

GERMAN CANCER RESEARCH CENTER (DKFZ)

DKFZ Clinician Scientist Program

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supported by the



DKFZ Clinician Scientist Program Fellows Brochure

FROM BEDSIDE TO BENCH AND BACK.

TRANSLATING RESEARCH CAREERS



” Through our DKFZ Clinician Scientist Fellowships we provide the much needed time for Clinician Scientists in training to focus on a research project for an extended period of time. This will foster the uptake of new research results into the clinical practice.“

The DKFZ is one of the leading cancer research centers worldwide and provides a nurturing environment in which translational cancer research can thrive. We have a strong and long-standing reputation of training excellent scientists at all career stages, and our research programs naturally integrate both basic and clinical research. In order to directly support researching clinicians in their professional development, we have established a dedicated program to foster the careers of Clinician Scientists at DKFZ and beyond. While they are part of the DKFZ Clinician Scientist Program, our Fellows receive state-of-the-art research training to work on interdisciplinary projects at the interface of basic and clinical oncology research.

The protected time at our Center allows them to exclusively focus on a research project that is relevant for their medical specialization. The Fellows gain hands-on laboratory experience, enhance their portfolio of research skills and establish their own network within the scientific community. The Fellows are therefore well equipped to maintain the ongoing transition

between the two worlds and ensure a fruitful exchange between the disciplines.

From my own experience I know that the treatment of patients and parallel lab work are not always easy to combine. However, I am convinced that in addition to the direct impact on scientific output, there is also a great personal benefit associated with the profession as a Clinician Scientist. I am therefore very happy that, due to the great donation of the Dieter Morszeck Foundation, we are in a pole position to support the career development of the future generation of Clinician Scientists.

We are truly impressed by the high level of qualification, enthusiasm and commitment to research that our first cohort of Fellows have shown since being competitively selected. Therefore, I want to cordially invite you to find out more about the Fellows 2019 and their individual research projects on the following pages of this brochure.



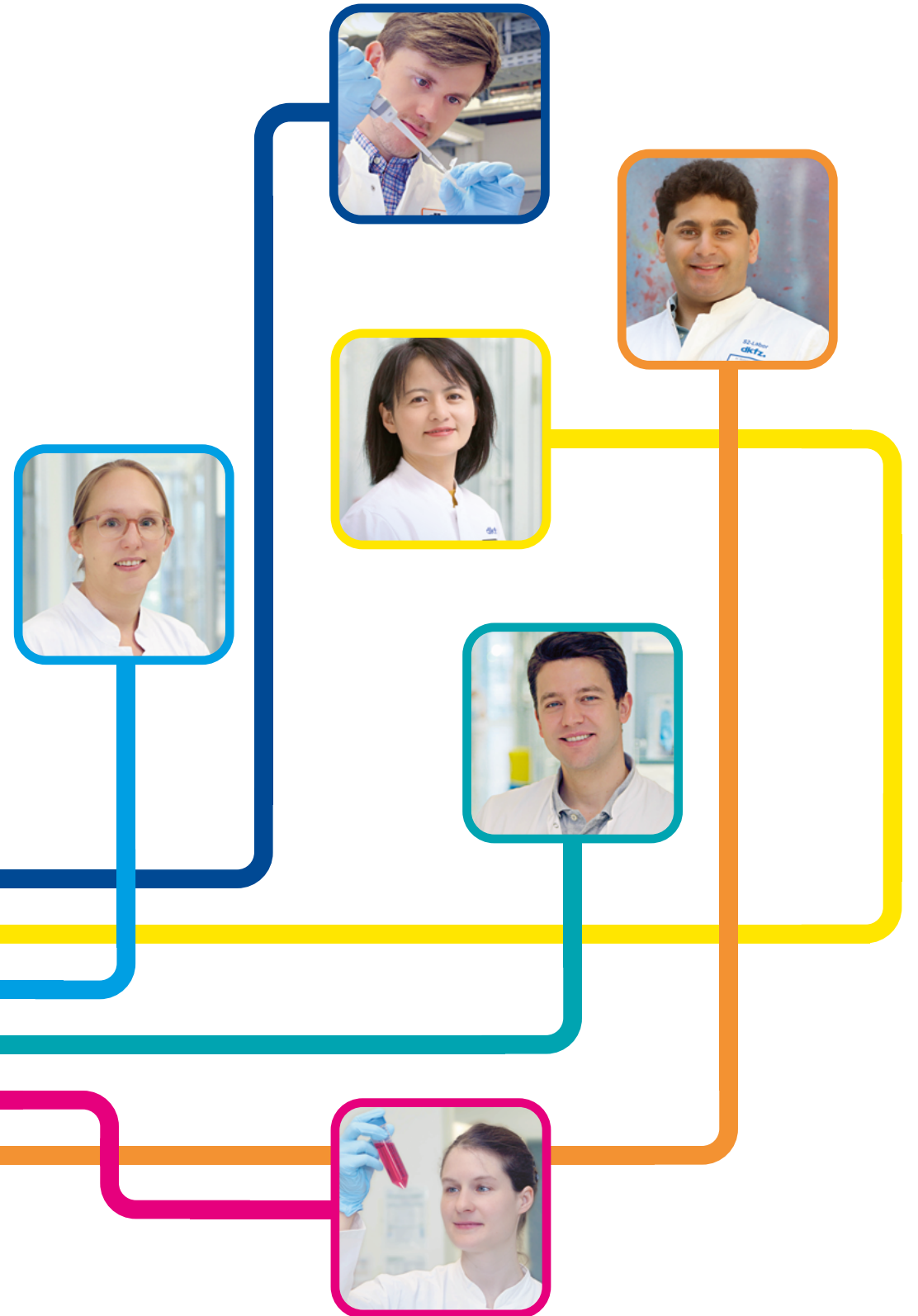
Prof. Dr. med. Michael Baumann
Chairman and Scientific Director
German Cancer Research Center





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Clinician Scientist training at the German Cancer Research Center

More than 450,000 people are diagnosed with cancer each year in Germany. Cancer is a disease that poses enormous challenges to research, because every cancer is different and its course can vary immensely even from one patient to the next. To perform research into cancer is the task of the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) according to its statutes. DKFZ is the largest biomedical research institution in Germany and a member of the Helmholtz Association of National Research Centers.



