Thoracic Surgery

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Prof. Dr. Ralph A. Schmid
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MD at University of Zurich; Residency, Division of Surgery (1988-1994). Fellowship (1994-1995) at Department of Thoracic and Cardiovascular Surgery, Washington University Medical School, St. Louis (US). Staff Surgeon (1996-1999) at Division of Surgery, University Hospital Zurich. Since 1999, Professor of Surgery and Chair, Department of Thoracic Surgery, Inselspital

Dr. Sean R.R. Hall
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PhD in Pharmacology and Toxicology at Queen's University (CA). Postdoc (2008-2010) at Brigham and Women's Hospital, Harvard Medical School (US). Senior Scientist (2011) at NeoStem Inc, Boston (US). Senior Scientist (2011-2012) at Erasmus Medical Center, Division of Transplantation and Intestinal Surgery, Rotterdam (NL). Since 2013, Group Leader, Department of Thoracic Surgery, Inselspital.

Dr. Thomas M. Marti
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PhD in Biology at University of Bern. Postdoc (2003-2006) at UCSF Comprehensive Cancer Center (US). Principal Investigator (2006-2012) at Laboratory of Molecular Oncology, University Hospital Zurich. Since 2012, Group Leader, Department of Thoracic Surgery, Inselspital.

Research Highlights 2015 / Outlook 2016

Hall Group

There is emerging evidence to suggest that the tumour (mesenchymal) microenvironment acts in concert with the cancer cell-centric changes driving tumour phenotype. We have recently identified rare mesenchymal stromal cells in primary human lung adenocarcinomas and are interested in how these cells promote tumour growth. Initially, mesenchymal stromal cells were shown to possess broad immunomodulatory properties. We postulate that these cells may act as key effectors in regulating the composition and function of infiltrating leukocytes within the tumour microenvironment, tipping the balance towards immunosuppression. Therefore, our aim is to use a combined pharmacological and genetic approach (patient-derived samples and inducible mouse models of human lung adenocarcinoma) to determine the potential of this tumour-derived mesenchymal subset to serve as a novel therapeutic target in lung cancer. In a second project, we are interested in identifying cell subsets that are critical for lung regeneration. To achieve this, we plan to utilise genetic fate mapping tools to identify cellular hierarchies in alveolar development and cell fate during injury and alveolar regeneration.

Marti Group

Lung cancer is the most common cause of cancer-related mortality worldwide. More than 80% of lung tumours are non-small-cell lung cancers (NSCLC). It has been postulated that tumour initiation and propagation are mediated by so-called 'tumour-initiating cells' (TICs) that can self-renew and spawn differentiated progeny. The DNA damage response (DDR) is a complex signalling network that maintains genome integrity, essential for the proper function and survival of all organisms. We were able to identify TICs in cell lines and primary NSCLC samples. Subsequent analysis indicated that factors of the DDR and nucleotide synthesis pathways are deregulated in TICs. Our aim is to identify differentially regulated DDR factors in TICs compared to tumour bulk cells, which will subsequently allow us to identify novel targets for pharmacological or genetic intervention to treat lung cancer.

Peng Group

Resistance to anticancer therapies causes tumour relapse, treatment failure and mortality. This forms the motivation for our research, which is mainly oriented towards identification of therapy-resistant tumour cells and of the underlying molecular mechanisms accounting for the phenomenon. We focus on cancer stem cells in the resistance of lung cancer to standard therapies currently used in the clinic, with the ultimate goal of unravelling the vulnerabilities – the 'Achilles' heel' – of therapy-resistant cells, and of developing new and more effective therapeutic strategies for the treatment of human lung cancer.

Dr. Ren-Wang Peng
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PhD in Biochemistry at Chinese Academy of Sciences, Beijing (CN). Research scientist (1998-2005) at Max Planck Institute for Biophysical Chemistry, Göttingen (DE) and Visiting Scholar (1999) at Dartmouth Medical School (US). Group Leader (2006-2010) at ETH Zurich. Since 2012, Group Leader, Department of Thoracic Surgery, Inselspital.

Group Members

Prof. Dr. Ralph A. Schmid, Chair
Dr. Sean R.R. Hall, Group Leader
Dr. Thomas M. Marti, Group Leader
Dr. Ren-Wang Peng, Group Leader
Laurène Froment, Laboratory Technician
Ming Qiao, Laboratory Technician
Dr. Patrick Dorn, Consultant
Dr. Gregor Kocher, Clinical Fellow
Andreas Keil, PhD Student
Liang Shunqing, PhD Student
Colin Tièche, PhD Student
Limei Wang, PhD Student

Selected Collaborators

Berezowska, S, University of Bern (CH)
Galetta, D, European Institute of Oncology (IT)
Ochsenbein A, University of Bern (CH)
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Selected Grants

Amounts allocated for 2015:

– Cancer League Bern: Role of PD-1/PD-L1 in NSCLC (S.R.R. Hall)
CHF 60,000
– Cancer League Switzerland: Characterization and Targeting of Cancer Initiating Cells in Lung Cancer (T. Marti)
CHF 84,616
– Cancer League Bern: Functional identification and molecular targeting of human lung cancer stem cells (R.-W. Peng)
CHF 72,000

Selected Publications

Human graft-derived mesenchymal stromal cells potently suppress alloreactive T-cell responses. de Mare-Bredemeijer, EL; Mancham, S; Verstegen, MM; de Ruiter, PE; van, GR; O'Neill, D; Tilanus, HW; Metselaar, HJ; de, JJ; Kwekkeboom, J; Hall, SR; van der Laan, LJ (2015) in: Stem Cells Dev, 24(12), p. 1436-1447.

The Topoisomerase I Inhibitor Irinotecan and the Tyrosyl-DNA Phosphodiesterase 1 Inhibitor Furamidine Synergistically Suppress Murine Lupus Nephritis. Keil, A; Frese-Schaper, M; Steiner, SK; Korner, M; Schmid, RA; Frese, S (2015) in: Arthritis Rheumatol, 67(7), p. 1858-1867.

The importance of phrenic nerve preservation and its effect on long-term postoperative lung function after pneumonectomy. Kocher, GJ; Poulson, JL; Blichfeldt-Eckhardt, MR; Elle, B; Schmid, RA; Licht, PB (2015) in: Eur J Cardiothorac Surg, e-pub ahead of print.

Is clipping the preferable technique to perform sympathicotomy? A retrospective study and review of the literature. Kocher, GJ; Taha, A; Ahler, M; Schmid, RA (2015) in: Langenbecks Arch Surg, 400(1), p. 107-112.

Blocking the epithelial-to-mesenchymal transition pathway abrogates resistance to anti-folate chemotherapy in lung cancer. Liang, SQ; Marti, TM; Dorn, P; Froment, L; Hall, SR; Berezowska, S; Kocher, G; Schmid, RA; Peng, RW (2015) in: Cell Death Dis, 6, p. e1824.