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INTERDISCIPLINARITY

25 YEARS IZKF

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Wilhelms-Universität Münster



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IZKF IN NUMBERS

PEOPLE AND PROJECTS

459

Scientific Staff

58

Institutions of Medical Faculty Münster (MFM)

11% Institutes with Patient Care 40% Clinical Departments 49% Institutes without Patient Care

298

38% Research Scientists 62% Physicians

Project Leaders

111

External Appointments to University Chairs

43% C3/W2 professorships 57% C4/W3 professorships

333

Funded Projects

- 291 Research Projects
- 10 Clinical Translation Research Projects/ Pilot Studies
- 6 Junior Research Groups
- 16 SEED.projects for Clinician Scientists
- 6 Return Projects for German Postdocs
- 4 Technology Development Projects



THE INTERDISCIPLINARY CENTRE FOR CLINICAL RESEARCH (IZKF) MÜNSTER

EDITORIAL AND GENERAL STRUCTURAL ASPECTS

Prof. Stephan Ludwig, Chairperson 2018–2024

Dear Readers,
Since 25 years, the IZKF Münster serves as a profile-sharpening intramural research centre and a motor for innovative, internationally recognised basic and patient-oriented clinical research in the Medical Faculty Münster. The overarching goal is to strengthen interdisciplinarity at all levels of funding through (a) defined research priorities, (b) cooperative project leadership from different disciplines and (c) platforms for internal scientific exchange. It serves as an instrument for the development of new funding formats at the Medical Faculty and the strengthening of third-party funding.

The tasks of the centre include the *ex-ante* funding of innovative research projects with high clinical relevance and originality, the development of concepts for the training of young scientists, especially talented clinician scientists, and the establishment and operation of central service and technology platforms for high-throughput methods and innovative detection techniques. Funding is provided according to a transparent and competitive two-step peer-review-based procedure and ensures high quality and consistent further development of the funding formats through regular evaluation.

In line with the other seven IZKF in North Rhine-Westphalia, Baden-Württemberg, Bavaria and Saxony, which were established through the structural funding from the Federal Ministry of Education and Research (BMBF) in the mid-1990s, the IZKF Münster has provided very substantial support for the continuous development of the Medical Faculty. Above all, several measures that are now taken for granted, such as performance-based funding or the separation of teaching & research and patient care, were established at the medical faculties after positive trial phases within the IZKF. Certain funding formats such as the IZKF returnee programme or the provision of high-throughput technologies in specific Core Units were also trial projects for similar formats offered today by the state of NRW or the German Research Foundation.



Moreover, the IZKF Münster had a very special task in the early phase of BMBF funding, namely the definition and development of research priorities for the Medical Faculty. Funded IZKF projects provided the nucleus for successful collaborative research proposals that led to several long-term DFG-funded Collaborative Research Centres.

After 25 years, the IZKF is still an extremely valuable intramural instrument to shape the research profile of the faculty and to boost clinical research on a high quality level. However, this is nothing to rest on. The ever-changing research landscape, the rapid development of novel technologies and the challenges of translational research ask for continuous adaptations of the programmes. The IZKF is ready to take these challenges by constantly evaluating and renewing funding formats as to the current needs. Thus, we are looking forward to the next 25 years of supporting high-level research.

FOCUS



SIGNIFICANCE OF A TOP-LEVEL RESEARCH CENTRE FOR A MEDICAL FACULTY

REVIEW AND OUTLOOK AFTER 25 YEARS

Prof. Frank U. Müller, Dean of the Medical Faculty



The task of university medicine is to continuously develop the scientific basis of the health system in order to assure the future quality of healthcare (cf. Wissenschaftsrat, Perspektiven der Universitätsmedizin, idem 5663–16, Weimar 21.10.2016). The particular challenge in fulfilling this task consists in taking into proper account the dynamic scientific and technological progress in research and healthcare under prevailing conditions. The lamented dominance of healthcare activities and the resulting marginalization of academic goals have continued to increase – not only as a result of clinical, academic and administrative demands in the context of the Corona pandemic, but also, and in particular, through the already existing and increasingly insufficient funding of university hospitals which has become clearly visible during the pandemic.

