in translational studies. In addition to protein expression and mutation profiles, we are evaluating microRNAs for their potential utility as prognostic and predictive biomarkers for the selection of patients for multimodality treatment. Besides, we are exploring novel targets for the treatment of MPM using *in vitro* cell models and pre-clinical animal models. Furthermore, we also assess the frequency germline mutation of BAP1 that predispose individuals to MPM.

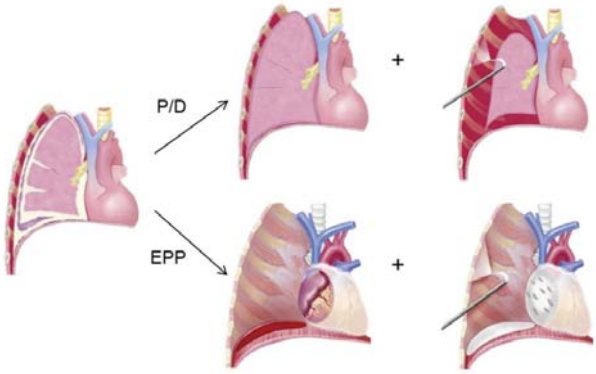


Figure 1: Macroscopic complete resection (MCR) of malignant pleural mesothelioma through P/D or EPP, followed by inctracavitary chemotherapy with cisplatin/fibrin (INFLuenCe-Meso).

Chronic thromboembolic pulmonary hypertension

On the topic of chronic thromboembolic pulmonary hypertension we are interested in implementing modern imaging techniques to better diagnose patients and to estimate the operability.

Lung cancer

With regard to lung cancer research, we are developing a new mass spectrometry protocol for the quantitation of serine hydrolases enzymatic activities in lung adenocarcinoma surgical resection specimens. The application of this new methodology will allow us to validate the biomarkers previously discovered in our last study. (Figure 2)

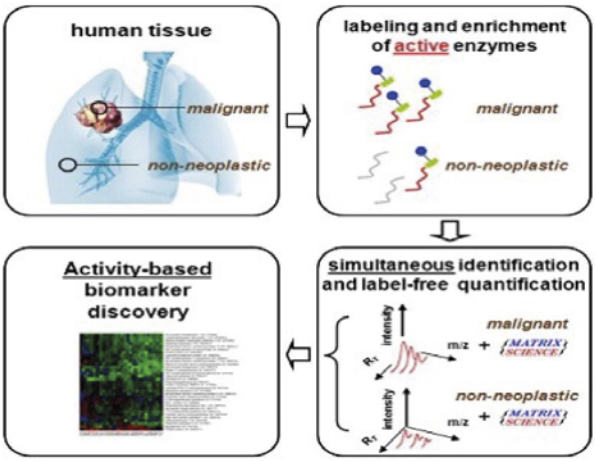


Figure 2: We screen lung resection specimens with activity based biomarker discovery and mass spectrometry and search for a) the modulation of enzyme activities caused by posttranslational events occurring during lung cancer progression, and b) new enzymatic targets to develop novel anti-lung cancer therapies

Lung transplantation
Another focus of our research is lung transplantation. Currently lung transplantation is the accepted treatment option for patients in end-stage lung disease. Waiting list mortality is continuing to be an issue among lung transplant candidates even after three decades of success stories in the field. Novel strategies have been implemented to overcome this shortage, such as application of extended criteria (marginal) donor lungs, donation after cardiac death donors, living donor lobar lung transplantation, and *ex vivo* lung perfusion for re-evaluation of injured donor lungs. ***Ex vivo* lung perfusion (EVLP)** provides future potential for the re-evaluation, treatment, and repair of injured donor lungs for transplantation by using alternative approaches.
Recently, we are interested in using cytokine filters during EVLP. The results are encouraging and this strategy will be tested in future in a large animal transplant model.
Immunological interfaces: Another research interest focusses on **immunological interfaces** in experimental lung cancer and lung transplantation. Our previous research showed that the inhibition of CD26/DPP4 by Vildagliptin resulted in a reduction of incidence and growth of lung metastasis from colorectal cancer *in vivo*. In our ongoing work, we show that upon CD26/DPP4-inhibition, antitumoral macrophages and NK cells enrich within lung tumors and enhance their activity and cytotoxicity against the tumor thus leading to a significant reduction of lung tumor burden. Ongoing work in our experimental lung transplantation research explores the role of IL-2 stimulated and enhanced regulatory T cells, which leads to viable long term engraftment in a fully MHC-mismatched mouse lung transplantation model.

Further clinical research focuses on refinement of existing programs such as our PEA and LVRS programs.

Lung volume reduction surgery (LVRS) for emphysema: In the field of lung volume reduction surgery focus is on outcome research. Additionally, patient selection criteria and pre-operative imaging is the focus in several studies.

Awards:

Opitz Isabelle, Friess Martina, Meerang Mayura, Kirschner Michaela, Bérard Karima, Olivia Lauk, Weder Walter
Poster Prize at the Joint Meeting of the German, Austrian and Swiss Societies for Surgery, Freiburg, Germany
“Factors associated with long term freedom from recurrence after induction chemotherapy and extrapleural pneumonectomy in mesothelioma patient”

Kathrin Oehl
Best poster prize of the Swiss Biotech Network at the Retreat of the MTB graduate school «Tracking the Clonal Origin and Chemotherapy Resistance of Malignant Pleural Mesothelioma» (Co-Author)

Kathrin Oehl
Prize for the best oral free paper presentation at the 3rd Joint Annual Meeting of the Swiss and Austrian Societies of Pathology in Vienna, Austria, «Tracking the Clonal Origin and Chemotherapy Resistance of Malignant Pleural Mesothelioma» (Co-author)

Claudio Caviezel
“ ESTS-AME-Prize Observership Attachment in China 2016” at the annual ESTS meeting in Naples

Ilker Iskender, Tugba Cosgun, Stephan Arni, Michael Trinkwitz, Stefan Fehlings, Nikola Cesarovic, Thomas Frauenfelder, Walter Weder, Ilhan Inci
SGC Best Poster Prize 2016 “Cytokine Filtration Modulates Pulmonary Metabolism and Edema Formation During *Ex Vivo* Lung Perfusion”

Wolfgang Jungraithmayr
Chair Position at Medical University Brandenburg
1st placed-listed W3-Professorship and offer for the Chair position at the Medical University Brandenburg (Lehrstuhl), Department of Thoracic Surgery, Germany.

Collaborations:

- Institut klinische Biochemie der Universität Antwerpen, Belgien
- Eidgenössische Technische Hochschule (ETH) Zürich, CH
- Klinik für Pneumologie, Universität Leuven, Belgien
- Institute of Physiology, Perelman University Pennsylvania, Philadelphia, USA
- Institut für Molekularbiologie, Universitätsspital Zürich, Universität Zürich, CH
- Klinik für Immunologie, Universitätsspital Zürich, CH
- Centre Hospitalier, Department of Thoracic Surgery, Strasbourg, France (Gilbert Massard)
- Dr. Shampa Chatterjee, Associate Professor, Institute for Environmental Medicine University of Pennsylvania
- Gilles Willemin, Mouse Metabolic Evaluation Facility (MEF), Center for Integrative Genomics, University of Lausanne
- Dr. Serena Di Palma, Functional Genomics Center Zurich, ETH Zurich/University of Zurich
- Dr. Keke Yu, Department of Pathology, Shanghai Chest Hospital, Shanghai, China
- Dr. Tatjana Sajic and Prof. Ruedi Aebersold, Department of Biology, Institute of Molecular Systems Biology (IMSB), ETH Zurich, Switzerland
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- Prof. Dr. R. Bueno, Department of Surgery, Brigham and Women's Hospital, Boston
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- Prof. Dr. D. Günther, Labor für organische Chemie, ETH Zürich
- Prof. Dr. B. Seifert, Department of Biostatistics, Epidemiology, Biostatistics and Prevention Institute, University of Zürich
- PD Dr. T. Frauenfelder, Dr. D. Nguyen-Kim, PD Dr. A. Boss, Institut für diagnostische und interventionelle Radiolgie, UniversitätsSpital Zürich
- Prof. Dr. M. Pruschy, Dr. A. Broggini-Tenzer, Institut für molekulare Radiologie, UniversitätsSpital Zürich
- Prof. Dr. M. Carbone, Prof. Dr. H. Yang, Prof. Dr. G. Gaudino, University of Hawai'i, Cancer Center, Honolulu
- Prof. Dr. G Reid, Prof. Dr. N. van Zandwijk, Asbestos Diseases Research Institute, Sydney, Australia
- Dr. Alessandra Curioni, Prof. Rolf Stahel, Clinic of Oncology, Zurich University Hospital
- Dr. Bart Vrugt, Institute for Surgical Pathology, Zurich University Hospital
- Dr. Hubert Rehrauer, Functional Genomic Center, University of Zurich
- Prof. Lorenza Penengo, IMCR, University of Zurich
- Prof. Beat Schwaller, Department of Medicine, University of Fribourg
- Prof. Egbert Smit, NKI, Amsterdam
- Dr. Victor Van Beusechem, Department of Medical Oncology VUmc, Amsterdam

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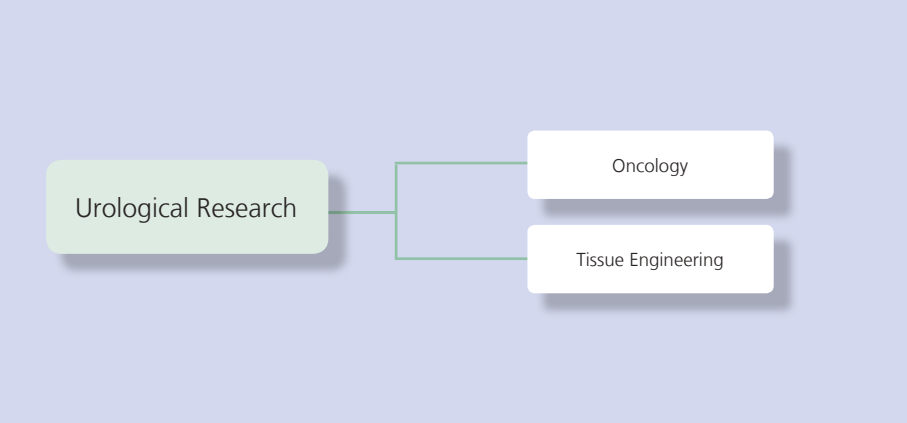

The department of Urology focuses its research interests on the two areas, which are Uro-Oncology and Tissue Engineering.

Novel immunological interventions relying on an active immune system

To study the complex interactions between the immune system and tumors we engage in three specific projects:

Banking of human antibody repertoires for therapeutic use: The main aim of this CTI project in collaboration with MEMO therapeutics is to establish a library ("antibody bank") of human antibody repertoires of individuals that have successfully mastered a disease. The comparison of the BKPyV-specific antibody repertoire in patients vs. healthy donors is expected to yield insights into the immune defense mechanisms that are required to control BKPyV-related diseases.

Prostate cancer-specific bispecific antibodies (biAbs) to prevent and treat prostate cancer: We are currently studying the interaction of a bispecific antibody, the TCT001 (STEAP1 x CD3 bsAb) with multiple malignant prostate cancer subpopulations to treat this cancer. The combinatory treatment with an additional tool for co-stimulatory activation (TCT002, EpCAM x CD28 bsAb) will enhance cytotoxic effects.

The indoleamine 2, 3-dioxygenase (IDO) as marker for prostate cancer diagnosis: IDO is an enzyme that degrades the essential amino acid tryptophan, thus inhibiting T cell proliferation and activity. It is predominantly induced in inflammatory environments. We were the first group proving the potential use of IDO as a marker in prostate cancer.

Diagnosis of Bladder Cancer

By investigations on prognostic markers and changes in methylation patterns in superficial bladder cancer we aim at the detection of a recurrent bladder cancer in urine or serum in a non-invasive manner. Applying a series of different detection methods, we also investigate upregulated genes specifically affecting angio- and/or lymphangiogenesis and thereby increasing the metastatic potential of invasive bladder cancer.

Furthermore, by Tissue Micro Arrays as well as by whole exome DNA sequencing to detect point mutations, gene fusions or chromosomal amplifications we aim to evaluate biomarkers as candidates for bladder cancer prognosis.

Focus Prostate Cancer Studies

The long-term observational study proCOC (Prostate cancer outcome study) collects serum and prostate tissue of patients with localized prostate cancer who underwent surgery. Since heterophilic antibodies might interfere with a diagnostic PSA testing and thereby falsify the resulting PSA value, in a prospective study and in collaboration with the Institute of Clinical Chemistry we investigate the frequency and the extent to which PSA-testing is altered by heterophilic antibodies.

Multiple androgen receptor (AR) dependent and independent resistance mechanisms limit the efficacy of current treatment modalities for castration resistant prostate cancer (CRPC). Autophagy is a survival mechanism in cells exposed to anti-cancer treatment. We hypothesized that also a promising N-terminal targeting-AR treatment may lead to up-regulation of autophagy, which can be targeted by a combination therapy with autophagy inhibitors.

Urologic Tissue Engineering

Targeting urologic diseases such as urinary incontinence, the Tissue Engineering group is engaging in research using several approaches.

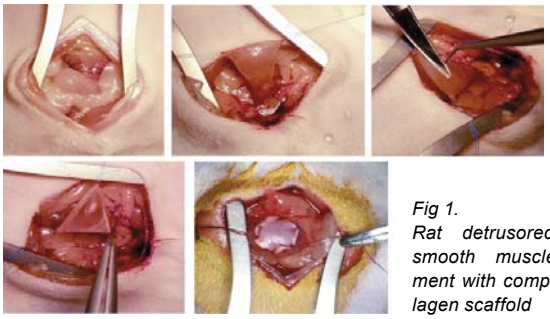

Fig 1.
Rat detrusorectomy and smooth muscle replacement with compressed collagen scaffold

Adipose derived stem cells (ADSC) might be a key instrument to bioengineer contractile bladder tissue when differentiated to smooth muscle cells. However, it is uncertain whether these cells maintain their cell fate long term *in vivo*. It is our aim to evaluate different combinations of cells to improve the bladder tissue formation, by improving the microenvironment and cell-to-cell interactions.

As autologous SMC cannot be harvested from organs with end-stage disease and tissue regeneration requires large amount of functional SMC, there is an urgent need for other cell sources. ADSC are suitable cell source for SM tissue engineering. We investigate the functional role of autophagy during differentiation and remodeling of ADSCs to SMC *in vitro.*

Previously, we also analyzed the impact of PGC-1α-genetically modified human muscle precursor cells on muscle tissue formation. More recently, we analyzed the impact of PGC-1α-genetically modified human muscle precursor cells (MPC) on in situ muscle tissue regeneration in a Tibialis anterior crush injury mouse model.

As part of an international consortium in Horizon 2020, we joined forces to fight urinary stress incontinence in a project entitled **Multisystem Cell Therapy for Improvement of Urinary Incontinence (MUSIC)**. In a first stage clinical trial patient-specific muscle precursor cells will be produced under good manufacturing practice conditions and re-injected into the patient. In combination with electromagnetic stimulation we expect a better regeneration of the sphincter muscle. A central concern associated with the use of any cell source for tissue engineering is the non-invasive monitoring of *in vivo* tissue formation. We therefore apply magnetic resonance imaging to directly assess stem cell differentiation and skeletal muscle fiber formation.

Since the regenerated tissue quality after stem cell therapy is crucially important for its proper function, we apply neuromuscular electromagnetic stimulation (NMES) to support *in vivo* tissue development, cell survival and innervation.

Another aim is to develop a functional substitute for the improvement of bladder wall function for patients suffering from end-stage bladder disease. We are currently investigating the regenerative capabilities of primary bladder smooth muscle cells and pre-differentiated, smooth muscle-like adipose-derived stem cells in compressed collagen hydrogel scaffolds.

