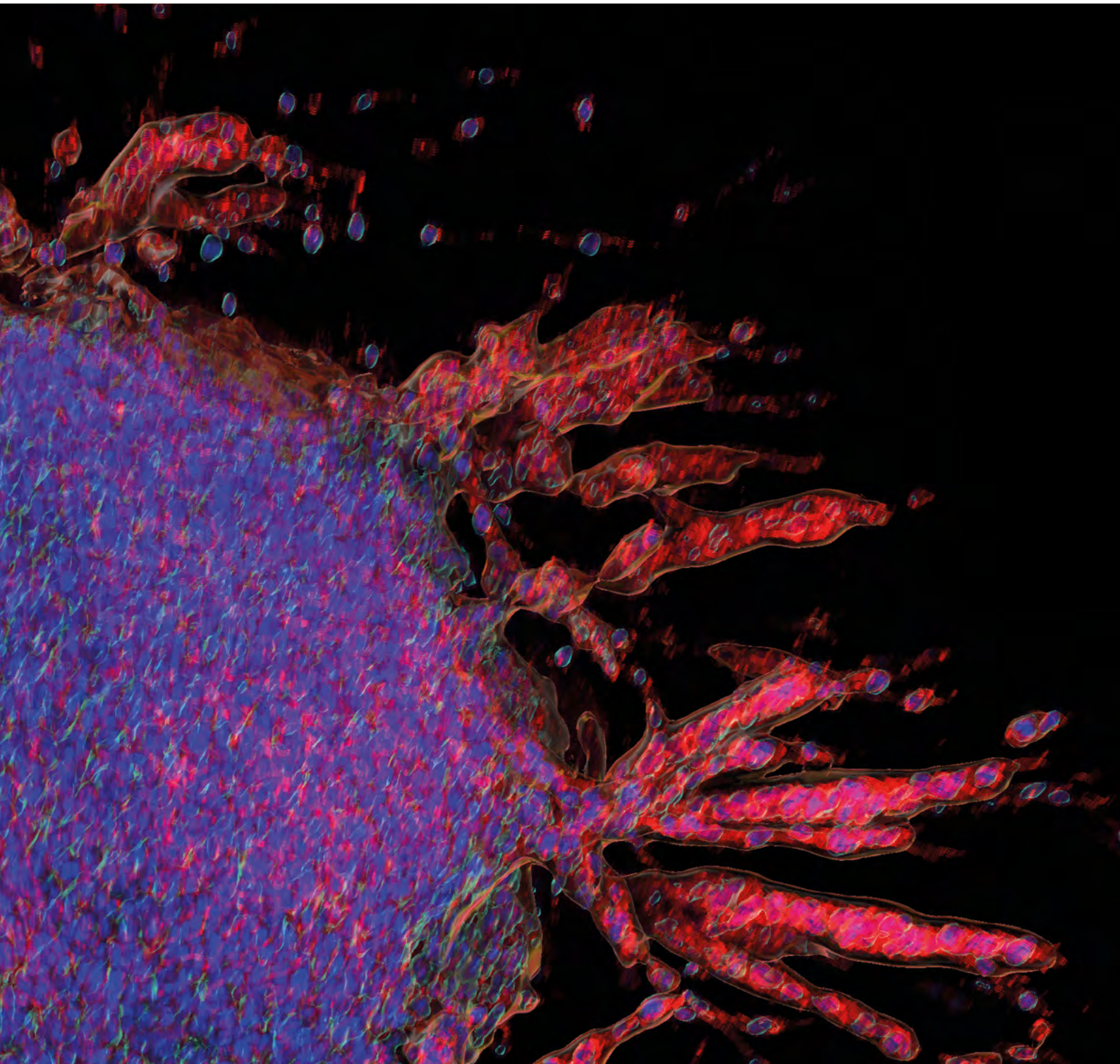
DKTK German Cancer Consortium

dkfz. GERMAN CANCER RESEARCH CENTER IN THE HELMHOLTZ ASSOCIATION

DZG DEUTSCHE ZENTREN DER GESUNDHEITSFORSCHUNG

German Cancer Consortium

Annual Report 2023/24



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The **German Cancer Consortium (DKTK)** is a national consortium of specialist oncological research institutions and university hospitals. It is funded by the German Federal Ministry of Research, Technology and Space, and participating German states.

Cover image:

Confocal microscopy image of the star-shaped tumor organoid of murine pancreatic carcinoma: Fluorescent labeling of cell nucleus (DAPI, blue) and actin filaments (phalloidin, red); surface segmentation of fluorescent labels using Imaris software (© Dr. Aristeidis Papargyriou)

Foreword

The number of people diagnosed with cancer each year continues to increase, giving rise to serious challenges, both for society and for the health system. Reasons for the rising numbers of new cancer cases include lifestyle changes, environmental factors, and the fact that we are living longer.

This is where the German Cancer Consortium (DKTK) comes in, with its important contributions to preclinical translational research. The aim is to transfer new scientific findings into patient treatments as quickly and directly as possible. This process is called "translation". For this process to succeed, teamwork is vital: Experts from various different subject areas pool their knowledge and technologies across the eight DKTK partner sites to advance the prevention, early detection, diagnosis, and treatment of cancer.

Additional strategic objectives were set in 2023 and 2024. One of these is collaboration with the National Center for Tumor Diseases (NCT), which has been extended to encompass six sites. The aim is to work on new findings from preclinical research so that they can be tested quickly in clinical trials within the NCT. At the same time, new research questions arising from clinical observations are being investigated in a targeted manner at the DKTK.

The DKTK is also working to expand structures that facilitate the journey from research finding to application, including spin-offs, licensing, and contributions to medical guidelines. This transfer strategy is intended to ensure that promising innovations reach patients faster. Many important research projects have been initiated within the DKTK since it was first set up. For instance, more than 60 collaborative, multicenter projects have already been funded through competitive calls in the DKTK Joint Funding Program. This collaboration enables both experienced researchers and those still in education to develop ideas together and forge new paths in cancer research. The latest calls for proposals involved the DKFZ Patient Advisory Council and integrated new patient participation formats. Patients now contribute their experiences and perspectives already in the planning phase, actively contributing to research design. This collaboration is essential in order to tailor research even more closely to the actual needs of those affected by cancer.

Support for early career researchers is still a particular focus. As well as the education and training provided by the DKTK School of Oncology, the DKTK set up a new fellowship program called CORTEX in 2023. CORTEX offers doctoral researchers in the life sciences, (bio)informatics, and related subject areas, and clinician scientists interested in data-driven oncology the opportunity to pursue their own innovative research projects using biodata from the DKTK, and to follow a training program where they are surrounded by experienced data scientists.

In the reporting period, numerous researchers in the DKTK once again received national and international grants and research prizes for their excellent achievements – testament to their individual successes and to the teamwork at the DKTK.

I invite you to discover more about the various developments within the DKTK and hope you find this report stimulating.

Prof. Dr. med. Dr. h. c. Michael Baumann

Spokesperson of the German Cancer Consortium (DKTK)

CANCER IN FIGURES

5 in 10 German citizens will get cancer during their lifetime.

There are around 500.000 **new cancer cases** per year in Germany.

More than **225,000 people die of cancer** each year.

According to current forecasts, the number of new cancer cases **will increase to over 600,000** per year **by the 2030s**.

66 % of women and **62 % of men survive** cancer (5 years).

Around **40 % of all new cancer cases** could be **avoided** through **primary prevention** and up to **60 % of all cancer deaths** could be avoided through **primary prevention and early detection**.

DKTK IN FIGURES

12 years since it was established

More than **60 multicenter projects** funded in the DKTK Joint Funding Program since 2012

More than **1,000 researchers** in the network

12 members of the Patient Advisory Council for Cancer Research

Around **160 DKTK School of Oncology fellows**

332 jobs financed by the DKTK

14 DKTK professorships, 5 DKTK-associated professorships, 1 clinical cooperation unit and **17 young investigator/ junior research groups** since 2012

Correct at: December 31, 2024

3rd German Cancer Research Congress at the DKFZ in Heidelberg (© Jutta Jung/DKFZ)

Bridging the gap between basic and clinical cancer research

About the DKTK

Despite major advances in cancer research, there are still many types of cancer for which no optimal treatment is available. To transfer new findings from basic research into clinical practice, scientists, physicians, and regulatory authorities need to work closely together in a translational process. Today we know that the term "cancer" stands for a large number of different diseases that arise as a result of changes in cell DNA. They can affect practically any type of tissue cell and, depending on a wide range of other factors, such as environment and lifestyle, can lead to very individual clinical manifestations. In order to manage this heterogeneity of cancer and, ultimately, to develop personalized cancer therapies, it is essential to have interdisciplinary collaboration and translational research in the space between basic and clinical research.

The establishment of the German Cancer Consortium (DKTK) as one of the German Centers for Health Research (DZG) in 2012 laid the foundations for a national cancer research network that brings together leading cancer research institutions and diverse expertise through innovative long-term structures. The aim is to speed up the transfer of promising laboratory results into clinical application in order to improve the prevention, early detection, diagnosis, and treatment of cancer.

Within the DKTK, the German Cancer Research Center (DKFZ) in Heidelberg collaborates with research institutes and with university hospitals that have a proven track record in oncology, through translation centers at eight partner sites in Germany (see page 44). Institutional funding is provided via the DKFZ with 90:10 financing from the federal government – Germany's Federal Ministry of Research, Technology and Space (BMFTR)

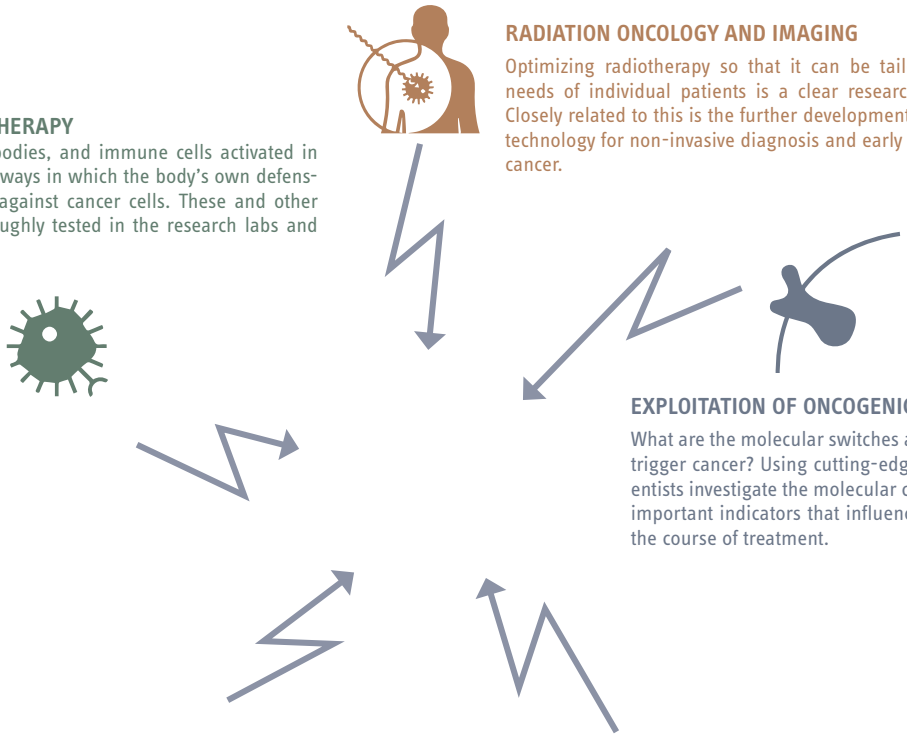
(© DKTK)

– and the participating host states. This ensures long-term prospects for the preclinical translational research projects, and close collaboration with other actors, e.g. the NCT.

Translating innovative research into practice

The five DKTK research programs focus on connecting different phases of the translation process, from discovering cancer-related molecular changes to developing and testing molecular biomarkers for prevention and diagnostics, through to preparing early clinical trials, and the future application of new diagnostic and therapeutic approaches in patients. Observations from clinical practice, for example the development of therapy resistance, tumor recurrence, and metastasis, are fed back into experimental research in close consultation with clinicians (= reverse translation), where they are investigated thoroughly. The main focus at the DKTK is on novel treatment approaches based on molecular analysis, such as the use of targeted therapeutics and combination therapies, cancer immunotherapy, advanced radiation therapy treatments, and personalized surgical procedures. Harmonization of processes and workflows at the participating sites plays a key role in ensuring efficient implementation.

In many cases, effectively joined-up research at the DKTK has been made possible by a range of tailor-made infrastructure and platforms. The consortium-wide, federated search function of the Clinical Communication Platform (CCP) enables the DKTK to link clinical patient data from research projects with biosample information, and to make this information available to researchers within the DKTK, while complying with the highest data protection standards (for more information, see page 22-23). The RadPlanBio (RadiationDosePlan-Image/Biomarker-Outcome) platform and the Joint Imaging Platform (JIP) for storing, exchanging, and analyzing clinical image material are used in DKTK research projects and elsewhere (for more information, see page 32 ff).



CANCER IMMUNOTHERAPY
Tumor vaccines, antibodies, and immune cells activated in the lab are just a few ways in which the body's own defenses can be mobilized against cancer cells. These and other approaches are thoroughly tested in the research labs and in clinical trials.

RADIATION ONCOLOGY AND IMAGING
Optimizing radiotherapy so that it can be tailored to the needs of individual patients is a clear research objective. Closely related to this is the further development of imaging technology for non-invasive diagnosis and early detection of cancer.

EXPLOITATION OF ONCOGENIC MECHANISMS
What are the molecular switches and genetic changes that trigger cancer? Using cutting-edge analysis methods, scientists investigate the molecular causes of cancer and find important indicators that influence therapy response and the course of treatment.

MOLECULAR DIAGNOSTICS, EARLY DETECTION AND BIOMARKER DEVELOPMENT
Biomarkers can be used to detect cancer at an early stage, predict recurrence, and assess more accurately whether a treatment will be successful. This also includes the further development of early detection and diagnostic methods, e.g. liquid biopsies, to provide a reliable diagnosis without having to remove tissue.

MOLECULARLY TARGETED THERAPY
Researchers working on this program identify molecular weak points for targeted cancer drug therapy. Clinical trials then help develop these drugs further and bring them into clinical practice.

New (associated) professors and junior/young investigator research group leaders supported by the DKTK, from left to right: Prof. Martin Sos, Prof. Johannes Huppa, Prof. Christiane Opitz, Dr. Inmaculada Martínez Reyes, Dr. Zuzana Tatarova, Dr. Phyllis Fung-Yi Cheung, Dr. Julia Frede, and Dr. David Koppstein

In molecular tumor boards (MTBs), teams of experts from different disciplines regularly discuss individual cancer cases and recommend the best possible treatment, based on the molecular characteristics. The DKTK has made a key contribution to the nationwide introduction and continuous further development of MTBs in Germany (for more information, see page 32 ff).

The central infrastructure provision also includes facilities for the production of peptide-based immunotherapies, high-throughput technologies for genome screening to decode whole individual tumor genomes, and bioinformatics data processing centers. In addition, the DKTK Organoid Platform, a Strategic Initiative, was launched at the beginning of 2023, with the aim of pooling expertise from the eight DKTK partner sites and sharing and standardizing established methods to further leverage the benefits of patient-derived tumor organoids for cancer research.

At the end of 2024, there were 14 jointly with DKFZ appointed professorships at the DKTK partner sites, five DKTK-associated professorships, one clinical cooperation unit, and six young investigator/junior research groups. Prof. Martin Sos took up the post of DKTK W3 Professor for Translational Oncology at Ludwig-Maximilians-Universität München (LMU) on May 1, 2023, with a focus on reverse translation. Prof. Christiane Opitz took up the DKTK-associated Professorship for Metabolic Crosstalk in Cancer at the DKFZ in Heidelberg on July 1, 2024, and Prof. Johannes Huppa became the DKTK-associated Professor of T Cell Antigen Recognition in Cancer and Autoimmunity at Charité – Universitätsmedizin Berlin on September 1, 2024. In terms of young investigator groups, Dr. Zuzana Tatarova became the leader of the Research Group for Therapy Resistance at the DKTK partner site Frankfurt/Mainz on September 1, 2023, and Dr. Inmaculada Martínez Reyes took up the role of leader of the Young Investigator Group for Metabolic Networks in Tumor Immunity in Berlin on September 1, 2024. Dr. David Koppstein became the leader of the DKTK Junior Research Group on Cancer Bioinformatics and Multiomics in Essen/Düsseldorf on June 1, 2023, Dr. Julia Frede led the Junior Research Group on Cancer Systems Biology in Munich from January 1, 2024 (she accepted an offer of a W2 professorship at the Technical University of Munich (TUM) on October 1, 2024), and Dr. Phyllis Fung-Yi Cheung became leader of the Junior Research Group on Spatiotemporal Tumor Heterogeneity in Essen/Düsseldorf on April 1, 2024.

Through professorships and junior research groups, the DKTK creates attractive career prospects in preclinical translational medical research for specialists with scientific and clinical experience, strengthening collaboration at the interface between basic and clinical research. It also supports the education and training of early career researchers in translational cancer research. At the DKTK School of Oncology (SoO), talented young professionals learn how to combine research tasks and clinical requirements.

Where are we now?

Numerous innovative translational cancer research approaches were developed into multicenter preclinical translational and trial-associated research projects in 2023 and 2024. A total of nine new research projects were selected for funding within the competitive DKTK Joint Funding Program over the course of the two reporting years through three calls for proposals. They included the HematoTrac research project, which uses clinical imaging-guided sampling techniques to reveal the mechanisms employed by hematopoietic cells to infiltrate malignant brain tumors and which impact the survival chances of patients. The LeOPARD project aims to develop ultra-rapid molecular cancer diagnostics based on liquid biopsies and intraoperative approaches for use in DKTK research and future clinical trials. The project makes use of technologies like nanopore sequencing for comprehensive molecular profiling of tumors in real time. The

Prof. Michael Baumann welcomed the participants of the 3rd German Cancer Research Congress on October 30, 2023 at the DKFZ in Heidelberg. (© DKTK)

NoviCARAZA project investigates the use of natural killer cells for chimeric antigen receptor (CAR) therapy, an immunotherapy with genetically modified immune cells, in patients with acute myeloid leukemia (AML). Further information about the Joint Funding Program and current projects can be found on page 27 ff.

The international DKTK Scientific Advisory Board (SAB) advises the DKTK on strategic scientific developments and reviewed the Joint Funding applications submitted during the funding rounds. The SAB comprises 11 members and meets once a year with the DKTK Steering Committee at the DKFZ in Heidelberg.

Members of the Scientific Advisory Board and Steering Committee at the meeting on October 25, 2024 (© DKTK)

Prof. Elaine Mardis (Columbus, Ohio, USA) has been Chair of the SAB since 2022. Prof. Kevin Brindle (Cambridge, UK) was elected Deputy Chair at the autumn 2023 meeting (for more information, see page 43).

The joint Patient Advisory Council for Cancer Research of the DKFZ and of its translational research network, the DKTK, plays a major role in making research projects more patient-oriented. It helps researchers explain their projects in lay terms and involve patient representatives at an early stage. The Patient Advisory Council has 12 members and is headed by a spokesperson, Rudolf Hauke. Since 2023, patient representatives have been actively involved in the content of funding applications within the DKTK Joint Funding Program. Researchers submit a summary written in lay terms via a specially designed short questionnaire and receive written feedback and support with finding suitable contacts. The Patient Advisory Council meets regularly to discuss various core topics. In 2023, the focus was on prevention. One of the focus topics in 2024 was artificial intelligence in imaging. The Patient Advisory Council regularly produces position papers and recommendations. An example is a recommendation to the Management Board of the DKFZ on HPV school vaccination programs to increase the vaccination rate. This recommendation was published following its adoption on September 27, 2024. Members of the Patient Advisory Council also took part in and helped organize various events, including the second National Conference Patients as Research Partners in September 2023, and the DKFZ Open Day and 4th International Conference on Cancer Prevention in 2024 (for more information, see page 43).

Prof. Angelika Eggert, DKTK Site Spokesperson for Berlin, received the German Cancer Prize 2023 for Translational Research awarded by the German Cancer Society and German Cancer Foundation. (© Peter-Paul Weiler)

In 2023 and 2024, there were more than 3,000 DKTK-affiliated academic publications. DKTK researchers also received numerous awards and grants for their research, including for example the Gottfried Wilhelm Leibniz Prize, the German Cancer Prize, and grants from the European Research Council (ERC) (for more information, see page 40). The following chapters give an insight into new findings and examples of the research carried out in the DKTK for the prevention, early detection, diagnosis, and treatment of cancer.

The research activities were accompanied by numerous events. In the area of scientific exchange, a particular highlight was the 3rd German Cancer Research Congress at the DKFZ in Heidelberg from October 30 to November 1, 2023. Nearly 400 participants from all scientific disciplines involved in cancer research held cross-disciplinary discussions on a broad range of topics – from decoding the fundamental mechanisms of carcinogenesis to the latest developments in precision medicine. The congress is a joint event organized by the DKFZ, the DKTK, the NCT, German Cancer Aid (DKH), the German Cancer Society (DKG), the Comprehensive Cancer Centers (CCC-Netzwerk), and the Division of Experimental Cancer Research (AEK) of the DKG.