From bedside to bench and back – the DKFZ Clinician Scientist Program addresses physicians who show enthusiasm for science and who have a wish to link basic and clinical research.

The DKFZ Clinician Scientist Program is the German Cancer Research Center's official program to foster innovative translational research by strengthening the research profile of clinician scientists. The program deepens the link between basic and clinical research, ensuring efficient transfer from bedside to bench and back.

We aim to recruit highly talented physicians in training who wish to gain basic and translational cancer research experience in a world-class scientific setting. Through the research groups in DKFZ's Research Programs we provide access to cutting-edge research facilities and state-of-the-art labs.

Program fellows are supported by dedicated fellowships encompassing protected research time, tailored training and intersectoral mentoring. Extensive network-building and continued institutional support lead the way to long-term career perspectives.



Information on the DKFZ Clinician Scientist Program, upcoming calls for application and eligibility criteria can be found at:

www.dkfz.de/clinicianscientist



Contact:

Dr. Philipp Gebhardt,
DKFZ Clinician Scientist
Program



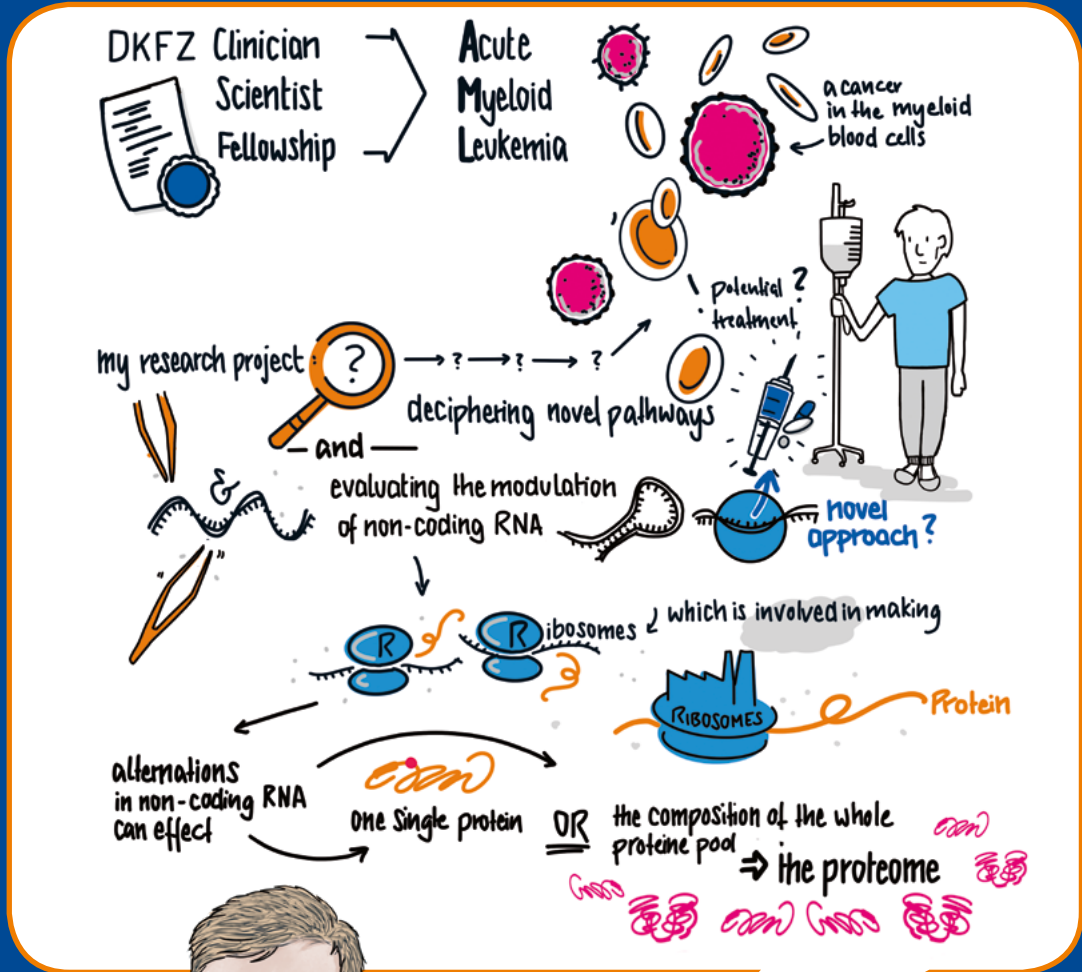
Translational Cancer Research at the DKFZ

The DKFZ is a prime location to pursue basic and translational oncology research in one of its six research programs.