In our Faculty, these underfunded demands on the clinical work undertaken by university hospitals impact negatively on research and teaching in a number of different ways. Two points are particularly worthy of mention: firstly, scarce resources in the face of digitalization, expensive technical developments and equipment-related methods which are not only to be made available in the Faculty but also further developed; and secondly, challenges in attracting the best minds and supporting junior researchers amid increasing workloads in the hospital and the associated ever-decreasing opportunities for research and teaching.

Over the past 25 years, the IZKF has helped the Faculty to a considerable extent to counteract these negative developments and, at the same time, to strengthen translational research. Setting up and funding Core Units meant that important equipment-based and methodological foundations were created, further developed and made available for the entire Faculty. As a result, scarce resources were pooled sensibly and used effectively in the light of the advance of technical developments. The methods thus made available were both the starting point and the indispensable basis for many individual research projects and important research alliances at the Faculty. Without this methodological basis – which is nowadays perhaps seen as a natural state of affairs, but which should nonetheless not be underestimated – and without this engagement which began years ago and has continued right through, many projects undertaken in the past decades would not have been possible, and our Faculty would have been much weakened, scientifically, both internally and externally.

For years now, the well-financed funding formats – geared to various qualification levels – have not only contributed substantially to attracting scientists and promoting junior researchers at the Faculty; they also represent an important element in the indicator-oriented funding approved by the

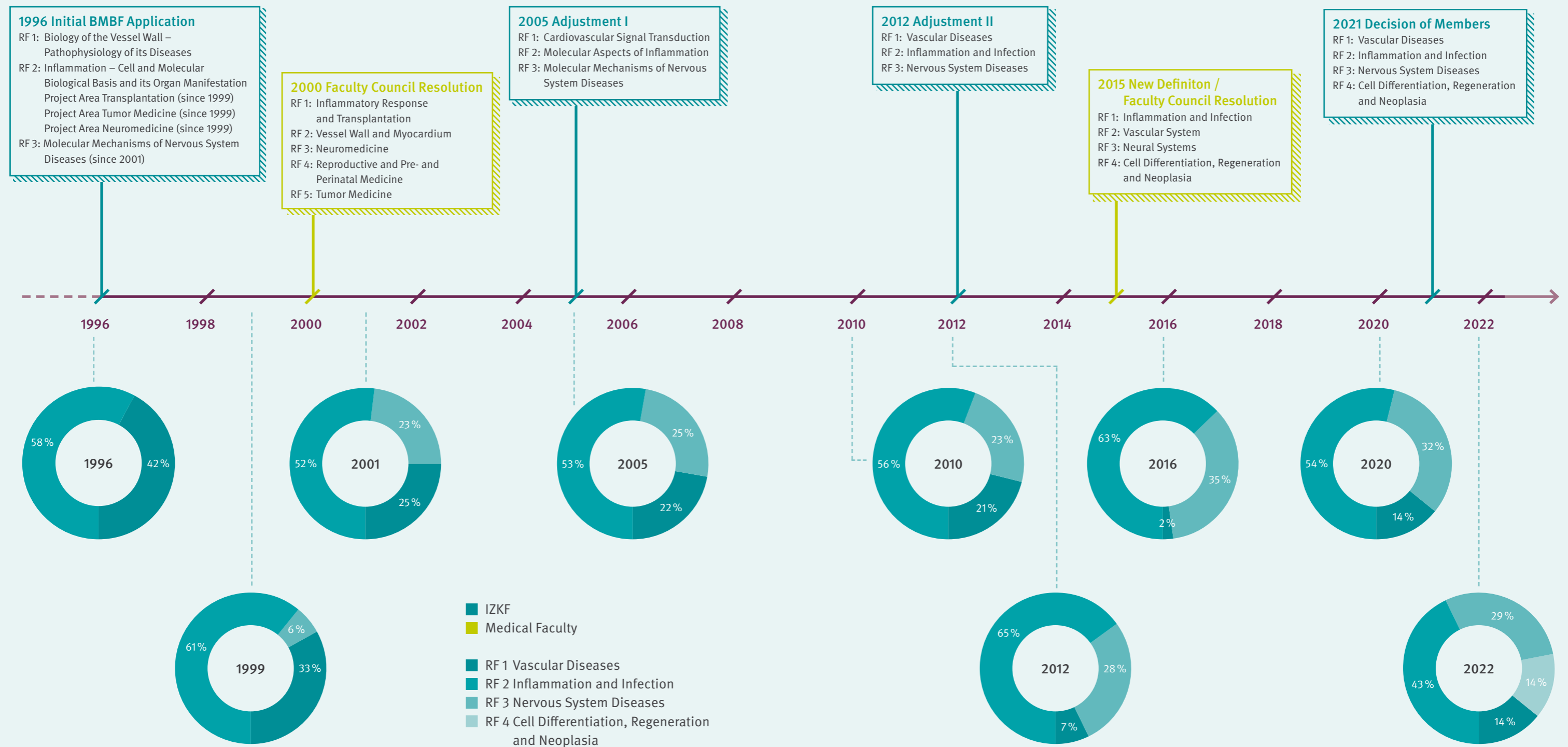
Faculty [“leistungsorientierte Mittelvergabe”]. A special focus was on rules, which provide an incentive to acquire further third-party funding (in particular from the German Research Foundation, DFG). These stringent rules, as well as a balanced process – closely supervised by the Scientific Advisory Board – on the approval of funding, always oriented towards scientific originality, stringency and work already done – have ensured the high scientific quality of the projects and, equally, contributed to the high quota of DFG funding per professor at our Faculty. According to the latest survey carried out by the DFG (Förderatlas [Funding Atlas] 2021, Tab 4–12; survey period 2017–19), this resulted in an excellent 4th place for Münster among German universities.