Session of the DKTK Strategic Meeting 2024 (© DKTK)

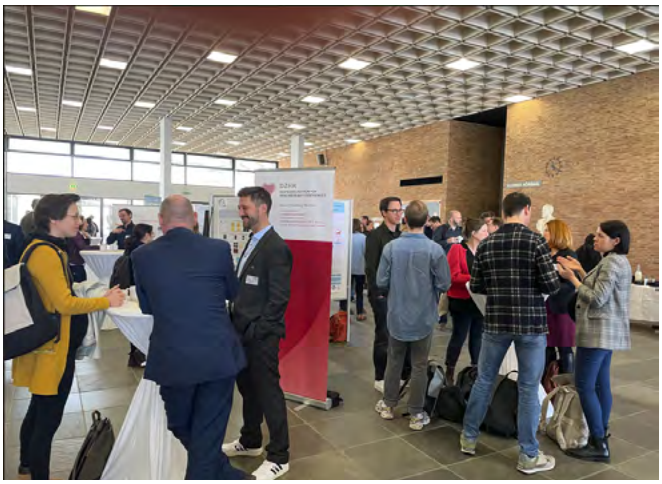
Participants at the Cancer Core Europe Summer School in Translational Cancer Research 2024 in Portugal (© Cancer Core Europe)

tations, there were guided tours of the Heidelberg premises, information stands, and hands-on activities. The DKTK organized a translation game, which introduced visitors to the process of implementing findings from oncological research.

Alongside these events, there were also specific events for the DKTK SoO fellows, including the DKTK School of Oncology Tech Talks, a series of regular talks on techniques in translational research, the DKTK Young Academics Conference, and the annual Cancer Core Europe Summer School in Translational Cancer Research (for more information, see pages 30-31).

In order to provide targeted support to early career researchers in the field of clinical data science, the DKTK initiated its own fellowship program on Cancer Outcomes and Reverse Translation – Educate & Accelerate (CORTEX) in 2023. The aim of CORTEX is to offer interdisciplinary training in clinical data science and to realize scientific projects based on data, biosamples, and software tools that are available within the DKTK. Eight CORTEX fellows started their fellowships at the beginning of 2024 and were supported in the planning and realization of their projects by experienced tandem partners. Alongside this, a series of seminars and lectures provided relevant content for project implementation (for more information, see pages 22-23).

Left to right: Prof. Solimena (Spokesperson, DZD Dresden), Prof. Krause (Spokesperson, DKTK Dresden), State Minister Gemkow (Saxon State Ministry of Science, Culture, and Tourism), Prof. Kempermann (Spokesperson, DZNE Dresden) at the 6th Joint Dresden DZG Symposium (© Stephan Wiegand)



The 1st DZG Heidelberg-Mannheim Day on February 28, 2024 brought together six DZGs represented at the Heidelberg and Mannheim sites. (© DZIF Heidelberg)

The expansion of the NCT is a core component of the National Decade against Cancer, which was initiated by the BMFTR and has been running since 2019. On February 2, 2023, the BMFTR announced the new NCT sites: Berlin, SouthWest (Tübingen-Stuttgart/Ulm), WERA (Würzburg with partners Erlangen, Regensburg, and Augsburg), and West (Cologne/Essen). This means that there are now six NCT sites in total cooperating with the DKFZ to bring about sustainable progress in clinical cancer research in Germany and to improve the treatment outcomes and quality of life for people living with cancer. This makes the NCT a key partner. It develops preclinical innovations from the DKTK in clinical trials and feeds new research questions back into the DKTK for reverse translation. Together with the National Cancer Prevention Center (NCPC), which is under development at the DKFZ in Heidelberg, the DKTK and NCT are advancing the creation of a comprehensive translational cancer research continuum in Germany.

In the reporting period, the coordination offices of the DKTK and NCT at the DKFZ were in close contact and shared information weekly in order to exploit synergies and harmonize processes. Besides the jointly organized scientific events mentioned above, joint DKTK and NCT Steering Committee meetings were held on December 14, 2023 and December 12, 2024 to discuss each other's developments and further opportunities for collaboration. Another meeting took place on January 16, 2024 involving the CCC Network, at which one of the main items on the agenda was patient involvement. Communication between the Scientific Advisory Boards of the DKTK and NCT was also intensified, with the two chairpersons regularly meeting to exchange information and ideas.

Various cross-DZG working groups have been established in recent years with experts from all centers on topics including research IT, global health, early career support, public relations, patient participation, and regulatory aspects of clinical trials. Both these cross-DZG groups and individual sites pursued activities and organized events in the reporting period. For example, additional calls for proposals were launched within the DZG Innovation Fund (DZGIF) to fund joint research projects. Details of the DZG activities can be found on page 35.

Exploitation of Oncogenic Mechanisms

These days, the success of new cancer diagnostic methods and treatments relies heavily on an in-depth understanding of the complex molecular basis of tumor diseases. Consequently, the Exploitation of Oncogenic Mechanisms program has defined three focus areas that address major challenges in the DKTK: 1) functional genomics to identify therapeutic targets and overcome therapy resistance in cancer, 2) decoding and targeted modulation of the host-tumor interaction/microenvironment, and 3) mechanism-driven preclinical trials with complex translational model systems.

The program includes the impacts of genetic and epigenetic changes, how cancer cells communicate with each other and with the microenvironment – particularly with the immune system – and the role of cancer stem cells. It generates and tests mechanistic hypotheses of cancer biology, gaining fundamental new insights into molecular oncogenic mechanisms and therapy response. These can then be used to develop particularly promising diagnostic and therapeutic approaches in close collaboration with the other DKTK programs.

Program coordination

Prof. Sven Diederichs (partner site Freiburg)
Prof. Björn Scheffler (partner site Essen/Düsseldorf)
Prof. Dieter Saur (partner site Munich)

◪ ongoing project ☑ goal achieved

Developments

- ◪ Decryption of drug actions and protein modifications by dose- and time-resolved proteomics.
- ☑ Organoid-stroma biobank for colorectal cancer allows subtype-specific assessment of therapy responses.
- ☑ Integrated cellular and molecular model of gastric neuroendocrine cancer evolution highlights therapeutic targets.
- ☑ Passenger gene co-amplification creates collateral therapeutic vulnerabilities in cancer.
- ☑ Spatially resolved transcriptomics and deep learning improve accuracy of routine central nervous system tumor diagnostics.
- ◪ Structure-guided design of a selective inhibitor of methyltransferase KMT9 with cellular activity.

Goals for 2025 onwards

- Discover therapeutic vulnerabilities and overcome therapy resistance in cancer using functional genomics.

  Decode and carry out targeted modulation of host-tumor interaction, the microenvironment, and interaction with the immune system.

  Conduct mechanism-driven preclinical trials with complex innovative translational model systems (patient-derived xenograft models (PDX), PDOs, single-cell and spatial models).

  Develop rational drug combinations to overcome resistance to targeted or immune-based therapies.

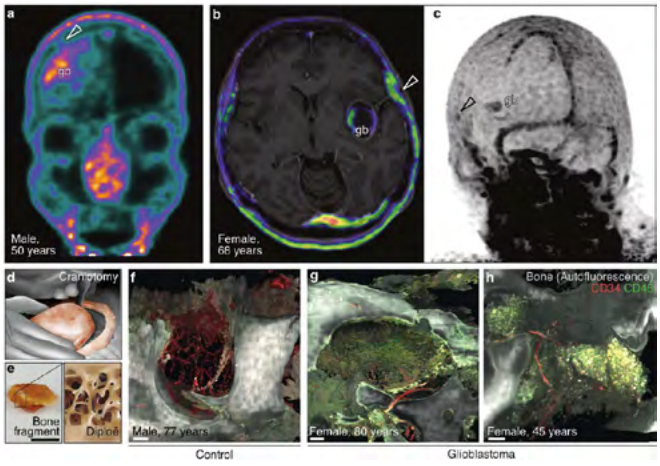
  Exploit epigenetic vulnerabilities for translation by pursuing the development of novel inhibitors through to clinical testing.

Research highlight

Glioblastoma: Pockets of potent immune cells discovered

Researchers working on HematoTrac, a DKTK Joint Funding project coordinated by Prof. Björn Scheffler and involving DKTK partner sites Essen/Düsseldorf, Frankfurt/Mainz, Freiburg, and Heidelberg, reported in the prestigious journal *Nature Medicine* on exciting research findings that open up completely new perspectives and treatment approaches.

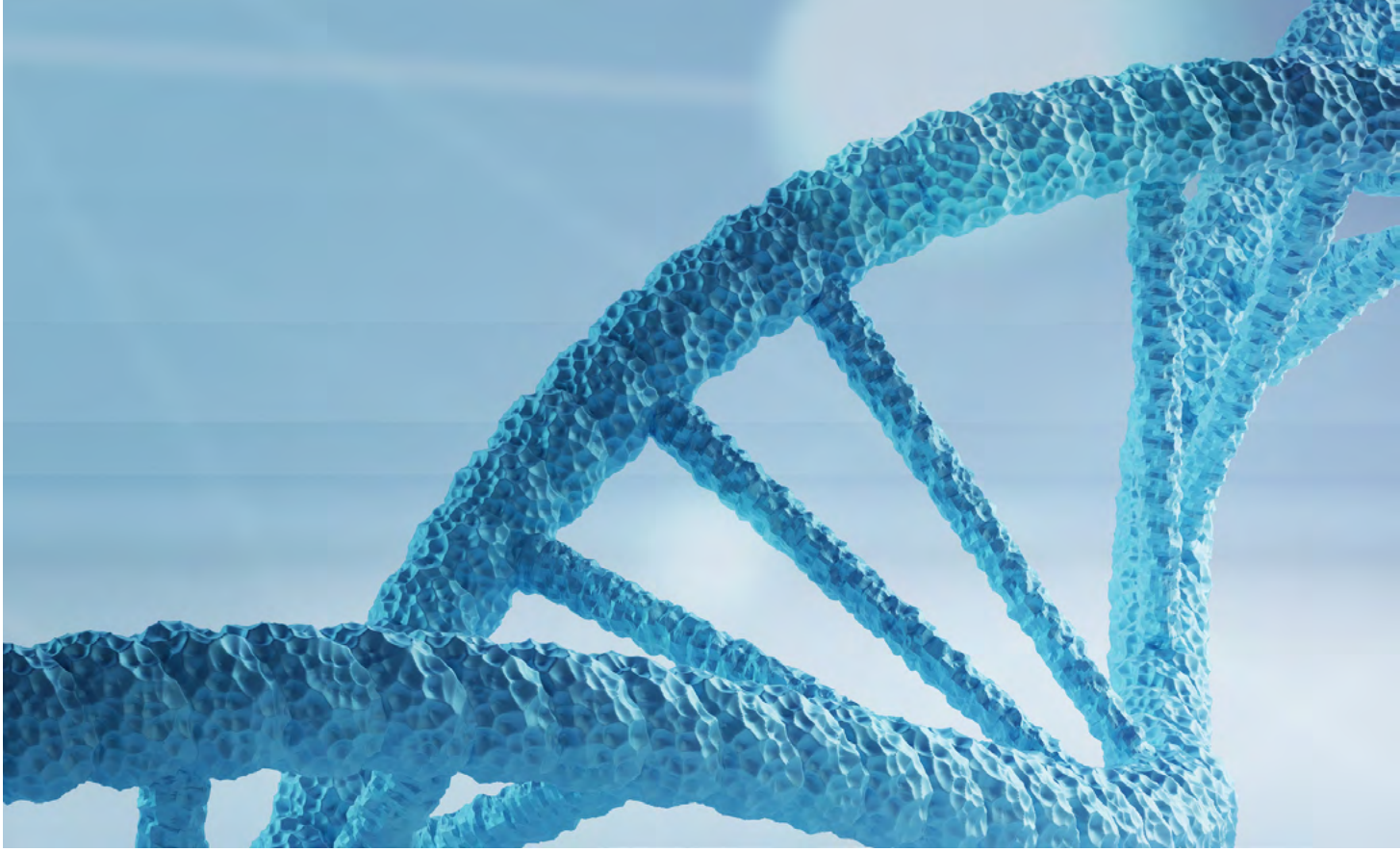
Glioblastoma remains an incurable brain tumor to this day, despite multimodal therapies. Even immunotherapy has been unable to achieve a breakthrough. Now, using clinical imaging, the research team has succeeded in identifying pockets of immune cells in the parts of the cranial bone adjacent to the brain tumor. Tissue analysis using numerous different methods, including innovative anatomic and molecular single-cell analysis, showed a specific immune response in the local cranial bone marrow. The simultaneous presence of cytotoxic T lymphocytes (CD8-positive T cells) in bone and tumor was surprising because these cells are regarded as highly effective cancer-fighting cells in the adaptive immune system. In addition, clinical imaging showed a correlation with survival in a small group of patients. In future, these pockets of potent immune cells in the cranial bone could play a major role in translational clinical trials..



Glioblastoma-associated enrichment of immune cells in the cranial bone. (a, b) Clinical positron emission tomography/computer tomography (PET-CT) image showing radiolabeled CXCR4 depicts focal contact between glioblastoma parenchyma and superficial cranial-meningeal compartment (a) or nodular enhancement ipsilateral to the GB parenchyma (b). (c) Three-dimensional reconstruction of PET-CT data from b. (d) Schematic representation of a craniotomy. (e) Representative fresh bone specimen (scale bar: 5 mm) with enlarged drawing of inner spongy structure. (f-h) Lightsheet microscopy shows accumulation of CD45-positive immune cells surrounding CD34-positive microvessels only in the diploë of patients with glioblastoma (g, h). (© C. Dobersalske et al., Nature Medicine 2024)

Further information:

Dobersalske C, Rauschenbach L, Hua Y, et al. Cranioencephalic functional lymphoid units in glioblastoma. Nat Med. 2024;30(10):2947-2956



Molecular Diagnostics, Early Detection and Biomarker Development

The DKTK's Molecular Diagnostics, Early Detection and Biomarker Development program is dedicated to the discovery of new molecular markers for cancer diagnosis, prognosis, and prevention. The aim of the program is to use these findings to develop reliable biomarkers so that disease progression and response/resistance to a planned treatment can be predicted more accurately.

A key aspect is the development of technological innovations in diagnostics. The focus is on cutting-edge methods for the molecular stratification of cancer, comprehensive multiomics analyses (genomics, epigenomics, proteomics, metabolomics), liquid biopsy, and the targeted use of artificial intelligence to analyze complex molecular data.

These technologies make it possible to perform efficient analysis of high-dimensional molecular data and to translate them into clinically actionable findings. Precise tumor characterization supports early detection of cancer, improves prevention through risk stratification, and lays the foundations for personalized treatment.

Program coordination

Prof. David Capper (partner site Berlin)
Prof. Thomas Oellerich (partner site Frankfurt/Mainz)
Prof. Hermann Brenner (Core Center Heidelberg)

◪ ongoing project ☑ Goal achieved

Developments

- ☑ Development of a proteomic assay (decryptM) that can decrypt drug actions and protein modifications using dose- and time-resolved proteomics.
- ☑ Definition of the role of DNA methylation profiles in adult ependymoma and identification of prognostic markers.
- ◪ 3D organoid platform established for colorectal liver metastases.
- ◪ Establishing nanopore sequencing of cerebrospinal fluid biopsies in routine clinical practice.
- ☑ Proteome data integrated into MTBs and associated infrastructure as a DKTK-wide initiative.
- ◪ Continuation of genetic analysis and interpretation of germline variants for the DKFZ/NCT/DKTK MASTER program..

Goals for 2025 onwards

- Introduce clinically actionable biomarkers into routine clinical practice.
- Conduct biomarker-stratified clinical trials, e.g. in the NCT, with DKTK IP.
- Develop diagnostic assays for clinical application (liquid biopsy, epigenomic biomarkers).
- Prevention through risk stratification.
- Develop AI algorithms for clinically applicable data interpretation.

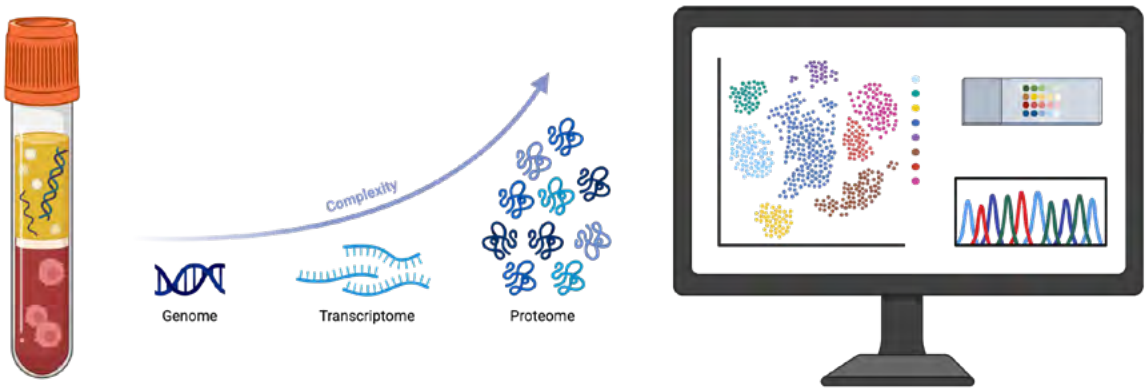
Research highlight

Analysis of post-translational modifications

Although most cancer drugs modulate the activity of cellular signaling pathways by regulating post-translational modifications (PTMs), little is known about the extent and the time- and dose-dependent characteristics of these drug-regulated PTMs. In this project, the researchers present a proteomic assay called decryptM that can quantify drug modulation of PTMs in cells for thousands of PTMs – generating new insights into target engagement and drug action. Potential applications range from detecting DNA damage caused by chemotherapy drugs to identifying drug-specific PTM signatures of kinase inhibitors, and demonstrating that rituximab kills CD20-positive B cells through over-activation of B cell receptor signaling pathways. DecryptM analysis of 31 cancer drugs in 13 cell lines demonstrated the broad applicability of the approach. The resulting 1.8 million dose-response curves are available as an interactive molecular resource in the ProteomicsDB database(https://www.proteomicsdb.org/).

Further information:

Zecha J, Bayer FP, Wiechmann S, et al. Decrypting drug actions and protein modifications by dose- and time-resolved proteomics. Science. 2023;380(6640):93-101.



The program integrates multiomics approaches (genomics, epigenomics, proteomics, metabolomics) combined with bioinformatics and artificial intelligence for precise and personalized cancer diagnostics and therapy planning. (© BioRender)

Molecularly Targeted Therapy

The DKTK research program on Molecularly Targeted Therapy focuses on investigating molecular signaling pathways and structures that can be targeted by cancer drugs. The overarching goal is to evaluate new treatment approaches and drugs in clinical trials, with the help of suitable biomarkers, so that they can be introduced into clinical practice as quickly as possible. The program works closely with two other research programs: Exploitation of Oncogenic Mechanisms and Molecular Diagnostics and Early Detection and Biomarker Development.

It follows an interdisciplinary approach that comprises both forward translation (from research model to patient) and reverse translation (from patient to improved models). The latter highlights the need for further lab research to clarify why certain drugs are only effective in some patients. Using patient-specific cell culture and animal models, the program also generates the comprehensive data required to obtain approval for clinical trials.

Program coordination

Prof. Stefan Pfister (Core Center Heidelberg)
Prof. Jens Siveke (partner site Essen/Düsseldorf)
Prof. Stefan Knapp (partner site Frankfurt/Mainz)

ongoing project ☑ Goal achieved

Developments

- 43 patients were admitted to INFORM2 NivEnt in 2023. The trial is currently in phase II.
- Development of novel mouse models for lymphomas, leukemia, pancreatic, and gastrointestinal tumors to identify therapeutic targets.
- Establishment of the FREEZE-O platform for PDOs and its recognition as a research infrastructure facility by Freiburg University's medical faculty.
- ☑ Whole exome sequencing (WES) advances cancer diagnostics and enables reliable biomarker identification despite methodological variability.
- Development of new E3 ligands for the development of new PROTACs for tissue-specific tumor degradation.
- PDOs model metastases and enable analyses by means of WES, RNA sequencing, and drug tests..