In order to ensure that novel results from the “lab bench” and newly developed methodologies can be put into practice more quickly for the benefit of future patient care, we draw on a wide range of know-how and highly specialized, networked infrastructures. This is complemented by the close collaboration of DKFZ researchers and clinicians, such as the DKFZ Clinician Scientist Fellows, who are performing cutting-edge research on a plethora of key oncology topics.

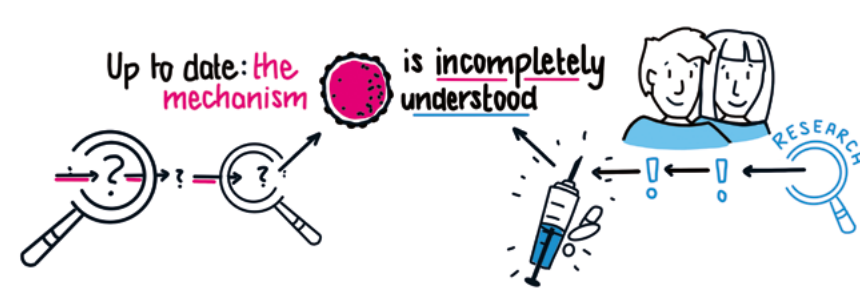
The pursuit of translation is, so to speak, embedded in our institutional DNA and we are constantly striving to further develop career options for the bright minds driving the innovative research projects DKFZ is known for.





Maximilian Blank

Hi, my name is Maximilian Blank and I am a hematology and oncology doctor by training. I obtained a DKFZ Clinician Scientist Fellowship to study Acute Myeloid Leukemia (AML).



Acute Myeloid Leukemia (AML), is a cancer of the myeloid blood cells. Besides deciphering novel pathways in the development of leukemia, my research project aims to evaluate the modulation of specific non-coding RNAs – which could potentially be used as a novel therapeutic approach for the treatment of AML. Non-coding RNAs (ncRNAs) are RNAs that are not directly translated into proteins. The ones I am focusing on are involved in the process of making ribosomes, the cellular factories where proteins are synthesized. Alterations of ncRNAs could thus affect synthesis of individual proteins and even the overall composition of the pool of proteins that are produced by a cell or an organism. The latter is called the proteome. To date, the mechanisms underlying formation of blood cancer remain

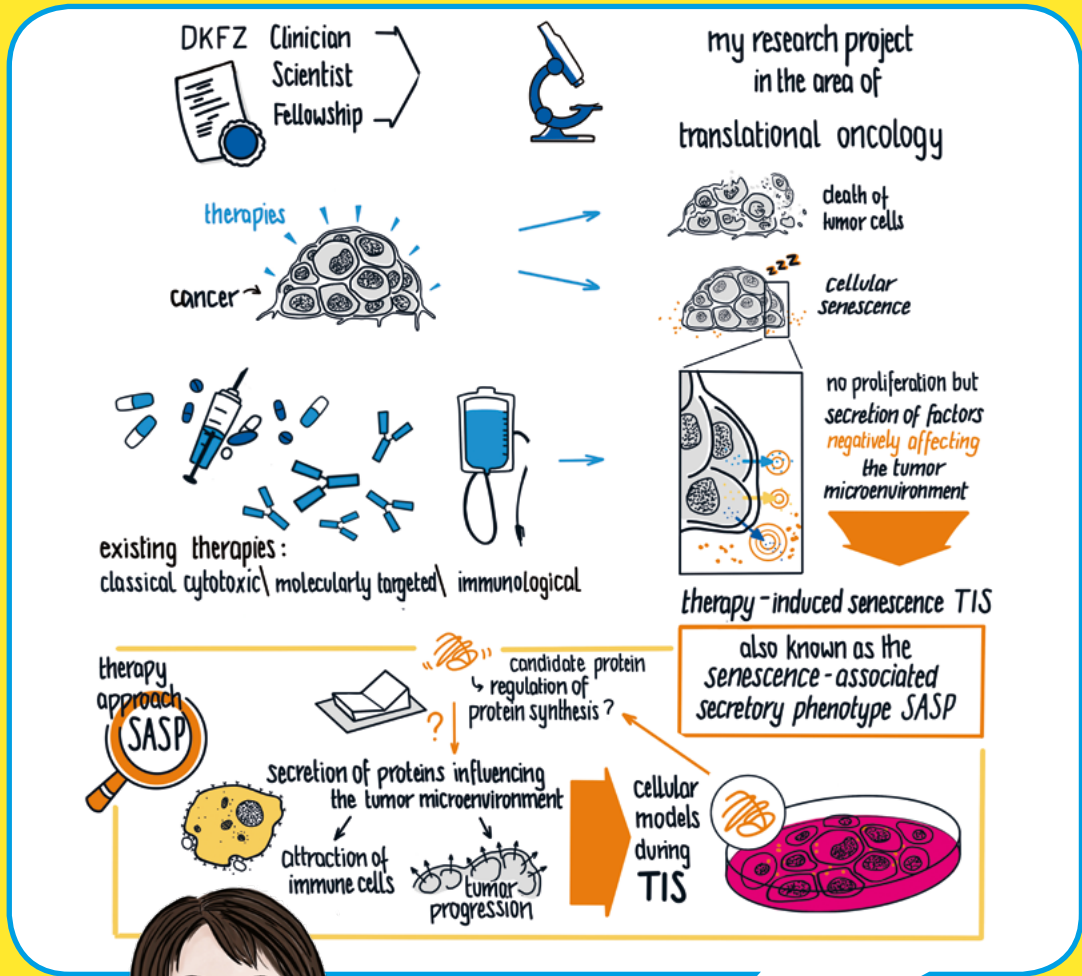
incompletely understood. Therefore, deciphering important pathways in the progress of AML might reveal novel and improved treatment options, especially with regard to the ability to induce remission and to prevent relapse of this severe disease. Clinical work is closely intertwined with both clinical and basic research. The DKFZ Clinician Scientist Fellowship offers me the unique opportunity to perform cutting-edge research while still pursuing my residency in the Department of Hematology and Oncology at the University Hospital Heidelberg. And my work will hopefully result in the identification of new therapeutic insights that will help us to translate our findings from bench to bedside.