25 years ago, as a result of the establishment of the IZKF – funded initially by the German Ministry of Education and Research – a forward-looking basis was laid for applying strict scientific rules for meeting the most important challenges which our Faculty has to contend with. By taking on the financing after the funding had come to an end, the Faculty enabled the IZKF to continue. The continuation – and continued development – of this structure, closely coordinated and fitting in well with other measures at the Faculty, will remain an important element in our future efforts to fulfil the tasks, which the University Hospital has here in Münster.

“Over the past 25 years, the IZKF has helped the Faculty to counteract negative developments and, at the same time, to strengthen translational research.”

Prof. Frank U. Müller

DEVELOPMENT OF RESEARCH AREAS IN IZKF AND MEDICAL FACULTY



DIVERSITY OF ACADEMIC TALENTS TO FOSTER RESEARCH FOR SOCIETAL CHANGE

Prof. Alex W. Friedrich, Medical Director and Chairman of the Board, University Hospital Münster (UKM)



“Innovative healthcare and healthcare-related research will be pivotal in initiating changes in structures and the way how healthcare is organised in the coming years.”

Prof. Alex W. Friedrich

Ensuring security will be for sure the single most important topic for all sectors of our society in the coming decade. This is also true for the healthcare sector as part of our security-relevant infrastructure as well as for research in biomedical science as the innovation driver for the challenges we all face today.

Innovative healthcare and healthcare-related research will be pivotal in initiating changes in structures and the way how healthcare is organised in the coming years. Several challenges, such as demographic change, the pandemic crisis, conflicts and war and the subsequent crisis and migration ask for structural changes in order to develop a sustainable healthcare and research environment. Sustainability comprises in this context all three important P's, namely People, Planet as well as Profit. The last is to be seen in a broader sense than just economic win, but also in form of grants or other funding possibilities. In the final consequence, this means that healthcare needs to be

balanced in all three of these sustainable factors. However, the factor “People” will be the most crucial for the coming years.

The factor “People” refers to scouting, development, and training of young talents in a carrier development towards a large diversity of academic profiles. Those profiles include academic activities such as leadership in research and teaching, but also innovative clinical activities as well as societal change. Here, I would like to focus on the last two profiles.

Academic talents and leadership in innovative clinical activities will focus on the development of new forms of healthcare, such as network medicine, intertwining healthcare within and between healthcare providers with the goal to improve healthcare outcome. The better-in better-out concept is a good example, using preventative measure for preparing patients optimally in the months and weeks before a complex medical intervention, in order to reduce time of recovery as well as possible complications and all related

consequences. Better-in better-out is not possible for all medical conditions, however where established it will help to improve quality of care and allow to increase healthcare capacity due to a meaningful use of waiting time as positive preparatory period.