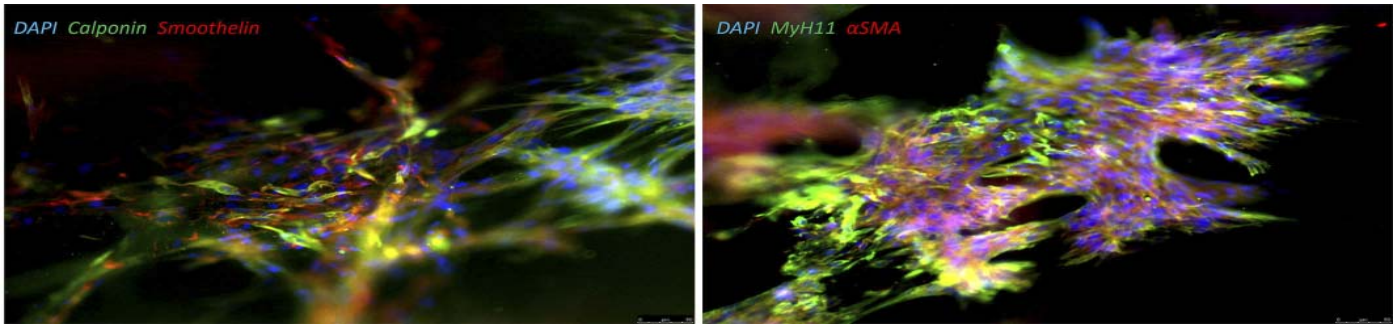

Fig 2. Smooth muscle and adipose-derived stem cells grown in compressed collagen scaffold for 2 weeks and stained for SMC marker

Collaborations:

- Prof. Hans H. Hirsch, Transplantation and Clinical Virology, Department of Biomedicine, University of Basel
- Prof. Pasquale Ferrante and Dr. Serena Delbue, Department of Biomedical Surgery and Dental Sciences, University of Milan, Italy
- Prof. Mauro Tognon, Department of Morphology, Surgery and Experimental Medicine, University of Ferrara, Italy
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- Prof. Dr. Michael Detmar, Institute of Pharmaceutical Sciences, ETHZ
- Prof. Dr. Peter Wild, Institute of Surgical Pathology University Hospital Zurich
- Proteomedix AG
- University of Applied Science North Western Switzerland (FHNW)
- Prof. Dr. Arnold von Eckardstein, Institute of Clinical Chemistry
- Dr. Andrew Vickers, Memorial Sloan Kettering Cancer Center, New York, USA
- Prof. Dr. Donna Ankerst, Technical University, Munich
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- Dr. Maya Horst, Division of Pediatric Urology, University Children's Hospital Zurich

- Prof. Hans Uwe Simon, Pharmacology Institute; Bern
- Prof. Dr. Simon M. Ametamey, Dpt. Pharmaceutical Sciences, ETHZ, Zurich, Switzerland
- Prof. Dr. Christoph Handschin, Biozentrum Basel, Basel, Switzerland
- PD Dr. med. Andreas Boss, Institute for Diagnostic and Interventional Radiology, USZ
- Dr. sc. nat. Martin Ehrbar, Division of Obstetrics, University Hospital Zurich

Awards:

Oliver Gross
Poster Prize at the Conference of the European Association of Urology (EAU München 2016) Session Prostate Cancer Diagnosis
“Minimizing the Gleason score upgrade from biopsy to prostatectomy specimen through mpMRI and template mapping fusion biopsy”


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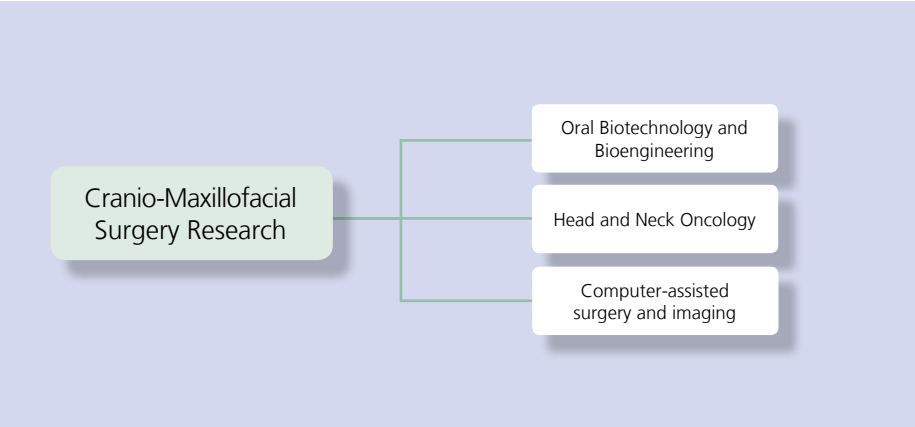
Cranio-Maxillofacial Surgery Research



Prof.
Dr. med. dent.
Martin Rücker

Prof.
Franz E. Weber,
PhD

Research in the Department of Cranio-Maxillofacial Surgery covers head and neck oncology, computer assisted surgery, photodynamic therapy, and oral biotechnology & bioengineering. The focus of the latter one is the development and realization of patient specific bone substitutes. This encompasses osteoinduction by growth factors and osteoconduction by scaffolds. In focus is additive manufacturing of bone substitutes with the final aim to deliver patient specific, osteoconductive bone substitutes for our patients. The project on additive manufacturing of bone substitutes is funded by the Swiss National Science Foundation and includes partners from the University of Applied Science (Muttenz, Switzerland) and the PolyU (Hong Kong). The materials used for additive manufacturing are titanium, magnesium, hydroxyapatite, tri-calcium phosphates and Bioglass. Only the first one is not degradable. All the others degrade over time and allow the final step of osteoconduction, called creeping substitution of the scaffold by newly formed bone. This setting allows studying osteoconduction dependent on material, surface and microarchitecture. The combination of osteoconductive scaffolds with osteoinductive hydrogels is facilitated by the long time experience established over the last decade on synthetic and natural hydrogels and their combination with growth factors.

The same combination: hydrogel and growth factors can also be utilized for the regeneration of teeth in particular of the pulp. Here the goal is to keep the tooth as long as possible alive before it has to be replaced by a dental implant. A Bundesstipendium supports this project for the next 3 years.

The solubility of drugs is a major problem in pharmacy. To facilitate the administration of drugs of low solubility, the federal drug administration in the USA and the European authorities approved 2 excipients. In the last year, we could show that both excipients approved in the US and in the EU bind bromodomains, act on the level of epigenetics, and show activities *in vivo*. In preclinical trials, they were shown to enhance bone regeneration, inhibit bone degradation, and inhibit inflammation and adiposity. Therefore, they appear as new potential drugs to treat and inhibit osteoporosis and other inflammation related diseases.

Computer assisted surgery is another focus in our department. Here we want to optimize the digital planning of operations and move on towards automation of planning and quality control. Finally, we want to offer our patients patient-specific implants and osteosynthesis materials.

Head and Neck Oncology is partner in a University project (KFSP) to study and provide new tools for the monitoring of oxygenation of tumors and the prognostic and therapeutic impact of this parameter. A new project has started on the field of prevention and treatment of periimplantitis by photodynamic therapy. The goal of this project is to identify photosensitive agents able to kill microorganisms upon stimulation with light. This project will be important in the long term since more patients have tooth implants, and the number of complications with periimplantitis are on the rise.

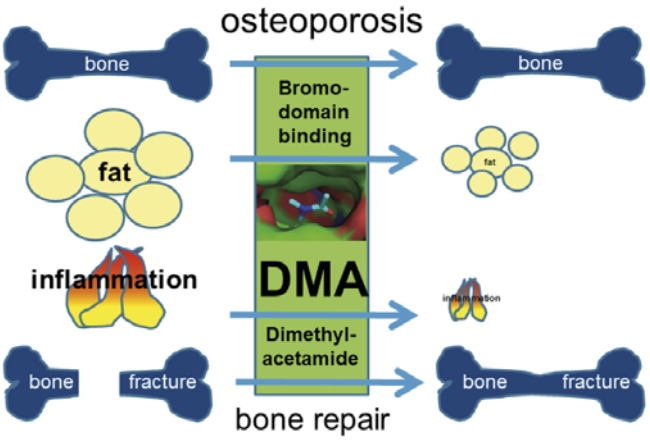


Figure 1: Effect of the excipient dimethylacetamide (DMA) on osteoporosis, adiposity and inflammation (from: Ghayor et al Scientific Report (2017).

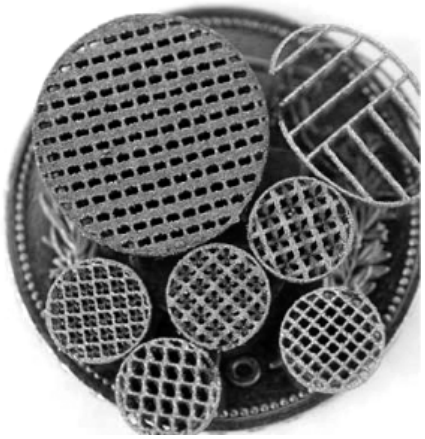


Figure 2: Titanium scaffolds produced by additive manufacturing (from de Wild et al., 3D Printing and additive manufacturing (2016))

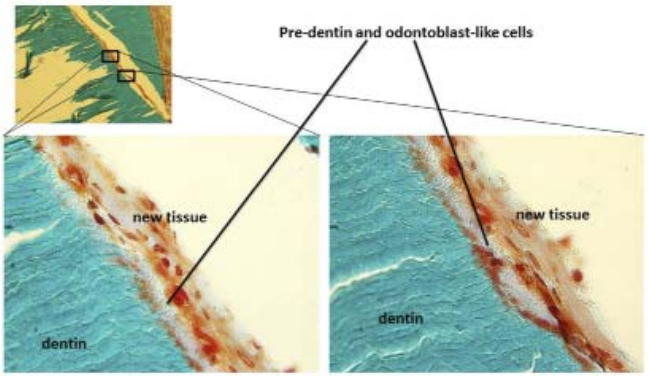


Figure 3: Pulp regeneration facilitated by a fibrin gel yields in formation of pre-dentin by odontoblast-like cells.

Collaborations:

- University of Applied Sciences Northwestern Switzerland, School of Life Sciences, Institute for Medical and Analytical Technologies (Prof. Michael de Wild, Prof. Ralf Schumacher)
- Department of Fixed and Removable Prothodontics and Dental Material Science, University of Zurich, Switzerland (Prof. Ch. Hämmerle, Prof. Dr. Ronald Jung, PD Dr. Daniel Thoma)
- Division of Preventive Dentistry, Periodontology, and Cariology, University of Zurich, Center of Dental Medicine, Zurich, Switzerland (Prof. T. Attin, Prof. M. Zehnder, Prof. P. Schmidlin)
- Department of Masticatory Disorders, University of Zurich, Switzerland (Prof. L. Gallo)
- Division of Obstetrics (Prof. R. Zimmermann, Dr. Martin Ehrbar)
- EPFL Institute of Bioengineering (Prof. M. Lütolf)
- ETH Zurich, Department of Chemistry and Applied Biosciences (Prof. W. Stark)
- ETH Zurich, Cartilage Engineering + Regeneration (Prof. M. Zenobi-Wong)
- Universität Hongkong, Prof. R. Zwahlen
- AO Research Institute, Davos, Switzerland (Prof. M. Alini)
- Surgical Planning Laboratory, Brigham & Women's Hospital, Harvard Medical School, Boston (MA), USA
- VU University Medical Center, Amsterdam (Netherlands) (Dr. M Helder, Prof. Th Smit)
- University of Sheffield (UK) (Prof. Ch. Sammon)
- Hong Kong Polytechnic University Kowloon (Prof. H. Man, Prof. Monica Mahesh Savalani)
- UZH, Biochemistry, Prof. Amedeo Caflisch

Prof.
Dr. med. dent.
Martin Rücker

Prof.
Franz E. Weber,
PhD

Marius Bredell

Chafik Ghayor, PhD

PD
Dr. med. dent.
Harald Essig

Dr. med. dent.
Paul Schumann

Dr. med. dent.
Thomas Gander

Dr. med. dent.
Daniel Zweifel

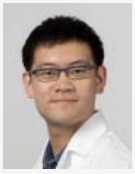
Bhattacharya
Indranil,
PhD

Alexander
Tchouboukov,
Lab. Technician

Yvonne Bloemhard,
Lab. Technician

Ana Perez,
Lab. Technician

Postdoctoral Fellows and Students



Tse-Hsing Chen,
PhD Student

Barbara
Siegenthaler,
PhD Student

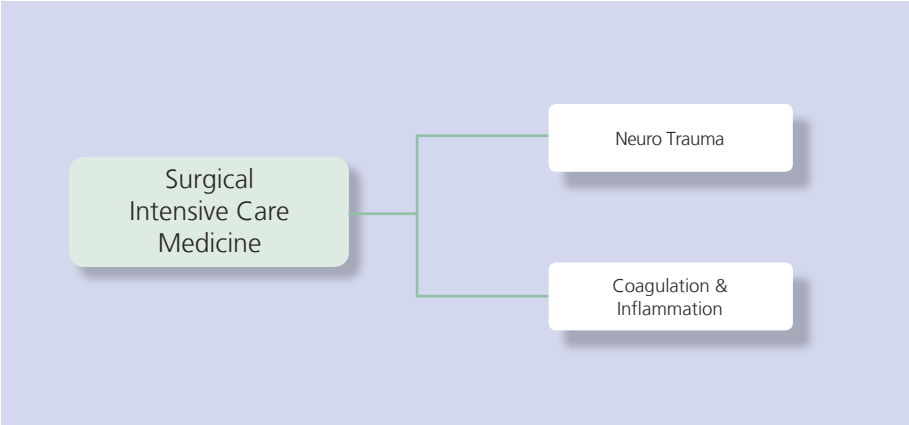
Bebeka Gjoksi,
PhD Student

Nisarat
Roungsawasdi,
MD-PhD Student

Nurpur Khera,
PhD Student

Anja Ivica,
PhD Student

Surgical Intensive Care Medicine



Dr. med.
Peter Steiger

PD Dr. med.
Reto Schüpbach,
M.Sc.

Critical care provides a platform allowing almost all specialties in medicine to offer advanced invasive or surgical procedures and therapies and promotes therapy of syndromes, typical seen in critical care (ICU) patients. These include vascular leakage, acute respiratory distress syndrome or hemodynamic instability to just mention a few. Progress in knowledge on how to handle or treat these ICU syndromes turned previously fatal into treatable conditions allowing patients to survive with a good quality of live.
In order to eventually improve therapeutic options in the ICU setting our research focus on how to optimize established therapeutic options on the one hand and on the understanding of pathophysiology driving clinical syndromes.

Optimizing therapy in patients with traumatic brain injury
Hospitalization and immobilization bears the risk of developing thromboembolic disease especially in inflamed patients. Thus, prophylactic anticoagulation became standard in most immobilized, hospitalized patients. In contrast, potential increased risk for fatal intracranial bleeding complication in patients with traumatic brain injury (TBI) excluded this patient group from thromboprophylaxis. In a soon to be published study our group however found thromboprophylaxis to be save in TBI patients.
Some patients on intensive care units are too sick or had too severe trauma to recover to a point of regaining satisfactory quality of live. In a soon to be published study our group describes the legal Swiss policy on how to implement patients will into the therapeutic decision process. The study also uncovers, the Swiss decision process, in contrast processes followed in other countries, suppresses ongoing hospitalization of patient remaining in a vegetative stage.

Optimizing therapy in patients with organ dysfunction
Transplantation is a therapeutic option in patients suffering from a non-reversible organ dysfunction. In a retrospective study in lung transplant recipients, we found dyslipidemia to drive primary graft dysfunction. Whether lipid-lowering statins reversely reduces the risk of primary graft dysfunction remains to be studied.

Twisting protease activated receptors to protect the vascular barrier
Advanced organisms such as humans separate the intravascular compartment from the rest of the body by a pathogen tight vascular endothelial barrier. During inflammation or clotting, physiology requires macromolecules and human cells to pass the endothelial barrier. Among others, the protease activate receptor (PAR) family orchestrates endothelial cells to either tighten up or disrupt the vascular barrier function. With the aim of eventually pharmacologically control the endothelial barrier function, we study how specific PAR activation could be obtained. Further we test human and pathogen derived proteases for their action on endothelial cells via activation of PAR.

Collaborations:

- Prof. Dr. A. Zinkernagel, Klinik für Infektionskrankheiten und Spitalhygiene, UniversitätsSpital Zurich, Switzerland
- Department of Pathophysiology and Transplantation, Università degli Studi di Milano, Milan, Italy

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Dr. med.
Stephanie Klinzing

Dr. med.
Giovanna Brandi

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Dorothea
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Dr. med.
Federica Stretti

Anesthesia and peri-operative Pain Research

An important reason for suffering in experimental animals is pain induced by invasive procedures, diseases and injuries. But pain management is more than an animal welfare concern, as it has important scientific and methodological implications for the design of experiments and the quality of the resulting data.

To ensure high-quality scientific outcomes and humane treatment of laboratory animals sufficient anesthesia, reliable alleviation of pain and supporting experimental housing conditions are essential.

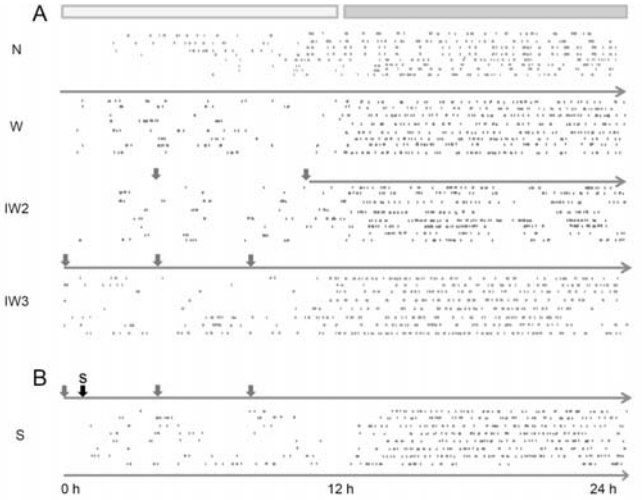

Figure 1: Buprenorphine administration via drinking water relies on frequent water intake. *Drinking behaviour of female B6 mice over 24 h: Water intake was frequent during the dark phase but rather sporadic during the light phase in all groups. Each row of dots represents the drinking events for an individual mouse. Data are solely descriptive; no statistical analysis was applied. A: Water intake in naïve (N) and with buprenorphine treated (W, IW2, IW3), pain free mice. B: Water intake in surgically treated mice, provided with three buprenorphine injections during light phase and via drinking water for 24 h.(N=Naïve, W = Buprenorphine administration via drinking water, IW2 = Buprenorphine administration via two injections during light phase and drinking water during dark phase, IW3 = Buprenorphine administration via three injections during light phase and via drinking water for 24 h, S = surgery plus buprenorphine administration via three subcutaneous injections and drinking water for 24 h). Dark phase is indicated by a dark grey bar and light phase by a light grey bar. Drinking events are depicted as dots for each individual. Buprenorphine injections are indicated by downward pointing grey arrows, provision of buprenorphine treated water is indicated by horizontal grey arrows. Surgery time is indicated by a downward pointing black arrow, labeled with an "S". n = 8 animals per treatment group. (Sauer et al. 2016)*

In the past, we have developed and evaluated physiology and behavior based pain assessment tools for laboratory mice. These tools and methods are used to improve analgesia protocols for post-surgical pain in mice to provide effective pain relief without affecting experimental read-out. In 2016 we characterized the opioid Tramadol as well as Tramadol-Antipyretics combinations in abdominal surgery and in orthopedic models, the antipyretic Paracetamol in embryo

Prof. Margarete Arras, DVM

Nikola Cesarovic, DVM, PhD

transfer surgery and different administration routes (injection, voluntary, retard) of the opioid Buprenorphine in laboratory mice as well as continuous infusion of opioids in high impact rat models. These studies resulted in several guidelines and publications concerning effective pain management protocols in the most widely used laboratory rodents.

Additionally, anaesthesia protocols for laboratory rodents, e.g. fentanyl–midazolam–medetomidine anaesthesia with antagonization with naloxone–flumazenil–atipamezole, have been developed, validated and published by our group.