“The DKFZ Clinician Scientist Fellowship offers two years of protected research time and I am flexible to intersperse clinical work if needed. It provides an excellent opportunity to pursue my research project with the aim to contribute to the better understanding of pathogenetic mechanisms in AML.”

+ DKFZ Clinician Scientist Fellowship

- ★ 2 years of protected research time
- ★ flexibility to intersperse clinical work
- ★ translate findings from bench to bedside



Xiangli Jiang

My name is Xiangli Jiang and I was trained as a medical oncologist in China. I joined the DKFZ as an international Clinician Scientist Fellow to work on a research project in translational oncology.

Cancer therapies are commonly applied to induce the death of tumor cells. But, in addition, they can also trigger so-called cellular senescence. This is a cellular state in which cancer cells are not proliferating but they can still secrete factors that might negatively affect the direct environment of the tumor – the tumor microenvironment. Known as therapy-induced senescence (TIS), this state can be induced by treating cancers with therapies such as classical cytotoxic therapies (e.g. chemotherapy), molecularly targeted therapies and also immunotherapies. The resulting senescent cells are characterized by the secretion of high amounts of protein. This phenomenon is known as the senescence-associated secretory phenotype (SASP). The secreted proteins influence the tumor microenvironment by attracting immune cells and are even promoting tumor progression. Therefore, targeting the SASP could be a promising approach for cancer therapy. In this research project I will study, together with colleagues, how senescent cells synthesize large amounts of protein despite being in an arrested state. Previous research

found that a protein involved in the regulation of protein synthesis – its name is eIF5A – might be a critical player in this process. Using cellular models and cutting-edge approaches, we will characterize the role of this molecule during TIS. Through this research project, we hope to potentially uncover a novel molecular pathway that can be exploited for a more effective cancer treatment. The DKFZ Clinician Scientist Fellowship directly supports my ambitions to gain international research experience and to build up my personal research network. In the era of precision medicine and rapidly evolving medical science, physicians not only need to have profound experience in clinical practice, but also need a deep understanding of basic research. The fellowship is therefore helping me to further deepen the link between clinical and basic cancer research in a world-class scientific setting. I am convinced that this experience will have a significant impact on my long-term career perspective as a clinician scientist.