Research highlight

Molecular profiling in the INFORM pediatric precision oncology registry

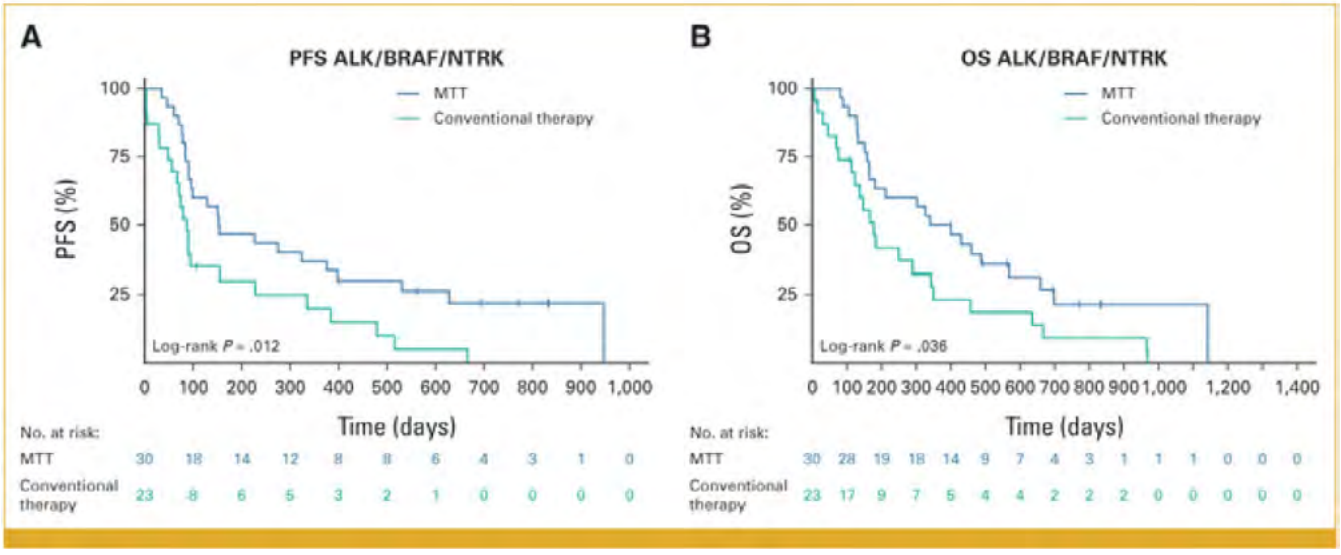
Using the INFORM (INdividualized Therapy FOr Relapsed Malignancies in Childhood) registry (for more information, see https://www.dkfz.de/en/research/inform/inform-register/about-inform), researchers investigated the treatment outcomes of children and adolescents with relapsed, refractory, or progressive cancers, who had received targeted treatments based on molecular tumor profiles. The analysis showed that patients with clearly defined molecular target structures (e.g. ALK, NTRK, or BRAF mutations) achieved significantly better survival rates with an appropriately targeted treatment. By contrast, no clear survival advantage was found for other classes of cancer drugs, such as CDK, MEK, and mTOR inhibitors. The results emphasize the high clinical benefit of molecular profiling for treatment personalization for hard-to-treat pediatric tumors.

Goals for 2025 onwards

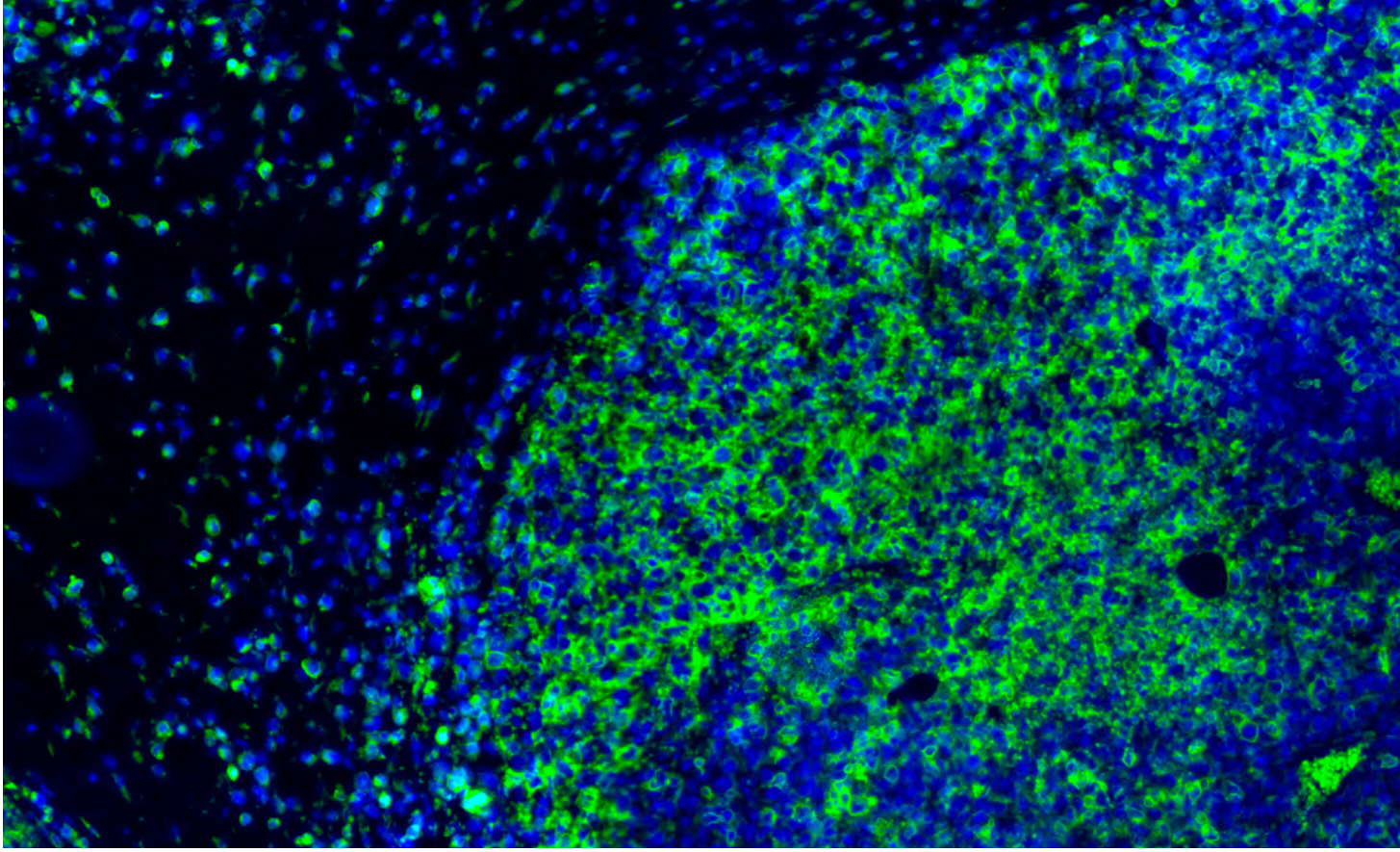
- Research new patient stratification methods, e.g. pharmacogenomic risk prediction and the integration of immune landscape analysis.
- Develop new treatments to combat primary and secondary resistance by redirecting/repurposing drugs.
- Create a comprehensive cancer atlas of lncRNA vulnerabilities. Long-term goal: RNA therapeutics.
- INFORM: "Omics" and drug screening to identify therapeutic targets and predict drug effects.
- Expand the direct contract under which, since February 1, 2023, some statutory health insurance schemes have been paying for INFORM provision in accordance with § 140a of Social Security Code (SGB) V, to more German health insurance schemes. (At December 31, 2024, 76% of statutory health insurance schemes were taking part.)

Further information:

Heipertz AE, Pajtler KW, Pfaff E, et al. Outcome of Children and Adolescents With Relapsed/Refractory/Progressive Malignancies Treated With Molecularly Informed Targeted Drugs in the Pediatric Precision Oncology Registry INFORM. JCO Precis Oncol. 2023 Jul;7:e2300341.



Survival analyses. (A) PFS of patients with ALK, BRAF, or NTRK genetic alterations receiving MTT with ALKi, BRAFi, or NTRKi, respectively, versus patients with the same molecular alterations who received conventional treatment or no treatment (P = .012). (B) OS of patients receiving MTT with ALK, BRAF, or NTRK genetic alterations receiving ALKi, BRAFi, or NTRKi versus other patients with the same molecular alterations who received conventional treatment or no treatment (P = .036). Abbreviations: ALK – anaplastic lymphoma kinase; ALKi – anaplastic lymphoma kinase inhibitor; BRAF – B-RAF kinase; BRAFi – B-RAF kinase inhibitor; MTT – matched targeted therapy; NTRK – neurotrophic receptor tyrosine kinase; NTRKi – neurotrophic receptor tyrosine kinase inhibitor; OS – overall survival; PFS – progression-free survival. MTT, defined as treatment with a targeted drug in the presence of a respective molecular pathway alteration. Conventional therapy, defined as treatment including surgery, radiation therapy, conventional chemotherapy, or no treatment. (© Heipertz AE, Pajtler KW, Pfaff E, et al., JCO Precis Oncol 2023)



Cancer Immunotherapy

In principle, the immune system is capable of recognizing and eliminating cancer. However, when cancer manifests, it means the immune system has failed – a phenomenon known as tumor immune escape. Researchers working in the DKTK Cancer Immunotherapy program are investigating these immune escape mechanisms and also how the immune system can be given extra support in the fight against cancer.

The focus is on innovative cancer vaccines, adoptive cell therapy (using cytotoxic T cells and natural killer cells), or bispecific antibodies that recognize structures on the surface of cancer cells (tumor antigens) and modulate the function of immune cells. Another focus is on optimizing the use of checkpoint inhibitors that are already used successfully for immune activation in clinical practice. An understanding of immune escape mechanisms is essential for this because it forms the basis for improved therapeutic approaches, especially ones that make use of combination therapies. The program also investigates whether immunotherapy should be neoadjuvant or adjuvant, i.e. administered before or after another therapy. This leads to close interrelationships with other DKTK research programs.

Program coordination

Prof. Jürgen Becker (partner site Essen/Düsseldorf)
Prof. Gerald Willimsky (partner site Berlin)
Prof. Helmut Salih (partner site Tübingen)

◧ ongoing project ☑ Goal achieved

Developments

- ◧ Identification of relevant resistance mechanisms in advanced tumors in initially responsive patients in the DKFZ/NCT/DKTK MASTER program.
- ◧ Discovery that activation-induced cell death does not occur in CAR-T cells that target the L1CAM protein with Fas/CD28 switch receptors. This prolongs the effectiveness of multiple antigen stimulation.
- ☑ Effectiveness of an adjuvant immunotherapy demonstrated for the first time in Merkel cell carcinoma in the randomized ADMEC-O trial.
- ◧ Identification of new therapy resistance mechanisms: KLK4-7, PARP7, and PGE2 expression in tumors and CD155 expression on circulating monocytes.
- ☑ Identification of rapidly proliferating CD20-positive B cells in the tumor tissue as an independent prognostic factor for neoadjuvant therapy in patients with pancreatic ductal adenocarcinoma (PDAC).
- ◧ Recruitment completed for the multicenter phase I trial AMPLIFY-NEOVAC with 69 patients at all eight DKTK partner sites.

Goals for 2025 onwards

- Use artificial intelligence to accelerate and improve analysis and integration of multiomics data.
- Undertake personalized characterization of tumors and immune responses to determine rational indications for various forms of immunotherapy.
- Identify ways of overcoming factors in the tumor microenvironment that have an impact on spontaneous, therapeutic, or adoptive T cell responses.
- Understand the co-evolution of cancer and immune responses to improve the indications for and timing of immunological interventions.
- Develop combinations of conventional therapies, molecularly targeted therapies, and immunotherapies.

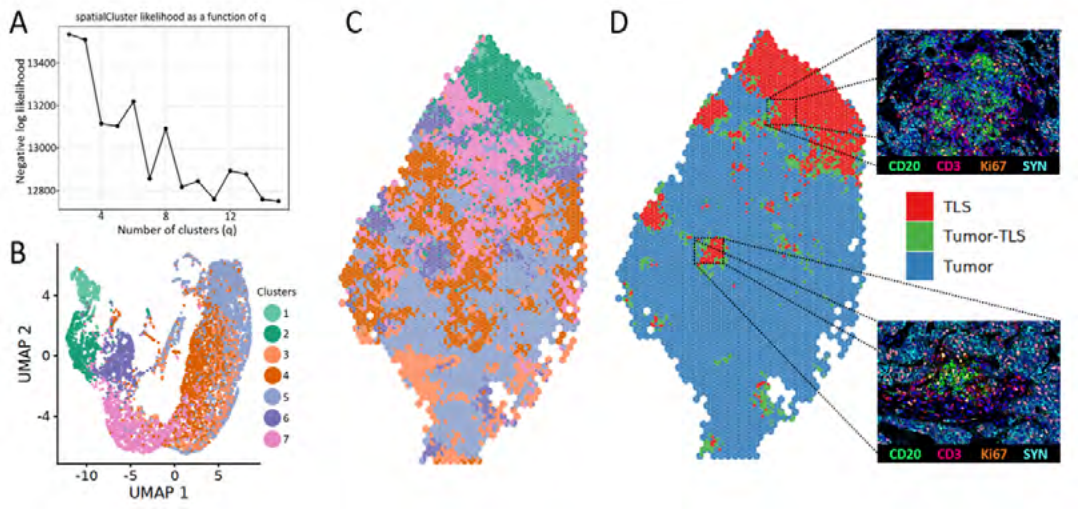
Research highlight

Immunotherapy for Merkel cell carcinoma

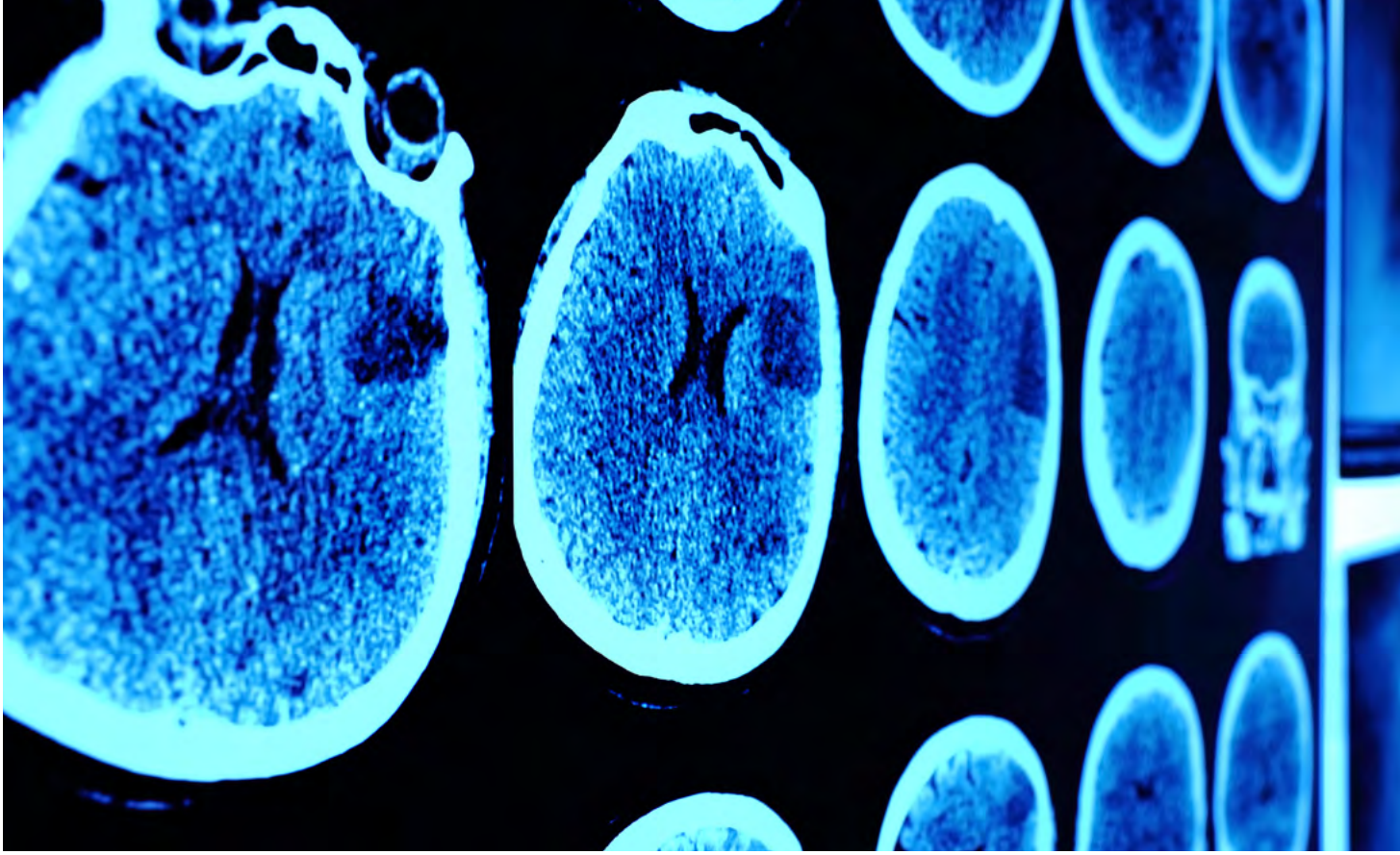
Merkel cell carcinoma (MCC) is a rare skin cancer. Although it is immunogenic, which means it can produce an immune response, it is highly aggressive. In Europe, there are only two to four cases per million inhabitants but the rate of recurrence is particularly high, at around 40% across all stages of the disease. Until now, it has not been possible to establish a systemic adjuvant therapy for MCC. Building on the success of immune checkpoint inhibitors (ICIs) in skin cancer and other tumor diseases, which have significantly increased disease-free survival rates, researchers have set new standards with ADMEC-O. In this first ever prospective study, they demonstrated the effectiveness of adjuvant ICI therapy in completely resected MCC. The randomized, explorative phase II trial recruited 179 patients, of whom 62% were already in tumor stage III or IV. The adjuvant ICI therapy produced compelling results, with a disease-free survival (DFS) rate of 85% after 12 months and 84% after 24 months, compared with 77% and 73% respectively in the observation group. This corresponds to an absolute DFS gain of 10% and a relative risk reduction of nearly 40%, although the remission rate under study conditions was lower than had been expected from the historical data. Patients younger than 65 appeared to benefit particularly from the treatment. ADMEC-O has therefore demonstrated the feasibility and clinical effectiveness of adjuvant checkpoint inhibition in MCC and addresses a previously unmet, urgent medical need.

Further information:

Becker JC, Ugurel S, Leiter U, et al. Adjuvant immunotherapy with nivolumab versus observation in completely resected Merkel cell carcinoma (ADMEC-O): disease-free survival results from a randomised, open-label, phase 2 trial. Lancet. 2023;402(10404):798-808.



Spatial transcriptomics confirms the presence of tertiary lymphoid structures (TLSs) in MCC tumors. (A) The optimal number of clusters for spatial grouping was determined using BayesSpace in combination with an elbow plot. (B) The results of the spatial neighborhood network (SNN) grouping were visualized using uniform manifold approximation and projection (UMAP, a dimension reduction method). (C) The clusters were projected back onto the tissue architecture. (D) Classification of the clusters as TLSs on the basis of gene expression patterns was validated using immunofluorescence. (© Translational Skin Cancer Research, Essen, Jürgen C. Becker)



Radiation Oncology and Imaging

Radiotherapy, one of the oldest methods of treating cancer, is now one of the most innovative fields of cancer medicine. In addition, modern imaging techniques are providing the basis for diagnoses with a level of accuracy that would have been inconceivable in the past. The DKTK's Radiation Oncology and Imaging research program combines these disciplines. The focus is on the technical optimization and biological individualization of radiation therapy and medical imaging.

To develop new biomarkers/biomarker signatures for personalized radiotherapy, the DKTK set up a unique, and internationally highly competitive network involving all DKTK partner sites: the DKTK Radiation Oncology Group (DKTK-ROG), which establishes and validates new biomarkers on shared patient cohorts. Investigating and further refining particle therapy and developing and funding innovative IT infrastructure are also important goals. In terms of imaging, the DKTK evaluates multiparametric imaging methods and imaging-based biomarkers. And it develops new, high-precision diagnostic methods in nuclear medicine that can also be used for therapeutic applications as part of a theranostic concept (combining therapy and diagnostics).

Program coordination

Prof. Mechthild Krause (partner site Dresden)
Prof. Matthias Eder (partner site Freiburg)
Prof. Amir Abdollahi (partner site Heidelberg)

ongoing project ☑ Goal achieved

Developments

- ☑ Matching of molecular characteristics of head and neck tumor models in mice with patient data, enabling the development of a robust biomarker signature.
- Evidence of the influence of [^{18}F]FPyGal senescence imaging on tumor treatment plans. A phase I/II clinical trial is currently in progress.
- Milestone achieved with the in vivo application of SABRE hyperpolarized substances, in particular pyruvate, for imaging.
- ☑ Establishment of patient-derived models for head and neck tumors (PDOs, vital sections) at several sites as a basis for joint projects.
- Monitoring the data from the prospective HNprädBio study to validate promising biomarker signatures from DKTK-ROG.
- ☑ Successful clinical translation: MMP14-targeted peptides were used successfully in positron emission tomography (PET) imaging for the first time.

Goals for 2025 onwards

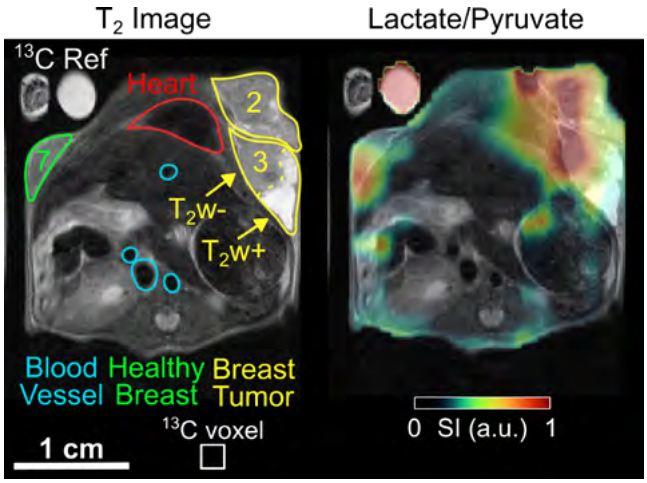
- Develop and validate further innovative biomarkers for personalized radiation oncology.
- Develop radiopharmaceuticals for improved tumor diagnosis and targeted radionuclide therapy (theranostics).
- Initiate further intervention studies on biomarker-based stratification of head and neck cancer patients in a matrix design.
- Establish a compound screening platform based on organoids and vital tissue sections from head and neck tumors.
- Improve magnetic resonance tomography (MRT) and the SABRE hyperpolarization process to optimize image resolution, sensitivity, and analysis of cancerous tissue.