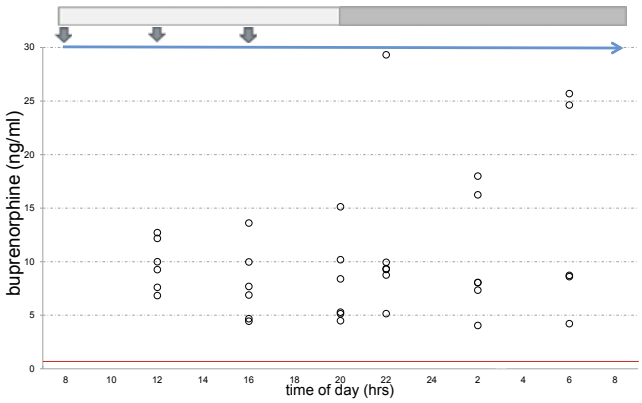

Figure 2: Serum concentrations resulting from Buprenorphine administration via drinking water in combination with injections. *Individual serum concentrations of buprenorphine in IW3 animals at the time points shown. All mice sampled show buprenorphine serum concentrations assumed therapeutically effective at all time points. The targeted blood concentration for effective buprenorphine treatment in rodents is 1 ng/ml (indicated by the solid red horizontal line). Buprenorphine injections are indicated by downward pointing arrows, provision of buprenorphine treated water is indicated by a horizontal arrow. Light phase is indicated by the light grey bar, dark phase is indicated by the dark grey bar. n = 6 animals per time point. (Sauer et al. 2016)*

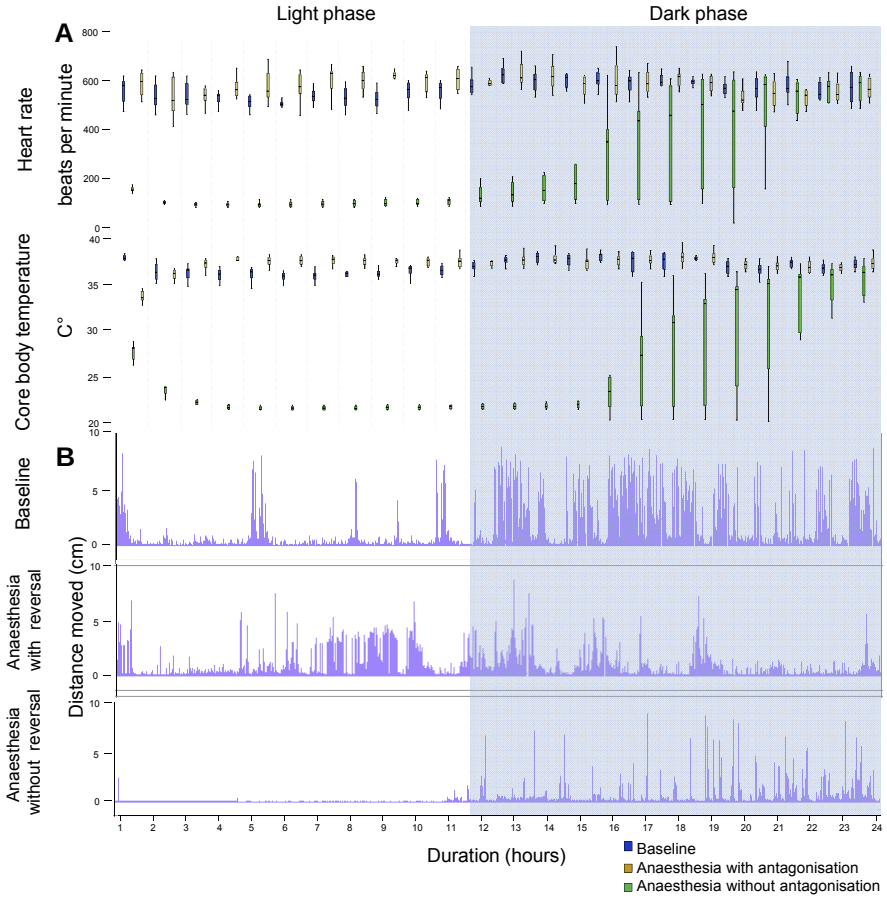

Figure 3: Fentanyl–midazolam–medetomidine anaesthesia. Post-anaesthetic period (24 h). *(a) Telemetric recordings of heart rate (HR) and core body temperature (BT) for 24 h during baseline and after anaesthesia with and without reversal are presented as boxplots for each hour (n=8 mice). (b) Activity shown as distance moved during 24 h. A single representative data-set of locomotor activity levels (represented as distance of animals' centre point moved in centimetres) during baseline as well as after anaesthesia with or without reversal as analysed by Ethovision software is presented. (Fleischmann et al. 2016)*

Collaborations:

- Alain Rudiger, Department of Anesthesiology, UniversityHospital Zurich
- Annemarie Lang, Clinic for Rheumatology and Clinical Immunology, Charité Berlin, Germany
- Michael Guarnieri, Johns Hopkins University, Baltimore, USA
- Knut Husmann, Orthopädische Universitätsklinik Balgrist und Schweizerisches Paraplegikerzentrum Nottwil, University of Zurich

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Paulin Jirkof,
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.hea .leischmann,
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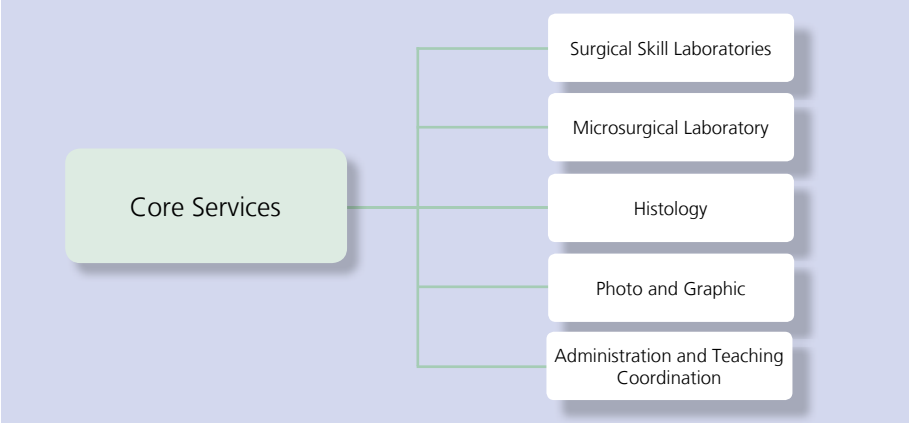
Mareike Sauer,
D.M

Marko Canic,
D.M


USZ Experimental
Hybrid OR

3. Core Services



Surgical Skill Laboratories

Surgery requires a number of practical and manual skills that can be trained in skill laboratories. In our facilities which are open to all members of the department we provide a number of tools and machines in a surgical environment. To perform operations under conditions similar to the clinical situation, technical help is provided by our staff which is also responsible for the maintenance of our facilities.

Microsurgical Laboratory

The microsurgery laboratory is a separate section in which several operating microscopes are available to all members of the department requiring special equipment. Maintenance of this laboratory includes all aspects of preparation of surgical instruments, sterilization and handling of waste materials. In addition, an intravital microscope including video equipment is available. This facility also provides for histological work-up.

Histology

The laboratory for Histology provides a histological work-up from preserved specimen to sectioning and staining. The laboratory contains an embedding machine, several microtomes, cryostat and staining devices. Several techniques including paraffin embedded, frozen and plastic embedded tissue can be processed.

Administration

- Administrative office management
- Financial accounting of the Research Divison
- Organisation, planning and coordination of workshops and vocational training
- Workshop, tutorials and seminars
- Quarterly reports
- Meeting organisation and coordination
- Personnel administration

Teaching Coordination

- Coordination and organization of the learning and teaching units in the Department of Surgery from 1st to 6th years of study including lectures and clinical courses in the compulsory part of the curriculum as well as in the electives.
- Coordination, organization of the clinical rotations during the 5th year of study.
- The work is done in cooperation with the University of Zurich and the University-Hospital Zurich for the Department of Surgery.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Nikola Cesarovic, DVM, PhD


Nico Wick, Photographer


Lea Schütz, Photographer


Carol De Simio, Scientific Illustrator


Pia Fuchs, Lab. Technician


Ursula Süss, PhD


Donata Gröflin, Teaching Coordination Division of Surgical Research


Corinne Renold, Teaching Coordination Division of Surgical Research


Susanne Frehner, Administration Division of Surgical Research

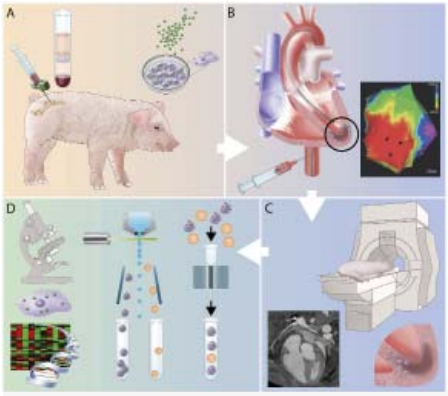

Tina Wentz Administration Division of Surgical Research

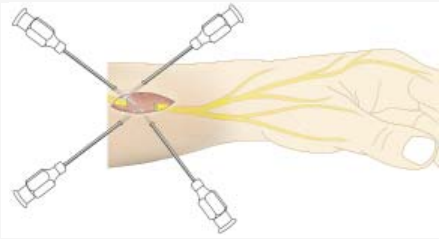
Photo and Graphic Services

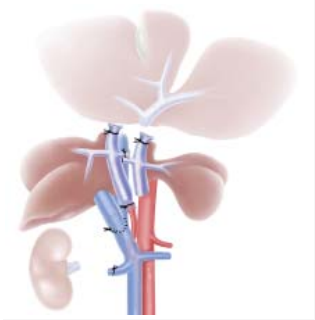
A quick, flexible, versatile and professional service

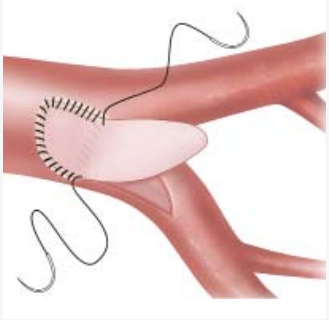
We offer

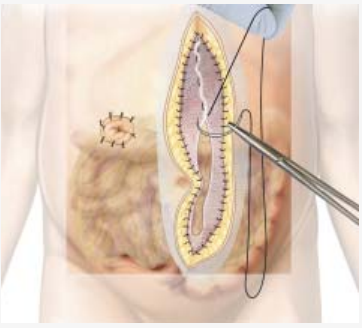
- photographic documentation of patients and events
- technical photography, on location or in our studio
- photography, graphic and design of illustrations for papers and books
- reproduction and digitalization of any original
- layout of printing matters
- preparation of files for external printing
- print service
- cutting and converting of video-files for presentation and web
- construction and maintainance of websites
- maintainance of the digital image archives





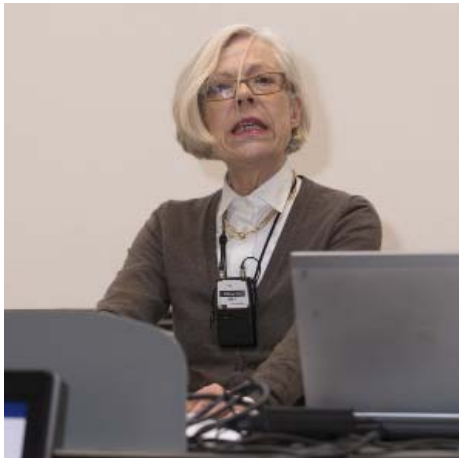






4. Events and Workshops at the Division of Surgical Research 2016

Assumption of Department Surgery Research by Prof. Rolf Graf, March 31



15th Day of Clinical Research, March 31

Surgical Suture Skills Course, Winterthur, May 25

CTC Symposium, November 11

Lab Retreat, Engelberg, January 15 - 17

Christmas Lecture and Apéro, December 22

Farewell of Susanne Frehner, September 13

Farewell of Sabrina Sonda, October 7

5. Grants

Cardiovascular Surgery Research:		
EU FP7	Intelligent Materials for *in situ* heart valve tissue engineering	M. Emmert
SNF	Interlacing magnetic resonance velocity encoding and computational fluid dynamic for mapping wall shear stress in the cardiovascular system	S. Benussi, S. Kozerke
Swiss Heart Foundation	Transcatheter aortic implantation of “off-the-shelf” tissue engineered heart valves in a translational adult sheep model	M. Emmert
Swiss Heart Foundation	Safety and efficacy of transcatheter transplantation of human GMP grade next-generation cardio poietic stem cell based 3D microtissues in a translational post-infarction heart failure pig model	M. Emmert
Swiss Heart Foundation	Role of LV volume overload and afterload mismatch during progression and treatment of functional mitral regurgitation	H. Rodriguez
USZ Innovationspool	Cerebral protection in transcatheter aortic valve replacement procedures	F. Maisano
Industry Grant	Development of minimally invasive and transcatheter therapeutic approaches	F. Maisano
Industry Grant	Development multimodality-imaging guided minimally invasive interventions	F. Maisano

Visceral & Transplant Surgery Research:		
SNF	Serotonin and regeneration in the normal, old and diseased liver	Clavien P.-A.
SNF	Molecular strategies for improved outcomes after major liver resection	Clavien P.-A.
SNF	HOPE for Human Liver Grafts obtained from Donors after Brain Death	Dutkowski P.
SNF	Serotonylation promotes pancreatic cancer by regulating cytoskeletal dynamics	Graf R.
SNF	Serotonin regulates secretion and regeneration of pancreatic acinar cells	Graf R.
SNF	Improving local clinical excellence, research methodology, and promoting dissemination of specialist knowledge in Hepato-Pancreato-Biliary and Oncologic Surgery between Switzerland - Russia and Kazakhstan	Clavien P.-A.
SINERGIA	Metabolic pathways governing liver carcinogenesis and regeneration.	Foti M., Humar B., Dufour J.-F., Clavien P.-A.
FOUNDATIONS:		
Vontobel Stiftung	Gastrokine as an early marker for pancreatic carcinogenesis	Graf R., Seleznik G., Reding T.
Novartis Foundation	Exogenous melatonin promotes graft regeneration in small-for-size liver transplantation	Tian Y.
Liver and Gastrointestinal Disease Foundation	ITPP und Krebs	Graf R.
Olga Mayenfisch Stiftung	Benchmark Research in Surgery	Staiger R.
Amelie Waring Stiftung	Role of deoxy-sphingolipids in acinar cell pathobiology following diabetes mellitus	Sonda S.
INSTITUTIONAL GRANTS:		
Clinical Research Priority Program	Non-resectable liver tumors – from palliation to cure Clinical Research Priority program	Clavien P.-A.
Wyss Translational Center Zurich	Liver4Life	Clavien P.-A., von Rohr P. (ETHZ)
Edoardo R.-, Giovanni, Giuseppe und Chiarina Sassella-Stiftung	The Impact of Associating Liver Partition and Portal vein ligation for Staged Hepatectomy (ALPPS) on Tumor progression	Kambakamba P., Lesurtel M., Borger P.

Edoardo R.-, Giovanni, Giuseppe und Chiarina Sassella-Stiftung	The role of LINE1-mediated genome transformations in tumor and metastasis development	Schneider M., Gupta A., Borger P.

Trauma Surgery Research:

Novartis Stiftung für Biologisch-Medizinische Forschung	The role of Pramel7 in chromatin remodeling during the switch from pluripotency to differentiation	P. Cinelli
Theodor und Ida Herzog-Egli Stiftung	The switch between pluripotency to differentiation: The role of Pramel7 in embryonic stem cells	P. Cinelli
Edoardo R., Giovanni, Giuseppe und Chiarina Sassella-Stiftung	Role of the PRAME Gene Family in Cancer Stem Cells	P. Cinelli
Stiftung für wissenschaftliche Forschung an der UZH	Role of the Prame Gene Family in Cancer Stem Cells	P. Cinelli
Gottfried und Julia Bangerter-Rhyner-Stiftung	Identification of subpopulation of adipose derived stem cells for bone bioengineering by CyTOF analysis	P. Cinelli
Synthes GmbH	Humerus Synthes - Zementverschraubungen	H.P. Simmen, C. Werner
Bayer (Schweiz) AG	Xamos-Xarelto in the Prophylaxis of post-surgical venous thromboembolism after elective major orthopedic surgery of hip or knee	H.-P. Simmen
Theodor und Ida Herzog-Egli Stiftung	Prevention of heterotopic ossification - new approaches	H.P. Simmen, C. Werner
B. Braun AG	Randomized, double-blind, controlled clinical trial on the antiseptic efficacy and tolerability of Lavasept 0.04% on acute traumatic wounds	H.P. Simmen, C. Werner
Dr. h.c. Robert Mathys Stiftung	Prevention of heterotopic ossification - new approaches	C. Werner
Emdo Stiftung Zürich	Neue Strategien in der Prävention Heterotoper Ossifikationen	C. Werner
CABMM (Center of Applied Biotechnology and Molecular Medicine) UZH	Identification of tenocyte specific markers in the horse	P. Cinelli
Olga Mayenfisch Stiftung	From pluripotency to differentiation: the role of Pramel7 in murine embryonic stem cells	P. Cinelli

Plastic, Hand & Reconstructive Surgery Research:

Allergan Inc., Irvine, CA, USA) , SNSF through NCCR Kidney.CH	*In vivo* characterization of the integration and vascularization of a silk-derived Surgical Scaffold	N. Lindenblatt
Swiss National Science Foundation	Cellular and molecular mechanisms of vascular maturation for therapeutic angiogenesis	A. Banfi, Basel; N. Lindenblatt (Co-Applicant)
Swiss National Science Foundation	New vascularization strategies for skin tissue engineering	N. Lindenblatt
Research Grant Olga Mayenfisch Stiftung, Zürich, Schweiz	Effect of fat and adipose-derived stem cells (ADSCs) on vascularisation and nerve regeneration in a new *in vivo* mouse model	N. Lindenblatt