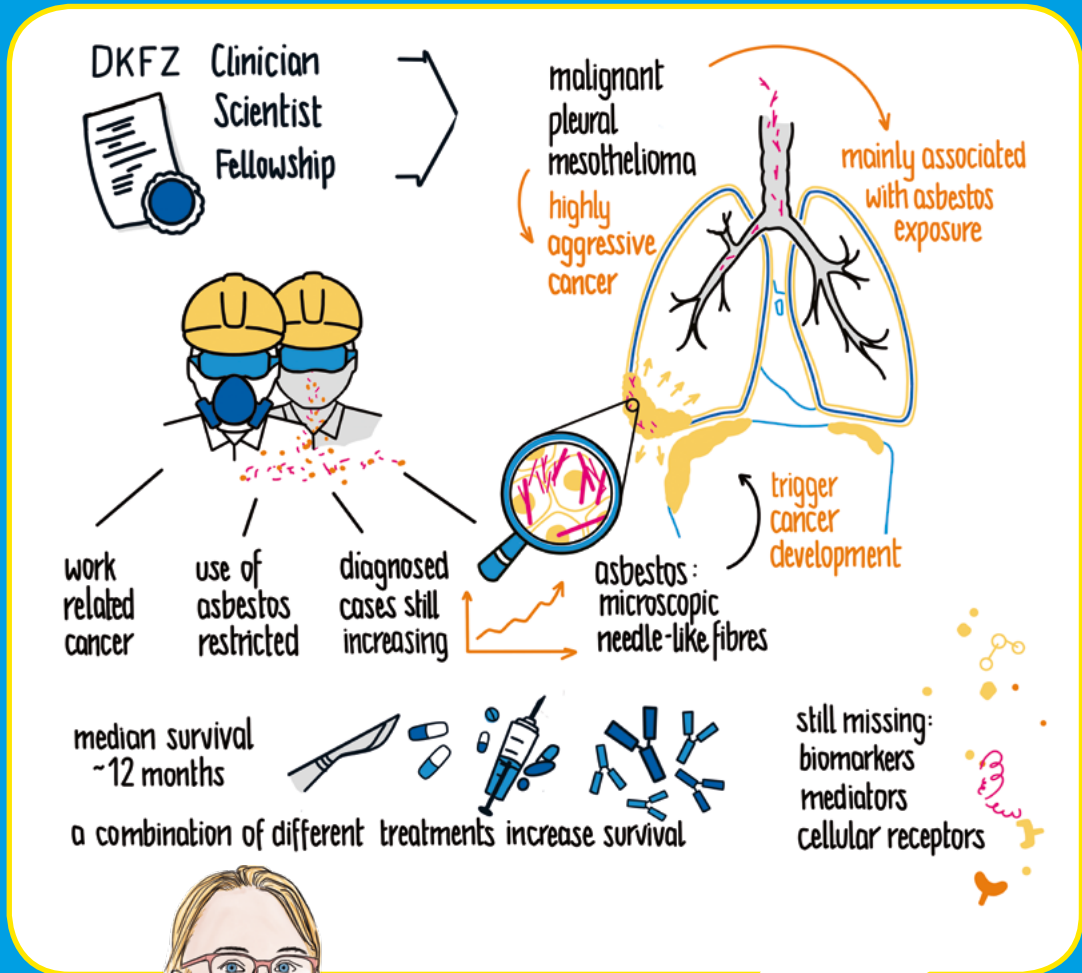


“The DKFZ Clinician Scientist Fellowship directly supports my ambitions to gain international research experience and to build up my personal research network.”

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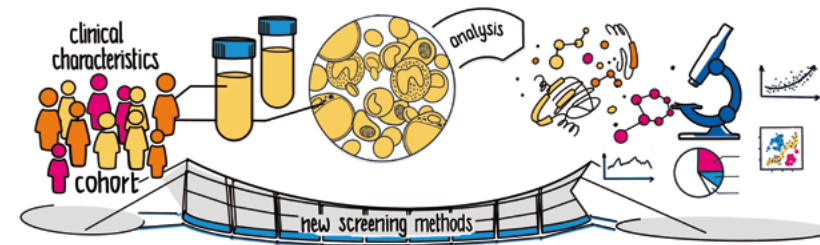
DKFZ Clinician Scientist Fellowship

- ☆ gaining international research experience
- ☆ deepening the link between clinical and basic research
- ☆ building a personal research network



Laura Klotz

My name is Laura Klotz and I am a thoracic surgeon. I applied for a DKFZ Clinician Scientist Fellowship to study malignant pleural mesothelioma.



Pleural mesothelioma is a locally invasive and highly aggressive cancer of the thorax. This tumor entity is mainly associated with asbestos exposure and actually represents a common work-related cancer. Despite the restricted use of asbestos in the industry in recent years, the number of newly diagnosed cases is still increasing. Asbestos consists of fibrous minerals that are composed of microscopic, needle-like fibers. It can trigger the development of mesothelioma up to 50 years after exposure. Unfortunately, the median survival for unresectable disease is about 12 months. To date, no specific biomarker has been identified for screening or early diagnosis – which would in turn enable treatment at an early stage of the disease and therefore increase survival. A combination of surgery, chemotherapy and potentially immunotherapy plays an important role in increasing

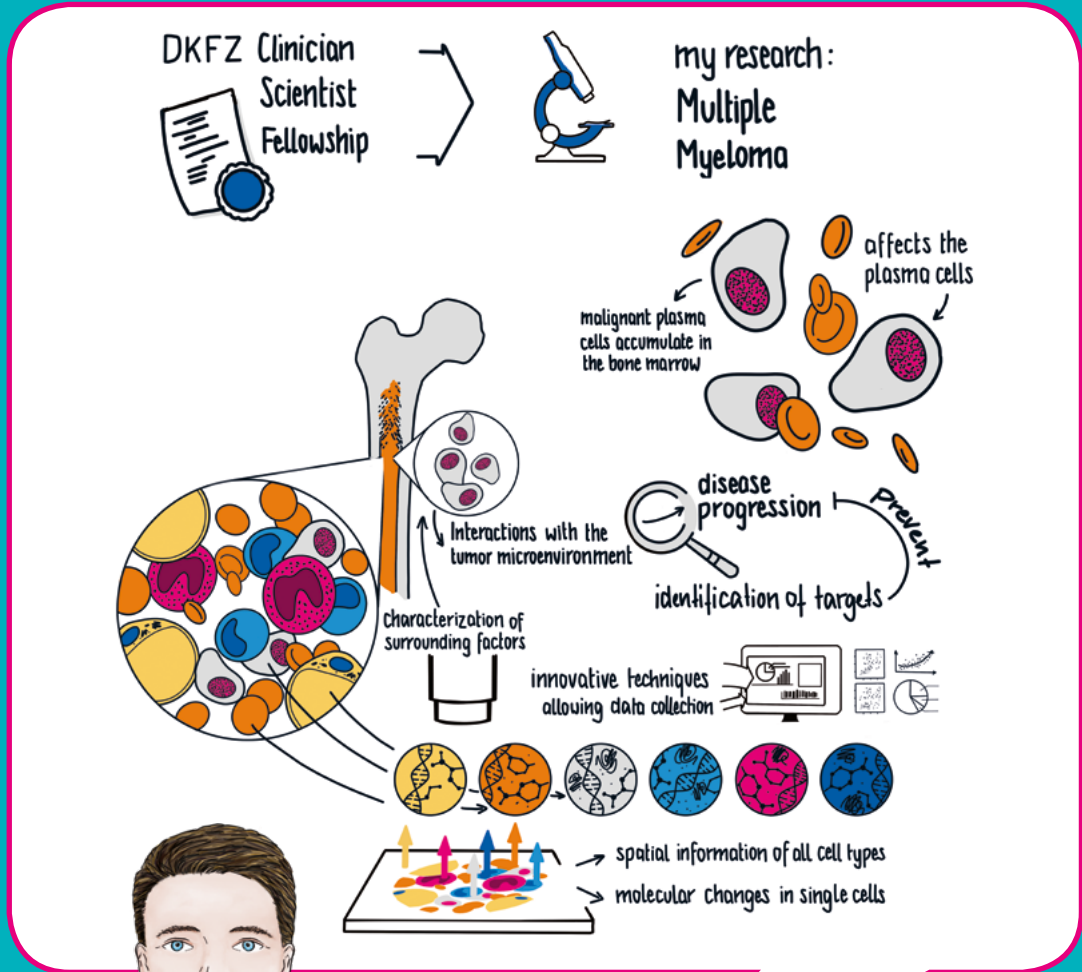
the survival rate for patients with early stage disease. More detailed analyses of clinical parameters and the correlation with molecular biomarkers might help to improve the knowledge of the complex pathobiology of the disease and to refine current treatment possibilities. To achieve this, it is essential to identify mediators and cellular receptors that play a crucial role for tumor development and tumor growth. Hence, the DKFZ Clinician Scientist Fellowship allows me to link the clinical characteristics of our large patient cohort to biomarkers which are identified by analyzing human tissue and blood samples. Within this translational research approach, my aim is to identify biomarkers that might be relevant for screening high-risk patients after work-related asbestos exposure and to predict their response to treatment.

