Faculty

Ruprecht Kuner, PhD

Research Interests

Translational research in lung and prostate cancer
Gene and miRNA expression profiling in cancer tissues and surrogates
Functional characterization of disease genes and miRNAs
Biomarker research for diagnosis and therapy of cancer patients

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>> homepage of the respective institute/department

Short CV

Affiliation

Ruprecht Kuner, PhD
Senior Scientist

German Cancer Research Center and
National Center for Tumor Diseases
Im Neuenheimer Feld 460
69120 Heidelberg
Phone:+49 6221 56-5958
email: r.kuner@dkfz.de
homepage: http://www.dkfz.de/en/krebsgenomforschung/index.php
http://www.nct-heidelberg.de/de/forschung/Molekulare_Diag/krebsgenomforschung/krebsgenomforschung.php

Curriculum Vitae

1991–1997	Study of Biology at the Eberhard-Karls-University of Tübingen, Division of Clinical Genetics (Diploma thesis: Uniparental disomy in Silver-Russell syndrome)
1997–1998	Department of Medical Virology, Tübingen (Project: Transmission of cytomegalovirus from mother to infant via breast milk)
1998–2002	Dissertation (PhD) at the metaGen Pharmaceuticals GmbH and the Humboldt University of Berlin (Differentially expressed genes in gynecological cancer)
2002	Scientist at the Cancer Drugs AG, Karlsruhe Research Centre (Gene function in metastasis)
2003–2006	Scientist at the Division of Molecular Genome Analysis, German Cancer Research Center, Heidelberg (Gene expression profiling in diverse human diseases)
2007–2010	Senior Scientist at the Division of Molecular Genome Analysis, German Cancer Research Center, Heidelberg (Functional genomics in lung and prostate cancer)
2010–2012	Senior Scientist and Project Leader at the Unit Cancer Genome Research, German Cancer Research Center and National Center for Tumor Diseases (Translational research in lung and prostate cancer)

Projects

Lung cancer development and progression is characterized by typical molecular alterations, which can be associated with distinct tumor subgroups of different histopathology, prognosis and therapy response. Our major contribution to the disease area lung cancer within the DZL research programme is to screen for aberrant activity of genes, miRNAs and proteins, and to identify novel targets driving cancer onset and progression. We conduct molecular profiling experiments in tumor tissues and body fluids of patients using microarrays, low-density and single/multiplex assay systems (qPCR, Luminex), and sequencing techniques. For early diagnosis of operable lung cancer, we search for tumor-specific gene and miRNA expression patterns in serum or bronchial fluids (ELF, BAL) from patients and controls. After cancer diagnosis, circulating miRNAs in serum are quantified before surgery to investigate their association with cancer recurrence and survival prognosis of patients. In lung cancer tissues, different types and microdissected architectures are profiled in order to identify novel biomarkers and therapy targets. Protein analyses (RPPA, Luminex) are done in NSCLC tumor models (xenograft, cell lines) to screen for predictive biomarkers valuable for established targeted therapies, and to propose novel therapy regimen using combinatorial approaches. Newly identified cancer-related genes, miRNAs and proteins are further characterized in cellular models and functional assays concerning proliferation, invasion, migration and apoptosis. Finally, we aim to translate technologies and biomarker research approaches to other lung disease areas like COPD and CF aiming at the improvement of diagnostics and therapeutic intervention.

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DZL - Federal Ministry for education and research (BMBF)

Team

Group Leader
Prof. Dr. Holger Sültmann
Email: h.sueltmann@dkfz.de

PhD students
Sajo Kaduthanam
Email: s.kaduthanam@dkfz.de

Helen Hülsmann
Email: h.huelsmann@dkfz.de

Selected Publications

- Kaduthanam S, Gade S, Meister M, Brase JC, Johannes M, Dienemann H, Warth A, Schnabel PA, Herth FJF, Sültmann H, Muley T, **Kuner R**. Serum miR-142-3p is associated with early relapse in operable lung adenocarcinoma patients. Lung Cancer, 2012, Accepted.
- Kahn, N., Meister, M., Eberhardt, R., Muley, T., Schnabel, P.A., Bender, C., Johannes, M., Keitel, D., Sültmann, H., Herth, F.J., **Kuner, R**. Early detection of lung cancer by molecular markers in endobronchial epithelial-lining fluid. 2012. J Thorac Oncol. 7:1001-8.
- **Kuner, R**., Fälth, M., Pressinotti, NC., Brase, J.C., Balaguer Puig, S., Metzger, J., Gade, S., Schäfer, G., Bartsch, G., Steiner, E., Klocker, H., Sültmann, H. The Maternal Embryonic Leucine Zipper Kinase (MELK) is Upregulated in High-Grade Prostate Cancer. 2012. J Mol Med (Berl).
- **Kuner, R**., Brase, J.C., Sültmann, H., Wuttig, D. microRNA biomarkers in body fluids of prostate cancer patients. 2012. Methods. Review.
- Warth, A., Muley, T., Meister, M., Herpel, E., Pathil, A., Hoffmann, H., Schnabel, PA., Bender, C., Buness, A., Schirmacher, P., **Kuner, R**. Loss of aquaporin-4 expression and putative function in non-small cell lung cancer. 2011. BMC Cancer. 11:161.
- Kahn N*., **Kuner R**.*, Eberhardt R., Meister M., Muley T., Winteroll S., Schnabel P.A., Ishizaka A., Herth F.J., Poustka A., Sültmann H., Hoffmann H. Gene expression analysis of endobronchial epithelial lining fluid in the evaluation of indeterminate pulmonary nodules. 2009. J Thorac Cardiovasc Surg. 138:474-479.
- **Kuner, R***., Muley, T*., Meister, M., Ruschhaupt, M., Buness, A., Xu, E.C., Schnabel, P., Warth, A., Poustka, A., Sültmann, H., Hoffmann, H. Global gene expression analysis reveals specific patterns of cell junctions in non-small cell lung cancer subtypes. 2009. Lung Cancer. 63:32-8.
- Singer, S., Malz, M., Herpel, E., Warth, A., Bissinger, M., Keith, M., Muley, T., Meister, M., Hoffmann, H., Penzel, R., Gdynia, G., Ehemann, V., Schnabel, PA., **Kuner, R**., Huber, P., Schirmacher, P., Breuhahn, K.. Coordinated expression of stathmin family members by far upstream sequence element-binding protein-1 increases motility in non-small cell lung cancer. 2009. Cancer Res. 69:2234-43.