Research Grant Allergan, Irvine, USA	Evaluation of the vascularisation and inflammatory reaction of the silk-based synthethic surgical scaffold SERI *in vivo*	N. Lindenblatt
Hartmann-Müller Stiftung, Zürich, Schweiz	Guided wound healing in full and split thickness wounds	N. Lindenblatt
Hartmann Müller-Stiftung für Med. Forschung	Fat grafting nerve	N. Lindenblatt
Forschung und Nach-wuchs-förderung der Universität Zürich	Hauttransplantate	N. Lindenblatt
Swiss Life Research Grant, Zurich	Skin grafting and tissue engineering of skin substitutes in burn surgery - what we can learn from nature	N. Lindenblatt
Hartmann Müller-Stiftung für Med. Forschung	Effect of moderate anemia in free vascular tissue transfer	N. Forster
Hartmann Müller-Stiftung für Med. Forschung	Knochenersatzkonstrukte	J. Buschmann
Wolfermann-Nägeli-Stiftung	Sehnenreparatur mit einem reversibel expandierbaren Schlauch - Kaninchen-modell *in vivo*	J. Buschmann
EMDO Stiftung, Zürich	Fabrikation eines Polymerschlauches zur Sehnenreparatur	J. Buschmann
AbMedica, Lainate (Italy)	Sehnenreparatur mit einem reversibel expandierbaren Schlauch - Kaninchenmodell *in vivo*	J. Buschmann
Hartmann-Müller Stiftung	Proteomics	J. Buschmann
Hartmann-Müller Stiftung	Sehnenreparatur unter Zuhilfenahme eines mit PDGF-BB bestückten DegraPol®-Rohrs	J. Buschmann
Kurt und Senta Hermann Stiftung	Fabrikation eines Polymer-Trägers: Bioaktivität und Release-Kinetik des Wachstumsfaktors Platelet-Derived Growth Factor-BB (PDG-BB) vom elek-trogesponnenen Träger DegraPol®	J. Buschmann
La Colline PhD Fellowship	Skin Engineering Platform	M. Calcagni
Innovationspool USZ	Adipose derived stromal vascular fraction for the treatment of finger contrac-tures in patients affected by systemic sclerosis	M. Calcagni, O. Distler, P. Giovanoli
Innovationspool USZ	Skin Engineering Platform	P. Giovanoli, M. Calcagni
Heubergstiftung	Investigating the effect of hypothermal conditioning on the quality and growth potential of *in vitro* cultured keratinocytes for skin grafting	M. Calcagni, S. Darwiche

Thoracic Surgery Research:

Zürcher Krebsliga	Prognostic Marker for MPM	I. Opitz
SNF Overhead		I. Opitz
Stiftung Becon	Gewebe- und Datenbank für das MPM – ein paneuropäisches Projekt	I. Opitz
Vontobel Stiftung	MikroRNAs als prognostische und prädiktive Tumormarker für die multi-modale Behandlung des malignen Pleuramesothelioms	I. Opitz
Lunge Zürich	MicroRNAs as prognostic and predictive tumour markers assisting the selection of patients with malignant pleural mesothelioma for multimodality treatment	I. Opitz
SNF Professorship	MPM – an integral approach for better outcome	I. Opitz

Krebsforschung Schweiz	Mesoscape 001-pS6: Construction of a multi-institutional European Tissuebank	I. Opitz
Polianthes Foundation	Comprehensive Investigation of Predictive Biomarkers for Chemotherapy Response and Novel Drug Targets in Patients with MPM by Next Generation Sequencing	I. Opitz
SAKF Foundation	Multi-omics profiling for identification of novel circulating biomarkers for malignant pleural mesothelioma	I. Opitz
Swiss National Science Foundation Sinergia grant	From asbestos exposure to cancer: a systemic approach to detect loss of homeostatic control in the mesothelial environment	E. Felley-Bosco
Walter Bruckerhoff Stiftung	Targeting epigenetic deregulation	E. Felley-Bosco
Polianthes Foundation	Mechanisms underlying development of resistance and progression to mesenchymal phenotype in mesothelioma	E. Felley-Bosco
Innovationspool	Implementierung der „Synapse 3D®“ Software von Fujifilm zur Planung und Simulation von (minimal-invasiven) anatomischen Lungenresektionen, Lungenvolumenreduktionschirurgie und minimal-invasiven Zugängen	C. Caviezel
Hartmann Müller Stiftung	The role of cytokine filtration during *ex vivo* lung perfusion	I. Inci
Hermann Klaus Stiftung	*Ex vivo* reconditioning of donor lungs with Trimetazidine after prolonged cold ischemia	I. Inci
Lungen Liga Zurich	The effect of lung volume reduction surgery on outcome after lung transplantation in patients with emphysema	I. Inci
Innovationspool	Assessment and reconditioning of donor lungs with *ex vivo* lung perfusion system	I. Inci
Schweizerischer Nationalfonds	Suppression of lung tumor growth by CD26 /DPP4-inhibition	W. Jungraithmayr
Helene Bieber Fonds	The CD26-costimutatory pathway is critical for Th17-mediated lung transplant improvement	W. Jungraithmayr
Hartmann-Müller Stiftung	The protective effect of local anesthetics on primary graft dysfunction after experimental lung transplantation	W. Jungraithmayr
Kurt und Senta Herrmann-Stiftung	Blockade of CD26/DPP4 - co-stimulation to improve lung transplant survival	W. Jungraithmayr
Stiftung für wissenschaftliche Forschung	Ein neues Therapiekonzept zur Bekämpfung des Lungenkarzinoms durch Hemmung der CD26/DPP4	W. Jungraithmayr
Forschungskredit, University Zurich	The protective role of CD26/DPP4-inhibition in lung transplantation – a preclinical study	W. Jungraithmayr
Assistant Professorship, University Zurich	Lungentransplantation	W. Jungraithmayr
Development program “Filling the Gap”	The protective role of CD26/DPP4-inhibition in lung transplantation – a preclinical study	W. Jungraithmayr
Hermann Klaus-Stiftung, University Zurich	A new therapeutic concept against lung cancer through inhibition of CD26/DPP4	W. Jungraithmayr
Stiftung für Krebsbekämpfung, University Zurich	Ein neues Therapiekonzept zur Bekämpfung des Lungenkarzinoms durch Hemmung der CD26/DPP4	W. Jungraithmayr
SAKF Foundation	Biomarkers with enzymatic activities for improved risk stratification of lung cancer patients	S. Hillinger

Urological Research :

Max & Hedwig Niedermayer Stiftung	N-terminal androgen receptor targeting and autophagy inhibition to overcome resistance development during the evolution of prostate cancer treatment	B. Kranzbühler
Horizon 2020 Förderung, Staatssekretariat für Bildung, Forschung und Innovation	MUSIC: Multisystem Cell Therapy for Improvement of Urinary Continence	D. Eberli
Unitectra	Proof-of-Concept Funding {PoC) “Novel Urine Biomaker for Prostate Cancer”	M. Provenzano
Stiftung für Urologische Forschung	Prostate cancer-specific bispecific antibodies to prevent and treat metastatic castrate-resistant prostate cancer (mCRPC)	M. Provenzano
Commission for technology and Innovation (CTI)	Banking of human antibody repertoires for therapeutic use	M. Provenzano
Swiss National Science Foundation	Non-invasive monitoring of muscle precursor cell differentiation *in vivo* by magnetic resonance imaging	D. Eberli, Co-Applicant
Helmut Horten Stiftung	Cell-enriched hydrogel biomaterial with optimized release of NGF and VEGF for the improvement of innervation and functionality of bioengineered bladder tissue	D. Eberli
Janssen Pharamaceutica NV	Antitumor effect of androgen synthesis inhibitors and autophagy inhibition in prostate cancer cells	D. Eberli
Research Grant from “Novartis Stiftung für Biologisch-Medizinische Forschung”	Improving human muscle engineering by PGC-1alpha overexpression	D. Eberli
Max & Hedwig Niedermayer Stiftung	The Role of Autophagy in the Differentiation of Adipose Derived Stem Cells for Functional Smooth Muscle Bioengineering	D. Eberli
Klinischer Forschungsschwerpunkt “Molecular Imaging Network Zurich”, Co-Applicant	*In-vivo* characterization of differentiating muscle precursor cells applying multi-modal molecular imaging	D. Eberli
Institutional Grant from “Baugarten Stiftung”, Zürich	MPCs for the treatment of urinary incontinence	D. Eberli, T. Sulser
Helmut Horten Stiftung	The role of autophagy in the differentiation of adipose derived stem cells for functional smooth muscle tissue bioengineering	S. Salemi
Research Grant Innovations-Fond University Zürich for the clinical research project	Focal Therapy for Prostate Cancer	D. Eberli

Cranio-Maxillofacial Surgery Research:

Schweizer National Fond	Osteoconductive and osteoinductive customized implants for large mandibular defects	F. E. Weber
Bundesstipendium	Pulp Regeneration	F. E. Weber

Surgical Intensive Care Medicine:		
Swiss National Science Foundation	Cytoprotection through non Anticoagulant Engineered Chimeric Activated Protein C	R. Schüpbach
Hartmann Müller-Stiftung für med. Forschung	Activation of Protease Activated Receptors by Bacterial Proteases	R. Schüpbach
Vontobel-Stiftung	Biased PAR-2 Signaling by Thrombomodulin Bound Thrombin	R. Schüpbach

Animal Welfare in Biomedical Research:		
BfR (Bundesinstitut für Risikobewertung, Berlin, Deutschland)	Project Funding, «RefineMoMo»	P. Jirkof

6. Publications 2016

1. Abegg K, Corteville C, Bueter M, and Lutz TA. Alterations in energy expenditure in Roux-en-Y gastric bypass rats persist at thermoneutrality. International Journal of Obesity 40: 1215-1221, 2016.

2. Aebersold MJ, Dermutz H, Forró C, Weydert S, Thompson-Steckel G, Vörös J, and Demkó L. “Brains on a chip”: Towards engineered neural networks. TrAC Trends in Analytical Chemistry 78: 60-69, 2016.

3. Alexandrova E, Miglino N, Hashim A, Nassa G, Stellato C, Tamm M, Baty F, Brutsche M, Weisz A, and Borger P. Small RNA profiling reveals deregulated phosphatase and tensin homolog (PTEN)/phosphoinositide 3-kinase (PI3K)/Akt pathway in bronchial smooth muscle cells from asthmatic patients. Journal of Allergy and Clinical Immunology 137: 58-67, 2016.

4. Alexandrova E, Nassa G, Corleone G, Buzdin A, Aliper AM, Terekhanova N, Shepelin D, Zhavoronkov A, Tamm M, Milanesi L, Miglino N, Weisz A, and Borger P. Large-scale profiling of signalling pathways reveals an asthma specific signature in bronchial smooth muscle cells. Oncotarget 25150-25161, 2016.

5. Armato SG, Blyth KG, Keating JJ, Katz S, Tsim S, Coolen J, Gudmundsson E, Opitz I, and Nowak AK. Imaging in pleural mesothelioma: A review of the 13th International Conference of the International Mesothelioma Interest Group. Lung Cancer 101: 48-58, 2016.

6. Auvinen A, Moss SM, Tammela TLJ, Taari K, Roobol MJ, Schröder FH, Bangma CH, Carlsson S, Aus G, Zappa M, Puliti D, Denis LJ, Nelen V, Kwiatkowski M, Randazzo M, Paez A, Lujan M, and Hugosson J. Absolute effect of prostate cancer screening: balance of benefits and harms by center within the European randomized study of prostate cancer screening. Clinical Cancer Research 22: 243-249, 2016.

7. Bächler T, le Roux CW, and Bueter M. How do patients‘ clinical phenotype and the physiological mechanisms of the operations impact the choice of bariatric procedure? Clinical and Experimental Gastroenterology 9: 181-189, 2016.

8. Banzic I, Lachat M, and Rancic Z. Aortic rupture following an EVAR secondary to graft erosion. Catheterization and Cardiovascular Interventions 87: 783-786, 2016.

9. Barth BK, Cornelius A, Nanz D, Eberli D, and Donati OF. Comparison of image quality and patient discomfort in prostate MRI: pelvic phased array coil vs. endorectal coil. Abdominal Radiology 41: 2218-2226, 2016.

10. Baumueller S, Hilty R, Nguyen TDL, Weder W, Alkadhi H, and Frauenfelder T. Influence of Sinogram-Affirmed Iterative Reconstruction on Computed Tomography-Based Lung Volumetry and Quantification of Pulmonary Emphysema. Journal of Computer Assisted Tomography 40: 96-101, 2016.

11. Beck-Schimmer B, Bonvini JM, Braun J, Seeberger M, Neff TA, Risch TJ, Stüber F, Vogt A, Weder W, Schneiter D, Filipovic M, and Puhan M. Which anesthesia regimen is best to reduce morbidity and mortality in lung surgery?: a multicenter randomized controlled trial. Anesthesiology 125: 313-321, 2016.

12. Benoit TM. High VEGF-D and Low MMP-2 Serum Levels Predict Nodal-Positive Disease in Invasive Bladder Cancer. 2016.

13. Bhattacharya I, Ghayor C, and Weber FE. The Use of Adipose Tissue-Derived Progenitors in Bone Tissue Engineering - a Review. Transfusion Medicine and Hemotherapy 43: 336-343, 2016.

14. Bhindi B, Hermanns T, Wei Y, Yu J, Richard PO, Wettstein MS, Templeton A, Li K, Sridhar SS, Jewett MAS, Fleshner NE, Zlotta AR, and Kulkarni GS. Identification of the best complete blood count-based predictors for bladder cancer outcomes in patients undergoing radical cystectomy. British Journal of Cancer 114: 207-212, 2016.

15. Bichsel D, Lanfranchi M, Attin T, Grätz KW, and Stadlinger B. Evaluation of oral prophylaxis during and after intensity-modulated radiotherapy due to head and neck cancer-a retrospective study. Clinical Oral Investigations 20: 721-726, 2016.

16. Bollschweiler E, Hölscher AH, Herbold T, Metzger R, Alakus H, Schmidt H, Drebber U, and Warnecke-Eberz U. Molecular Markers for the Prediction of Minor Response to Neoadjuvant Chemoradiation in Esophageal Cancer: Results of the Prospective Cologne Esophageal Response Prediction (CERP) Study. Annals of Surgery 264: 839-846, 2016.

17. Bonani M, Frey D, Brockmann J, Fehr T, Mueller T, Saleh L, von Eckardstein A, Graf N, and Wüthrich RP. Effect of twice-yearly denosumab on prevention of bone mineral density loss in de novo kidney transplant recipients: a randomized controlled trial. American Journal of Transplantation 16: 1882-1891, 2016.

18. Bonani M, Frey D, de Rougemont O, Mueller NJ, Mueller TF, Graf N, and Wüthrich RP. Infections in de novo kidney transplant recipients treated with the RANKL inhibitor denosumab. Transplantation Epub ahead of print, 2016.

19. Bredell MG, Ernst J, El-Kochairi I, Dahlem Y, Ikenberg K, and Schumann DM. Current relevance of hypoxia in head and neck cancer. Oncotarget 7: 50781-50804, 2016.

20. Brinkmann S, Schroeder W, Junggeburth K, Gutschow CA, Bludau M, Hoelscher AH, and Leers JM. Incidence and management of chylothorax after Ivor Lewis esophagectomy for cancer of the esophagus. Journal of Thoracic and Cardiovascular Surgery 151: 1398-1404, 2016.

21. Brüstle K, Lema S, Komminoth P, Weder W, Vrugt B, and Jungraithmayr W. Placental transmogrification of the lung presenting as progressive symptomatic bullous emphysema. Thorax 2, 2016.

22. Burger IA, Casanova R, Steiger S, Husmann L, Stolzmann P, Huellner MW, Curioni A, Hillinger S, Schmidtlein CR, and Soltermann A. FDG-PET/CT of non-small cell lung carcinoma under neo-adjuvant chemotherapy: background based adaptive volume metrics outperform TLG and MTV in predicting histopathological response. Journal of Nuclear Medicine 57: 849-854, 2016.

23. Calmy A, van Delden C, Giostra E, Junet C, Rubbia Brandt L, Yerly S, Chave J-P, Samer C, Elkrief L, Vionnet J, Berney T, Berger C, and Nadal D. HIV-Positive-to-HIV-Positive Liver Transplantation. American Journal of Transplantation 16: 2473-2478, 2016.

24. Calo N, Ramadori P, Sobolewski C, Romero Y, Maeder C, Fournier M, Rantakari P, Zhang F-P, Poutanen M, Dufour J-F, Humar B, Nef S, and Foti M. Stress-activatedmiR-21/miR-21*in hepatocytes promotes lipid and glucose metabolic disorders associated with high-fat diet consumption. Gut gutjnl-2015-310822, 2016.

25. Caviezel C. Observership in China: an opinion about current and future collaboration. Journal of Thoracic Disease 8: E979-E981, 2016.

26. Caviezel C, Franzen D, Inci I, and Weder W. Emphysemchirurgie – State of the Art 2016. Zentralblatt für Chirurgie 141: S26-S34, 2016.

27. Cheng YY, Wright CM, Kirschner MB, Williams M, Sarun KH, Sytnyk V, Leshchynska I, Edelman JJ, Vallely MP, McCaughan BC, Klebe S, van Zandwijk N, Lin RCY, and Reid G. KCa1.1, a calcium-activated potassium channel subunit alpha 1, is targeted by miR-17-5p and modulates cell migration in malignant pleural mesothelioma. Molecular Cancer 15: 44, 2016.

28. Chuck NC, Boss A, Wurnig MC, Weiger M, Yamada Y, and Jungraithmayr W. Ultra-short echo-time magnetic resonance imaging distinguishes ischemia/reperfusion injury from acute rejection in a mouse lung transplantation model. Transplant International 29: 108-118, 2016.

29. Ciuca C, Tarantini G, Latib A, Gasparetto V, Savini C, Di Eusanio M, Napodano M, Maisano F, Gerosa G, Sticchi A, Marzocchi A, Alfieri O, Colombo A, and Saia F. Trans-subclavian versus transapical access for transcatheter aortic valve implantation: A multicenter study. Catheterization and Cardiovascular Interventions 87: 332-338, 2016.