“By building a bridge from thoracic surgery to basic research, I aim to learn cutting-edge methods and techniques in order to optimize future treatment possibilities for our mesothelioma patients.”

+

DKFZ Clinician Scientist Fellowship

- ☆ build a bridge between thoracic surgery and basic oncology research
- ☆ acquire new technical skill and expand research methods portfolio
- ☆ gain better understanding of cancer biology to improve treatment of mesothelioma patients



Raphael Lutz

I am on my way to becoming a hematologist. During my DKFZ Clinician Scientist Fellowship I am performing research on Multiple Myeloma, a type of blood cancer that affects so-called plasma cells.



“The fellowship provided by the DKFZ Clinician Scientist Program gives me the opportunity to perform state of the art translational research.”

During my DKFZ Clinician Scientist Fellowship I am performing research on Multiple Myeloma (MM), which is a type of blood cancer that affects so-called plasma cells. Malignant plasma cells typically accumulate in the bone marrow. In recent years it became clear that the interactions of these specific cells with the tumor microenvironment play an important role in the progression of the disease.

Thus, there is an urgent need to deeply characterize the relationship of plasma cells with surrounding factors in order to gain a global understanding of MM development. We are currently using innovative techniques that enable us to describe molecular changes in MM on the level of single cells and at the same time keep the spatial information of all cell types within the bone marrow. This approach has the

potential to unravel the key drivers of MM pathogenesis on a cellular and molecular level. A global and profound understanding of these processes might subsequently lead to the identification of drug targets in order to prevent disease progression.

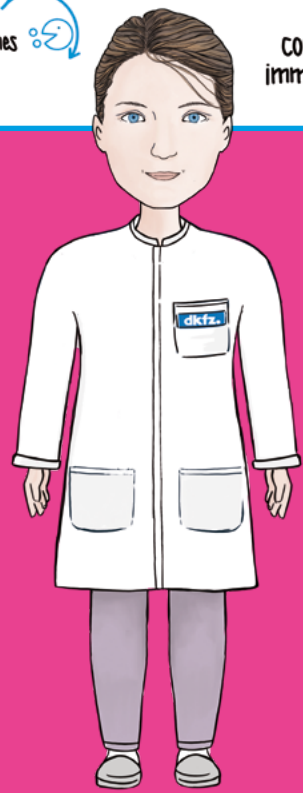
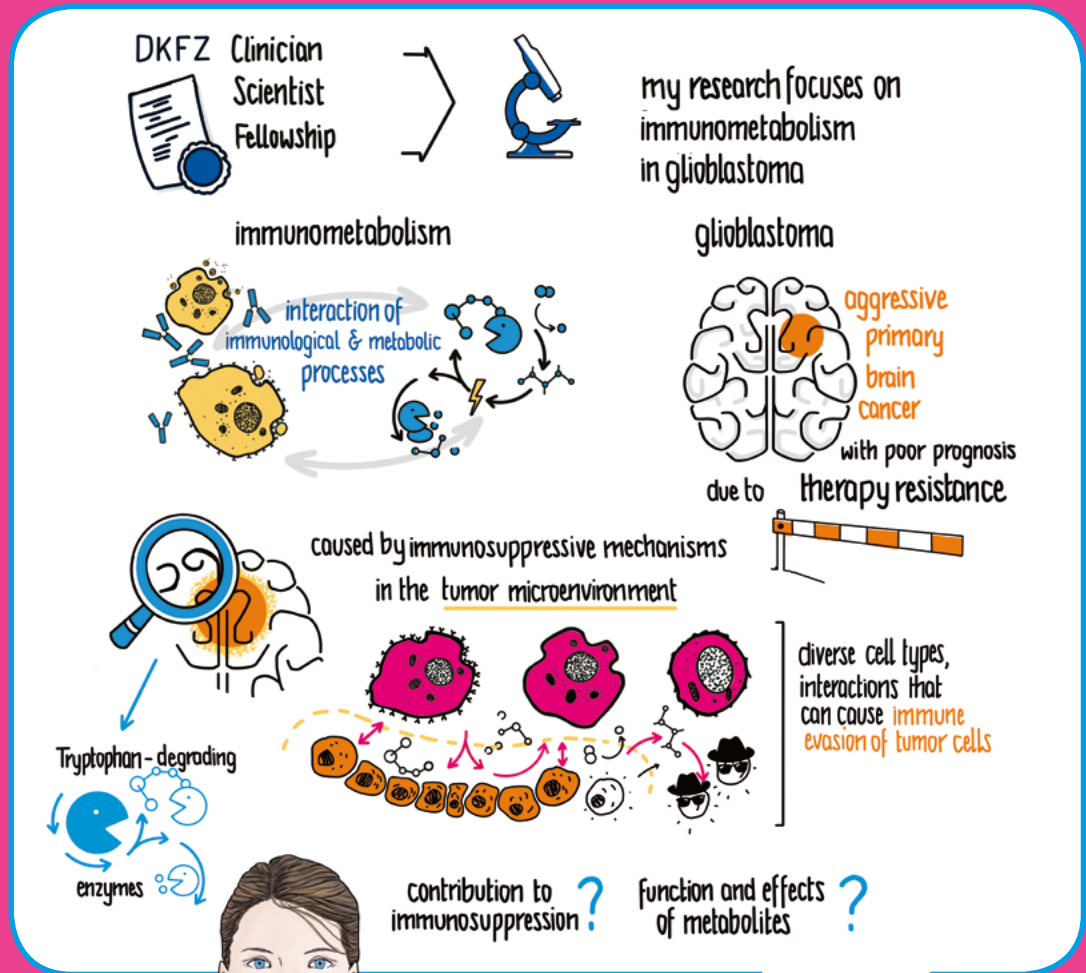
The fellowship provided by the DKFZ Clinician Scientist Program gives me the opportunity to perform state of the art translational research. My goal is to generate scientific results that will have a major impact on future patient outcomes. In the future, I want to combine my expertise in clinical and translational research and develop novel therapeutic strategies to prevent disease progression of Multiple Myeloma. I am confident that this research can contribute to our ultimate goal of finding a cure for this specific cancer entity.