Research highlight

Combining preclinical and clinical data for better predictions

A DKTK-ROG study researched the robustness of prognostic biomarkers and molecular tumor subtypes for patients with head and neck tumors on tumor models in mice. Archived material from ten tumor models from mice experiments was analyzed together with the post-operative retrospective patient cohort of DKTK-ROG. Gene expression analyses revealed that tumors belonging to the mesenchymal subtype responded less well to radiotherapy, both in patients and in the preclinical tumor models.

This innovative approach, combining both early preclinical and clinical data, offers considerable potential for future clinical translation. For instance, other experiments have shown improved healing through a combination of nimorazole and radiochemotherapy. In addition, researchers showed that despite the higher radiation sensitivity of human papillomavirus (HPV)-positive head and neck tumors, when the chemotherapy component was omitted, the therapeutic effect was no longer adequate. This and other similar results can now be taken into account directly when preparing clinical trials.



In a transgenic mouse model for breast cancer, hyperpolarized pyruvate metabolizes into lactate. MRT enables a non-invasive assessment of the dynamics, enzyme rate constant, and spatial distribution of the process. The imaging results corresponded well with the histological findings. (© Petersen S, Nagel L, et al., Theranostics 2025)

Moreover, by combining preclinical and clinical data, researchers developed a robust two-gene signature (FN1, SERPINE1) that can predict how tumors will respond to radiotherapy or radiochemotherapy. This signature will be validated along with other promising biomarker signatures in DKTK-ROG's prospective HN-prädBio study, and could then be used for patient stratification and personalized radiotherapy.

Further information:

Linge A, Patil S, Grosser M, et al. The value of subcutaneous xenografts for individualised radiotherapy in HNSCC: Robust gene signature correlates with radiotherapy outcome in patients and xenografts. Radiother Oncol. 2024;191:110055.

Koi L, Bitto V, Weise C, et al. Prognostic biomarkers for the response to the radiosensitizer nimorazole combined with RCTx: a pre-clinical trial in HNSCC xenografts. J Transl Med. 2023;21(1):576.

Valentini C, Ebert N, Koi L, et al. Preclinical trial comparing radiotherapy alone versus standard radiochemotherapy in three human papilloma virus (HPV) negative and three HPV-positive head and neck squamous cell carcinoma (HNSCC) xenograft tumour models. Radiother Oncol. 2023;183:109546.

Clinical Communication Platform

Molecular analysis, linked to diverse disease progression data, is essential for the development of personalized cancer therapies and diagnostic procedures. In the DKTK, the Clinical Communication Platform (CCP) provides federated IT infrastructure to virtually link patient data and biosamples from clinical care and research and make them available to DKTK researchers across all sites. This collaborative venture by the DKTK partner sites is a valuable resource and is further augmented through connections to other certified oncological partner centers. The CCP supports DKTK Joint Funding research projects, and data science projects conducted by the DKTK Clinical Data Science Group (CDSG), and CORTEX, the new DKTK fellowship program.

In collaboration with other DZGs, the German Biobank Node/Alliance (GBN/GBA), the European Research Infrastructure for biobanking and molecular resources (BBMRI-ERIC) and the Medical Informatics Initiative (MII), the CCP offers a federated approach for the standardization and harmonization of biosample collections, as well as data structures and federated processes in the German research landscape.

Various CCP components that are published as open-source data are used in MII/NUM data integration centers and by the German Biobank Alliance and the German Center for Infection Research, among others.

Platform coordination

CCP Spokesperson and CCP office: Prof. Janne Vehreschild (partner site Frankfurt/Mainz)

CCP-Bio: Dr. Heidi Altmann (partner site Dresden),
PD Dr. Katja Steiger (partner site Munich)
CCP-IT: Prof. Martin Lablans (Kernzentrum Heidelberg)

ongoing project ☑ Goal achieved

Developments

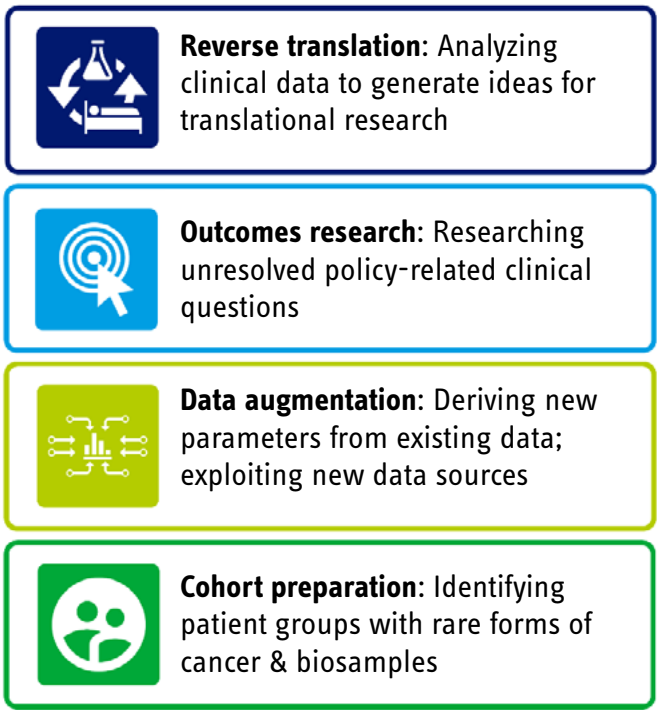
- ☑ IT applications provided for federated searches (CCP Explorer) and for secure, fast data analysis.
- ☑ Three new CCP partners admitted: the oncological centers of the university hospitals of Mannheim, Marburg (both 2023), and Schleswig-Holstein (2024).
- ☑ The DKTK-wide liquid biopsy collection of the EXLIQUID Joint Funding project can be viewed in a web application and is available to project participants as a sample exchange platform.
- Active networking initiated between the biobank coordinators at the DKTK partner sites.
- Electronic data capture initiated in the local biobank systems and web applications for oversight and monitoring of the organoid collection for the DKTK Strategic Initiative SIOrgP.
- Support for early career scientists in oncological, clinical data science through the CORTEX fellowship program.

Goals for 2025 onwards

- Support the CORTEX fellows in their second year and with the completion of their projects.
- Conduct and publish CDSG-supported, multicenter projects.
- Coordinate optimization of local processes to harness existing biosamples and data, and support DKTK-funded sample collections.
- Focus on the next DKTK funding period and develop the CCP into a DKTK BioDataHub with a focus on making biosamples visible and on data exchange with data integration centers.

Highlights

CORTEX, a new internal DKTK fellowship program, was launched in 2023 to support early career researchers in the field of oncological, clinical data science. Three doctoral researchers in life sciences (three-year grant) and five clinician scientists (one-year grant) were selected in a competitive process. A seminar series on working with clinical data and biosamples was introduced in 2024 to support the participants. In addition to the support provided by the CCP, the fellows are also supported by tandem partners - experienced colleagues - and by designated contact persons at the partner sites. These local contacts provide guidance, particularly with applications for access to clinical patient data and with complex queries concerning biosamples.



Research topics within the CORTEX fellowship program (© DKTK CCP)

Screenshot of CCP Explorer – for federated searches of oncological patient data and biosamples (© DKTK CCP)

CCP Explorer, a web application for federated searches of oncological patient data and biosamples at 12 participating sites, was enabled for all network researchers in 2024. Users can enter individual search queries using clinical parameters and biosample criteria. The search results show aggregated case numbers and a graphic overview of potentially available data and biosamples that can be requested for scientific use at the site. Researchers can request access via a registration form on the CCP website (for further information, see https://dktk.dkfz.de/en/clinical-platform/ccp-explorer).

Cancer Genome and Proteome Analysis Platform

Comprehensive analysis of the genome and molecular signaling pathways of cancer cells improves our understanding of cancer and enables more targeted treatment of tumors in the future. The DKTK's site-overarching Cancer Genome and Cancer Proteome Analysis Platform has infrastructure dedicated to clinically oriented cancer research. A wealth of experience and expertise is combined here to investigate the genetic causes of cancer using the latest technological methods and to decode whole tumor genomes. Here, artificial intelligence offers the potential to improve how new diagnostic and treatment options are derived from big data. Modern bioinformatics also facilitates extensive systems medicine research.

For many aspects of molecular cancer research, it is also vital to consider the protein level, for example to measure the activity of cancer genes or cancer-related signaling pathways. At the same time, scientists can see how well cancer cells respond to a drug. Recent advances in proteomics – analysis of the entire protein complement of a cell or organism at a particular point in time – make it possible to conduct unprecedented qualitative and quantitative research on cancer-related topics.

Platform coordination

Proteomics: Prof. Bernhard Küster (partner site Munich)
Cancer genome analysis: Prof. Stefan Fröhling (Core Center Heidelberg), Prof. Benedikt Brors (Core Center Heidelberg)

ongoing project ☑ Goal achieved

Developments

- Validation of a newly identified subtype of AML that responds to BCL2 inhibitor venetoclax.
- ☑ Development of an automated pipeline for the preparation of tumor tissue (autoSP3) that can be used with any type of clinical sample and leads to more complete detection in tissue and single-cell proteomics.
- Development of a quality management system for the entire precision oncology workflow of the DKTK at the DKFZ in accordance with the guidelines of the German Medical Association.
- Development of new concepts for molecularly stratified clinical trials within the NCT (e.g. COGNITION-GUIDE, PAMSARC, and RATIONALE) as well as translational research projects.
- ☑ Initiation of regular MTBs to discuss the proteomic results and compare clinical recommendations on the basis of proteomic and/or genomic data.
- ☑ Development of pharmacogenomic risk forecasts within the DKTK's precision oncology programs.

- Updating a software system to visualize molecular data and provide semi-automated support for clinical decisions (Knowledge Connector): (i) integrating additional data levels (pharmacogenomics, HLA genotype, and proteomics) and external biomarkers, (ii) improved visualization, and (iii) advanced filter functions.
- Ongoing use of molecular and clinical data from the DKTK's precision oncology programs to initiate translational research projects at various partner institutions.
- Comprehensive use of multifaceted molecular profiles from the DKTK's precision oncology programs to research intratumoral heterogeneity and treatment resistance.

Highlights of the Cancer Genome Analysis Platform

Comprehensive molecular profiles collected in the MASTER and INFORM precision oncology programs provided a starting point for functional and mechanistic research that led to the characterization of a recently described sarcoma entity, including the detection of several potential therapeutic targets that can be investigated in future clinical trials.

Following a successful pilot phase, ex vivo drug tests on viable fresh tissue samples were included in the MTBs of the DKTK's precision oncology programs as an additional functional component.

For example, the annual HARPOON conference, organized jointly by the DKFZ, NCT Heidelberg, and DKTK, took place in November 2024 at the Heidelberg Congress Center with around 150 registered participants.

Session at the HARPOON conference 2024 (© Marius Stark/NCT Heidelberg)

Goals for 2025 onwards

- Develop new proteomic work processes to characterize (i) low sample quantities, (ii) secretomes, and (iii) bodily fluids, e.g. blood plasma and urine.
- Carry out multidimensional characterization of various clinically or molecularly defined patient cohorts.
- Continue ongoing studies and projects and initiate new ones, e.g. through the DKTK Joint Funding Program (including ASTRON, DECODE-UM, PEVIDS).
- Complete the quality management system for the bioinformatic preparation, biological curation, and clinical annotation of genome/exome and transcriptome data, and achieve DIN EN ISO 15189 accreditation of the entire precision oncology workflow.
- Make continuous infrastructure improvements for DKTK-wide integrated analysis of clinical and molecular data, especially using AI methods.
- Test new methods for multidimensional characterization of tumors, e.g. long-read sequencing, metabolome and single-cell analysis, and conduct research on the tumor microenvironment, paying particular attention to longitudinal samples obtained from clinical trials.
- Test new methods for proteomic analysis of single cells to record both the heterogeneity of leukemia and the spatial resolution of tumor cells in the tumor microenvironment in tissue.
- Modernize the infrastructure to enable single-cell analysis at proteome level and increase the sample throughput for blood proteome analysis.

Further information:

Schöpf J et al. Multi-omic and functional analysis for classification and treatment of sarcomas with FUS-TFCP2 or EWSR1-TFCP2 fusions. Nat Commun. 2024 Jan 2;15(1):51.

Rheinnecker M et al. Zygosity predictor. Bioinform Adv. 2024 Feb 6;4(1):vbae017.

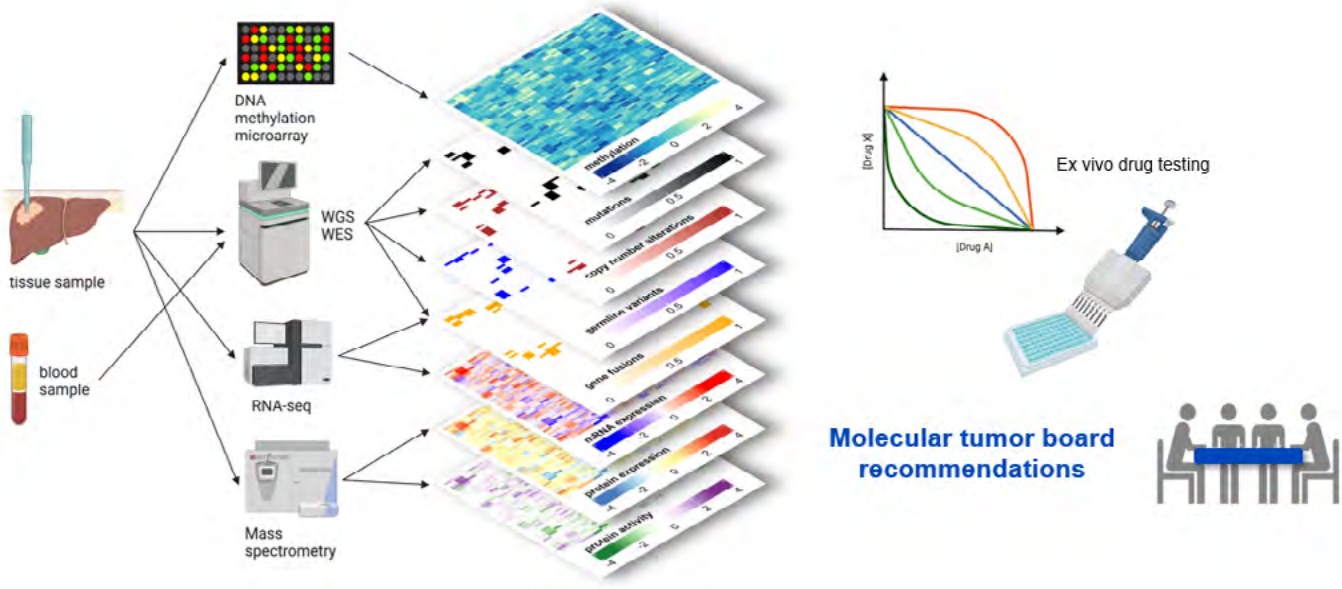


Diagram of multidimensional tumor characterization (© Andreas Mock/NCT Heidelberg)

Highlights of the Cancer Proteome Analysis Platform

The DKTK partner site Freiburg identified a protein – acid ceramidase – that is a new biomarker candidate for the progression of recurrent glioblastoma and represents an unexpected link between cellular metabolism and the tumor microenvironment.

Colleagues in Berlin identified a prognostic protein signature in multiple myeloma that is associated with aggressive disease, regardless of established risk factors. By integrating functional genetics and single-cell RNA sequencing, researchers discovered general and genetic subtype-specific, deregulated proteins and signaling pathways in plasma cell malignancies that are potential targets for (immuno)therapy.

The annual World Congress of the Human Proteome Organization took place in Dresden in October 2024 with more than 1,600 participants. Members of the DKTK's Cancer Proteome Analysis Platform and the BMFTR-funded Mass Spectrometry in Systems Medicine research consortium were prominently involved, giving talks and poster presentations on proteomics in precision oncology.

Prof. Bernhard Küster opened the World Congress of the Human Proteome Organization in October 2024. (© Susann Bargas Gomez/Conventus)

Further information:

Cosenza-Contreras M, Schäfer A, Sing J, et al. Proteometabolomics of initial and recurrent glioblastoma highlights an increased immune cell signature with altered lipid metabolism. Neuro Oncol. 2024;26(3):488-502.

Ramberger E, Sapozhnikova V, Ng YLD, et al. The proteogenomic landscape of multiple myeloma reveals insights into disease biology and therapeutic opportunities. Nat Cancer. 2024;5(8):1267-1284.

Multicenter translational projects

A key focus area within the DKTK is working on interdisciplinary research topics at the interface between basic research and clinical care, in particular supporting the preclinical development of innovative therapy approaches and diagnostic procedures. Through its INNOVATION funding line, the competitive DKTK Joint Funding Program finances collaborative research projects with a translational focus. Project proposals that demonstrated a particularly high level of scientific excellence and innovation potential were selected for funding in a process involving the DKTK's international Scientific Advisory Board. In its second funding line, UPGRADE, the DKTK funds research projects that build on or are associated with clinical trials to find answers to new scientific questions through experimental research, and to maximize the knowledge gained from clinical trials. A new funding line was announced at the end of 2024. It was launched with a call for proposals at the beginning of 2025, with the aim of further accelerating the implementation of scientific discoveries in the fields of molecular prevention, early detection, diagnosis, and treatment for patients.

All Joint Funding projects in the INNOVATION and UPGRADE funding lines involve at least three partner sites, and some involve all eight. External partners can also be brought in to support the projects. Moreover, the program addresses and provides targeted funding for current topics of outstanding scientific and medical importance in multicenter Strategic Initiatives of the DKTK Steering Committee. Infrastructure facilities installed by the DKTK are of central importance for project implementation. They provide technological support and, combined with the specialist expertise of everyone involved, play a key role in helping to connect preclinical and clinical research. Since the DKTK was founded, more than 60 translational research projects, investigator-initiated early clinical trials, and Strategic Initiatives have been funded through the Joint Funding Program. A list of these projects with descriptions and a user-friendly filter function (by site, entity, funding line, and other categories) is available on the DKTK website (see https://dktk.dkfz.de/en/research/joint-funding-projects/projects).

Developments 2023/2024:

In spring 2023, in the context of the **10th call in the competitive Joint Funding Program's UPGRADE funding line**, the DKTK Steering Committee selected three projects for funding, which launched in the second half of the year. Work also started on an UPGRADE project from the 8th funding round. The **DKTK Organoid Platform, a Strategic Initiative**, was launched at a kick-off meeting. It aims to pool the complementary expertise of all eight DKTK partner sites in this area and make it widely available, and to establish a sustainable structure and shared knowledge base for follow-on projects. In summer 2023, during the **11th Joint Funding Call in the INNOVATION funding line**, a further three projects were selected that started at the beginning of 2024. Three more Joint Funding projects will start at the beginning of 2025, having been selected for funding in summer 2024 during the **12th Joint Funding Call in the INNOVATION funding line**.