30. Clavien C, and Chapuisat M. The evolution of utility functions and psychological altruism. Studies in History and PHilosophy of Biological and Biomedical Sciences 56: 24-31, 2016.

31. Clavien P-A, and Fong Y. Introduction: Liver. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, Sarr MG, Fong Y, and Myiasaki M. Berlin: Springer, 2016, p. 347-349.

32. Clavien P-A, and Sarr MG. Introduction: General Principles. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Pierre-Alain C, Michael S, Human F, and Masaru M. Berlin: Springer, 2016, p. 3-5.

33. Clavien P-A, Sarr MG, Fong Y, Miyazaki M, and Tschuor C. Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery Berlin: University of Zurich, 2016.

34. Clavien PA, and Lillemoe KD. Associating liver partition and portal vein ligation for staged hepatectomy. Annals of Surgery 263: 835-836, 2016.

35. Collaud S, Benden C, Ganter C, Hillinger S, Opitz I, Schneiter D, Schuepbach R, Inci I, and Weder W. Extracorporeal life support as bridge to lung retransplantation: a multicenter pooled data analysis. Annals of Thoracic Surgery 102: 1680-1686, 2016.

36. Correro-Shahgaldian MR, Introvigne J, Ghayor C, Weber FE, Gallo LM, and Colombo V. Properties and Mechanobiological Behavior of Bovine Nasal Septum Cartilage. Annals of Biomedical Engineering 44: 1821-1831, 2016.

37. Cottini SR, Ehlers UE, Pagnamenta A, Brandi G, Weder W, Schuepbach RA, Béchir M, and Benden C. Pretransplant dyslipidaemia influences primary graft dysfunction after lung transplantation. Interactive Cardiovascular and Thoracic Surgery 22: 402-405, 2016.

38. Dall'Acqua P, Johannes S, Mica L, Simmen H-P, Glaab R, Fandino J, Schwendinger M, Meier C, Ulbrich EJ, Müller A, Jäncke L, and Hänggi J. Connectomic and surface-based morphometric correlates of acute mild traumatic brain injury. Frontiers in Human Neuroscience 10: 127, 2016.

39. Damerau G, and Rücker M. Die zahnärztlich-chirurgische Behandlung von Patienten mit Bestrahlungstherapie im Kopf-Hals-Bereich. Die Quintessenz 1437-1445, 2016.

40. De Bonis M, Al-Attar N, Antunes M, Borger M, Casselman F, Falk V, Folliguet T, Iung B, Lancellotti P, Lentini S, Maisano F, Messika-Zeitoun D, Muneretto C, Pibarot P, Pierard L, Punjabi P, Rosenhek R, Suwalski P, Vahanian A, Wendler O, and Prendergast B. Surgical and interventional management of mitral valve regurgitation: a position statement from the european society of cardiology working groups on cardiovascular surgery and valvular heart disease. European Heart Journal 37: 133-139, 2016.

41. De Bonis M, Taramasso M, Lapenna E, Denti P, La Canna G, Buzzatti N, Pappalardo F, Di Giannuario G, Cioni M, Giacomini A, and Alfieri O. MitraClip therapy and surgical edge-to-edge repair in patients with severe left ventricular dysfunction and secondary mitral regurgitation: mid-term results of a single-centre experience. European Journal of Cardio-Thoracic Surgery 49: 255-262, 2016.

42. de Wild M, Zimmermann S, Rüegg J, Schumacher R, Fleischmann T, Ghayor C, and Weber FE. Influence of Microarchitecture on Osteoconduction and Mechanics of Porous Titanium Scaffolds Generated by Selective Laser Melting. 3D Printing and Additive Manufacturing 3: 142-151, 2016.

43. Döring R, Jentzsch T, Scheyerer MJ, Pfäffli W, and Werner CML. The value of modular hemiarthroplasty for unstable femoral neck fractures in elderly patients with coxarthrosis. BMC Musculoskeletal Disorders 17: 223, 2016.

44. Dutkowski P, and Clavien P-A. Scorecard and insights from approaches to liver allocation around the world. Liver Transplantation 22: 9-13, 2016.

45. Dutkowski P, Schlegel A, Kron P, de Oliveira ML, and Clavien P-A. Reply to "Reducing nonanastomotic biliary strictures in donation after circulatory death liver transplantation". Annals of Surgery Epub ahead of print, 2016.

46. Eberhardt C, Wurnig MC, Wirsching A, Rossi C, Rottmar M, Özbay PS, Filli L, Lesurtel M, and Boss A. Intravoxel incoherent motion analysis of abdominal organs: computation of reference parameters in a large cohort of C57Bl/6 mice and correlation to microvessel density. Magma 29: 751-763, 2016.

47. Eberli D. Optimal thromboprophylaxis remains a challenge. BJU International 118: 342, 2016.

48. Edmondson MJ, Sodergren MH, Pucher PH, Darzi A, Li J, Petrowsky H, Campos RR, Serrablo A, and Jiao LR. Variations and adaptations of associated liver partition and portal vein ligation for staged hepatectomy (ALPPS): Many routes to the summit. Surgery 159: 1058-1072, 2016.

49. Eshmuminov D. Where Oncologic and Surgical Complication Scoring Systems Collide: Time for a New Consensus for CRS/HIPEC. 2016.

50. Eshmuminov D, Raptis DA, Linecker M, Wirsching A, Lesurtel M, and Clavien P-A. Meta-analysis of associating liver partition with portal vein ligation and portal vein occlusion for two-stage hepatectomy. The British Journal of Surgery 103: 1768-1782, 2016.

51. Evrova O, Hosseini V, Milleret V, Palazzolo G, Zenobi-Wong M, Sulser T, Buschmann J, and Eberli D. Hybrid randomly electrospun poly(lactic-co-glycolic acid):poly(ethylene oxide) (PLGA:PEO) fibrous scaffolds enhancing myoblast differentiation and alignment. ACS applied materials & interfaces 8: 31574-31586, 2016.

52. Fankhauser CD, Bode PK, Hermanns T, Sander S, Beyer J, Sulser T, Altevogt P, Moch H, and Tischler V. L1-CAM is commonly expressed in testicular germ cell tumours. Journal of Clinical Pathology 69: 460-462, 2016.

53. Fankhauser CD, Nietlispach F, Emmert MY, and Maisano F. Antegrade valve embolization after transcatheter treatment for pure aortic regurgitation. European Heart Journal 37: 856-856, 2016.

54. Filosso PL, Yao X, Ruffini E, Ahmad U, Antonicelli A, Huang J, Guerrera F, Venuta F, van Raemdonck D, Travis W, Lucchi M, Rimner A, Thomas P, Weder W, Rocco G, Detterbeck F, and Korst R. Comparison of outcomes between neuroendocrine thymic tumours and other subtypes of thymic carcinomas: a joint analysis of the European Society of Thoracic Surgeons and the International Thymic Malignancy Interest Group. European Journal of Cardio-Thoracic Surgery 50: 766-771, 2016.

55. Finger A, Teunis T, Hageman MG, Thornton ER, Neuhaus V, and Ring D. Do patients prefer optional follow-up for simple upper extremity fractures: A pilot study. Injury 47: 2276-2282, 2016.

56. Frank T, Osterhoff G, Sprague S, Garibaldi A, Bhandari M, and Slobogean GP. The Radiographic Union Score for Hip (RUSH) identifies radiographic nonunion of femoral neck fractures. Clinical Orthopaedics and Related Research 474: 1396-1404, 2016.

57. Franzen D, Schneiter D, and Freitag L. Bronchoskopie in therapeutischer Mission – interventionelle Bronchologie. Praxis 105: 1433-1440, 2016.

58. Fuchs H, Hölscher AH, Leers J, Bludau M, Brinkmann S, Schröder W, Alakus H, Mönig S, and Gutschow CA. Long-term quality of life after surgery for adenocarcinoma of the esophagogastric junction: extended gastrectomy or transthoracic esophagectomy? Gastric Cancer 19: 312-317, 2016.

59. Ghayor C, and Weber FE. Epigenetic Regulation of Bone Remodeling and Its Impacts in Osteoporosis. International Journal of Molecular Sciences 17: online, 2016.

60. Gjoksi B, Ghayor C, Bhattacharya I, Zenobi-Wong M, and Weber FE. The bromodomain inhibitor N-methyl pyrrolidone reduced fat accumulation in an ovariectomized rat model. Clinical Epigenetics 8: 42, 2016.

61. Gloor S, Jensen KO, Gingert C, Junker T, and Hetzer FH. A Rare Case of a Complex System of Fistulas in Crohn‘s Disease. Journal of Hepatology and Gastrointestinal disorders 1000119, 2016.

62. Golshayan D, Wójtowicz A, Bibert S, Pyndiah N, Manuel O, Binet I, Buhler LH, Huynh-Do U, Mueller T, Steiger J, Pascual M, Meylan P, Bochud P-Y, Berger Christoph, and Nadal David. Polymorphisms in the lectin pathway of complement activation influence the incidence of acute rejection and graft outcome after kidney transplantation. Kidney International 89: 927-938, 2016.

63. Gomes de Lima V. The benefits of elective spinal implant removal: a retrospektive study of 137 patients (Inaugural-Dissertation). 2016.

64. Gordic S, Desbiolles L, Sedlmair M, Manka R, Plass A, Schmidt B, Husarik DB, Maisano F, Wildermuth S, Alkadhi H, and Leschka S. Optimizing radiation dose by using advanced modelled iterative reconstruction in high-pitch coronary CT angiography. European Radiology 26: 459-468, 2016.

65. Grabliauskaite K, Saponara E, Reding T, Bombardo M, Seleznik GM, Malagola E, Zabel A, Faso C, Sonda S, and Graf R. Inactivation of TGF-β receptor II signaling in pancreatic epithelial cells promotes acinar cell proliferation, acinar-to-ductal metaplasia and fibrosis during pancreatitis. Journal of Pathology 238: 434-445, 2016.

66. Graf R, Cinelli P, and Arras M. Morbidity scoring after abdominal surgery. Laboratory Animals 50: 453-458, 2016.

67. Grochola LF, et al., and Clavien P-A. Surgical Energy Devices or Devices for Hemostasis. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 37-44.

68. Groner AC, Cato L, de Tribolet-Hardy J, Bernasocchi T, Janouskova H, Melchers D, Houtman R, Cato ACB, Tschopp P, Gu L, Corsinotti A, Zhong Q, Fankhauser C, Fritz C, Poyet C, Wagner U, Guo T, Aebersold R, Garraway LA, Wild PJ, Theurillat J-P, and Brown M. TRIM24 is an oncogenic transcriptional activator in prostate cancer. Cancer Cell 29: 846-858, 2016.

69. Guarnero V, Hoffmann H, Hetzer F, Oertli D, Turina M, Zingg U, Demartines N, Ris F, and Hahnloser D. A new stomaplasty ring (Koring™) to prevent parastomal hernia: an observational multicenter Swiss study. Techniques in Coloproctology 20: 293-297, 2016.

70. Gubler C, Metzler JM, and Turina M. Hemospray treatment for bleeding intestinal anastomoses in the early postoperative period: a novel non-operative approach. Techniques in Coloproctology 20: 495-498, 2016.

71. Guenkel S, Scheyerer MJ, Osterhoff G, Wanner GA, Simmen H-P, and Werner CML. It is the lateral head tilt, not head rotation, causing an asymmetry of the odontoid-lateral mass interspace. European Journal of Trauma and Emergency Surgery 42: 749-754, 2016.

72. Güntert T, Hänggi P, Othman A, Suriyanarayanan S, Sonda S, Zuellig RA, Hornemann T, and Ogunshola OO. 1-Deoxysphingolipid-induced neurotoxicity involves N-methyl-d-aspartate receptor signaling. Neuropharmacology 110: 211-222, 2016.

73. Hageman MG, Bossen JK, Neuhaus V, Mudgal CS, Ring D, and Group SoV. Assessment of Decisional Conflict about the Treatment of carpal tunnel syndrome, Comparing Patients and Physicians. Archives of Bone and Joint Surgery 4: 150-155, 2016.

74. Haralampieva D. The Impact of PGC-1α on Engineered Muscle Tissue and the Use of PET-Scan for Cell Tracking and Functional Analyses. 2016.

75. Haralampieva D, Betzel T, Dinulovic I, Salemi S, Stoelting M, Krämer S, Schibli R, Sulser T, Handschin C, Eberli D, and Ametamey SM. Non-invasive Imaging and Tracking of Engineered Human Muscle Precursor Cells for Skeletal Muscle Tissue Engineering Using Positron Emissi-

on Tomography. Journal of Nuclear Medicine 57: 1467-1473, 2016.

76. Heinrich S, et al., and Clavien P-A. Extended Heihepatectomy. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 405-412.

77. Héquet D, Kralidis G, Carrel T, Cusini A, Garzoni C, Hullin R, Meylan PR, Mohacsi P, Mueller NJ, Ruschitzka F, Tozzi P, van Delden C, Weisser M, Wilhelm MJ, Pascual M, and Manuel O. Ventricular assist devices as bridge to heart transplantation: impact on post-transplant infections. BMC Infectious Diseases 16: 321, 2016.

78. Herrmann IK, Beck-Schimmer B, Schumacher CM, Gschwind S, Kaech A, Ziegler U, Clavien P-A, Günther D, Stark WJ, Graf R, and Schlegel AA. *In vivo risk* evaluation of carbon-coated iron carbide nanoparticles based on short- and long-term exposure scenarios. Nanomedicine 11: 783-796, 2016.

79. Hierholzer C. Die Behandlung von Femurpseudarthrosen. In: Spezielle Unfallchirurgie, edited by Pohlemanns T, and Marzi I. München: Elsevier, 2016, p. 301-309.

80. Hierholzer C. Femurschaftfrakturen. In: Checkliste Traumatologie, edited by Von Bühren M, Keel M, and Marzi I. Stuttgart: Georg Thieme Verlag, 2016, p. 372-380.

81. Hierholzer C, Friederichs J, Glowalla C, Woltmann A, Bühren V, and von Rüden C. Reamed intramedullary exchange nailing in the operative treatment of aseptic tibial shaft nonunion. International orthopaedics Epub ahead of print, 2016.

82. Higashigaito K, Husarik DB, Barthelmes J, Plass AR, Manka R, Maisano F, and Alkadhi H. Computed tomography angiography of coronary artery bypass grafts: low contrast media volume protocols adapted to tube voltage. Investigative Radiology 51: 241-248, 2016.

83. Hinger D, Gräfe S, Navarro F, Spingler B, Pandiarajan D, Walt H, Couffin A-C, and Maake C. Lipid nanoemulsions and liposomes improve photodynamic treatment efficacy and tolerance in CAL-33 tumor bearing nude mice. Journal of Nanobiotechnology 14: 71, 2016.

84. Hoda MA, Dong Y, Rozsas A, Klikovits T, Laszlo V, Ghanim B, Stockhammer P, Ozsvar J, Jakopovic M, Samarzija M, Brcic L, Bendek M, Szirtes I, Reid G, Kirschner MB, Kao SC, Opitz I, Weder W, Frauenfelder T, Nguyen-Kim TDL, Aigner C, Klepetko W, van Zandwijk N, Berger W, Dome B, Grusch M, and Hegedus B. Circulating activin A is a novel prognostic biomarker in malignant pleural mesothelioma - A multi-institutional study. European Journal of Cancer 63: 64-73, 2016.

85. Hoffmeyer P, Simmen H, Jakob M, Sommer C, Platz A, Ilchmann T, Grossen E, Ryf C, Christofilopoulos P, Schueler M, Lassen MR, Rimle M, and Gasser UE. Rivaroxaban for thromboprophylaxis after nonelective orthopedic trauma surgery in Switzerland. Orthopedics Epub ahead of print, 2016.

86. Holubec T, Flammer AJ, Bettex D, Emmert MY, Maisano F, and Wilhelm MJ. Successful transplantation of a donor heart with multiple traumatic defects. European Heart Journal 37: 120-120, 2016.

87. Jauernik J, Fenner C, Rücker M, Damerau G, Stadlinger B, and Metzler P. Evaluation von Protokollen zur Behandlung des keratozystischen odontogenen Tumors und der orthokeratotischen odontogenen Zyste : Eine retrospektive Studie. Die Quintessenz 1353-1364, 2016.

88. Jauernik J, Stadlinger B, Rücker M, and Damerau G. Der plastische Verschluss einer oroantralen Fistel : Ein Fallbericht. Die Quintessenz 979-984, 2016.

89. Jenny G. A systematic review and meta-analyses on the influence of biological implant surface coatings on periimplant bone formation. 2016.

90. Jenny G, Jauernik J, Bierbaum S, Bigler M, Grätz KW, Rücker M, and Stadlinger B. A systematic review and meta-analysis on the influence of biological implant surface coatings on periimplant bone formation. Journal of Biomedical Materials Research Part A 104: 2898-2910, 2016.

91. Jensen KO. The Impact of mild induced hypothermia on the rate of Transfusion and the mortality in severely injured patients - a retrospective multi-Center study. 2016.

92. Jensen KO, Angst E, Hetzer FH, and Gingert C. Acute cytomegalovirus hepatitis in an immunocompetent host as a reason for upper right abdominal pain. Case Reports in Gastroenterology 10: 36-43, 2016.

93. Jensen KO, Held L, Kraus A, Hildebrand F, Mommsen P, Mica L, Wanner GA, Steiger P, Moos RM, Simmen H-P, and Sprengel K. The impact of mild induced hypothermia on the rate of transfusion and the mortality in severely injured patients: a retrospective multi-centre study. European Journal of Medical Research 21: online, 2016.

94. Jentzsch T, Gomes de Lima V, Seifert B, Sprengel K, and Werner CML. The benefits of elective spinal implant removal: a retrospective study of 137 patients. European Spine Journal 25: 856-864, 2016.

95. Jentzsch T, Neuhaus V, Seifert B, Osterhoff G, Simmen H-P, Werner CML, and Moos R. The impact of public versus private insurance on trauma patients. Journal of Surgical Research 200: 236-241, 2016.