Another example of leadership in innovative clinical activity but also academic leadership for societal change is the development of regional healthcare networks, such as implementing inter-sectoral and inter-institutional patient paths for care and cure and finally optimizing healthcare for specific healthcare questions relevant for the own region. Academic talents focusing on leadership in societal change will discover regional responsibility and develop academic activities in collaboration with partner institutions within the region, such as public health, care&cure, GP's, specialist, long-term care facilities as well as nursing homes and others. This way, the societal impact of the academic activities of the University Hospital Münster and the Medical Faculty will be interconnected with important other social and political institutions in our region. It will also allow to initiate a real programme of citizens-science, where a dialogue between interested citizens and the academic world of the University and the Medical Faculty of Münster can be started. This will also allow to build a bridge to industry and especially regional small and medium enterprises (SME's) in order to use funding for developing knowledge and using the innovative power of SME's to convert this knowledge again into funding opportunities by reinvesting the revenues into new academic activities.

In order to build a bridge between such innovative clinical research as well as societal change with existing basic and clinical research activities and modern teaching we could define a programme on regional systemic and public health, which will be rooted within our European healthcare region comprising the German and Dutch border region. This is a unique possibility for the development of research of health systems comparison in our German-Dutch border region using both sides of the common border as two natural cohorts in order to structurally learn from differences in all public health related fields. The aspect of regional and full-area research allows to reach a higher level of evidence for many questions in medical science as an alternative to multi-centre studies comprising only patients of university medical centres in different parts of Germany or even different countries often with different socio-economic background. This way, we include the real life healthcare reality of two EU member states, which is displayed in a full-area public health research region.

The aforementioned academic profiles and activities can be the next step of translational research in healthcare and will mainly focus on third-party funding such as the German Innovation-Fund, BMBF, EIT (European Institute of Technology), major EU/EFRE-funding as well as other regional private and public funding opportunities. Today, we have the chance to present to the talents among the Millennials such a plentiful diversity of future academic profiles working in a modern research and clinical environment. This will lead to an academic development of innovative healthcare, teaching, research and societal change and insure the future compatibility of the UKM.

KEY MILESTONES OF THE IZKF MÜNSTER

22.06.1993	Resolution passed by the Faculty Council to establish the “Clinical Research Network” (Representatives Prof. van de Loo and Prof. Sorg)
09.12.1994	“Interdisciplinary Clinical Research Centre” (IKF) founded by decision of the Faculty Council (FBR)
06/1996 – 05/2004	BMBF funding in the programme “Health Research 2000” (FKZ 01KS9604/0)
06/1996 – 05/1998	1 st funding period – construction phase (funding years 1–2) – 2 research areas / 25 research projects, 8 central project groups (ZPGs)
27.01.1997	Official inauguration, Auditorium of the University ‘Schloss’. Prof. Clemens Sorg, elected Chairperson of the new Executive Board
01/1998	Recruitment of the first Junior Research Group (after an international call for proposals; funding for 5 years)
06/1998 – 05/2001	2 nd funding period – consolidation phase (funding years 3–5) – 2 research areas / 27 research projects / 1 junior research group / 8 ZPGs
06/1999	Budget for project funding raised according to the financial plan – 2 research areas, 7 project sections with 48 research projects
09/1999	Partnering Meeting – Science and business in dialogue. Meeting of all IZKF and BMBF with the Association of Pharmaceutical Companies (VfA) in Bonn
04/2000	Head Office of the “Association of Clinical Research Centres” (ACRC) opened in Münster
06/2000	First Affymetrix Gene Chip Core Lab established at a German university; co-funded by the NRW Biochip initiative; service lab installed in Münster for all IZKF
06/2001	3rd funding period – continued consolidation phase (funding years 6–8) – 3 research areas, 8 project sections / 44 research projects / 2 junior research groups / 4 ZPGs
11/2001	High-throughput technology platform ‘Integrated Functional Genomics’ (IFG) established
01/2002	‘Klinik Patent’ – IZKF Patent and Licensing Office in Germany initiated at Fraunhofer Patent Office, Munich. Funded by BMBF and included in the nationwide “Innovation Offensive”
03/2002	First Joint Symposium of all IZKF in Germany organised by IZKF Münster – ACRC national workshops commence
10/2003	ACRC Strategy Papers on (1) “the future of clinical research at medical faculties in Germany”, and (2) “the German funding system for young scientists in medical research” published