DKFZ Clinician Scientist Fellowship



- ☆ opportunity for state-of-the-art translational research
- ☆ impact on future patient outcomes
- ☆ combination of expertise in clinical and basic research



Verena Panitz

During my Clinician Scientist Fellowship at the DKFZ my research focuses on the complex topic of immunometabolism in glioblastoma.



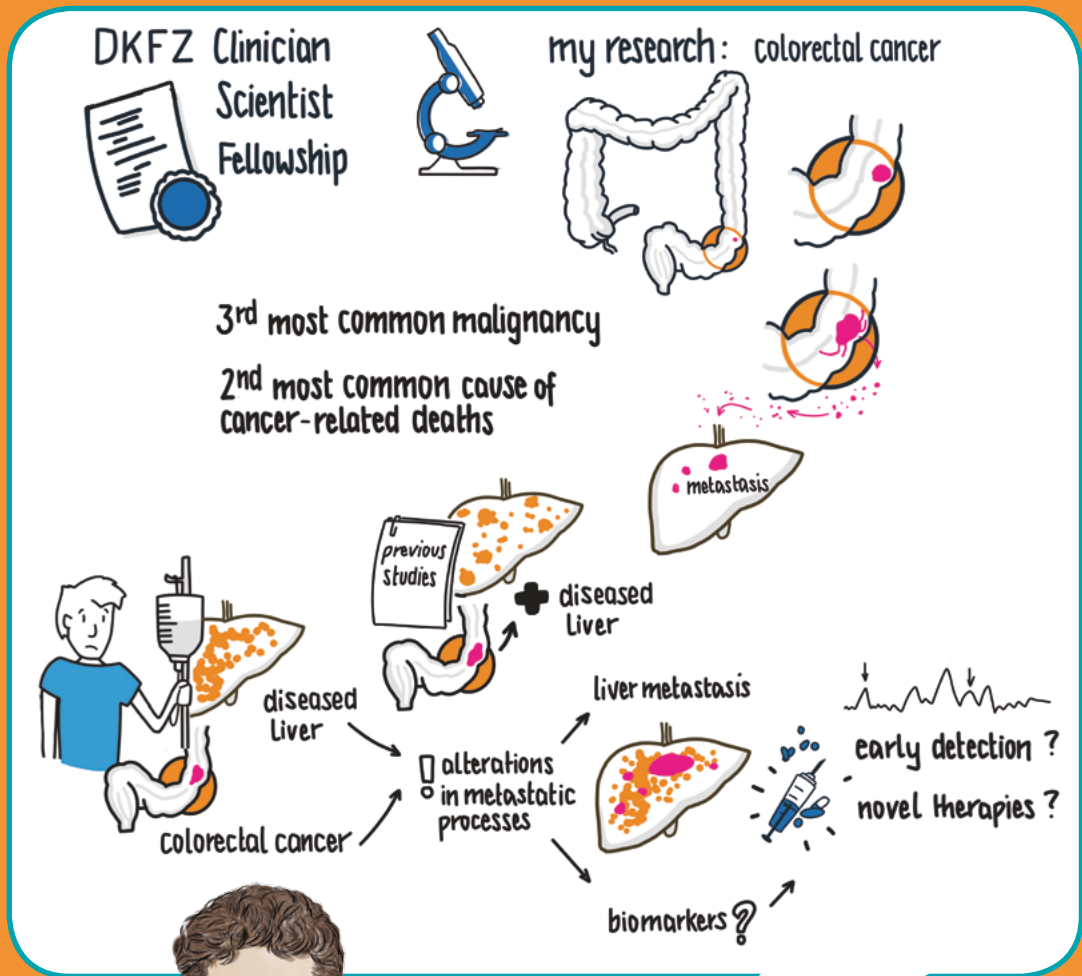
“The concept of a career as a Clinician Scientist fascinates me because it allows the deep integration of clinical and scientific knowledge and experience and hence facilitates the translation from bench to bedside.”