96. Jentzsch T, Rahm S, Seifert B, Farei-Campagna J, Werner CML, and Bouaicha S. Correlation between arthroscopy simulator and video game performance: a cross-sectional study of 30 volunteers comparing 2- and 3-dimensional video games. Arthroscopy: The Journal of Arthroscopic & Related Surgery 32: 1328-1334, 2016.

97. Jentzsch T, Sprengel K, Peterer L, Mica L, and Werner CML. 3D navigation of endoscopic rhizotomy at the lumbar spine. Journal of Clinical Neuroscience 23: 101-105, 2016.

98. Jentzsch T, Zimmermann SM, Nicholls F, Cinelli P, Simmen H-P, and Werner CML. Echinomycin did not affect the safety of fracture healing: an experimental pilot study on a murine femur fracture model. Patient Safety in Surgery 10: online, 2016.

99. Jepsen S, Sanz M, Stadlinger B, and Terheyden H. Cell-to-Cell Communication: Oral Health and General Health : The Links Between Periodontitis, Atherosclerosis, and Diabetes Berlin: University of Zurich, 2016.

100. Jepsen S, Stadlinger B, Terheyden H, and Sanz M. Guest editorial science transfer: oral health and general health - the links between periodontitis, atherosclerosis, and diabetes. Journal of Clinical Periodontology 42: 1071-1073, 2016.

101. Jungraithmayr W, Brüstle K, and Weder W. Harnessing regulatory B cells to prevent experimental obliterative bronchiolitis. Journal of Thoracic and Cardiovascular Surgery 151: 497-498, 2016.

102. Jungraithmayr W, Tzafos S, Distler O, Kolios AGA, Weder W, and Franzen D. Rapid growth of lung nodules due to combined pulmonary vasculitis, silicoanthracosis, and chondrocalcinosis. Canadian Respiratory Journal 2016: 9254374, 2016.

103. Kachaylo E. The crossroads of tissue growth and metabolism in liver regeneration. 2016.

104. Kambakamba P, Bonvini JM, Glenck M, Castrezana López L, Pfammatter T, Clavien P-A, and DeOliveira ML. Intraoperative adverse events during irreversible electroporation-a call for caution. American Journal of Surgery 212: 715-721, 2016.

105. Kambakamba P, Linecker M, Alvarez FA, Samaras P, Reiner CS, Raptis DA, Kron P, de Santibanes E, Petrowsky H, Clavien PA, and Lesurtel M. Short chemotherapy-free interval improves oncological outcome in patients undergoing two-stage hepatectomy for colorectal liver metastases. Annals of Surgical Oncology 23: 3915-3923, 2016.

106. Kambakamba P, Stocker D, Reiner CS, Nguyen-Kim TD, Linecker M, Eshmuminov D, Petrowsky H, Clavien P-A, and Lesurtel M. Liver kinetic growth rate predicts postoperative liver failure after ALPPS. HPB 18: 800-805, 2016.

107. Kao SC, Kirschner MB, Cooper WA, Tran T, Burgers S, Wright C, Korse T, van den Broek D, Edelman J, Vallely M, McCaughan B, Pavlakis N, Clarke S, Molloy MP, van Zandwijk N, and Reid G. A proteomics-based approach identifies secreted protein acidic and rich in cysteine as a prognostic biomarker in malignant pleural mesothelioma. British Journal of Cancer 114: 524-531, 2016.

108. Karangwa SA, Dutkowski P, Fontes P, Friend PJ, Guarrera JV, Markmann JF, Mergental H, Minor T, Quintini C, Selzner M, Uygun K, Watson CJ, and Porte RJ. Machine perfusion of donor livers for transplantation: a proposal for standardized nomenclature and reporting guidelines. American Journal of Transplantation 16: 2932-2942, 2016.

109. Karar ME, Merk DR, Falk V, and Burgert O. A simple and accurate method for computer-aided transapical aortic valve replacement. Computerized Medical Imaging and Graphics 50: 31-41, 2016.

110. Käser SA, Hofmann I, Willi N, Stickel F, and Maurer CA. Liver Cirrhosis/Severe Fibrosis Is a Risk Factor for Anastomotic Leakage after Colorectal Surgery. Gastroenterology Research and Practice 2016: 1563037, 2016.

111. Käser SA, Mattiello D, and Maurer CA. Distant Metastasis in Colorectal Cancer is a Risk Factor for Anastomotic Leakage. Annals of Surgical Oncology 23: 888-893, 2016.

112. Kaserer A, Stein P, Simmen H-P, Spahn DR, and Neuhaus V. Failure rate of prehospital chest decompression after severe thoracic trauma. American Journal of Emergency Medicine Epub ahead of print, 2016.

113. Kenkel D, Yamada Y, Weiger M, Jungraithmayr W, Wurnig MC, and Boss A. Magnetization transfer as a potential tool for the early detection of acute graft rejection after lung transplantation in mice. Journal of Magnetic Resonance Imaging (JMRI) 44: 1091-1098, 2016.

114. Kiran R, and Turina M. Reply to Letter: „The Clinical Significance of an Elevated Postoperative Glucose Value in Nondiabetic Patients After Colorectal Surgery: Evidence for the Need for Tight Glucose Control?“. Annals of Surgery 263: e51, 2016.

115. Kobe A, Dutkowski P, Müllhaupt B, Clavien P-A, and Pfammatter T. Liver retransplantation with cavoportal hemitransposition after percutaneous mesocaval shunt creation. Liver Transplantation 22: 1154-1158, 2016.

116. Kokudo N, et al., and Clavien P-A. Gastroesophageal Devascularization: Sugiura Type Procedures. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 775-796.

117. König MA, Canepa DD, Cadosch D, Casanova E, Heinzelmann M, Rittirsch D, Plecko M, Hemmi S, Simmen H-P, Cinelli P, and Wanner GA. Direct transplantation of native pericytes from adipose tissue: A new perspective to stimulate healing in critical size bone defects. Cytotherapy 18: 41-52, 2016.

118. König MA, Hediger S, Schmitt JW, Jentzsch T, Sprengel K, and Werner CML. In-screw cement augmentation for iliosacral screw fixation in posterior ring pathologies with insufficient bone stock. European Journal of Trauma and Emergency Surgery Epub ahead of print, 2016.

119. Kostron A, Friess M, Crameri O, Inci I, Schneiter D, Hillinger S, Stahel R, Weder W, and Opitz I. Relapse pattern and second-line treatment following multimodality treatment for malignant pleural mesothelioma†. European Journal of Cardio-Thoracic Surgery 49: 1516-1523, 2016.

120. Kozomara-Hocke M, Hermanns T, and Poyet C. Urininkontinenz beim Mann: ein Tabuthema. Praxis 105: 269-277, 2016.

121. Kranzbühler B, Burger IA, Schmid DM, Sulser T, Kaufmann P, and Eberli D. Verbesserte Diagnostik beim Prostatakarzinom: PSMA-PET. Swiss Medical Forum 16: 943-945, 2016.

122. Kresoja-Rakic J, Kapaklikaya E, Ziltener G, Dalcher D, Santoro R, Christensen BC, Johnson KC, Schwaller B, Weder W, Stahel RA, and Felley-Bosco E. Identification of cis- and trans-acting elements regulating calretinin expression in mesothelioma cells. OncoTarget 7: 21272-21286, 2016.

123. Kron P, Linecker M, Limani P, Schlegel A, Kambakamba P, Lehn J-M, Nicolau C, Graf R, Humar B, and Clavien P-A. Hypoxia-driven Hif2a coordinates mouse liver regeneration by coupling parenchymal growth to vascular expansion. Hepatology 64: 2198-2209, 2016.

124. Kron P, Schlegel A, de Rougemont O, Oberkofler CE, Clavien P-A, and Dutkowski P. Short, Cool, and Well Oxygenated – HOPE for Kidney Transplantation in a Rodent Model. Annals of Surgery 264: 815-822, 2016.

125. Książek AA, Mitchell KJ, Cesarovic N, Schwarzwald C, Hoerstrup SP, and Weber B. PGA (polyglycolic acid)-P4HB (poly-4-hydroxybutyrate)-based bioengineered valves in the rat aortic circulation. Journal of Heart Valve Disease 25: 380-388, 2016.

126. Kuemmerle JM, Theiss F, Okoniewski MJ, Weber FA, Hemmi S, Mirsaidi A, Richards PJ, and Cinelli P. Identification of novel Equine (Equus caballus) tendon markers using RNA sequencing. Genes 7: 97, 2016.

127. Lambertz R, Hölscher AH, Bludau M, Leers JM, Gutschow C, and Schröder W. Management of Tracheo- or Bronchoesophageal Fistula After Ivor-Lewis Esophagectomy. World Journal of Surgery 40: 1680-1687, 2016.

128. Largo R, Stolzmann P, Fankhauser CD, Poyet C, Wolfsgruber P, Sulser T, Alkadhi H, and Winklhofer S. Predictive value of low tube voltage and dual-energy CT for successful shock wave lithotripsy: an in vitro study. Urolithiasis 44: 271-276, 2016.

129. Lehmann K, Eshmuminov D, Slankamenac K, Kranzbühler B, Clavien P-A, Vonlanthen R, and Gertsch P. Where Oncologic and Surgical Complication Scoring Systems Collide: Time for a New Consensus for CRS/HIPEC. World Journal of Surgery 40: 1075-1081, 2016.

130. Leisibach P, Schneiter D, Soltermann A, Yamada Y, Weder W, and Jungraithmayr W. Prognostic value of immunohistochemical markers in malignant thymic epithelial tumors. Journal of Thoracic Disease 8: 2580-2591, 2016.

131. Leuenberger C, Schuoler C, Bye H, Mignan C, Rechsteiner T, Hillinger S, Opitz I, Marsland B, Faiz A, Hiemstra PS, Timens W, Camici GG, Kohler M, Huber LC, and Brock M. MicroRNA-223 controls the expression of histone deacetylase 2: a novel axis in COPD. Journal of Molecular Medicine 94: 725-734, 2016.

132. Leuzzi G, Rocco G, Ruffini E, Sperduti I, Detterbeck F, Weder W, Venuta F, Van Raemdonck D, Thomas P, Facciolo F, and Group ETW. Multimodality therapy for locally advanced thymomas: A propensity score-matched cohort study from the European Society of Thoracic Surgeons Database. Journal of Thoracic and Cardiovascular Surgery 151: 47-57.e41, 2016.

133. Limani P, Borgeaud N, Linecker M, Tschuor C, Kachaylo E, Schlegel A, Jang J-H, Ungethüm U, Montani M, Graf R, Humar B, and Clavien P-A. Selective portal vein injection for the design of syngeneic models of liver malignancy. American Journal Of Physiology Gastrointestinal And Liver Physiology 310: G682-G688, 2016.

134. Limani P, et al., and Clavien P-A. Techniques of Vascular Clamping, Vascular Exclusion, and Caval Resection in Liver Surgery. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 353-361.

135. Limani P, Linecker M, Kachaylo E, Tschuor C, Kron P, Schlegel A, Ungethuem U, Jang JH, Georgiopoulou S, Claude Nicolau C, Lehn J-M, Graf R, Humar B, and Clavien P-A. Antihypoxic potentiation of standard therapy for experimental colorectal liver metastasis through myo-inositol trispyrophosphate. Clinical Cancer Research 22: 5887-5897, 2016.

136. Limani P, Linecker M, Oberkofler CE, Barmettler G, Kaech A, Graf R, Humar B, and Clavien P-A. Remote Ischemic Preconditioning. Annals of Surgery 264: 797-803, 2016.

137. Lin RCY, Kirschner MB, Cheng YY, van Zandwijk N, and Reid G. MicroRNA gene expression signatures in long-surviving malignant pleural mesothelioma patients. Genomics Data 9: 44-49, 2016.

138. Linecker M, Kron P, Lang H, de Santibañes E, and Clavien P-A. Too Many Languages in the ALPPS. Annals of Surgery 263: 837-838, 2016.

139. Linecker M, Limani P, Kambakamba P, Kron P, Tschuor C, Calo N, Foti M, Dufour J-F, Graf R, Humar B, and Clavien P-A. Omega-3 fatty acids protect fatty and lean mouse livers after major hepatectomy. Annals of Surgery Epub ahead of print, 2016.

140. Linecker M, Petrowsky H, and Clavien P-A. Reply to the Letter: Improving the Safety of ALPPS Procedure: The Optimal Compromise Between the Optimal Compromise Between Drop-out and Mortality Risk? Comment on: Schadde E et al Prediction of Mortality After ALPPS Stage-1: An Analysis of 320 Patients From the International ALPPS Registry. Ann Surg. 2015;262: 780-786. Annals of Surgery Epub ahead of print, 2016.

141. Linecker M, Pfammatter T, Kambakamba P, and DeOliveira ML. Ablation Strategies for Locally Advanced Pancreatic Cancer. Digestive Surgery 33: 351-359, 2016.

142. Linecker M, Stavrou GA, Oldhafer KJ, Jenner RM, Seifert B, Lurje G, Bednarsch J, Neumann U, Capobianco I, Nadalin S, Robles-Campos R, de Santibañes E, Malagó M, Lesurtel M, Clavien P-A, and Petrowsky H. The ALPPS risk score: Avoiding futile use of ALPPS. Annals of Surgery 264: 763-771, 2016.

143. Lutz TA, and Bueter M. The Use of Rat and Mouse Models in Bariatric Surgery Experiments. Frontiers in Nutrition 3: 25, 2016.

144. Maisano F, Taramasso M, Nickenig G, Hammerstingl C, Vahanian A, Messika-Zeitoun D, Baldus S, Huntgeburth M, Alfieri O, Colombo A, La Canna G, Agricola E, Zuber M, Tanner FC, Topilsky Y, Kreidel F, and Kuck K-H. Cardioband, a transcatheter surgical-like direct mitral valve annuloplasty system: early results of the feasibility trial. European Heart Journal 37: 817-825, 2016.

145. Marcon M, Keller D, Wurnig MC, Eberhardt C, Weiger M, Eberli D, and Boss A. Separation of collagen-bound and porous bone water transverse relaxation in mice: proposal of a multi-step approach. NMR in Biomedicine 29: 866-872, 2016.

146. Marcon M, Keller D, Wurnig MC, Weiger M, Kenkel D, Eberhardt C, Eberli D, and Boss A. Separation of collagen-bound and porous bone-water longitudinal relaxation in mice using a segmented inversion recovery zero-echo-time sequence. Magnetic Resonance in Medicine Epub ahead of print, 2016.

147. Marcon M, Weiger M, Keller D, Wurnig MC, Eberhardt C, Eberli D, and Boss A. Magnetization transfer imaging of cortical bone in vivo using a zero echo time sequence in mice at 4.7 T: a feasibility study. Magma 29: 853-862, 2016.

148. Martin-Gandul C, Stampf S, Héquet D, Mueller NJ, Cusini A, van Delden C, Khanna N, Boggian K, Hirzel C, Soccal P, Hirsch HH, Pascual M, Meylan P, and Manuel O. Preventive strategies against cytomegalovirus and incidence of α-herpesvirus infections in olid-organ transplant recipients: A nationwide cohort study. American Journal of Transplantation Epub ahead of print, 2016.

149. Martini K, Meier A, Opitz I, Weder W, Veit-Haibach P, Stahel RA, and Frauenfelder T. Diagnostic accuracy of sequential co-registered PET+MR in comparison to PET/CT in local thoracic staging of malignant pleural mesothelioma. Lung Cancer 94: 40-45, 2016.

150. Mauf S, Jentzsch T, Laberke PJ, Thali MJ, and Bartsch C. Why we need postmortem analysis of cardiac implantable electronic devices. Journal of Forensic Sciences 61: 988-992, 2016.

151. Maurer CA, Walensi M, Käser SA, Künzli BM, Lötscher R, and Zuse A. Liver resections can be performed safely without Pringle maneuver: A prospective study. World Journal of Hepatology 8: 1038-1046, 2016.

152. Meerang M, Bérard K, Felley-Bosco E, Lauk O, Vrugt B, Boss A, Kenkel D, Broggini-Tenzer A, Stahel RA, Arni S, Weder W, and Opitz I. Antagonizing the hedgehog pathway with vismodegib impairs malignant pleural mesothelioma growth in vivo by affecting stroma. Molecular Cancer Therapeutics 15: 1095-1105, 2016.

153. Meerang M, Bérard K, Friess M, Bitanihirwe BKY, Soltermann A, Vrugt B, Felley-Bosco E, Bueno R, Richards WG, Seifert B, Stahel R, Weder W, and Opitz I. Low Merlin expression and high Survivin labeling index are indicators for poor prognosis in patients with malignant pleural mesothelioma. Molecular Oncology 10: 1255-1265, 2016.

154. Meier R, Lutz C, Cosín-Roger J, Fagagnini S, Bollmann G, Hünerwadel A, Mamie C, Lang S, Tchouboukov A, Weber FE, Weber A, Rogler G, and Hausmann M. Decreased fibrogenesis after treatment with pirfenidone in a newly developed mouse model of intestinal fibrosis. Inflammatory Bowel Diseases 22: 569-582, 2016.

155. Melloul E, Hübner M, Scott M, Snowden C, Prentis J, Dejong CHC, Garden OJ, Farges O, Kokudo N, Vauthey J-N, Clavien P-A, and Demartines N. Guidelines for perioperative care for liver surgery: Enhanced Recovery After Surgery (ERAS) society recommendations. World Journal of Surgery 40: 2425-2440, 2016.

156. Melloul E, Lesurtel M, and Clavien P-A. Modified associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) procedure with right anterior liver sector congestion: Friend or foe? Surgery 160: 820-821, 2016.

157. Metzger S, Blache U, Lienemann PS, Karlsson M, Weber FE, Weber W, and Ehrbar M. Cell-Mediated Proteolytic Release of Growth Factors from Poly(Ethylene Glycol) Matrices. Macromolecular Bioscience 16: 1703-1713, 2016.

158. Mica L, Jensen KO, Pothmann C, Simmen H-P, and Hierholzer C. Jejunal injuries in a Young male‘s blunt abdominal trauma. Trauma and Emergency Care 2: 1-3, 2016.