Prof. Jürgen van de Loo (†)
Haemostaseology
1994 – 1997



Prof. Clemens Sorg
Exp. Dermatology
1997 – 1999 and 2003 – 2005



Prof. Eric Harms
Pediatrics
1999 – 2003



Prof. Georg Peters (†)
Med. Microbiology
2006 – 2012



Prof. Volker Gerke
Med. Biochemistry
2012 – 2018



Prof. Stephan Ludwig
Virology
2018 – 2024

01/2004	IZKF Münster Strategy Paper for the future goals by the IZKF Board enforced (signed by the IZKF Chairman, Dean of the Faculty and Medical Director of the UKM)
01/2004	Clinic Invent – Patent and Licensing Office of the Medical Faculty implemented and managed by the IZKF Münster
05/2005	New rules for grant applications / regular annual call for project proposals, one project per leading scientist enforced. Peer-review panel of the Scientific Advisory Board implemented
03/2006	IZKF Bonus Programme for successful transfer of IZKF projects into DFG grant applications implemented
11/2007	Binding ‘Terms of Use’ for all IZKF Core Units enforced
11/2008	New funding format ‘Clinical Research Awards’ for patient-oriented translational research projects (two per year) initiated
01/2009	New Core Unit concept implemented following evaluation (IFG, TRAM, Optical Imaging, Small Animal PET, Electrophysiology for small animal cardio-phenotyping, Ultrasound Imaging)
02/2011	New flexible, enhanced research rotation programme ‘SEED.projects’ (<i>Scientific Education and Experiences for Medical Doctors</i>) implemented
03/2012	All imaging Core Units merged into a single integrated technology platform ‘Preclinical Imaging eXperts’ (PIX)
12/2012	Research funding format ‘Clinical Research Awards’ revised and upgraded to ‘Clinical Translation Research Projects’ (CTRP programme)
04/2013	DFG Mentoring Programme of the IZKF and the Deanery headed by Prof. Helge Karch initiated
10/2014	Technology platform ‘Integrated Functional Genomics’ (IFG) segregated into ‘Core Facility Genomics’ managed by the Medical Faculty and the Core Unit ‘Proteomics’ managed by IZKF
07/2015	Core Unit ‘Transgenic animal and genetic engineering models’ (TRAM) transferred into managerial responsibility of the Medical Faculty
12/2015	Participation of IZKF in the ‘Medical College’ (Medizinerkolleg – MedK) stipend programme
06/2016	20 th Anniversary Symposium. Joint publication of four active IZKF in Germany in a special issue of the <i>Deutsche Universitätszeitung</i> (DUZ)
12/2016	IZKF Research Rotation programme terminated after 20 successful years – budget reassigned to the Clinician Scientist programme ‘SEED.projects’
07/2018	‘Clinical Translation Research Projects’ programme amended and new funding format ‘Clinical Translation Start Trials’ (ClinicStarT) implemented
09/2018	IZKF Online Application Tool (OLA) and online Peer Review Tool for all IZKF funding formats implemented
10/2019	First IZKF SCIENCE CONFERENCE – new conference format to encourage interaction between applicants and currently funded principal investigators
10/2021	Women-in-Science Network of the Medical Faculty initiated by the IZKF Münster and launched
06/2021 – 05/2022	25 th year of funding. A highlight issue of Biological Chemistry entitled “Molecular determinants of health and disease” with review articles by former IZKF members published

VISION FOR TOP-LEVEL RESEARCH AT UNIVERSITY MEDICINE MÜNSTER

A PIONEER'S VIEW

INTERVIEW with Prof. emer. Clemens Sorg, former Chairman of the IZKF Board



with valuable information. We started the organisation of an application, actually months ahead of everybody else.

In order to give many scientists of the Medical Faculty a chance to apply, the title of the proposal was “The Chronic Disease”. From the many more proposals, we selected 56. In parallel, we drafted a financial plan and a plan for the future structure and organisation, which already included a statute.

The first round of review was disappointing. Our proposal was rejected based on the poor science. However, the financial and organisational plan were found to be excellent and so we were given a second chance.

Since we did not have an external Scientific Advisory Board at that time, we had to select the best projects internally according to strict scientific criteria. We thereby narrowed it down to 28 projects. Our IZKF application was now approved and the centre was officially opened by the University Rector on January 27, 1997.

How did you develop the concept and the organisational structure of the IZKF?