Immunometabolism is a field of research that is dedicated to the interaction of immunological and metabolic processes. Glioblastoma is the most common and also most aggressive primary brain cancer in adults with a median overall survival of only 15 months after diagnosis despite current standard of care. One reason for this very poor prognosis is the glioblastoma’s resistance to therapy, to which immunosuppressive mechanisms in the tumor microenvironment contribute relevantly. The tumor microenvironment consists of diverse cell types, including different immune cell subtypes. Metabolic processes play a relevant role in the interaction between immune cells and tumor cells as they can, for example, foster the immune evasion of the tumor cells, i.e. the tumor cells escape the control by the immune system.

Therefore, my special interest lies in the regulation of tryptophan-degrading enzymes in glioblastoma cells and in different immune cell subsets, as these enzymes contribute to immunosuppression in the tumor microenvironment. I also want to study the metabolites that are produced by the metabolic enzymes and their effects and functions. On the clinical side, I am training as a resident in Neurology at Heidelberg University Hospital. The DKFZ Clinician Scientist Fellowship provides me with the opportunity to conduct research over a timespan of two years. During this protected research time I am able to specifically focus on my research topic immunometabolism in glioblastoma. In the future, I hope that a better understanding of the resistance mechanisms in glioblastoma will help to improve treatment of glioblastoma patients.

+ DKFZ Clinician Scientist Fellowship

- ☆ Integration of clinical and scientific knowledge and experience
- ☆ Focus on research project over a two-year period
- ☆ Translation of findings for the well-being of cancer patients

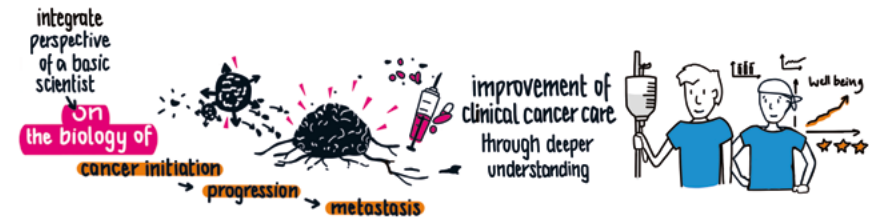


Mohammad Rahbari

As a trained clinical surgeon, already during my first clinical internship I had to see the horrendous fate of patients who suffered from advanced cancerous diseases. This motivated me to focus my career on the improvement of clinical cancer care.



“Dedicated mentorship by selected academic and clinical experts will help me to further develop my career as a clinician scientist.”

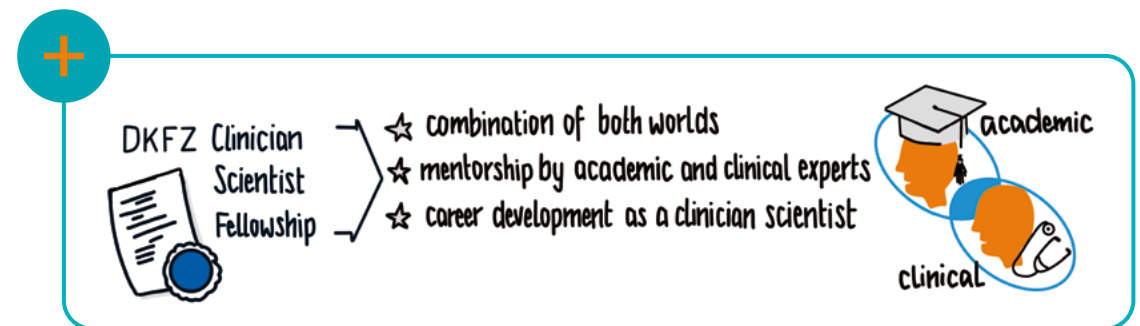


Pursuing my career, I soon realized that it will be more than helpful to integrate the perspective of a basic scientist into my clinician’s viewpoint. Thus, I decided to dive deeper into the biology of cancer initiation, progression and finally metastasis, the process which ultimately causes the death of cancer patients.

In my research project I am working on colorectal cancer. This cancer develops from the colon or rectum and it represents the third most common malignancy and the second most common cause of cancer-related deaths worldwide. Patients suffering from colorectal cancer die of cancer manifestations at distant organs, so-called metastasis. The most frequent organ in which metastases occur is the liver. Previous studies have shown that

patients with colorectal cancer often concurrently suffer from fatty liver disease. Fatty liver disease is characterized by the accumulation of excess fat in the liver, which can lead to chronic inflammation and tissue damage.

Most importantly, patients who suffer at the same time from colorectal cancer and fatty liver disease seem to have alterations in the processes leading to metastasis in the liver. We aim to better understand the influence of fatty liver disease on liver metastasis, and may therefore not only be able to develop new clinical biomarkers for early detection, but also novel therapies to treat this devastating disease. In this regard, the DKFZ Clinician Scientist Fellowship represents a unique opportunity for me to combine both worlds.



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TO BENCH AND BACK.

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GERMAN
CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION

Research for a Life without Cancer



www.dkfz.de/clinicianscientist

DKFZ Clinician Scientist Fellowships

Are you considering a career
as a clinician scientist?

The DKFZ in Heidelberg belongs to the leading cancer research centers worldwide. Team up with a strong partner to support your translational research ambitions!

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You are a physician conducting specialized medical training and wish to enhance your career? Apply now!

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