159. Mica L, Simmen H, Werner CML, Plecko M, Keller C, Wirth SH, and Sprengel K. Fresh frozen plasma is permissive for systemic inflammatory response syndrome, infection, and sepsis in multiple-injured patients. American Journal of Emergency Medicine 34: 1480-1485, 2016.

160. Michelitsch C, Nguyen-Kim TDL, Jentzsch T, Simmen H-P, and Werner CML. Computed tomography-based three-dimensional visualisation of bone corridors and trajectories for screws in open reduction and internal fixation of symphysis diastasis: a retrospective radiological study. Archives of Orthopaedic and Trauma Surgery 136: 1673-1681, 2016.

161. Moor BK, Kuster R, Osterhoff G, Baumgartner D, Werner CML, Zumstein MA, and Bouaicha S. Inclination-dependent changes of the critical shoulder angle significantly influence superior glenohumeral joint stability. Clinical Biomechanics 32: 268-273, 2016.

162. Moos RM, Sprengel K, Jensen KO, Jentzsch T, Simmen H-P, Seifert B, Ciritsis B, Neuhaus V, Volbracht J, and Mehra T. Reimbursement of care for severe trauma under SwissDRG. Swiss Medical Weekly 146: w14334, 2016.

163. Morgenstern M, von Rüden C, Callsen H, Friederichs J, Hungerer S, Bühren V, Woltmann A, and Hierholzer C. The unstable thoracic cage injury: The concomitant sternal fracture indicates a severe thoracic spine fracture. Injury 47: 2465-2472, 2016.

164. Mortezavi A, and Eberli D. Re: Prostate Cancer Detection with Magnetic Resonance-ultrasound Fusion Biopsy: The Role of Systematic and Targeted Biopsies. European Urology 70: 891-892, 2016.

165. Mortezavi A, Keller EX, Poyet C, Hermanns T, Saba K, Randazzo M, Fankhauser CD, Wild PJ, Moch H, Sulser T, and Eberli D. Clinical impact of prostate biopsy undergrading in an academic and community setting. World Journal of Urology 34: 1481-1490, 2016.

166. Mortezavi A, Sulser T, Robbiani J, Drescher E, Disteldorf D, Eberli D, Poyet C, Baumgartner MK, Seifert H-H, and Hermanns T. Long-term oncologic outcome of an initial series of laparoscopic radical prostatectomy for clinically localized prostate cancer after a median follow-up of 10 years. Clinical Genitourinary Cancer 14: 290-297, 2016.

167. Müller A. al-Ghorab Shunt for Priapism. Journal of Sexual Medicine 13: 1279-1284, 2016.

168. Müllhaupt GS. How do stone attenuation and skin-to-stone distance in computed tomography influence the performance of shock wave lithotripsy in ureteral stone disease? 2016.

169. Naganuma T, Latib A, Costopoulos C, Oreglia J, Testa L, De Marco F, Candreva A, Chieffo A, Naim C, Montorfano M, Bedogni F, and Colombo A. Drug-eluting balloon versus second-generation drug-eluting stent for the treatment of restenotic lesions involving coronary bifurcations. EuroIntervention 11: 989-995, 2016.

170. Nayan M, Bhindi B, Yu JL, Mamdani M, Fleshner NE, Hermanns T, Chung P, Milosevic M, Bristow R, Warde P, Hamilton RJ, Finelli A, Jewett MAS, Zlotta AR, Sridhar SS, and Kulkarni GS. The initiation of a multidisciplinary bladder cancer clinic and the uptake of neoadjuvant chemotherapy: A time-series analysis. Canadian Urological Association Journal 10: 25-30, 2016.

171. Niedzwiecki M, Yamada Y, Inci I, Weder W, and Jungraithmayr W. Decrease of airway allergies after lung transplantation is associated with reduced basophils and eosinophils. Transplantation Proceedings 48: 2140-2146, 2016.

172. Nowak AK, Chansky K, Rice DC, Pass HI, Kindler HL, Shemanski L, Billé A, Rintoul RC, Batirel HF, Thomas CF, Friedberg J, Cedres S, de Perrot M, Rusch VW, Staging, Prognostic Factors Committee AB, and Pa. The IASLC mesothelioma staging project: proposals for revisions of the T descriptors in the forthcoming eighth edition of the TNM classification for pleural mesothelioma. Journal of Thoracic Oncology 11: 2089-2099, 2016.

173. Olthof PB, Huiskens J, Wicherts DA, Huespe PE, Ardiles V, Robles-Campos R, Adam R, Linecker M, Clavien P-A, Koopman M, Verhoef C, Punt CJA, van Gulik TM, and de Santibanes E. Survival after associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) for advanced colorectal liver metastases: a case-matched comparison with palliative systemic therapy. Surgery Epub ahead of print, 2016.

174. Opitz I, and Weder W. Clinical relevance of our multimodality prognostic score. Journal of Thoracic Oncology 11: e39-e40, 2016.

175. Osterhoff G, Morgan EF, Shefelbine SJ, Karim L, McNamara LM, and Augat P. Bone mechanical properties and changes with osteoporosis. Injury 47 Suppl: S11-S20, 2016.

176. Osterhoff G, Tiziani S, Hafner C, Ferguson SJ, Simmen H-P, and Werner CML. Symphyseal internal rod fixation versus standard plate fixation for open book pelvic ring injuries: a biomechanical study. European Journal of Trauma and Emergency Surgery 42: 197-202, 2016.

177. Panoulas VF, Montorfano M, Latib A, Giustino G, Spagnolo P, Taramasso M, Chieffo A, Civilini E, Chiesa R, and Colombo A. Transarterial endoleak closure after endovascular thoracoabdominal aneurysm repair: when the „sandwich“ goes wrong. Journal of Endovascular Therapy 23: 220-224, 2016.

178. Pass H, Giroux D, Kennedy C, Ruffini E, Cangir AK, Rice D, Asamura H, Waller D, Edwards J, Weder W, Hoffmann H, van Meerbeeck JP, Nowak A, Rusch VW, Staging I, and Prognostic Factors Committee AB. The IASLC mesothelioma staging project: improving staging of a rare disease through international participation. Journal of Thoracic Oncology 11: 2082-2088, 2016.

179. Pecoraro Y, Tsushima Y, Opitz I, Benden C, Schupbach R, Lenherr R, Jungraithmayr W, Weder W, and Inci I. Impact of time interval between donor brain death and cold preservation on long-term outcome in lung transplantation. Eur J Cardiothorac Surg 50: 264-268, 2016.

180. Pecoraro Y, Tsushima Y, Opitz I, Benden C, Schüpbach R, Lenherr R, Jungraithmayr W, Weder W, and Inci I. Impact of time interval between donor brain death and cold preservation on long-term outcome in lung transplantation. European Journal of Cardio-Thoracic Surgery 50: 264-268, 2016.

181. Petrowsky H. Does Volume Translate in Function in Interstage Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy?: Commentary on „Drop of Total Liver Function in the Interstages of the New Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy Technique: Analysis of the Auxiliary Liver by Hepatobiliary Iminodiacetic Acid Scintigraphy“. Annals of Surgery 263: e35, 2016.

182. Petrowsky H. Pump the organ: procurement and resuscitation technologies beyond static cold storage. Current Opinion in Organ Transplantation 21: 285-287, 2016.

183. Petrowsky H, and Clavien P-A. The Principle of Preserving Outflow Structures in Partial ALPPS: a commentary on „Segment 4: A Key Point of ALPPS Procedure“. Annals of Surgery Epub ahead of print, 2016.

184. Possner M, Vontobel J, Nguyen-Kim TDL, Zindel C, Holy EW, Stämpfli SF, Zuber M, Kaufmann PA, Nietlispach F, Maisano F, Niemann M, and Tanner FC. Prognostic value of aortic regurgitation after TAVI in patients with chronic kidney disease. International Journal of Cardiology 221: 180-187, 2016.

185. Poyet C, and Hermanns T. Prostate cancer risk calculators: still much work ahead. BJU International 118: 670-671, 2016.

186. Poyet C, Nieboer D, Bhindi B, Kulkarni GS, Wiederkehr C, Wettstein MS, Largo R, Wild P, Sulser T, and Hermanns T. Prostate cancer risk prediction using the novel versions of the ERSPC and PCPT risk calculators: Independent validation and comparison in a contemporary European cohort. BJU International 117: 401-408, 2016.

187. Poyet C, Wettstein MS, Lundon DJ, Bhindi B, Kulkarni GS, Saba K, Sulser T, Vickers AJ, and Hermanns T. External evaluation of a novel prostate cancer risk calculator (ProstateCheck) based on data of the Swiss arm of the ERSPC. Journal of Urology 196: 1402-1407, 2016.

188. Pozzi LF. Risikofaktoren für postoperative Wundinfektionen bei Tumor- und Traumapatienten nach Operationen an der Wirbelsäule. 2016.

189. Pozzoli A, Mazzone P, Benussi S, and Alfieri O. Incomplete surgical exclusion of the left atrial appendage. European Heart Journal 37: 188, 2016.

190. Randazzo M, Müller A, Carlsson S, Eberli D, Huber A, Grobholz R, Manka L, Mortezavi A, Sulser T, Recker F, and Kwiatkowski M. A positive family history as risk factor for prostate cancer in a population-based study with organized PSA-screening: results of the Swiss ERSPC (Aarau). BJU International 117: 576-583, 2016.

191. Raptis DA, and Clavien P-A. Liver Resections. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, Sarr MG, Fong Y, and Myazaki M. Berlin: Springer, 2016, p. 385-387.

192. Rauer T, De Zulueta T, Caspar U, Wagner B, and Zünd M. Das histiozytäre Sarkokom - Eine Herausforderung für alle Beteiligten. Swiss Medical Forum 16: 256-258, 2016.

193. Rauer T, Hürlimann S, Krüger T, Rindlisbacher A, and Zünd M. Akrale Metastasierung: Seltenes Erstsymptom eines hepatozellulären Karzinoms. Swiss Medical Forum 16: 1029-1031, 2016.

194. Rice D, Chansky K, Nowak A, Pass H, Kindler H, Shemanski L, Opitz I, Call S, Hasegawa S, Kernstine K, Atinkaya C, Rea F, Nafteux P, Rusch VW, Staging MDotI, and Factors P. The IASLC mesothelioma staging project: proposals for revisions of the n descriptors in the forthcoming eighth edition of the TNM classification for pleural mesothelioma. Journal of Thoracic Oncology 11: 2100-2111, 2016.

195. Riesterer O, Weder W, and Stahel R. Hemithoracic radiotherapy for mesothelioma: lack of benefit or lack of statistical power? - Authors‘ reply. Lancet Oncology 17: e44-e45, 2016.

196. Rittirsch D, Schoenborn V, Lindig S, Wanner E, Sprengel K, Günkel S, Blaess M, Schaarschmidt B, Sailer P, Märsmann S, Simmen H-P, Cinelli P, Bauer M, Claus RA, and Wanner GA. An integrated clinico-transcriptomic approach identifies a central role of the heme degradation pathway for septic complications after trauma. Annals of Surgery 264: 1125-1134, 2016.

197. Robaszkiewicz A, Qu C, Wisnik E, Ploszaj T, Mirsaidi A, Kunze FA, Richards PJ, Cinelli P, Mbalaviele G, and Hottiger MO. ARTD1 regulates osteoclastogenesis and bone homeostasis by dampening NF-κB-dependent transcription of IL-1β. Scientific Reports 6: 21131, 2016.

198. Robles AI, Olsen KS, Tsui DWT, Georgoulias V, Creaney J, Dobra K, Vyberg M, Minato N, Anders RA, Børresen-Dale A-L, Zhou J, Sætrom P, Nielsen BS, Kirschner MB, Krokan HE, Papadimitrakopoulou V, Tsamardinos I, and Røe OD. Excerpts from the 1st international NTNU symposium on current and future clinical biomarkers of cancer: innovation and implementation, June 16th and 17th 2016, Trondheim, Norway. Journal of Translational Medicine 14: 295, 2016.

199. Rössler F, Sapisochin G, Song G, Lin Y-H, Simpson MA, Hasegawa K, Laurenzi A, Sánchez Cabús S, Nunez MI, Gatti A, Beltrame MC, Slankamenac K, Greig PD, Lee S-G, Chen C-L, Grant DR, Pomfret EA, Kokudo N, Cherqui D, Olthoff KM, Shaked A, García-Valdecasas JC, Lerut J, Troisi RI, De Santibanes M, Petrowsky H, Puhan MA, and Clavien P-A. Defining Benchmarks for Major Liver Surgery. Annals of Surgery 264: 492-500, 2016.

200. Rostetter C, Kuster IM, Schenkel JS, Lanzer M, Gander T, and Kruse AL. The effects of preoperative radiotherapy on head and neck free flap anastomosis success. Journal of Oral and Maxillofacial Surgery 74: 2521-2525, 2016.

201. Rostetter C, Lübbers H-T, and Metzler P. Management von Schmerzen nach zahnärztlichen Eingriffen. Swiss Dental Journal 126: 928-929, 2016.

202. Rostetter C, Lübbers H-T, and Metzler P. Traitement analgésique après des interventions en médecine dentaire. Swiss Dental Journal 126: 1054-1055, 2016.

203. Rothschild SI, Zippelius A, Prince SS, Gonzalez M, Weder W, Xyrafas A, Rusterholz C, and Pless M. 129TiP: SAKK 16/14 - anti-PD-L1 antibody durvalumab (MEDI4736) in addition to neoadjuvant chemotherapy in patients with stage IIIA (N2) non-small cell lung cancer (NSCLC): a multicenter single-arm phase II trial. Journal of Thoracic Oncology 11: S112, 2016.

204. Rottmar M, Haralampieva D, Salemi S, Eberhardt C, Wurnig MC, Boss A, and Eberli D. Magnetization transfer MR imaging to monitor muscle tissue formation during myogenic in vivo differentiation of muscle precursor cells. Radiology 281: 436-443, 2016.

205. Ruangsawasdi N, Zehnder M, Patcas R, Ghayor C, and Weber FE. Regenerative dentistry: animal model for regenerative endodontology. Transfusion Medicine and Hemotherapy 43: 359-364, 2016.

206. Rupp NJ, Schüffler PJ, Zhong Q, Falkner F, Rechsteiner M, Rüschoff JH, Fankhauser C, Drach M, Largo R, Tremp M, Poyet C, Sulser T, Kristiansen G, Moch H, Buhmann J, Müntener M, and Wild PJ. Oxygen supply maps for hypoxic microenvironment visualization in prostate cancer. Journal of Pathology Informatics 7: 3, 2016.

207. Rusch VW, Chansky K, Kindler HL, Nowak AK, Pass HI, Rice DC, Shemanski L, Galateau-Sallé F, McCaughan BC, Nakano T, Ruffini E, van Meerbeeck JP, Yoshimura M, Staging I, and Prognostic Factors Committee ab. The IASLC mesothelioma staging project: proposals for the m descriptors and for revision of the TNM stage groupings in the forthcoming (eighth) edition of the TNM classification for mesothelioma. Journal of Thoracic Oncology 11: 2112-2119, 2016.

208. Sakar MS, Eyckmans J, Pieters R, Eberli D, Nelson BJ, and Chen CS. Cellular forces and matrix assembly coordinate fibrous tissue repair. Nature Communications 7: 11036, 2016.

209. Santourlidis S, Ghanjati F, Beermann A, Hermanns T, and Poyet C. IDLN-MSP: Idiolocal normalization of real-time methylation-specific PCR for genetic imbalanced DNA specimens. BioTechniques 60: 84-87, 2016.

210. Sapisochin G, Facciuto M, Rubbia-Brandt L, Marti J, Mehta N, Yao F, Vibert E, Cherqui D, Grant D, Hernandez-Alejandro R, Dale C, Cucchetti A, Pinna A, Hwang S, Lee SG, Agopian VG, Busuttil RW, Rizvi S, Heimbach JK, Montenovo M, Reyes J, Cesaretti M, Soubrane O, Reichman T, Seal J, Kim PTW, Klintmalm G, Sposito C, Mazzaferro V, Dutkowski P, Clavien PA, Toso C, Majno P, Kneteman N, Saunders C, and Bruix J. Liver transplantation for “very early” intrahepatic cholangiocarcinoma: International retrospective study supporting a prospective assessment. Hepatology 64: 1178-1188, 2016.

211. Saponara E. The role of Serotonin in pancreatic acinar cell secretion and regeneration during pancreatitis. 2016.

212. Saran U, Humar B, Kolly P, and Dufour J-F. Hepatocellular carcinoma and lifestyles. Journal of Hepatology 64: 203-214, 2016.

213. Sauer M, Fleischmann T, Lipiski M, Arras M, and Jirkof P. Buprenorphine via drinking water and combined oral-injection protocols for pain relief in mice. Applied Animal Behaviour Science 185: 103-112, 2016.

214. Sauvain M-O, Tschirky S, Patak MA, Clavien P-A, Hahnloser D, and Muller MK. Acute appendicitis in overweight patients : the role of preoperative imaging. Patient Safety in Surgery 10: 13, 2016.

215. Sauvain MO, Slankamenac K, Müller MK, Wildi S, Metzger U, Schmid W, Wydler J, Clavien PA, and Hahnloser D. Delaying surgery to perform CT scans for suspected appendicitis decreases the rate of negative appendectomies without increasing the rate of perforation nor postoperative complications. Langenbeck‘s Archives of Surgery 401: 643-649, 2016.

216. Scaglioni MF, Lindenblatt N, Barth AA, Fuchs B, Weder W, and Giovanoli P. Free fillet flap application to cover forequarter or traumatic amputation of an upper extremity: A case report. Microsurgery 36: 700-704, 2016.

217. Scarci M, Caruana E, Bertolaccini L, Bedetti B, Brunelli A, Varela G, Papagiannopoulos K, Kuzdzal J, Massard G, Ruffini E, Falcoz PE, Opitz I, Batirel H, Toker A, Rocco G, and Group EMPEW. Current practices in the management of malignant pleural effusions: a survey among members of the European Society of Thoracic Surgeons. Interactive Cardiovascular and Thoracic Surgery Epub ahead of print, 2016.