In summer 1992, I was invited as a longtime reviewer for the national AIDS programme together with other colleagues to a final round of evaluation and discussion to the Ministry of Science and Technology in Bonn. Towards the end of the meeting, Dr. Rembser, head of the department, and his colleagues Dr. Lange and Dr. Franke-Ullmann (later Gieselmann) informed about the plans to initiate a new programme to promote clinical research through incentives in order to recover funds (“Landeszuschuss für Forschung & Lehre”) that were largely spent on patient care instead of research and teaching. I was electrified, saw the tremendous chances, went home, wrote a letter to the Rector of the WWU Prof. Wasna, suggesting immediate action and contacting the Ministry for more detailed and official information. Rector Wasna, Prof. van de Loo and myself travelled to Bonn and returned

After the start of the IZKF and the approval of the SFB 293, you spoke of a “breakout of salutary foundation fever in the Medical Faculty”. ...

The foundation of the IZKF was not an initiative out of the blue. We had other successful initiatives, which paved the way to this success. Few years before, in 1995, we opened the Centre for Molecular Biology of Inflammation (ZMBE), which was completely financed by the State NRW (5 Professorships, 50 positions). The key to this centre was the building. At the beginning of the 90s the British Army left Münster and the Military Hospital was vacant. Following examples at other universities I suggested the foundation of a centre for molecular biology in order to catch up with developments in this field with respect to the new research techniques in molecular biology. As we were a Medical Faculty, it appeared obligatory to put clinical problems on top of the agenda. Inflammation was the most fascinating and relevant field to almost all

clinical disciplines comprising Immunology (acquired and natural), Infectiology, Virology, Experimental Pathology, Vascular Biology. Areas, which are of outmost importance in the current pandemic.

Before the state started this project they wanted convincing proof, that Münster is capable to compete nationwide in the acquisition of one of the prestigious Clinical Research Groups of the DFG. Yet, we gained not only one but two: ‘Endothel of the skin’ (Speaker C. Sorg), ‘Audiology’ (Speaker M. Hoke). As mentioned above, parallel to the IZKF Münster we founded a new Collaborative Research Centre (SFB 293, Speaker C. Sorg). This all demonstrated the large potential of the Medical Faculty. It just needed some organisation to be developed.

Few years later, I took the initiative for the acquisition of a Max-Planck Institute and approached the late politician Jürgen Möllemann with this idea. He was very supportive and got things moving as he maintained close relationships to the President of the Max-Planck Society, Prof. Hubert Markl and the state President of NRW Wolfgang Clement. When the founding commission (‘Stammkommission’) of the MPG visited Münster, we could present not only the above list of achievements, but a perfect scientific, academic and clinical environment for the institute.

The gain of all the above foundations was shown in an increased output of publications, a rise in impact factors and grant money. The state NRW also started to attribute 15% of the funds to the Medical Faculties of NRW according to their scientific achievements. Münster was for many years the No.1, drawing considerable amounts of money from other faculties.

The working group of speakers of the eight IZKF founded the ACRC (Association of Clinical Research Centers in Germany). What were the intentions and activities of the ACRC?

Soon after establishing the eight IZKF Prof. van de Loo convoked a meeting of all speakers in Cologne. It was consensus to institutionalise these meetings. Soon thereafter Prof. van de Loo retired from his function as chairperson and I was elected instead. It was decided to finance jointly an office at the chairperson’s location.

Apart from scientific and technological exchange, it was envisaged to represent the Centers politically. It was obvious that not all other Universities were benevolent. The DFG in particular was watching us closely, because we were felt to cross onto DFG turf.



“Academia must be in a constant process of renewal.”

Prof. emer. Clemens Sorg

The ACRC also organised the integration of one new IZKF in Jena, which had evolved from the programme “Fünf Neue Länder” soon after the reunification.

In part, the ACRC still exists. A few IZKF-Faculties have followed the principle “Take the money and run”, or the opinion became predominant: that’s enough now, let’s do something else. Indeed, several programmes of the BMFT and the DFG have supported this attitude.

It is quite remarkable that the three IZKF of NRW (Aachen, Cologne, Münster) are still existing and thriving. Most likely this is due to the concept of funding. After the approval of the IZKF I went to Dr. Kaiser at the Ministry and expressed my fears that the annual budget of about 5 Mio Euro could be endangered by Deans, Medical Directors or Administrative Directors. Dr. Kaiser suggested to put a fence around the money by adding it to the state budget which is approved by the state parliament. Every unauthorized use of the funds would then be a criminal offence. So, the long term funding of the IZKF was assured.