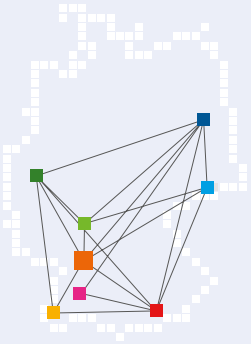
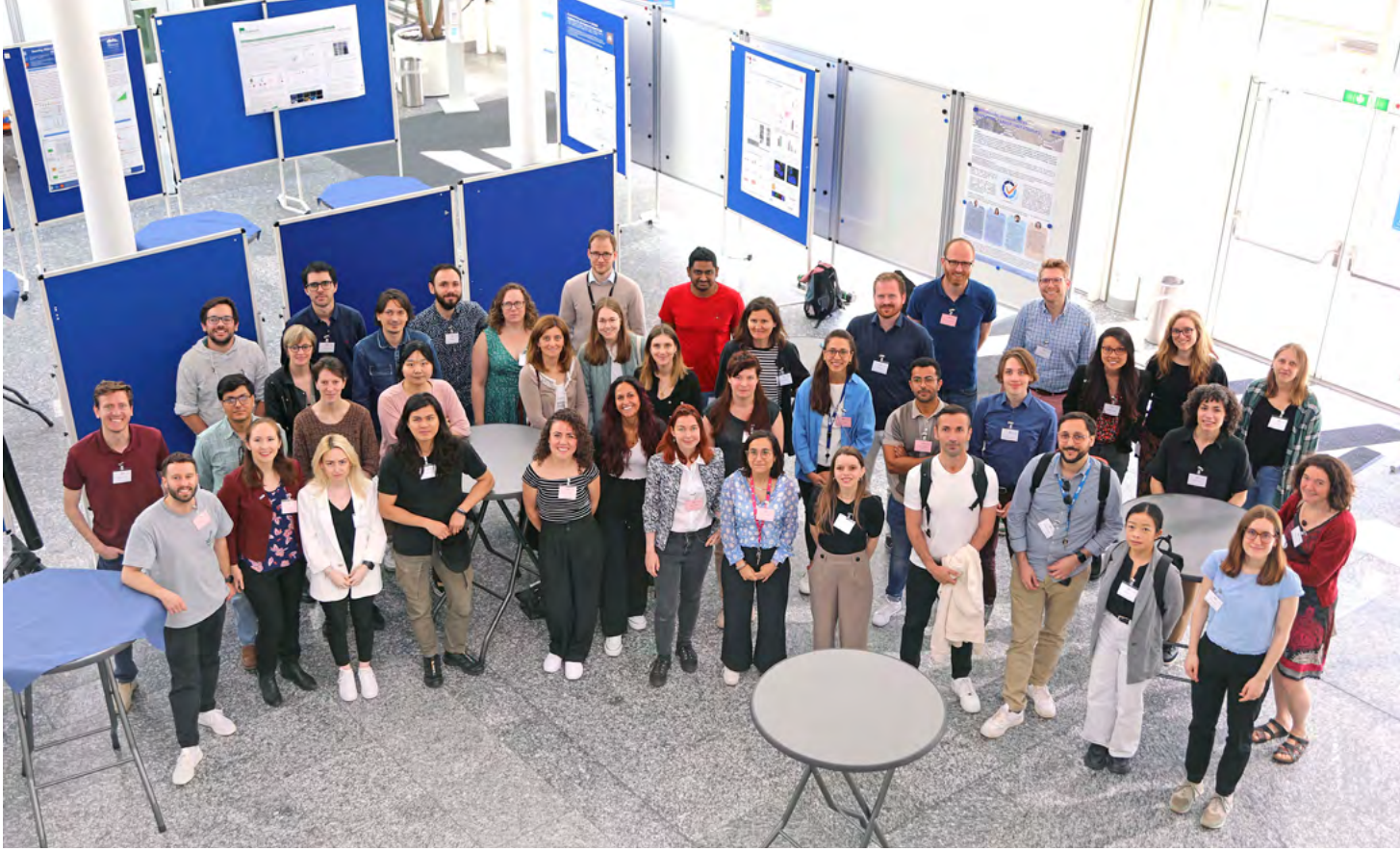


Tabelle: Auflistung aller in 2023/2024 aktiven Projekte des DKTK Joint Funding-Programms

Acronym	Description
AMI2GO	A project accompanying the AMPLIFY-NEOVAC trial, using tumor tissue organoids to gain insights into the mechanisms of T cell response and resistance following treatment.
AMPLIFY-NEOVAC	A multicenter trial assessing the safety and immunogenicity of a vaccine against a mutation of the IDH-1 protein in combination with immune activation via checkpoint inhibition in recurrent brain tumors.
ARMANI	A prospective trial assessing the safety and efficacy of a molecularly guided anatomical resection compared with a non-anatomical resection of liver metastases in RAS-mutated colorectal cancer.
CD276xCD3	A phase I immunotherapy trial investigating the safety, tolerability, and efficacy of bispecific antibody CD276xCD3-CC-3 in colorectal cancer.
EXLIQUID	A liquid biopsy project that supplements the MASTER program and local programs at all the DKTK partner sites. It is building a collection of blood samples during molecular, targeted therapies, and developing diagnostic tools.
Decode-UM	A project studying mechanisms responsible for the onset and spread of uveal melanoma, an aggressive eye cancer. It monitors the course of treatment and develops new therapy approaches.
HematoTrac	A project that uses clinical imaging-guided sampling techniques to discover the mechanisms used by hematopoietic cells to infiltrate malignant brain tumors and impact overall patient survival rates.
HYPERBOLIC	A project on hyperpolarized magnetic resonance tomography (HP-MRT) that develops tailor-made probes to visualize functional and prognostic hallmarks of cancer non-invasively and without ionizing radiation.
IDENTI-T	A project that analyzes samples from leukemia patients (T-ALL) to obtain a refined resolution of cell biological characteristics of T-ALL subtypes, with the aim of developing an improved risk stratification and new therapy approaches.
IMMUNED	A project that combines molecular analyses of tumor tissue samples with characterization of immunological and tumor-specific biomarkers and clinical data from the IMMUNED trial to develop a prediction model for use in clinical practice.
INFORM	A registry trial focusing on children with recurrent cancer who have run out of established treatment concepts. Researchers analyze the tumor genome for potential use of new, targeted drugs.

Acronym	Description
INVENT4GB	A phase I trial investigating a new immunotherapy in glioblastoma, a particularly aggressive form of brain tumor. A T cell therapy developed in the DKTK is being used for the first time to treat recurrence following radiochemotherapy.
IVAC-AN	Building on the IVAC-ALL-1 trial, this project characterizes the T cell responses triggered by peptide vaccination in recurrent acute lymphoblastic leukemia (ALL) with greater accuracy.
JF-PSMA	The DKTK-sponsored phase I/II 68Ga-PSMA-11 trial on preoperative diagnosis made an essential contribution to the establishment of imaging with 68Ga-PSMA11 PET/CT in high-risk prostate cancer. This project investigates the molecular and histomorphological basis for the variability in radioligand uptake and tumor imaging in PET.
LeOPARD	A project that aims to develop ultra-rapid molecular cancer diagnostics as decentralized research tools in the DKTK network. It makes use of technologies like nanopore sequencing to provide real-time, comprehensive molecular profiling of tumors.
MASTER-Programm	A DKTK-wide registry trial that detects individual changes in the genome of cancer cells in young adults with advanced cancer and in people with rare tumors, with the aim of developing a personalized therapy recommendation.
MIMETIC	Using cutting-edge methods, such as plasma proteomics and multispectral imaging, this project aims to gain a comprehensive understanding of the immunomodulatory characteristics of combined targeted immunotherapies for the CRAFT trial.
MTBA	A DKTK-wide project associated with the MASTER program that aims to collate all local molecular tumor board (MTB) datasets in one database and to harmonize workflows with other MTB initiatives in Germany.
NoviCARAZA	A project investigating the use of natural killer cells (NK cells) for CAR therapy, an immunotherapy with genetically modified immune cells, in AML.
PEVIDS	A project that investigates the impacts at molecular level of personalized vitamin D supplementation on various health aspects in colorectal cancer patients from the VICTORIA trial.
PerVision	A phase I trial investigating the safety and effectiveness of a personalized peptide vaccine for treating children and young adults with metastatic sarcoma. The vaccine is designed to recognize the specific mutations in the tumor.
PSMAxCD3	Two phase I immunotherapy studies investigating the safety, tolerability, and efficacy of the bispecific PSMAxCD3-CC1 antibody developed in the DKTK for prostate cancer or plate epithelial carcinoma of the lung.
PredictAHR	A project that aims to improve predictions of the efficacy of tyrosine kinase inhibition, radio/chemotherapy, and immunotherapy by analyzing the activity of the transcription factor acryl hydrocarbon receptor (AHR).
RiskY-AML	A project that makes use of novel single-cell technologies and data analysis tools to develop new predictive biomarkers and therapeutic options that prevent or overcome resistance and recurrence in AML.
SORATRAM	A project evaluating a new concept for treating a wide range of tumors in patients from the MASTER program with kinase-inactivating BRAF mutations.
TRICKY	A project investigating various factors in skin cancer, such as heterogeneity in tumor regions, which influence different responses to immunotherapy.
TRUST	Accompanying the multicenter phase I IT-PD1/NOA-26 trial, longitudinal patient samples, taken following treatment with a PD1 antibody for metastatic solid tumors with leptomeningeal disease (LMD), are analyzed at the cellular, molecular, and metabolic levels.



Participants at the DKTK School of Oncology Young Academics Conference and the DKFZ Postdoc Retreat in Heidelberg 2024 (© DKFZ Heidelberg)

Early career support in the DKTK

Spokesperson

Prof. Mechthild Krause (partner site Dresden)

The DKTK plays an important role in providing career support for young scientists – both for young medical scientists working on patient-oriented research projects, and for clinician scientists working at the interface between translational cancer research and clinical practice. Supplementing the education and training programs offered at its partner sites, and the courses of the DKFZ Cancer Research Academy, the DKTK School of Oncology (SoO) offers medical scientists and clinician scientists further training and networking activities, covering all aspects of translational cancer research. This means that around 160 DKTK SoO fellows benefit directly from cross-site networking, the expertise of colleagues in translational oncology research, and the research infrastructure at the DKTK partner sites.

Career prospects in the field of patient-oriented cancer research

- Several sites have offered fellowships to enable physicians in residency programs to take time off for research, so that they can devote themselves to a fixed-term research project.
- The DKTK has launched its own CORTEX fellowship program to support young scientists in clinical data science.
- The DKFZ in Heidelberg has already completed the sixth selection round for its DKFZ Clinician Scientist Program.
- At the end of 2024, there were six DKTK young investigator/junior research groups active at various partner sites.

Support measures and events

As well as in-person events, virtual and hybrid formats were offered to facilitate regular nationwide networking among the fellows and to make it easy for people across all partner sites to participate in events. An online seminar series on techniques in translational research, the **DKTK School of Oncology Tech Talks**, which launched in 2021, continued in 2023 and 2024. A total of six online seminars took place, including a talk by Dr. Iovan Mircetic, a DKTK junior research group leader from Dresden, on modern genetic approaches to two problems in stomach cancer. Prof. Hedwig Deubzer and Dr. Christof Winter from the DKTK partner sites Berlin and Munich explained how liquid biopsies can be used for personalized treatment of tumor patients and for treatment monitoring.

Participants at the Cancer Core Europe Summer School in Translational Cancer Research 2024 in Portugal (© DKFZ/NCT Heidelberg)

The **DKTK School of Oncology Young Academics Conference 2024** was held in conjunction with the annual DKFZ Postdoc Retreat in Heidelberg. Besides a keynote speech by Prof. Dieter Henrik Heiland (DKTK partner site Freiburg) on "From descriptive to predictive analysis of high-dimensional data: Recent advantages of supervised learning", and presentations by Dr. Delia Braun (Patient Participation Coordinator, DKFZ) and Dr. Stefanie Houwaart from the joint DKFZ and DKTK Patient Advisory Council for Cancer Research, there were numerous other talks, poster sessions, and discussions about the research fields of the participating young scientists.

The annual Cancer Core Europe **Summer School in Translational Cancer Research** provides an important platform for young researchers to exchange views on current topics of cancer medicine at international level with oncologists, cancer researchers, and members of leading cancer associations, to undertake further training, and expand their own networks.

At DZG level, the **Lunchtime Career Talks** continued, presenting early career researchers with a broad portfolio of possible career paths in academia and associated fields. A total of seven talks took place in 2023 and 2024.

On June 12 and 13, 2023, the DZG also organized the first **DZG Science & Career Day** on translational health research. Prof. Martin Hrabě de Angelis (DZD and acting DZG Spokesperson) and Dr. Ute Petereit (BMFTR) opened the two-day event. Among other things, DZG researchers presented best practice models in translational medical research and took part in a panel discussion on how DZG early career researchers can advance translational research in the health sciences. The second DZG Science & Career Day was on "Translational medicine – From lab to life: How to translate your research into medical innovations" and took place on November 7 and 8, 2024 in Potsdam. As well as a panel discussion on the challenges of translating scientific findings into daily practice and the advantages offered by the DZG network in this area, early career DZG researchers presented some of their own research projects in poster sessions and in a science pitch session. A workshop gave the participants tips on expanding their own networks, with role models, including Prof. David Capper (DKTK partner site Berlin), sharing their personal experience of the importance of networking in academia.

Travel and research rotation grants enable the fellows to take part in scientific conferences or research residencies of up to three months in a host laboratory in Germany or abroad. A total of 26 travel grants and six lab rotation grants were approved in 2023 and 2024.

Other events and training offers include:

- DKTK site retreats
- Young Investigator Club in Dresden
- Munich Cancer Retreat and DKTK Munich Cancer Colloquium
- DKTK Academic Career Seminar
- Essen Translational Oncology Symposium (ETOS)
- DKTK Freiburg Seminar Series
- Heidelberg Grand Rounds and initiatives of the DKFZ Postdoc Program and Postdoc Network
- Career Day at the DKFZ on research & development
- DZG site symposia at various DZG sites

Goals for 2025 onwards

- Send out regular newsletters with information on events, seminars and funding opportunities.
- Standardize further the application processes for the SoO at the different DKTK partner sites.
- Continue the online series of DKTK School of Oncology Tech Talks.
- Expand DZG-wide training measures in the field of translational research.
- Design a regular joint DZG newsletter.
- Support the participation of SoO fellows in (inter)national scientific events and facilitate external research residencies to obtain additional specialist expertise.
- Supplementary education and training offers with the NCT.

National and international cooperation and networking in the DKTK

Since it was first established, the DKTK has created a unique research environment. In the eight translation centers set up across Germany by the DKFZ (as the core center) with leading German university partner sites, researchers, clinician scientists, and other associated experts work closely together in an interdisciplinary manner. The central Coordination Office at the DKFZ in Heidelberg and the scientific and administrative coordinators at the individual sites support the consortium, including by providing organizational support for the researchers and developing efficient communication and networking structures.

Multi-site collaboration

Fostering collaboration between researchers at the various DKTK partner sites is one of the consortium's central aims, and there are various measures and instruments in place to help with this. The translation centers regularly organize scientific retreats that not only promote an exchange of ideas within the individual partner sites, but also strengthen wider networking with partners of other DKTK sites. In addition, there are several themed working groups that focus on specialist research questions and work collaboratively across several sites. In 2023 and 2024, representatives of the five DKTK research programs met several times to develop the programs further based on the recommendations issuing from the 2021 internal evaluation.

A key instrument of success is the DKTK Joint Funding Program. Particularly innovative DKTK-wide research projects are selected and funded through competitive calls for proposals. The program also offers the possibility of bringing in external partners who can support the projects in complementary ways (for more information, see page 27 ff).

Expansion of DKTK research structures

The consortium has established joint research infrastructure and platforms, largely for use by DKTK scientists, although they can also be used by external cooperation partners. The Clinical Communication Platform (CCP) provides researchers with tools for data sharing that comply with the most stringent quality, ethical, and data protection standards. Biological samples and clinical and experimental patient data are essential for medical research, especially for the development of new personalized therapeutic and diagnostic methods. The human biobanks at the DKTK partner sites offer comprehensive, annotated collections for this purpose, including tissue samples, liquid samples, and their derivatives. The DKTK Clinical Data Science Group con-

nects researchers across disciplines and sites. To support young scientists in the field of clinical data science, the DKTK launched a new internal fellowship program called CORTEX (for more information, see pages 22-23).

The RadPlanBio and JIP platforms also continue to develop rapidly. They are used for storing, exchanging, and analyzing clinical image material, including in multicenter biomarker studies for therapy personalization. The Joint Imaging Platform (JIP) is based on decentralized evaluation of algorithms for the analysis of medical imaging methods (federated learning) and is used in DKTK research projects. It is also highly regarded by national and European research networks, including the Radiological Cooperative Network (RACOON) of the radiology departments of all the German university hospitals, where it provides a training environment for the development of new algorithms for multicenter data.

The MASTER and INFORM programs are core personalized cancer research activities within the DKTK. Standardized protocols and procedures for in-depth molecular genetic analysis of tumors provide valuable information for diagnosis and therapy. At the center of this process are the molecular tumor boards (MTBs), in which experts from various disciplines interpret the complex molecular data of individual tumor genomes and identify possible therapy options. The DKTK, together with the DKFZ and the NCT, played an important role in the development of MTBs to ensure that these critical analyses are carried out to an extremely high standard. For instance, more than 120 partners are now registered for the regular MTBs of the MASTER program. All areas of oncology in Germany are represented in these MTBs – from the DKTK and NCT sites to the Oncology Centers of Excellence of Deutsche Krebshilfe and registered oncologists. In 2023 and 2024, the MASTER team organized the established HARPOON conference, which brought together participants from all over the world, including representatives from all the DKTK partner sites, to discuss the latest developments in precision oncology.

Projects with industry

Collaboration with BicycleTx Ltd. (DKTK Freiburg)

In 2024, BicycleTx Ltd. (Cambridge, UK) extended its cooperation agreement with the DKFZ for another two years. The aim of the project, led by DKTK Professor Matthias Eder, is to advance the development and discovery of Bicycle® Radioconjugates (BRCs) for various oncological target structures. Within the framework of this industry partnership, the researchers generate and characterize preclinical data for the development and characterization of BRCs for targeted tumor diagnostics and therapy. In vitro and in vivo research has been conducted on biodistribution, pharmacokinetics, and effectiveness in xenograft models. A further aim is the chemical optimization of the conjugates in terms of their stability, binding affinity, and distribution properties. BicycleTx is covering a substantial share of the project costs over the cooperation period, which runs until April 2026. The first MT1-MMP candidate has already been clinically characterized in a first imaging study, and published in the specialist journals Cancer Research and Nuclear Medicine and Biology.

Participants at the HARPOON workshop on November 23-24, 2023 in Heidelberg (© Marius Stark)

BMFTR GO-Bio initial funding for TumiKo-ZAP-2 (DKTK Essen)

Following successful completion of the exploratory phase by DKTK Professor Björn Scheffler and his team, the feasibility phase (which runs to September 30, 2026) was approved by the BMFTR in September 2024. The focus is on a novel biological discovery that self-sustaining compartments of the adaptive immune system form as dynamic components of brain tumor diseases in the cranial bone. Active cranioencephalic immune cell exchange takes place between bone and tumor. This new finding reveals an unexpected interface to brain tumor immunology. At present, the only way to access the cranioencephalic structure is through extremely invasive interventions that risk destroying the immune compartment, so the project aims to develop a smart medical device for gentle interaction with this previously inaccessible immunological niche.

Licensing agreement with Twyce GmbH (DKTK Tübingen)

DKTK Professor Helmut Salih and the researchers in his Clinical Cooperation Unit for Translational Immunology formed a new start-up, Twyce GmbH, with managing directors Prof. Gundram Jung and Martin Pflügler, to develop bispecific antibodies for cancer treatment. It has received an eight-figure euro sum in funding from BiconY Therapeutics GmbH, a fully-owned subsidiary of the Federal Agency for Disruptive Innovation (SPRIND). An extensive licensing agreement covering all patents, know-how, good manufacturing practice (GMP) materials, and clinical data is currently being negotiated between the DKFZ, the Faculty of Medicine of the University of Tübingen, and Twyce. In return, instead of holding a direct stake in the business, the academic partners – the DKFZ and University Hospital Tübingen – receive an appropriate, market-standard share of later revenues when the technology is brought to market.

International cooperation and exchange

The DKTK cultivates close contacts with the European Association for Cancer Research (EACR), the Organisation of European Cancer Institutes (OECI), Cancer Core Europe, Cancer Prevention Europe, and others in order to foster collaboration and exchange in cancer research throughout Europe. The DKTK research program on Molecularly Targeted Therapy, for instance, collaborates with leading cancer centers in the Cancer Core Europe consortium. The focus is on multiomics methods, clinical trials, rare cancers, data exchange, and education and training. In addition, several DKTK research programs have joined international research networks. For instance, the Radiation Oncology program works intensively with the European Particle Therapy Network of the European Society for Therapeutic Radiology and Oncology (ESTRO). Some of the platforms are used beyond the DKTK. For instance, international research centers have access to the RadPlanBio platform. Twelve countries are now also involved in the INFORM program for molecular genetic analysis of pediatric tumors. Members of all DKTK research programs are regularly invited to give presentations at international conferences and workshops.

Dialogue with regulatory authorities

The Paul Ehrlich Institute (PEI), the German Federal Institute for Vaccines and Biomedicines, is one of the key players in Germany when it comes to regulatory oversight and legal compliance in the conduct of clinical trials. The DKTK and the PEI have a long-standing partnership through their joint research program on "Regulatory analysis and optimization of development candidate translation in the DKTK". The PEI supports DKTK researchers and clinicians who want to translate their research results into human clinical trials, by providing regulatory expertise during the planning phase. As well as personal consultations on product-specific questions, there are kick-off meetings where interested DKTK scientists can find answers to general questions.

The information and dialogue events organized by the PEI in the reporting period included a workshop on current topics in the area of gene therapy and cell therapy drug development, which was attended by DKTK members.

The National Decade against Cancer

The DKTK has become an active driver and focal point for the further development of cancer research and cancer care in Germany. An example is the National Decade Against Cancer, which was launched by the BMFTR in 2019, and in which the DKFZ, DKTK, NCT, and many other partners, including the Federal Ministry of Health, are actively involved. Here, important decision-makers from politics, cancer research, research funding, healthcare, the economy, and society pool their expertise on effective strategies to combat cancer. Prof. Michael Baumann is Co-Chair of the Strategy Circle of the National Decade against Cancer and, with other DKTK scientists, engages in a wide range of working groups and research initiatives.

The 2nd National Conference Patients as Partners in Cancer Research was held from September 15 to 17, 2023 at the DKFZ in Heidelberg on the theme "Learn. Change. Cooperate." The 3rd National Conference Patients as Partners in Cancer Research was held in Dresden from September 20 to 22, 2024. The events were organized by patient representatives, including some from the DKFZ and DKTK Patient Advisory Council for Cancer Research, and helped advance the integration of patient perspectives in cancer research. The participants were able to discuss a wide range of aspects and take part in training activities. The conferences offered a mixture of presentations, discussions, a science slam, and workshops – an ideal platform for exchange and group learning.

Fighting common diseases together

The primary goal of the German government's health research program is developing the ability to tackle widespread diseases more effectively. Together with the German Centers for Health Research (DZG), the BMFTR, and the federal states have developed powerful structures for this purpose. These long-term partnerships between non-university research institutions, such as the Helmholtz, Max Planck, and Leibniz institutes, and universities with university hospitals pool expertise. The six established DZGs specialize in cancer (DKTK), diabetes (DZD), cardiovascular diseases (DZHK), infectious diseases (DZIF), lung diseases (DZL), and neurodegenerative diseases (DZNE). Two more centers – for mental health (DZPG) and for child and adolescent health (DZKJ) – were set up in 2023 and 2024 respectively. Strategic collaboration between leading researchers in the DZG strengthens Germany's international standing as a research location and makes it considerably more visible and attractive to early career scientists in Germany and abroad in the field of translational research.