218. Schadde E, et al., and Clavien P-A. ALPPS (Associatin Liver Partition with Portal Vein Ligation for Staged Hepatectomy). In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 447-456.

219. Schenkel JS. Inferior alveolar nerve function after open reduction and internal fixation of mandibular fractures. 2016.

220. Schenkel JS, Jacobsen C, Rostetter C, Grätz KW, Rücker M, and Gander T. Inferior alveolar nerve function after open reduction and internal fixation of mandibular fractures. Journal of Cranio-Maxillofacial Surgery 44: 743-748, 2016.

221. Schlegel A, Kron P, De Oliveira ML, Clavien P-A, and Dutkowski P. Is single portal vein approach sufficient for hypothermic machine perfusion of DCD liver grafts? Journal of Hepatology 64: 239-241, 2016.

222. Schlegel A, Kron P, de Oliveira ML, Clavien P-A, and Dutkowski P. Reply to 'Is single portal vein perfusion the best approach for machine preservation of liver grafts?'. Journal of Hepatology 64: 1195-1196, 2016.

223. Schlegel A, Kron P, and Dutkowski P. Hypothermic machine perfusion in liver transplantation. Current Opinion in Organ Transplantation 21: 308-314, 2016.

224. Schmid FA, Inci I, Bürgi U, Hillinger S, Schneiter D, Schmitt-Opitz I, Huber LC, Isenring BD, Jungraithmayr W, Schuurmans MM, Weder W, and Benden C. Favorable outcome of children and adolescents undergoing lung transplantation at a European adult center in the new era. Pediatric Pulmonology 51: 1222-1228, 2016.

225. Schmidt HM, El Lakis MA, Markar SR, Hubka M, and Low DE. Accelerated Recovery Within Standardized Recovery Pathways After Esophagectomy: A Prospective Cohort Study Assessing the Effects of Early Discharge on Outcomes, Readmissions, Patient Satisfaction, and Costs. Annals of Thoracic Surgery 102: 931-939, 2016.

226. Schmidt HM, Mohiuddin K, Bodnar AM, El Lakis M, Kaplan S, Irani S, Gan I, Ross A, and Low DE. Multidisciplinary treatment of T1a adenocarcinoma in Barrett's esophagus: contemporary comparison of endoscopic and surgical treatment in physiologically fit patients. Surgical Endoscopy 30: 3391-3401, 2016.

227. Schmitt JW, Benden C, Dora C, and Werner CML. Is total hip arthroplasty safely performed in lung transplant patients? Current experience from a retrospective study of the Zurich lung transplant cohort. Patient Safety in Surgery 10: 17, 2016.

228. Schneider M, Lesurtel M, and Weber A. Pancreatic cystic lesion with baffling fluid levels of cea and amylase. Journal of Gastrointestinal and Liver Diseases 25: 270, 2016.

229. Schulz UJ. The Universtiy Hostpial Zurich offers an Online Consultation Service for men with intimate health problems. 2016.

230. Schumann P, Kampmann A, Sauer G, Lindhorst D, von See C, Stoetzer M, Tavassol F, Gellrich N-C, Rücker M, and Essig H. Accelerated vascularization of tissue engineering constructs in vivo by preincubated co-culture of aortic fragments and osteoblasts. Biochemical Engineering Journal 105: 230-241, 2016.

231. Scotland H, Widmer JD, Wildi S, Bueter M, Weber M, and Muller MK. How to cope with insufficient pneumoperitoneum and exposure when performing laparoscopic gastric bypass surgery. Langenbeck's Archives of Surgery 401: 299-305, 2016.

232. Seleznik G, Seeger H, Bauer J, Fu K, Czerkowicz J, Papandile A, Poreci U, Rabah D, Ranger A, Cohen CD, Lindenmeyer M, Chen J, Edenhofer I, Anders HJ, Lech M, Wüthrich RP, Ruddle NH, Moeller MJ, Kozakowski N, Regele H, Browning JL, Heikenwalder M, and Segerer S. The lymphotoxin β receptor is a potential therapeutic target in renal inflammation. Kidney International 89: 113-126, 2016.

233. Sepesi B, Schmidt HE, Lada M, Correa AM, Walsh GL, Mehran RJ, Rice DC, Roth JA, Vaporciyan AA, Ajani JA, Watson TJ, Swisher SG, Low DE, and Hofstetter WL. Survival in Patients With Esophageal Adenocarcinoma Undergoing Trimodality Therapy Is Independent of Regional Lymph Node Location. Annals of Thoracic Surgery 101: 1075-1080, 2016.

234. Sergeant G, et al., and Clavien P-A. Right Living-Donor Hepatectomy. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 545-552.

235. Slamecka J, Salimova L, McClellan S, van Kelle M, Kehl D, Laurini J, Cinelli P, Owen L, Hoerstrup SP, and Weber B. Non-integrating episomal plasmid-based reprogramming of human amniotic fluid stem cells into induced pluripotent stem cells in chemically defined conditions. Cell Cycle 15: 234-249, 2016.

236. Slankamenac K, Puhan MA, and Clavien P-A. Reply to Slankamenac et al's Comprehensive Complication Index Validation Study (November 2014). Annals of Surgery 264: e12, 2016.

237. Smolar J, Salemi S, Horst M, Sulser T, and Eberli D. Stem Cells in Functional Bladder Engineering. Transfusion Medicine and Hemotherapy 43: 328-335, 2016.

238. Soll C, et al., and Clavien P-A. Left Hemihepatectomy. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, Sarr MG, Fong Y, and Miyazaki M. Berlin: Springer, 2016, p. 397-405.

239. Sprengel K, Simmen H, Werner CML, Jensen KO, Keller C, Wirth SH, Berli M, and Mica L. Analysis of fluid resuscitation in critically injured patients: a central role of saline solutions. Journal of Acute Medicine 6: 29-34, 2016.

240. Sprengel K, Simmen H, Werner CML, Sulser S, Plecko M, Keller C, and Mica L. Resuscitation with polymeric plasma substitutes is permissive for systemic inflammatory response syndrome and sepsis in multiply injured patients: a retrospective cohort study. European Journal of Medical Research 21: 39, 2016.

241. Starck CT, Steffel J, Caliskan E, Holubec T, Schoenrath F, Maisano F, and Falk V. Clinical performance of a new bidirectional rotational mechanical lead extraction sheath. Europace 18: 253-256, 2016.

242. Steuer J, Lachat M, Veith FJ, and Wanhainen A. Endovascular grafts for abdominal aortic aneurysm. European Heart Journal 37: 145-151, 2016.

243. Stölting MNL, Arnold AS, Haralampieva D, Handschin C, Sulser T, and Eberli D. Magnetic stimulation supports muscle and nerve regeneration after trauma in mice. Muscle & Nerve 53: 598-607, 2016.

244. Stracquadanio G, Vrugt B, Flury R, Schraml P, Würl P, Müller TH, Knippschild U, Henne-Bruns D, Breitenstein S, Clavien P-A, Graf R, Bond GL, and Grochola LF. CD44 SNP rs187115: A novel biomarker signature that predicts survival in resectable pancreatic ductal adenocarcinoma. Clinical Cancer Research 31, 2016.

245. Studer G, Bredell M, Studer S, Huber G, and Glanzmann C. Risk profile for osteoradionecrosis of the mandible in the IMRT era. Strahlentherapie und Onkologie 192: 32-39, 2016.

246. Tan DSW, Yom SS, Tsao MS, Pass HI, Kelly K, Peled N, Yung RC, Wistuba II, Yatabe Y, Unger M, Mack PC, Wynes MW, Mitsudomi T, Weder W, Yankelevitz D, Herbst RS, Gandara DR, Carbone DP, Bunn PA, Mok TSK, and Hirsch FR. The international association for the study of lung cancer consensus statement on optimizing management of EGFR mutation-positive non-small cell lung cancer: status in 2016. Journal of Thoracic Oncology 11: 946-963, 2016.

247. Tao J-Q, Sorokina EM, Vazquez Medina JP, Mishra MK, Yamada Y, Satalin J, Nieman GF, Nellen JR, Beduhn B, Cantu E, Habashi NM, Jungraithmayr W, Christie JD, and Chatterjee S. Onset of inflammation with ischemia: implications for donor lung preservation and transplant survival. American Journal of Transplantation 16: 2598-2611, 2016.

248. Taramasso M, Guidotti A, Cesarovic N, Denti P, Addis A, Candreva A, Nietlispach F, Fleischmann T, Emmert MY, and Maisano F. Transcatheter direct mitral annuloplasty with Cardioband: feasibility and efficacy trial in an acute preclinical model. EuroIntervention 12: e1428-e1434, 2016.

249. Taramasso M, Maisano F, De Bonis M, Pozzoli A, Schiavi D, Benussi S, Grimaldi A, La Canna G, and Alfieri O. Prognostic impact and late evolution of untreated moderate (2/4+) functional tricuspid regurgitation in patients undergoing aortic valve replacement. Journal of Cardiac Surgery 31: 9-14, 2016.

250. Taramasso M, Nietlispach F, Dvir D, Anabitarte P, Moarof I, Webb JG, and Maisano F. Transfemoral tricuspid valve-in-valve implantation: snare it to make it simpler! EuroIntervention 12: 402-402, 2016.

251. Taramasso M, Nietlispach F, Schmid M, and Maisano F. Corevalve Evolut R implantation to treat severe left ventricle outflow tract obstruction following mitral valve-in-ring: first-in-man report. European Heart Journal 37: 317, 2016.

252. Templeton AJ, Knox JJ, Lin X, Simantov R, Xie W, Lawrence N, Broom R, Fay AP, Rini B, Donskov F, Bjarnason GA, Smoragiewicz M, Kollmannsberger C, Kanesvaran R, Alimohamed N, Hermanns T, Wells JC, Amir E, Choueiri TK, and Heng DYC. Change in neutrophil-to-lymphocyte ratio in response to targeted therapy for metastatic renal cell carcinoma as a prognosticator and biomarker of efficacy. European Urology 70: 358-364, 2016.

253. Thürig G. Safety of total hip arthroplasty for femoral neck fractures using the direct anterior approach: a retrospective observational study in 86 elderly patients. 2016.

254. Tian Y, Lesurtel M, Ungethuem U, Song Z, Maurizio E, and Clavien P-A. A novel technique in mouse liver transplantation. Transplant International 29: 742-743, 2016.

255. Togan B, Gander T, Lanzer M, Martin R, and Lübbers H-T. Incidence and frequency of nondental incidental findings on cone-beam computed tomography. Journal of Cranio-Maxillofacial Surgery 44: 1373-1380, 2016.

256. Tolboom H, Olejníčková V, Reser D, Rosser B, Wilhelm MJ, Gassmann M, Bogdanova A, and Falk V. Moderate hypothermia during *ex vivo* machine perfusion promotes recovery of hearts donated after cardiocirculatory death†. European Journal of Cardio-Thoracic Surgery 49: 25-31, 2016.

257. Trumello C, Pozzoli A, Mazzone P, Nascimbene S, Bignami E, Cireddu M, Della Bella P, Alfieri O, and Benussi S. Electrophysiological findings and long-term outcomes of percutaneous ablation of atrial arrhythmias after surgical ablation for atrial fibrillation. European Journal of Cardio-Thoracic Surgery 49: 273-280, 2016.

258. Tschuor C, and Clavien P-A. Right Hemihepatectomy. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato Biliary Surgery, edited by Clavien P-A, Sarr MG, Fong Y, and Miyazaki M. Berlin: Springer, 2016, p. 387-397.

259. Tschuor C, et al., and Clavien P-A. Techniques of liver parenchyma dissection. In: Atlas of Upper Gastrointestinal and Hepato-Pancreato-Biliary Surgery, edited by Clavien P-A, and et al. Berlin: Springer, 2016, p. 377-383.

260. Tschuor C, Kachaylo E, Limani P, Raptis DA, Linecker M, Tian Y, Herrmann U, Grabliauskaite K, Weber A, Columbano A, Graf R, Humar B, and Clavien P-A. Constitutive androstane receptor (Car)-driven regeneration protects liver from failure following tissue loss. Journal of Hepatology 65: 66-74, 2016.

261. van Wulfften Palthe ODR, Neuhaus V, Janssen SJ, Guitton TG, Ring D, and Group SoV. Among Musculoskeletal Surgeons, Job Dissatisfaction Is Associated With Burnout. Clinical Orthopaedics and Related Research 474: 1857-1863, 2016.

262. Vetter D, Schuurmans MM, Benden C, Clavien P-A, and Nocito A. Long-term follow-up of lung transplant recipients supports non-operative treatment of uncomplicated diverticulitis. Clinical Transplantation 30: 1264-1270, 2016.

263. von Rüden C, Morgenstern M, Friederichs J, Augat P, Hackl S, Woltmann A, Bühren V, and Hierholzer C. Comparative study suggests that human bone morphogenetic proteins have no influence on the outcome of operative treatment of aseptic clavicle non-unions. International orthopaedics 40: 2339-2345, 2016.

264. von Rüden C, Morgenstern M, Hierholzer C, Hackl S, Gradinger FL, Woltmann A, Bühren V, and Friederichs J. The missing effect of human recombinant Bone Morphogenetic Proteins BMP-2 and BMP-7 in surgical treatment of aseptic forearm nonunion. Injury 47: 919-924, 2016.

265. Wagner MEH, Gellrich N-C, Friese K-I, Becker M, Wolter F-E, Lichtenstein JT, Stoetzer M, Rana M, and Essig H. Model-based segmentation in orbital volume measurement with cone beam computed tomography and evaluation against current concepts. International Journal of Computer Assisted Radiology and Surgery 11: 1-9, 2016.

266. Wakabayashi G, Cherqui D, Geller DA, et al., and Clavien P-A. Recommendations for laparoscopic liver resection: a report from the second international consensus conference held in Morioka. Annals of Surgery 261: 619-629, 2016.

267. Wanis KN, Buac S, Linecker M, Ardiles V, Tun-Abraham ME, Robles-Campos R, Malago M, de Santibañes E, Clavien P-A, and Hernandez-Alejandro R. Patient survival after simultaneous ALPPS and colorectal resection. World Journal of Surgery Epub ahead of print, 2016.

268. Weber B, Kehl D, Bleul U, Behr L, Sammut S, Frese L, Ksiazek A, Achermann J, Stranzinger G, Robert J, Sanders B, Sidler M, Brokopp CE, Proulx ST, Frauenfelder T, Schoenauer R, Emmert MY, Falk V, and Hoerstrup SP. In vitro fabrication of autologous living tissue-engineered vascular grafts based on prenatally harvested ovine amniotic fluid-derived stem cells. Journal of Tissue Engineering and Regenerative Medicine 10: 52-70, 2016.

269. Weder W, and Inci I. Carinal resection and sleeve pneumonectomy. Journal of Thoracic Disease 8: S882-S888, 2016.

270. Weitkunat T, Buck FM, Jentzsch T, Simmen H-P, Werner CML, and Osterhoff G. Influence of high-heeled shoes on the sagittal balance of the spine and the whole body. European Spine Journal 25: 3658-3665, 2016.

271. Wettstein M. Absorption of irrigation fluid during XPS(TM) GreenLight laser vaporization of the prostate: results from a prospective breath ethanol monitoring study. 2016.

272. Wettstein MS, Poyet C, Grossmann NC, Fankhauser CD, Keller EX, Kozomara M, Meyer S, Sulser T, Müller A, and Hermanns T. Absorption of irrigation fluid during XPS™ GreenLight laser vaporization of the prostate: results from a prospective breath ethanol monitoring study. World Journal of Urology 34: 1261-1267, 2016.

273. Wiesli P, Majerus S, Amrein I, Cozzio A, Eberli D, Felix B, Kavvadias T, and Lehmann R. Diabetes und urogenitale Infektionen unter SGLT2-Hemmern. Swiss Medical Forum 16: 363-368, 2016.

274. Woloszyk A, Buschmann J, Waschkies C, Stadlinger B, and Mitsiadis TA. Human dental pulp stem cells and gingival fibroblasts seeded into silk fibroin scaffolds have the same ability in attracting vessels. Frontiers in Physiology 7: 140, 2016.

275. Wurnig MC, Weiger M, Wu M, Kenkel D, Jungraithmayr W, Pruessmann KP, and Boss A. In vivo magnetization transfer imaging of the lung using a zero echo time sequence at 4.7 Tesla in mice: Initial experience. Magnetic Resonance in Medicine 76: 156-162, 2016.

276. Yamada Y, Jang J-H, De Meester I, Baerts L, Vliegen G, Inci I, Yoshino I, Weder W, and Jungraithmayr W. CD26 costimulatory blockade improves lung allograft rejection and is associated with enhanced interleukin-10 expression. Journal of Heart and Lung Transplantation 35: 508-517, 2016.

277. Yamada Y, Vandermeulen E, Heigl T, Somers J, Vaneylen A, Verleden SE, Bellon H, De Vleeschauwer S, Verbeken EK, Van Raemdonck DE, Vos R, Verleden GM, Jungraithmayr W, and Vanaudenaerde BM. The role of recipient derived interleukin-17A in a murine orthotopic lung transplant model of restrictive chronic lung allograft dysfunction. Transplant immunology 39: 10-17, 2016.

278. Zhong Q, Rüschoff JH, Guo T, Gabrani M, Schüffler PJ, Rechsteiner M, Liu Y, Fuchs TJ, Rupp NJ, Fankhauser C, Buhmann JM, Perner S, Poyet C, Blattner M, Soldini D, Moch H, Rubin MA, Noske A, Rüschoff J, Haffner MC, Jochum W, and Wild PJ. Image-based computational quantification and visualization of genetic alterations and tumour heterogeneity. Scientific Reports 6: 24146, 2016.

279. Zimmermann SM, Schwitter LW, Scheyerer MJ, Jentzsch T, Simmen H-P, and Werner CML. Prevention of heterotopic ossification: an experimental study using a plasma expander in a murine model. BMC Surgery 16: 29, 2016.

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