Continuity in research is absolutely essential. Excellence and expertise is only acquired by a continuous endeavour in a specific topic. Project hopping from DFG to BMBF to EU is detrimental. Very decisive, however is, that a faculty strengthens its research profile by developing a structural and developmental plan for several years which serves as guideline for hiring new professors, large investments, buildings and so on.

STARTING POSITION IN THE EARLY 1990s

THE STRATEGY OF THE FEDERAL MINISTRY OF EDUCATION AND RESEARCH IN GERMANY

Dr. Peter Lange, Ministerialdirektor a.D., Federal Ministry of Education and Research (BMBF), Bonn



SEPARATE ACCOUNTING

This gave the BMBF the impetus to develop an initial structural programme, which primarily aimed at transparent financing of research and teaching and the use of available research funds according to quality criteria. In particular, the first priority was to refute the argument of the health insurance companies that research at the medical faculties was co-financed from health care funds. A case study initiated by the BMBF¹ in 1998 came to the opposite conclusion, namely that the university outpatient clinics do not (cannot) cover their costs and, depending on the university site, are subsidised with around 50% of the funding for research and teaching (several million Euros). Until today, this fact has not changed significantly. On the contrary – the health care industry's pressure on the amount allocated annually to the medical faculties has increased again. In the course of implementing the IZKF, however, separate accounting and relatively well-structured LOM systems were established and tested at all sites. Eventually, these measures were generally demanded in university medicine by the science ministries of the federal states and enforced with some vigour at the beginning of the new centennial.

QUALITY CRITERIA

Furthermore, it was discussed for the first time that a catalogue of performance and output-oriented criteria should be used to ensure that research funding is granted based on quality. However, which criteria are relevant for this and which weightings should be applied? The impact factor or the age factor in publication evaluation? Can DFG and BMBF funds be weighted equally? Is it fair to compare ERC grants to EU funds? How does one evaluate industry funding? The discussions in this area are certainly not over yet, but the faculties now strive for understandable and fair LOM systems and a nationwide awareness for these issues has been created.

To be very clear: at the beginning of the 1990s, the situation of clinical research at German universities was questionable in comparison to international standards. In general, there were no joint strategies at the medical faculties and clinics had very hierarchical power structures. The funds for research and teaching from the State government were not allocated transparently. There was no separation of funds for faculty operations (research and teaching) and patient care in the hospital. With respect to clinical research, the so-called “Feierabendforschung” (off duty research) was a common practice. Quality criteria for research played as little of a role as peer review in publications, which were often published in German. In addition, a joint research infrastructure was lacking. As a result, the international visibility of German clinical research was extremely low. The forces in university medicine appeared divided.

EXTERNAL ADVICE

Another major goal of the structural programme was the establishment of efficient structures for clinical research at an interdisciplinary level. Yet, which structures does a faculty need to develop its research priorities optimally? Based on existing experience values that science needs guardrails and visionary development on the one hand, but on the other hand as much scientific freedom as possible to be successful, one very important component was to have continuous assessment by a scientific advisory board. An external advisory body of scientifically highly respected peers can act as a mirror for a structure within the faculty and for each individual institution. At best, external advice should be constructively critical, but fundamentally positive. Only when neutrally presented, constructively positive advice leads to further development. The IZKF Münster has implemented this in a consistent manner and launched a number of initiatives and support programmes for the Medical Faculty.

RESEARCH FOCUS

Finally, the establishment of a university-specific clinical research profile was also intended to be viewed as a scientific structural element that would allow the Medical Faculty to identify its own strengths and limitations. This issue was of course quite a complicated task in the context of hierarchical structures. The difficulty was not only to agree on the research areas in which the faculty would like to be more active in the future. First and foremost, it was important to assess whether the personnel capacity in the chosen areas is sufficient and internationally competitive, as well as whether the financial capacity is available to a corresponding extent or can be obtained in the form of third party funding. Thus, not only is government funding for research and teaching essential, but also the third-party funds acquired by the scientists in competition. Above all, funds obtained in international competition, such as the ERC grants, have very quickly developed into a performance class and attest the high level of performance, even in Münster.