The DZG work closely together. Their regular meetings focus on strategic development and collaboration. In 2023 and 2024, the DZG board met quarterly with representatives of all DZG management boards and leadership teams, and there were additional DZG Forum meetings twice a year, in which representatives from the BMFTR and individual federal states also participated.

More than 170 researchers from the eight German Centers for Health Research and invited political guests discussed current DZG research projects at the second DZG Munich Day on July 12, 2024. (© DZD/Michael Haggenmüller)

The DZG research network spans the whole of Germany with 113 partner institutions. (© DZG/WirDesign)

DZG collaboration has expanded and intensified in recent years. An example is the DZG Innovation Fund (DZGIF), a joint program that facilitates and provides financial support for promising DZG-wide research ideas for the prevention and treatment of various widespread diseases. During the second DZGIF call for proposals in 2023/24, two projects on the microbiome were selected for funding, both involving DKTK researchers. Scientists also form working groups to share knowledge and use joint structures. There are working groups on research IT, patient participation, regulatory aspects of clinical trials, biobanks, early career support, public relations, and global health. Activities relating to career support for young scientists included a seminar series (see pages 30-31) while, in public relations, four more issues of the joint research magazine SYNERGIE were published (see pages 36-37).

The DKTK in public

It is not only scientists who ask questions about cancer research, but the general public as well. That is why the DKTK regularly informs the scientific community and interested members of public about exciting research results, events, funding, and awards through its own website, social media accounts, press releases, magazines, and newsletters. The annual report, published in German and English, also provides a clear overview of DKTK activities.

The regular DKTK newsletter appears at regular intervals, and continued to be published in 2023 and 2024 in German and English. It is aimed primarily at researchers and research support staff at all DKTK partner sites. Monthly event newsletters are also sent out with details of events that are relevant to DKTK scientists, or organized with their help. In its newsletters in 2023, the BMFTR reported on how DKTK researchers were developing a method to classify hard-to-diagnose tumors of the nasal cavity with the help of AI, and had successfully tested an adjuvant treatment for Merkel cell carcinoma in a skin cancer trial. In 2024, an article described how researchers had discovered a way of strengthening the effect of cell-based CAR-T cell therapy in leukemia while reducing side effects.

Behind the scenes of cancer research

To mark its 60th anniversary, the DKFZ held an open day on November 17, 2024, inviting the general public to visit its Heidelberg premises. Besides scientific presentations, there were numerous guided tours, information stands, and hands-on activities. The DKTK used fun ways to demonstrate to visitors of all ages the various phases of drug development, from basic research to clinical practice, i.e. the importance of translational research, and the challenges that have to be overcome.

(© Carina Kircher/DKTK)

DKFZ Open Day on November 17, 2024: The DKTK used a marble run as a fun way to demonstrate the various phases of drug development, from basic research to clinical practice. (© DKFZ)

The DKFZ's einblick magazine also reports regularly on research conducted in its translational networks. For instance, it described how patients with rare cancers are benefiting from early molecular diagnostics through the DKTK's MASTER program. In an interview, DKTK Professor Benedikt Brors explained the role of telomeres – the non-coding DNA sequences at the ends of chromosomes – in cancer, and an article presented new findings by DKTK Professor Thomas Oellerich and his team for the treatment of lymphoma.

A new, informative overview of all active and completed Joint Funding projects, including a short description of each project, was added to the DKTK website in 2023 (see https://dktk.dkfz.de/en/research/joint-funding-projects/projects). Various filters allow searches by partner site, entity, funding line, and other categories.

Scientific exchange

A large number of national and international congresses, conferences, symposia, and other scientific events took place in 2023 and 2024. DKTK researchers took part in the annual local events organized by the DKTK partner sites, including the Essen Translational Oncology Symposium, the Munich Cancer Retreat, the Rhine-Main Cancer Retreat, and the DKTK Scientific Meeting Heidelberg, as well as national and international conferences, such as the German Cancer Congress, the German

Events organized by the DKTK partner sites – top: the 5th Rhine-Main Cancer Retreat (© Viktoria Jenkner/UCT Frankfurt); above: the Best Talk and Best Poster Awards at the 11th Munich Cancer Retreat (© DKTK Munich)

Cancer Research Congress, the Congress of the European Society for Medical Oncology (ESMO), and the Annual Meeting of the American Association for Cancer Research (AACR).

The DKTK scientific community also connected via social media. Individual researchers and research groups used X (formerly Twitter) to share information about their research, and to discuss, network, and engage directly with readers. As a result, the number of followers has continued to increase. The Coordination Office regularly posted news about translational cancer research and – as part of the German Centers for Health Research (DZG) – about various widespread diseases and joint initiatives.

Cancer and other common diseases

Under the heading "Research for health", the DZG provide a joint overview of translational research in the areas of cancer, cardiovascular diseases, lung diseases, neurodegenerative diseases, infectious diseases, diabetes, mental health, and child and adolescent health. The individual centers and the joint activities are presented on the website at www.deutschezentren.de/en. News items regularly appear here and on various social media channels. The DZG magazine SYNERGIE is also published twice a year (in German only). In 2023, the issues focused on organ crosstalk and blood counts, while the 2024 issues covered the exposome and intelligent medicine. The magazine is available as a high-quality print product and in a digital version at www.dzg-magazin.de.

Covers of the 2023 and 2024 issues of SYNERGIE, the DZG research magazine (© DZG/WirDesign)

In terms of events, the DKTK, DZD, and DZNE organized the 5th and 6th Joint Dresden DZG Symposiums, at which funding is also announced for local overarching DZG research projects. The first DZG Munich Day, held in summer 2023, and the second in 2024 welcomed all the DZGs and provided insights into the scientific highlights of individual centers and cross-DZG collaborations. The first DZG Heidelberg-Mannheim Day was held in early 2024, with researchers from six DZGs from the Heidelberg and Mannheim sites.

A workshop at the 3rd German Cancer Research Congress 2023 in Heidelberg (© DKTK)

DKTK highlights of 2023 & 2024

2023

FEBRUARY

© DKFZ

ERC Consolidator Grant for Prof. Florian Büttner

The European Research Council's Consolidator Grants support excellent researchers, helping them consolidate their independent careers. Prof. Florian Büttner, DKTK Professor for Bioinformatics in Oncology at Goethe University at DKTK partner site Frankfurt/Mainz, was a recipient of one of these major grants in the reporting period. He is using the €2 million grant to develop AI models that will reliably help physicians diagnose cancer or recommend treatments.

MAY

Pancreatic cancer: What do tumor cells feed on?

Ductal adenocarcinoma, also known as pancreatic cancer, is one of the most deadly forms of cancer. There are no treatments that are effective in the long term. A team led by Prof. Jens Siveke, DKTK Professor for Translational Oncology at the Medical Faculty of the University of Duisburg-Essen at partner site Essen/Düsseldorf, studied the cell metabolism of these tumors in a project funded by the Wilhelm Sander Foundation. Working with colleagues from Munich, they discovered that some tumors have a particularly active sugar metabolism, which could present a new therapeutic target.

JULY

© DZG

First DZG Munich Day brings together all the DZGs

Around 140 researchers from all eight DZGs at the Munich site came together on July 6, 2023 for the first DZG Munich Day. Presentations, posters, and a panel discussion gave the participants insights into the activities of the individual DZGs and DZG-wide collaboration. The local centers at other partner sites organized similar meetings: The Joint Dresden DZG Symposium has been held every year since 2019, and the first Heidelberg-Mannheim Day took place in 2024.

Known cancer driver with new functions

Prof. Dieter Saur, DKTK Professor for Translational Cancer Research at the Technical University of Munich at DKTK partner site Munich, is researching the role of the SNAIL transcription factor in the onset and progression of various tumors. In a particular form of pancreatic cancer, SNAIL accelerates tumor growth dramatically by boosting cell cycle progression and bypassing senescence. These SNAIL functions, which were discovered recently in lab experiments, could potentially be slowed down by targeted drugs.

MARCH

Cancer research in Germany – achieving more together

The 3rd German Cancer Research Congress, which took place from October 30 to November 1, 2023 in Heidelberg, provided a central forum for researchers in all cancer-related scientific disciplines from all over Germany to exchange ideas across disciplinary boundaries. A primary aim of the congress was to promote networking between key actors and interest groups in the German cancer research landscape. The German Cancer Research Congress is a joint event organized by the DKFZ, Deutsche Krebshilfe, the German Cancer Society (DKG), the Comprehensive Cancer Centers (CCC) network of Deutsche Krebshilfe, the NCT, the Division of Experimental Cancer Research (AEK) of the DKG, and the DKTK.

OCTOBER

Precision oncology: Lively debates at HARPOON

The fourth HARPOON conference took place in Heidelberg on November 23 and 24, 2023 with the active participation of over 100 experts. HARPOON stands for HArmonization of Reporting in PrecisiOn ONcology and, as in previous years, the conference was organized jointly by the DKFZ, NCT Heidelberg, and the DKTK. Precision oncology concentrates on tailoring cancer treatment to the individual disease, based on the biological characteristics of the tumor. Comprehensive datasets obtained through interdisciplinary collaboration play an increasingly important role in this.

DECEMBER

2024

JANUARY

Prostate cancer: Newly developed inhibitor shows great potential

More than 65,000 men in Germany are diagnosed with prostate cancer every year. Of these, 12,000 will develop a form of the disease that resists treatment and is ultimately fatal. A team of researchers led by Prof. Roland Schüle and Dr. Eric Metzger, from Freiburg University's Faculty of Medicine at DKTK partner site Freiburg, developed a drug that could become a new therapy option in future: KMI169 targets an enzyme that plays a key role in the onset of prostate cancer. In preclinical studies, the inhibitor showed great potential in cancer cells that were resistant to conventional therapies.

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JUNE

© DKFZ

DKTK Young Academics Conference 2024

The Postdoc Symposium, including the DKTK Young Academics Conference 2024, took place on June 7 at the DKFZ Communication Center. The Postdoc Network Committee, supported by the Postdoc Office and the DKTK School of Oncology, and sponsored by the Health and Life Sciences Alliance, organized an interactive, full-day event. The symposium offered the opportunity to listen to stimulating short talks and poster presentations. More than 50 postdocs had the chance to expand their networks and find out more about the work of their colleagues.

JULY

DKTK biobanking: New leadership team

Dr. Heidi Altmann, Dresden University of Technology at DKTK partner site Dresden, and Dr. Katja Steiger, Technical University of Munich at DKTK partner site Munich, took over as leaders of CCP-Bio (networked biobanking) within the DKTK Clinical Communication Platform. In their new role, they hope to provide more comprehensive support to translational cancer research by providing quality-assured biosamples to the DKTK partner sites and integrating relevant data. The human biobanks manage extensive collections of biosamples in order to make them available for research projects while complying with legal and ethical requirements.

© Heidi Altmann, Katja Steiger

© istockphoto

MARCH

Milestone in the treatment of liver tumors and liver disease

A newly developed drug could open up new options for liver cancer surgery and liver transplants. The drug candidate HRX-215, an MKK4 inhibitor, inhibits the MKK4 protein that occurs in liver cells, and boosts liver cell regeneration. The preclinical and phase I study were made possible by a collaboration with Tübingen-based start-up HepaRegeniX and researchers from the Mayo Clinic (USA), led by Prof. Lars Zender, Department for Medical Oncology and Pneumology at University Hospital Tübingen at DKTK partner site Tübingen.

© Sebastian Tromm/Charité

DKTK-associated Professorship for Tumor Immunology in Berlin

On September 1, 2024, Prof. Johannes Huppa took up the Professorship for T Cell Antigen Recognition in Cancer and Autoimmunity at Charité – Universitätsmedizin Berlin at DKTK partner site Berlin and, in this connection, also took over the leadership of the Institute of Immunology at Campus Berlin-Buch. An acknowledged expert in T cell identification, he plans to discover in detail how the immune system differentiates between friend and foe, in order to improve treatment for cancer and autoimmune diseases. His work is also supported by the DKTK.

SEPTEMBER

DECEMBER

Prevention of colorectal cancer: The role of obesity has been underestimated

Being overweight increases the risk of colorectal cancer. Researchers in Heidelberg reviewed a large data pool and came to the conclusion that being overweight accounted for more than 20% of colorectal cancer cases, rather than only 10%, as had previously been thought. The impact of this avoidable risk factor has therefore been significantly underestimated. "Our results suggest that the risk contribution of obesity in colorectal cancer is around twice as high as had been assumed until now," says Hermann Brenner, a DKFZ epidemiologist and DKTK researcher.

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Selected awards and publications

Selected prizes and grants

Site	Award
Berlin	Prof. Angelika Eggert: German Cancer Prize 2023 for Translational Research from the German Cancer Society and German Cancer Foundation
	Prof. Simon Haas: Lisec Artz Prize from the University of Bonn Foundation
Dresden	Prof. Lena Seifert: UEG Rising Star Award 2023 from United European Gastroenterology (UEG)
	Dr. Theresa Suckert: Roland Ernst Research Prize from the Roland Ernst Foundation
Essen/Düsseldorf	Prof. Christian Reinhardt: German Cancer Prize 2023 for Experimental Research from the German Cancer Society and German Cancer Foundation
	Dr. Esteban Arrieta-Bolaños: Next Generation Award 2023 from the German Society for Immunogenetics
Frankfurt/Mainz	Prof. Claus Rödel: German Cancer Prize 2023 for Clinical Research from the German Cancer Society and German Cancer Foundation
	Prof. Evelyn Ullrich: 2023 sponsorship award for research from the Alfred und Angelika Gutermuth-Stiftung
Freiburg	PD Dr. Dieter Henrik Heiland: Publication Prize 2023 from the Else Kröner-Fresenius Foundation (EKFS)
	Prof. Robert Zeiser: Mechtild Harf Science Award 2024 from DKMS Stiftung Leben Spenden
Heidelberg	Prof. Stefan Pfister: Gottfried Wilhelm Leibniz Prize 2023 from the German Research Foundation
	Prof. Michael Platten: Paul Martini Prize 2024 from the Paul Martini Foundation
	Prof. Michael Baumann: Honorary doctorate from Julius-Maximilians-Universität Würzburg
Munich	Prof. Sebastian Kobold: Georges Köhler Prize 2023 from the German Society for Immunology
	Prof. Marion Subklewe: Robert Pfleger Research Prize 2024 from the Doktor Robert Pfleger Foundation
Tübingen	Prof. Hans-Georg Rammensee: CIMT Lifetime Achievement Award 2023 from the Association for Cancer Immunotherapy (CIMT)
	Prof. Juliane Walz: Robert Pfleger Research Prize 2024 from the Doktor Robert Pfleger Foundation

The European Research Council promotes excellence in research.
18 ERC Grants went to DKTK researchers in 2023 and 2024.

DKTK publications

In 2023 and 2024, 2,727 ISI or Scopus peer-reviewed scientific papers by authors affiliated to the DKTK were published (correct at April 25, 2025), of which 751 appeared in particularly high-ranking scientific journals with an impact factor of ten or more (impact factor in 2023). From January 1, 2023 to December 31, 2024, DKTK-affiliated publications were cited 167,967 times. A PDF file containing the complete list of DKTK publications for the reporting period can be found online at: https://www.dkfz.de/zbi/nolink/Publikationen-DKTK-2023-und-2024.pdf

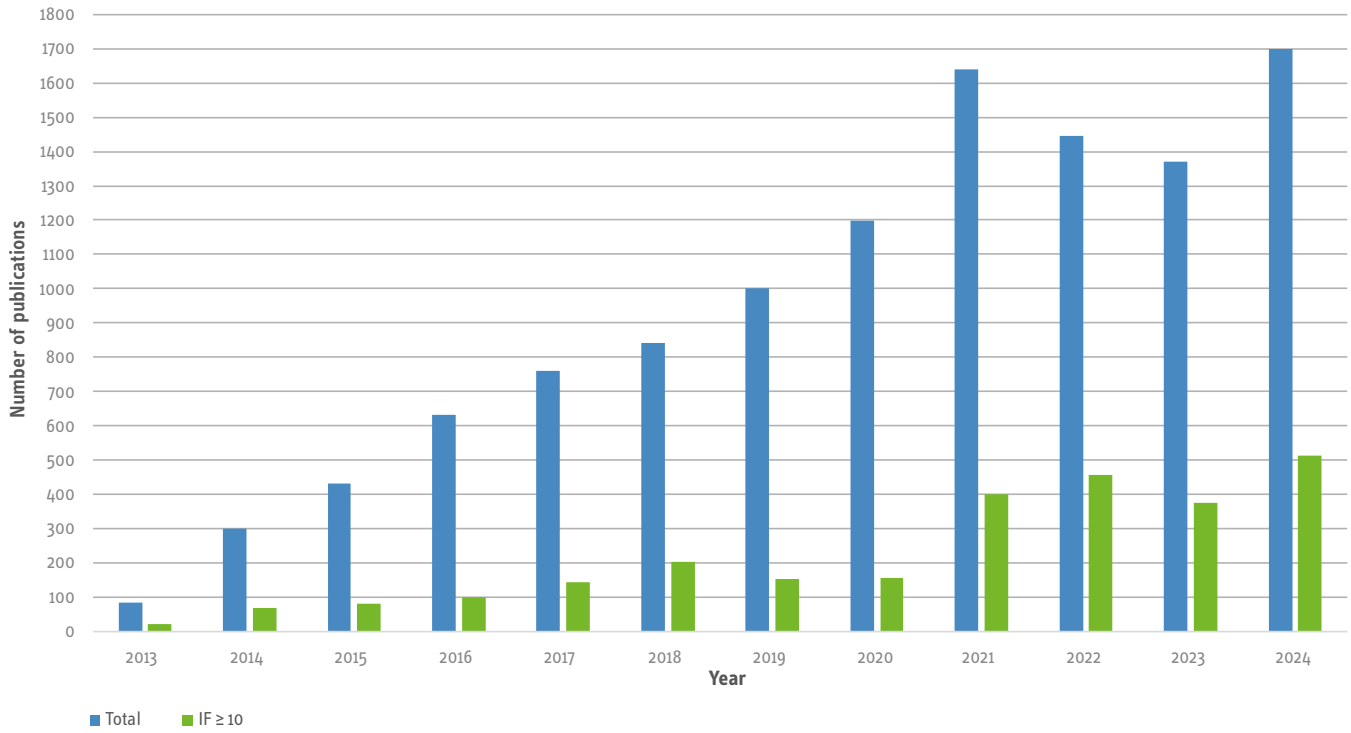


Chart showing the number of scientific publications by DKTK researchers mentioning their DKTK affiliation since 2013 (source: Web of Science, Scopus). Publications in particularly influential scientific journals (measured by impact factor [IF]) are shown separately. In 2013: 83 publications, of which 20 with IF ≥ 10; in 2014: 301 publications, of which 68 with IF ≥ 10; in 2015: 433 publications, of which 80 with IF ≥ 10; in 2016: 633 publications, of which 99 with IF ≥ 10; in 2017: 761 publications, of which 143 with IF ≥ 10; in 2018: 842 publications, of which 204 with IF ≥ 10; in 2019: 1002 publications, of which 154 with IF ≥ 10; in 2020: 1197 publications, of which 155 with IF ≥ 10; in 2021: 1641 publications, of which 401 with IF ≥ 10; in 2022: 1446 publications, of which 458 with IF ≥ 10; in 2023: 1370 publications, of which 375 with IF ≥ 10; in 2024: 1698 publications, of which 514 with IF ≥ 10.

DKTK structure and governing bodies

The DKTK was set up on October 18, 2012. It is an unincorporated, public-law foundation having its registered office in Heidelberg and being represented by the DKFZ. Within the DKTK, the DKFZ (the core center) is connected to research institutes and university hospitals that have a particular track record in oncology in translation centers at eight partner sites in Germany: Berlin, Dresden, Essen/Düsseldorf, Frankfurt/Mainz, Freiburg, Heidelberg, Munich, and Tübingen.

DKTK governing bodies

Steering Committee

The Steering Committee is the foundation's central governing body and manages the foundation's activities. It is responsible for ensuring that the foundation accomplishes its mission on a continuing and sustainable basis. The Steering Committee consists of the two DKFZ directors and the spokespersons of the translation centers (see figure, correct at December 31, 2024).

Board of Trustees

The Board of Trustees oversees the legal compliance, fitness for purpose, and cost effectiveness of the foundation's activities and decides on the foundation's general research aims, its research policy and financial matters. The Board of Trustees consists of representatives of the DKTK's eight funding bodies:

- Federal Ministry of Research, Technology and Space (Chair)
- Ministry of Science, Research and the Arts of Baden-Württemberg
- Bavarian State Ministry of Science and the Arts
- Berlin Senate Department for Higher Education and Research, Health and Long-Term Care
- Hessian Ministry of Science and Research, Art and Culture
- Ministry of Culture and Science of North Rhine-Westphalia
- Ministry of Science and Health of Rhineland-Palatinate
- Saxon State Ministry of Science, Culture and Tourism

Scientific Advisory Board

The Scientific Advisory Board advises the Board of Trustees and Steering Committee on all important scientific matters. It is composed of up to 12 world-leading experts in the field of translational cancer research.

In 2024, the Scientific Advisory Board said goodbye to Prof. Sir Michael Brady and welcomed Prof. Francesca Ciccarelli, an expert in data science, as a new member.

- Prof. Scott Armstrong, Boston, MA, USA
- Prof. Kevin Brindle, Cambridge, UK (SAB Deputy Chair)
- Prof. Carlos Caldas, Cambridge, UK
- Prof. Francesca Ciccarelli, London, UK
- Prof. Amato Giaccia, Oxford, UK
- Prof. Rama Khokha, Toronto, CA
- Prof. Elaine Mardis, Columbus, Ohio, USA (SAB Chair)
- Prof. Holger Moch, Zurich, CH
- Stefanie Polat, Erlangen, DE
- Prof. Licia Rivoltini, Milan, IT
- Han Steutel, Berlin, DE

Coordination Office

The DKTK Coordination Office at the DKFZ in Heidelberg supports the Steering Committee on behalf of the DKFZ Management Board, and helps the DKFZ implement the decisions taken by the Steering Committee and the Board of Trustees. Its tasks include scientific and administrative coordination, committee work, helping with the strategic development of the consortium, and the DKTK's press and public relations activities. The DKTK Coordination Office is headed by an administrative and a scientific managing director.

Group photo of the DKTK Steering Committee and Scientific Advisory Board on October 25, 2024 (© Jutta Jung/DKFZ)

Patient Advisory Council for Cancer Research

The Patient Advisory Council for Cancer Research of the DKFZ and its DKTK translational network consists of 12 members, led by Spokesperson Rudolf Hauke. It brings patient perspectives into cancer research, promoting patient-oriented approaches in all areas of cancer research.

In 2023, the meetings of the Patient Advisory Council focused on medical cancer survivorship research and the development of the National Cancer Prevention Center, and preventive outpatient health services and the Dieter Morszeck Biorepository. These topics were discussed in detail both in the meetings and in the Patient Academy. The topics addressed by the Patient Advisory Council in 2024 included AI in imaging, HPV school vaccination programs, regulatory requirements for clinical trials, and cancer prevention in politics and citizen science.

Moreover, patient representatives from the Patient Advisory Council have been actively involved in reviewing funding applications for the DKTK Joint Funding Program since 2023, giving researchers valuable support and insights from a patient perspective regarding their planned projects.

Group photo of the members of the Patient Advisory Council for Cancer Research and the DKFZ Management Board (© Nina Pfisterer/DKFZ)

DKTK sites and associated partners

The sites at a glance

Berlin

- Charité – Universitätsmedizin Berlin

Charité Comprehensive Cancer Center (CCCC)

Dresden

- Dresden University of Technology
- University Hospital Carl Gustav Carus Dresden
- Helmholtz-Zentrum Dresden-Rossendorf (HZDR)
- Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)

National Center for Tumor Diseases (NCT) Dresden / University Cancer Center (UCC), NCT/UCC Dresden

Essen | Düsseldorf

- University of Duisburg-Essen
- University Hospital Essen
- Heinrich Heine University Düsseldorf
- University Hospital Düsseldorf

National Center for Tumor Diseases (NCT) Dresden / University Cancer Center (UCC), NCT/UCC Dresden

Frankfurt | Mainz

- Goethe University Frankfurt am Main
- University Hospital Frankfurt
- Georg-Speyer-Haus (GSH) Frankfurt
- University Medical Center of Johannes Gutenberg University Mainz

University Cancer Centers (UCT) Frankfurt and Mainz

Freiburg

- University of Freiburg
- University Hospital Freiburg
- Max Planck Institute of Immunobiology and Epigenetics (MPI-IE)

Comprehensive Cancer Center Freiburg (CCCF)

Heidelberg (Core Center)

- German Cancer Research Center (DKFZ), DKTK Core Center
- Associated partner: Paul Ehrlich Institute, Langen

National Center for Tumor Diseases (NCT) Heidelberg

Munich

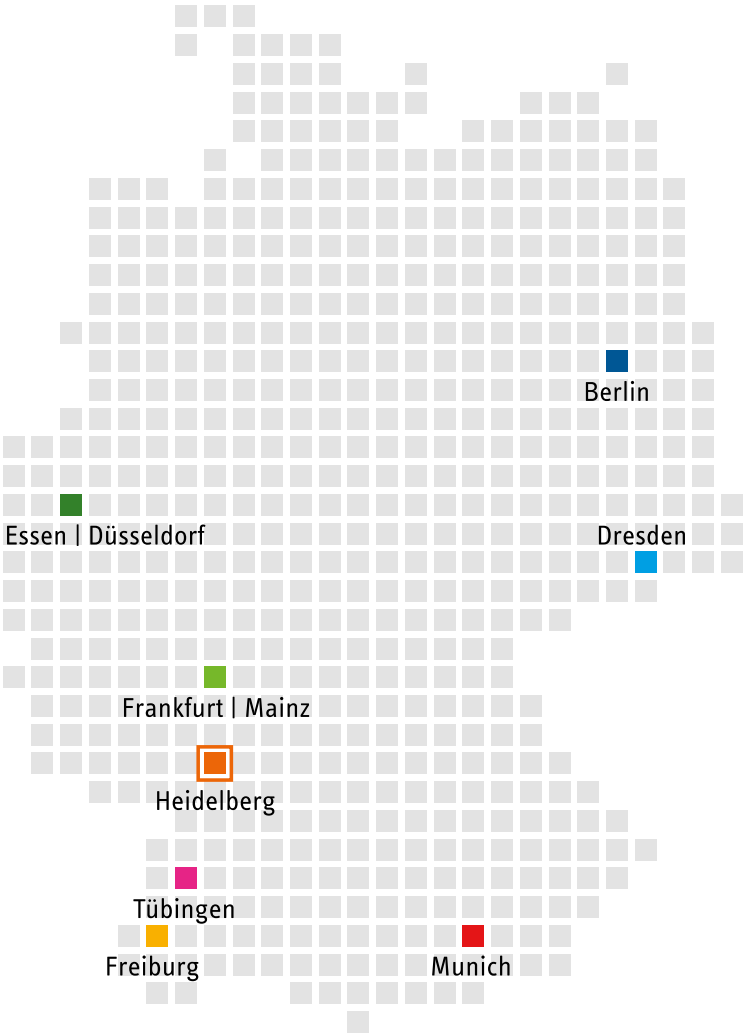
- Ludwig-Maximilians-Universität München (LMU)
- LMU University Hospital Munich (LMU Klinikum)
- Technical University of Munich (TUM)
- TUM University Hospital Rechts der Isar

Comprehensive Cancer Center Munich (CCCM)

Tübingen

- University of Tübingen
- University Hospital Tübingen

Comprehensive Cancer Center (CCC) Tübingen – Stuttgart



DKTK partner site Berlin

Site Spokesperson
Prof. Angelika Eggert

Deputy Spokesperson
Prof. Ulrich Keller

Research profile

The DKTK partner site Berlin is integrated in Charité – Universitätsmedizin Berlin and cooperates closely with the Charité Comprehensive Cancer Center (CCCC). As Europe's largest university hospital, Charité not only brings its scientific expertise to the DKTK network, but also contributes the latest technologies for molecular tumor analysis and extensive clinical resources. In addition, there is a complementary collaboration between Charité, the Berlin Institute of Health (BIH), and the Max Delbrück Center (MDC) in the field of translational cancer research.

The Berlin site is dedicated to the early translational phase of personalized cancer medicine. Research at this site focuses primarily on the preclinical development of new cellular cancer immunotherapy approaches and on tumor evolution research as a basis for optimized, molecularly targeted therapy approaches.

Other priority research areas in the DKTK are cancer-related molecular signaling pathways, research on the interactions between tumor cells and their niche, and the development of relevant preclinical models for different tumor types. In terms of technology, the primary focus in Berlin is on molecular analysis methods at single cell level and proteomic and metabolomic research, as well as the further development of liquid biopsies for precise diagnosis and disease monitoring.

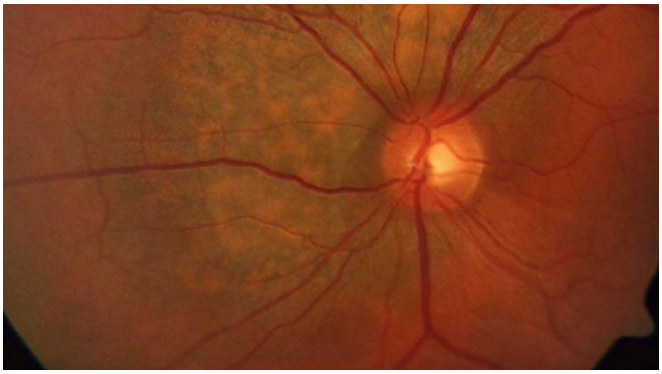
Besides the DKTK Professorship for Experimental and Translational Cancer Immunology, held by Prof. Gerald Willimsky, there are two DKTK-associated professorships: Prof. David Capper is Professor of Molecular Neuropathology and Tumor Epigenetics, and Prof. Johannes Huppa is Professor of T Cell Antigen Recognition in Cancer and Autoimmunity. Dr. Inmaculada Martínez Reyes leads the DKTK Young Investigator Group on Metabolic Networks in Tumor Immunity.

Developments

- **New experts in cancer immunotherapy**
  Since September 2024, DKTK Young Investigator Group Leader Dr. Martínez Reyes has been investigating metabolic processes in cancer cells and their interaction with immune cells. DKTK-associated Prof. Johannes Huppa is using new microscopy methods to research how the immune system differentiates between friend and foe.

- **DKTK Joint Funding Program**
  The Berlin site is coordinating three new DKTK Joint Funding research projects: IDENTI-T (Prof. Ulrich Keller), LeoPARD (PD Dr. Philipp Euskirchen), and DECODE-UM (Prof. Ulrich Keller).

Charité Campus Mitte (© Charité)



The DECODE-UM research project is dedicated to researching uveal melanoma. (© A. Joussen/ Charité)

- **Platforms**
  The DKTK funds the areas of Cancer Liquid Biopsies/Single Cell Technologies and Proteomics/Immunopeptidomics.

- **DZG Innovation Fund**
  A project on gene and cell therapy (Prof. Annette Künkele) and a project on the microbiome (Prof. Michael Sigal), both involving DKTK partner site Berlin, are being funded and conducted in collaboration with other DZGs.

- **German Cancer Prize**
  Prof. Angelika Eggert was awarded the German Cancer Prize 2023 in the translational research category for her pioneering research on molecular pathogenesis and new therapeutic approaches in neuroblastoma.

- **Berlin as a new NCT site**
  As one of four new NCT sites, NCT Berlin has been pooling the expertise of Charité, BIH, and MDC since 2023 to translate promising DKTK research findings into clinical trials.

- **Expansion of gene and cell therapy**
  A structural research unit for gene and cell therapy was established at Charité, an operative board was installed to run the Berlin Center for Advanced Therapies (BeCAT), and a new Translation Center for Gene and Cell Therapies was launched by Charité and Bayer in 2024.

DKTK partner site Dresden

OncoRay – National Center for Radiation Research in Oncology Dresden (© André Wirsig)

Site Spokesperson
Prof. Mechthild Krause

Deputy Spokesperson
Prof. Esther Troost

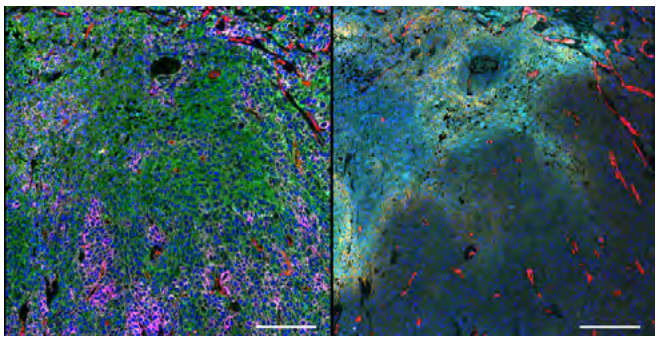
Research profile

The Dresden site specializes in improving radiation oncology treatment in terms of personalized and technically optimized cancer medicine. The focus is on biologically stratified high-precision radiotherapy, with the DKTK Professorship for Translational Radiation Oncology, which is held by Prof. Mechthild Krause. As one of four proton therapy centers in Germany, the site is dedicated to optimizing particle therapy using protons. Imaging methods and radiation-specific biomarkers are combined for personalized cancer treatment in preclinical models and clinical trials. Radiation methods are also studied in combination with molecularly targeted drugs that can increase the effect of radiation in the tumor or reduce its effect in healthy tissue. In addition, Dr. Jovan Mircetic's Junior Research Group on Forward Genetics for Translational Solid Cancer Research focuses on identifying metabolic pathways that lead to therapy resistance. It models the evolution of resistance in organoid models and studies them with the help of innovative screening methods. As an NCT site, DKTK Dresden is an important pipeline for the development of new clinical therapeutic approaches.

Dresden played a leading role in setting up DKTK-ROG, which has been delivering international research results for personalized radiation therapy ever since. The RadPlanBio platform, which supports clinical and preclinical studies with complex multimodal datasets, was also developed in Dresden. All DKTK partner sites receive basic user support and access to one of two redundant RadPlanBio instances (Dresden, Heidelberg). External partners can also be involved.

Developments

- **New biomarkers for personalized radiotherapy**
  Validation of the biomarkers developed within the DKTK for personalized radiation oncology is an important step for translation of the results into clinical practice, and is carried out with data from HNprädBio, a completed prospective multicenter DKTK trial. In addition, more biomarkers are being developed, including some based on image characteristics from medical imaging or histology. For instance, researchers were able to demonstrate that the accumulation of certain immune cells was associated with better survival in HPV-positive patients and patients with hypoxemia. In one study, a good alignment was confirmed between the molecular characteristics of preclinical head and neck tumor models in mice and the patient data, which formed the basis for the development of a robust two-gene signature. This underscores the suitability of preclinical models for clinical radiation oncology research. The results of two further preclinical studies in Dresden build on these, forming the basis for further clinical developments: The combination of nimorazole and chemoradiotherapy was shown to improve healing in head and neck tumor models. In addition, researchers showed that, despite the higher radiation sensitivity of HPV-positive head and neck tumors, the chemotherapy component cannot be omitted.



Microscope images of a head and neck tumor model with colored biomarkers that are being studied as biomarkers of radiotherapy response: stem cell markers (purple and green), areas and cells with low oxygen levels (turquoise and orange), blood vessels (red), cell nuclei (blue). Scale bar = 200 µm (© Nathalie Borgeaud/DKTK Dresden)

- **Proton therapy studies**
  Nearly all patients treated with proton therapy were included in clinical trials. Studies on brain tumor patients and preclinical analyses in a clinically relevant mouse model delivered new findings in 2024 on how radiation-induced damage occurs. This knowledge can now inform the development of treatment strategies to avoid or treat these kinds of side-effects.

- **Events**
  The DKTK hosted the annual Joint Dresden DZG Symposium in 2024. More than 120 researchers from the various different disciplines took part in discussions on the Dresden campus, and Saxony's State Minister of Science, Sebastian Gemkow, attended as an invited guest.

DKTK partner site Essen/Düsseldorf

Site Spokesperson
Prof. Jens Siveke

Deputy Spokesperson
Prof. Selma Ugurel

Research profile

The Essen/Düsseldorf site focuses on patient-oriented translational research and designing innovative clinical translational studies. The three DKTK divisions are embedded in the West German Cancer Center (WTZ), a structure-forming institution and Oncological Center of Excellence of Deutsche Krebshilfe, along with NCT West (including Cologne). They are: Translational Skin Cancer Research (DKTK Prof. Jürgen C. Becker), Translational Neurooncology (DKTK Prof. Björn Scheffler), and Translational Oncology of Solid Tumors (DKTK Prof. Jens Siveke). In addition, Dr. Fung-Yi Phyllis Cheung in Essen leads the DKTK Junior Research Group on Spatiotemporal Tumor Heterogeneity, while Dr. David Koppstein in Düsseldorf leads the DKTK Junior Research Group on Cancer Bioinformatics and Multiomics.

Three of the current DKTK research programs are (co-)coordinated by researchers at this site: Molecular Diagnostics, Early Detection and Biomarker Development, Cancer Immunotherapy, and Molecularly Targeted Therapy. The scientific focus in Essen/Düsseldorf is on (1) tumor evolution and plasticity, (2) tumor microenvironment, and (3) drug research with numerous DKTK researchers in local collaborative projects (including DFG SFB1430, KFO337/2, GRK2762; SATURN3/BMFTR TACTIC/DKH). Other key focus areas include a theranostics program that is active at the preclinical and clinical level, and AI and real-world data approaches for patient-centered and intuitive evidence generation.

Developments

- **Involvement in research initiatives**
  The site is associated with two active collaborative research initiatives on tumor heterogeneity (BMFTR/National Decade against Cancer). It provides the spokesperson for SATURN3 and is heavily involved in HEROES-AYA.

- **New DKTK Junior Research Groups**
  Dr. David Koppstein's Junior Research Group on Cancer Bioinformatics and Multiomics launched in June 2023, and Dr. Phyllis Fung-Yi Cheung's Junior Research Group on Spatiotemporal Tumor Heterogeneity started in April 2024.

- **NCT West (Cologne/Essen)**
  NCT West is a collaboration between WTZ Essen and the Center for Integrated Oncology (CIO) Cologne.

New nuclear medicine building at the partner site Essen (© University Hospital Essen)

Researchers from the DKTK partner site Essen/Düsseldorf at the Essen Translational Oncology Symposium (ETOS) 2024 (© DKTK Essen/Düsseldorf)

- **Research examples**
  Researchers studied the impact of the HLA class I immunopeptidome on survival of leukemia patients following allogenic hematopoietic stem cell transplants (allo-HCT) from mismatched, unrelated donors (Crivello P et al., J Clin Oncol 2023). Results reveal new strategies to discover and overcome resistance to imatinib in gastrointestinal stromal tumors (GISTs) and to develop new KIT inhibitors (Mühlenberg et al., J Clin Oncol 2024). Researchers from various DKTK partner sites were able to show that fibroblast activation protein α (FAPα)-directed imaging and therapy is a treatment option for solitary fibrous tumors (SFTs). This therapy option is being tested in Essen for MASTER patients with SFTs and high FAP expression (Hamacher et al., J Nucl Med 2024).

- **Awards and grants**
  Award-winners included Prof. Christian Reinhardt, who received the German Cancer Prize for experimental research in 2023, and Dr. Johanna Falkenhorst, who was awarded the Swiss GIST Prize 2023. Prof. Alpaslan Tasdogan was awarded an ERC Starting Grant to study the metabolism of skin cancer cells.

- **Events**
  The Essen Translational Oncology Symposium (ETOS) takes place annually. In 2023, more than 180 researchers from Essen/Düsseldorf and partners from Münster (WTZ) and Cologne (CCCE) presented and discussed current research approaches and results in sessions on the site's focus areas (tumor plasticity, microenvironment, and drug development).

DKTK partner site Frankfurt/Mainz

Site Spokesperson
Prof. Thomas Oellerich

Deputy Spokesperson
Prof. Hubert Serve

Research profile

The Frankfurt/Mainz site conducts research in the areas of molecular diagnostics, drug development, mechanistic tumor biology, tumor immunology, and data science. Under Frankfurt's leadership, the site develops new cancer drugs and innovative therapeutic strategies. Its main research areas are tumor pathogenesis, the tumor microenvironment and therapy resistance, molecular diagnostics, data science, and the development and validation of new therapy strategies (e.g. cell therapies).

Under Mainz's leadership, the site runs an innovative immunotherapy program with a focus on novel immunotherapy approaches, including next-generation mRNA vaccines and tumor antigen-specific antibodies. Cell therapy is another shared focus area of Frankfurt and Mainz. The DKTK site has considerable experience in clinical translation, particularly in the areas of leukemia, lymphoma, pediatric tumors, brain tumors, colorectal carcinoma, and stomach and breast cancer.

The two DKTK professorships focus on translational proteome research in cancer (Prof. Thomas Oellerich) and bioinformatics in oncology (Prof. Florian Büttner). These activities are supplemented by a DKTK junior research group that researches therapy resistance mechanisms in solid tumors (Dr. Zuzana Tatarova).

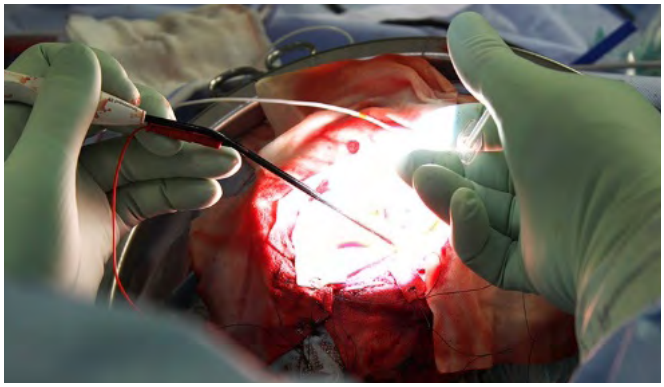
Developments

- **Organoid-Biobank**
  The Georg-Speyer-Haus, a DKTK partner in Frankfurt, made consistent efforts, in collaboration with other DKTK partner sites, to expand the organoid biobank for mechanistic research and drug screening (Farin H et al., Cancer Discovery 2023) and, together with Mainz, to expand the immunotherapy program.

- **DKTK Junior Research Group**
  Dr. Zuzana Tatarova took up her post as Junior Research Group Leader for Therapy Resistance in September 2023.

- **Expansion and funding**
  All DKTK activities in Frankfurt are closely integrated in the Frankfurt Cancer Institute (FCI), which is being funded by the state of Hesse from 2023 for another three years. In addition, the state of Hesse, Goethe University Frankfurt, and Deutsche Krebshilfe have jointly approved funding for the FCI building (> €100 million). The drug development program, a key DKTK innovation platform, was expanded further with funding of over €10 million from Deutsche Krebshilfe. The TACTIC & CAR Factory programs that were secured in 2024 (Deutsche Krebshilfe, with over €14 million) and LOEWE program CARISMa (€5m) are expanding the translational oncology programs at this DKTK partner site.

University Hospital Frankfurt (© Uwe Dettmar)



Intraoperative injection of CAR NK cells during the CAR2BRAIN study (© Christian Senft)

- **Research examples**
  CAR cell therapy initiatives were developed further, for instance in the DKTK Joint Funding projects NoviCARAZA, and in the first CAR NK cell study in glioblastoma, CAR2BRAIN-Check (NCT03383978). Researchers discovered that BTK inhibitors promote degradation of mutated MYD88L265P protein in MCD DLBCL tumors (Phelan JD, Scheich S, Choi J, et al., Cancer Cell 2024). The site also worked on establishing a multiplex implantable microdevice assay (MIMA) as a strategy management system for cancer.

- **ERC-Förderung**
  Prof. Florian Büttner received an ERC Consolidator Grant for his research on multimodal data integration. A successful example of this multimodal proteogenomics research is a study that identified deregulated glycosylation pathways as a therapy target in lymphomas (Scheich S et al., Cancer Discovery 2023).

DKTK partner site Freiburg

Site Spokesperson
Prof. Melanie Börries

Deputy Spokesperson
Prof. Robert Zeiser

Research profile

The Freiburg site pursues a translational research profile with a focus on personalized oncology and cancer immunotherapy. Prof. Matthias Eder holds the DKTK Professorship for Radiopharmaceutical Development, and Prof. Marc Timmers holds the Professorship for Medical Epigenetics. Alongside these two professorships, Prof. Melanie Börries is DKTK-associated Professor for Systems Biology and Systems Medicine, and Prof. Sven Diederichs is DKTK-associated Professor for Oncological Research.

Outstanding research examples include the development and clinical testing of innovative therapies for AML, such as TIM3 and MDM2 inhibition and CAR NK cell therapies. Epigenetic regulator KMT9 was validated as a promising target and progressed through to proprietary drug development in a spin-off company. In addition, epigenetic mechanisms are being systematically characterized in order to identify new therapeutic targets. In the area of radiopharmacy, the site successfully deploys PSMA hybrid molecules and novel bicyclic peptides in clinical practice and develops them further. CAST-Seq technology enables comprehensive safety assessments of CRISPR/Cas-based therapies. Freiburg is developing new diagnosis and therapy procedures that are translated directly into clinical application: PDOs, omics analyses, hyperpolarized MRT, and innovative radiotherapy technologies. This underscores the site's interdisciplinary competence and the systematic manner in which it translates innovative research into patient care.

Developments

- **Funding**
  The DFG-funded UcarE research unit was set up with the involvement of DKTK researchers Prof. Ian Frew, Prof. Melanie Börries, and Prof. Marc Timmers. It will investigate the impacts of mutations in epigenetic regulation genes on the onset and progression of bladder cancer and identify new therapeutic approaches for aggressive urothelial carcinoma.

- **(Pre-)clinical research**
  Functional analysis of epigenetic target structures led to the development of KMT9 inhibitors with preclinical evidence of effectiveness. Radiopharmaceutical developments, such as PSMA hybrid molecules and bicyclic peptides, were translated successfully into clinical application. In molecular diagnostics, ctDNA analysis using liquid biopsies enabled minimally invasive therapy monitoring.

Ground-breaking ceremony for the new Technology Innovation Laboratory (TIL). Left to right: Karl-Heinz Gilgin, Prof. Dimos Baltas, Prof. Frederik Wenz, Prof. Anca-Ligia Grosu, Dr. Arthur Kaindl, Prof. Lutz Hein (© University Hospital Freiburg)

DKMS presents Prof. Robert Zeiser with the DKMS Mechtild Harf Science Award 2024. Left to right: Marcel van den Brink, Johannes Schetelig, Robert Zeiser, Elke Neujahr, Alexander Schmidt, Katharina Fleischhauer (© Fraser Cameron/DKMS)

- **Clinical trials**
  The mode of action of ROCK1/2 inhibition was identified in patients with corticosteroid-refractory graft-versus-host disease (GvHD) and translated into a clinical trial with ROCK2 inhibitor Belumosudil. Similarly, CD155 was identified as an immune-relevant marker in an AML trial and is now being studied separately.

- **Platforms and technologies**
  Organoid models and platforms such as FREEZE-O were used to inform therapy decisions for individual patients. Omics technologies and hyperpolarized MRT contributed to improved imaging and therapy evaluation. Significant progress was made in surgical treatment of glioblastoma and in IDH inhibition in low-grade glioma and hemanglioblastoma. A Technology Innovation Laboratory was launched, combining cutting-edge radiation technology with innovative 3D and 4D imaging – for interdisciplinary research that will directly benefit patients.

DKTK Core Center Heidelberg

Management Board of the DKFZ and DKTK Core Center
Prof. Michael Baumann (DKTK Spokesperson), Ursula Weyrich

Spokesperson of the DKTK Translation Center Heidelberg
Prof. Christiane Opitz

Deputy Spokesperson of the DKTK Translation Center Heidelberg
Prof. Benedikt Brors

Research profile

The Heidelberg site covers the entire portfolio of translational cancer research through to clinical, prevention, and outcome research. One particular focus area is the further development of personalized oncology and the conception of future oncology topics, such as cancer neuroscience. Other research topics that are relevant to the DKTK include personalized radiation oncology, machine learning methods to interpret oncologic imaging data, pediatric oncology, therapy resistance, and cancer immunotherapy, particularly in the context of combination therapies. At the Heidelberg site, Prof. Benedikt Brors holds the DKTK Professorship for Applied Bioinformatics, Prof. Holger Sültmann holds the DKTK Professorship for Cancer Genome Research, and Prof. Christiane Opitz holds the DKTK-associated Professorship for Metabolic Crosstalk in Cancer. In addition, Prof. Amir Abdollahi leads the DKTK Clinical Cooperation Unit for Translational Radiooncology and Dr. Felix Hartmann leads the DKTK Young Investigator Group on Systems Immunology and Single-Cell Biology.

The DKFZ plays a dual role within the DKTK: It is i) the core center of the DKTK and home to the central DKTK Coordination Office that coordinates its scientific activities, provides central administration support for the foundation, and coordinates site-overarching activities and infrastructure, and ii) the DKTK's local translation center in Heidelberg, which collaborates closely with NCT Heidelberg.

Developments

- **DKTK Joint Funding Program**
  Together with Freiburg, the site coordinates BACTORG (Dr. Jens Puschhof), a new research project from the INNOVATION funding line and the first with active involvement of a patient representative. In addition, Heidelberg researchers are involved in seven other Joint Funding projects.

- **Research examples**
  The MAC-Score, a personalized predictive biomarker to predict response to venetoclax in AML (Waclawiczek et al., Cancer Discovery 2023), was introduced into routine clinical practice and is currently being developed into a clinical test system with industry partners. In the area of T cell therapies, a classification system was developed for the prediction of tumor-reactive T cell receptors to speed up the deployment of personalized treatment options (Tan et al., Nature Biotechnology 2024). Together with DKTK partner site Dresden, the Heidelberg site investigated prognostic biomarkers for head and neck cancer (Tawk et al., Clin Cancer Res 2023; Besso et al., Radiother Oncol 2024).

DZG Heidelberg-Mannheim Day 2024 (© DZIF Heidelberg)

DKTK Heidelberg Community Meeting 2024 (© Marius Stark/DKTK)

- **Spin-off**
  Heidelberg Epignostix GmbH is a start-up company of the DKFZ that was made possible with DKTK funding. Dedicated to improving diagnostic accuracy for cancer patients, it develops AI-assisted software solutions for DNA methylation-based tumor classification.

- **Professorship**
  Prof. Christiane Opitz, who has been a department head at the DKFZ since 2022 and Spokesperson of the Heidelberg Translation Center since 2023, took up the DKTK-associated Professorship for Metabolic Crosstalk in Cancer at the DKFZ in Heidelberg in July 2024.

- **Events**
  The local DKTK Community Meetings took place on the theme of "Inform, Network, Exchange" (2023) and "Inform, Network, Translate" (2024).

- **Networking with other DZGs**
  The first DZG Heidelberg-Mannheim Day was held in February 2024 involving all six DZGs represented at the partner site. Besides presentations on research projects and translational highlights, DKTK Young Investigator Group Leader Dr. Felix Hartmann took part in a panel discussion on support options at different career stages.

DKTK partner site Munich

Site Spokesperson
Prof. Michael von Bergwelt,
Prof. Wilko Weichert (died 2023)

Deputy Spokesperson
Prof. Wolfgang Weber

Research profile

Understanding the altered signaling pathways in cancer cells is one of the key joint research areas being worked on by scientists and physicians at DKTK partner site Munich. Their approaches are based on the functional characterization of cancer in preclinical model systems, with the aim of explaining new molecular mechanisms of cancer. The findings are translated into molecularly targeted therapies for patients that are precisely tailored to the individual tumor.

The other two focus areas – mechanistic modeling and molecularly targeted therapy – are supplemented by new research approaches that use cells and mechanisms of the immune system to fight cancer (immuno-oncology). There are two DKTK professorships at this partner site: Prof. Dieter Saur is DKTK Professor for Translational Tumor Research and Prof. Martin Sos is DKTK Professor for Translational Oncology with a focus on reverse translation.

The Munich site specializes in gastrointestinal cancers, such as pancreatic cancer, stomach cancer, and colorectal cancer, as well as lung cancer, leukemia, and malignant lymphoma.

Developments

- **Professorship for Translational Oncology with a focus on reverse translation**
  Following his appointment, Prof. Martin Sos began setting up his DKTK research group in May 2023. Employing innovative tumor models and systematic research, it aims to harness genetically definable target molecules for therapeutic use, especially in lung cancer.

- **Junior Research Group**
  In January 2024, Dr. Julia Frede launched the DKTK Junior Research Group on Cancer Systems Biology at LMU Klinikum. In October 2024, she took the next step in her career, transferring to the tenure-track Professorship in Systems Immune Oncology (W2) at the TUM. A call for applications for a new junior research group at the Munich site was launched at the end of 2024.

2nd Faculty Retreat at the Obere Firstalm inn near Spitzingsee (© S. Endres)

Munich OncoTrack: Dr. med. Ngoc Thien Thu Nguyen (Department of Clinical Pharmacology, LMU Klinikum) with Prof. Wolfgang Kunz in the Radiology Clinic and Policlinic at LMU Klinikum (© N.T.T. Nguyen)

- **Events**
  The regular DKTK Cancer Colloquiums and the annual DKTK Munich Cancer Retreat discuss the latest findings from translational research and clinical trials. The keynote lectures at the 10th Munich Cancer Retreat (MCR10) in 2023 were presented by two members of the DKTK Scientific Advisory Board: Stefanie Polat (Siemens Healthineers) and Han Steutel (vfa). The keynote lectures of the 11th Munich Cancer Retreat in 2024 were presented by Prof. Angelika Eggert (DKTK Site Spokesperson Berlin) and Prof. Bernd Bodenmiller (ETH Zürich). The governing body of the Munich site prepare the strategy for the upcoming DKTK funding period during the 2nd Faculty Retreat at the Obere Firstalm inn.

- **Early career support**
  Munich-based fellows of the DKTK School of Oncology take part in short-term exchanges as part of Munich OncoTrack, switching from TUM University Hospital Rechts der Isar to LMU Klinikum and vice versa. The three-year program gives them insights into areas outside their own oncology specialty..

- **In memoriam**
  A grant was set up in memory of Site Spokesperson Prof. Wilko Weichert, who died in 2023. The Wilko Weichert Grant supports interdisciplinary projects by early career scientists. The first Wilko Weichert Grant, for funding in 2024, was shared by Dr. Stefanie Bärthel, Dr. Joscha Griger, and Dr. Jennifer Rivière. The second Wilko Weichert Grant, for funding in 2025, went to Dr. Christoph Geisenberger.

DKTK partner site Tübingen

Site Spokesperson
Prof. Klaus Schulze-Osthoff

Deputy Spokesperson
Prof. Juliane Walz

Research profile

The primary focus of the Tübingen site is on immunotherapy, a research field that dates back to the discovery of MHC-mediated antigen presentation, but now covers the entire spectrum of modern immunotherapies. For example, researchers in Tübingen identify MHC-presented peptides that originate from tumor antigens in order to develop personalized peptide vaccines. An additional focus area is on developing therapeutic antibodies and innovative therapy approaches that specifically trigger effective T cell responses against tumors. Intensive research is carried out in the areas of CAR-T cell therapy and virotherapy. Prof. Helmut Salih is DKTK Professor for Translational Immunology.

Multiparametric imaging and functional genomics & drug development are two complementary focus areas. In the field of drug development, new tumor targets are identified to generate efficient inhibitors – against oncogenic kinases, for instance – and test them in clinical trials. In addition, new PET tracers are developed for imaging of therapy-induced senescence processes and immune responses to tumors.

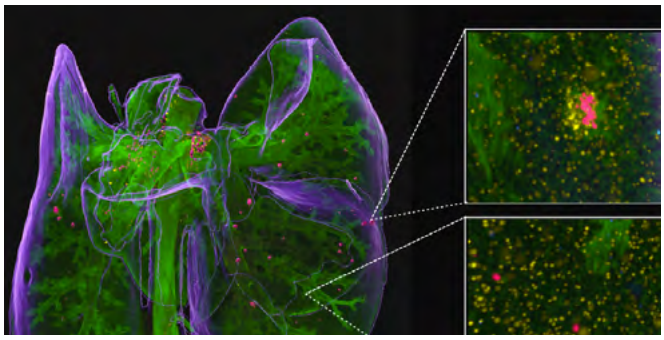
Developments

- **Professorships in oncology**
  New appointments to twelve existing oncology-related professorships have strengthened the site's research profile and offer additional opportunities for collaboration with the DKTK.

- **Expansion of mass spectrometry technology**
  TOFIMS mass spectrometry technology has been established for immunopeptidome analysis to help identify new tumor-associated HLA ligands. These include neoepitopes that are generated through mutations, noncanonical translation processes, epigenetic changes, or therapy-induced stress processes and which considerably expand the spectrum of possible peptide vaccines.

- **Advances in the development of bispecific antibodies**
  These are characterized by an optimized format and improved stability, specificity and effectiveness. They include T cell-activating bispecific antibodies against tumor antigens, and co-stimulatory molecules that can restrict tumor growth.

A laboratory at the Werner Siemens Imaging Center with several PET scanners (© Oliver Lang/ Werner Siemens Foundation)



Light sheet microscopy image of a mouse lung with metastatic tumor cells (red) and cytotoxic T cells (yellow) (© Prof. Bettina Weigelin/Tübingen)

- **PET tracers**
  Significant advances were made in the development of new proprietary PET tracers to visualize senescence processes in therapy monitoring of solid tumors. Through targeted derivatization, it was possible to synthesize tracers with improved specificity and signal strength, and they are currently undergoing preclinical testing.

- **New research center**
  The M3 Research Center is a new institute for 18 research groups conducting research on interactions between malignancy, metabolome, and microbiome.

- **Clinical trials**
  A phase I trial with a proprietary MKK4 inhibitor, developed by HepaRegeniX, a Tübingen start-up, was completed successfully. The inhibitor will be tested further for hepatologic and oncologic indications. In addition, a phase I trial for functional imaging was successfully completed that used a proprietary PET tracer for the first time to show senescence processes in therapy monitoring with solid tumors.

- **ERC grants for early career scientists**
  Junior Professor Josef Leibold and Dr. Florian Wimmers, two junior research group leaders who are active in the DKTK, were awarded an ERC Starting Grant.

Finance and personnel

The DKTK is funded by the German federal government (90%) and the federal states in which the DKTK partner sites are located (10%).

Expenditure

In 2024, expenditure in the DKTK amounted to €32.1 million. More than half (59%) went on personnel. A third of expenditure went on equipment and materials (33%), and eight percent on investments.

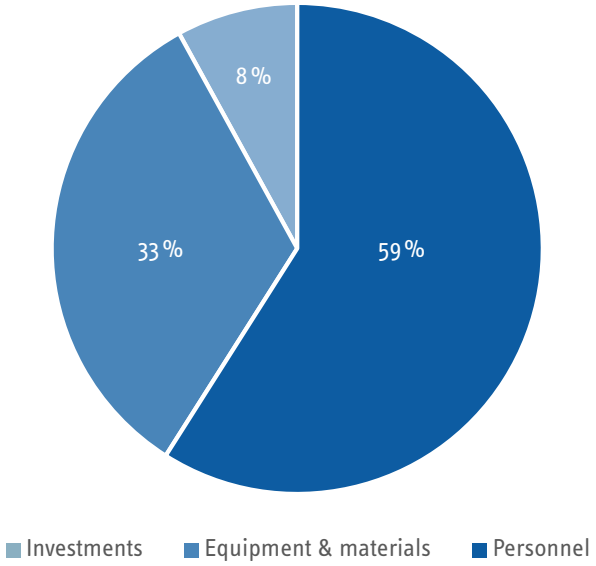


Figure: Breakdown of DKTK expenditure in 2024

Personnel

In 2024, the DKTK financed 332 individuals or 277 full-time equivalents (as of December 31, 2024). Scientists made up the largest proportion (34%). Doctoral researchers accounted for 24%. Around 17% of DKTK-funded employees are scientific support staff, e.g. technical assistants, and 25% of staff work in coordinating functions and infrastructure facilities.

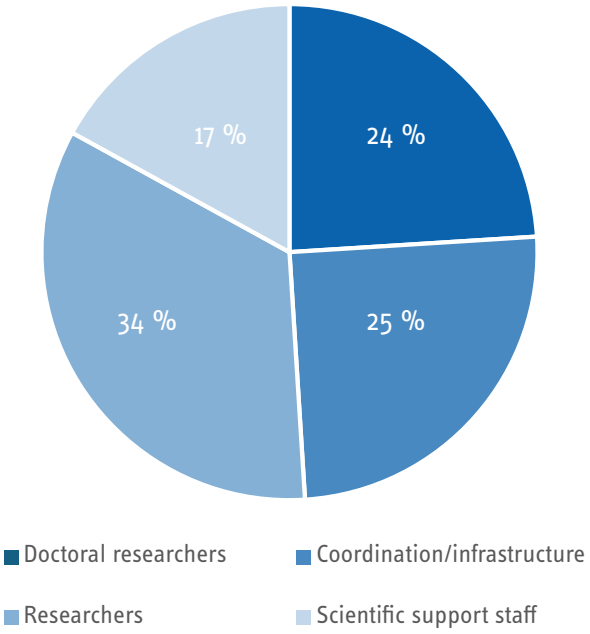


Figure: DKTK personnel by job type in 2024

The DKTK workforce is international: Around 30% of employees come from other countries, with 37 different nationalities represented. Of the staff members financed by the DKTK, 59% are women. In the DKTK's governing bodies, the proportion of women is 50% in the Steering Committee and 45% on the Scientific Advisory Board. As well as the DKTK-financed employees, many other researchers work in the DKTK who are financed by DKTK partners. In total, more than 1000 scientists and clinician scientists are active in the DKTK.

List of abbreviations

AI	artificial intelligence
AML	acute myeloid leukemia
BMFTR	Federal Ministry of Research, Technology and Space (German: Bundesministerium für Forschung, Technologie und Raumfahrt)
CAR	chimeric antigen receptor
CCC	Comprehensive Cancer Center
CCP	Clinical Communication Platform
CORTEX	Cancer Outcomes and Reverse Translation – Educate & Accelerate (DKTK fellowship program)
CT	computer tomography
DKFZ	German Cancer Research Center (German: Deutsches Krebsforschungszentrum)
DKTK	German Cancer Consortium (German: Deutsches Konsortium für Translationale Krebsforschung)
DKTK-ROG	DKTK Radiation Oncology Group
DZG	German Centers for Health Research (German: Deutsche Zentren der Gesundheitsforschung)
DZGIF	DZG Innovation Fund
ERC	European Research Council
HARPOON	HArmonization of Reporting in PrecisiOn Oncology – conference on harmonizing molecular tumor boards
INFORM-Programm	INdividualized Therapy FOr Relapsed Malignancies in Childhood
JIP	DKTK Joint Imaging Platform
MASTER-Programm	Molecularly Aided Stratification for Tumor Eradication – a joint DKFZ/NCT/DKTK precision oncology program for advanced cancer in adults
MTB	molecular tumor board
MRT	magnetic resonance tomography
NCT	National Center for Tumor Diseases
NK	natural killer cells
PDO	patient-derived organoid
PEI	Paul Ehrlich Institute, the Federal Institute for Vaccines and Biomedicines
PET	positron emission tomography
RadPlanBio	RadiationDosePlan-Image/Biomarker-Outcome platform
SoO	DKTK School of Oncology
WES	whole exome sequencing

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