The establishment of such structures within the framework of the IZKF in Germany helped the Medical Faculty of Münster to secure a leading position in the German medical research scene. The IZKF Münster promotes innovative, interdisciplinary research projects within the framework of its research priorities and young scientists in medicine. It focuses on improving the structural conditions for clinical research in the field. Peer review-based awarding procedures and transparent allocation of funds are the prerequisites for successful research management and increased competitiveness at the Medical Faculty. In the future, the IZKF Münster must continue to strive to be a driver of innovation at the heart of

“Every faculty should have such a seedbed for new interdisciplinary questions, new cooperation structures and for promoting young researchers.”

Dr. Peter Lange, DUZ.Special, Interview 2016

the faculty and serve as a guarantor for profile enhancement and quality assurance.

In conclusion, we have to admit that some of the issues taken up at that time have yet to be satisfactorily resolved. In the recommendations published by the German Council of Science and Humanities² in 2016, the obstacles of the organisational structures in German university medicine among other well-known problem areas, which impair future viability and international competitiveness, were addressed again. Accordingly, one of the Medical Faculty of Münster's future challenges should be to strengthen interdisciplinary scientific collaboration between the clinic and the laboratory, as well as to establish regional, superregional and possibly even international networking with excellent partners to achieve benefit synergies. For this reason, rivalry within a university medical centre is counterproductive. Team spirit is more important than ever to successfully shape the future in a dynamic research landscape in order to obtain a maximum of useful results for science and patients.

Lecture transcript for the 20th anniversary of the IZKF Münster in 2016.

¹ Lauterbach K, Schwartz F, Potthoff P et al., Bestandsaufnahme der Rolle von Ambulanzen der Hochschulkliniken in Forschung, Lehre und Versorgung an ausgewählten Standorten (Hochschulambulanzenstudie). Gutachten im Auftrag des BMBF, Sankt Augustin, 2003.

² Wissenschaftsrat. Perspektiven der Universitätsmedizin, Drs. 5663-16, 21.10.2016.



“Research funding instruments, which are generally oriented towards time-limited projects, can only have limited effectiveness with regard to institutional change. In general, research funding institutions such as the DFG and BMBF can use their instruments to provide incentives for structurally effective measures as well, but the measures themselves must be designed and implemented by the medical faculties.”

Dr. Christian Schneider, DFG,
Quote from the talk “Die Rolle der DFG bei der Gestaltung der Medizinischen Forschung in Deutschland”,
2003 (Leiter Abteilung “Fachliche Angelegenheiten”)

FUNDING GRANTED! THE TWO-STEP ASSESSMENT PROCEDURE

IMPORTANCE OF AN EXTERNAL SCIENTIFIC ADVISORY BOARD

Ex-ante/ex-post funding is the most important selection principle of the IZKF Münster. In the ex-ante funding decision, project applications will be evaluated based on the applicants' previous research output. Publications of existing preliminary work and the acquisition of qualified third-party funding (DFG, NIH, BMBF, EU, ...) is proof of active research activity, which is necessary for the well-funded research grants. The output of an approved IZKF project is subject to an ex-post performance evaluation when a scientist submits the next application. This may result in the downgrading of a subsequent new project application in some situations.

In order to make this funding principle transparent and fair, a two-stage review process was already implemented during the BMBF funding period. In the context of quality assurance, it was particularly important to conduct the review according to clear, previously communicated evaluation criteria.

The **first step** in the selection process is the internal preliminary evaluation of the short project proposals by the IZKF Research Council. This committee is formed by nine members elected by the Faculty Council and three members of the IZKF Executive Board. According to the IZKF statutes, reappointment is only permitted once.

The evaluation by the Research Council was already in place during the initial phase of the IZKF and honed in the context of the simultaneous establishment of performance-based allocation of funds at the faculty. It was especially vital in this case to make even ostensibly "difficult" judgments understandable by clearly defined quality criteria. The Research Council makes a recommendation for submission of full grant proposals that meet the criteria, which are subject to peer-review by the external Scientific Advisory Board. There is no "move-up list".

The external Scientific Advisory Board has played a pivotal role in the development of internal funding allocation methods since the beginning. It serves as a key advisor to the IZKF Board for the overall structural development in addition to providing professional competence for the research areas. The valuable "external perspective" helps to improve the quality of research in Münster, while also critically examining the general framework for researchers at the Medical Faculty.

The twelve members of the Scientific Advisory Board are appointed by the Rectorate of the Münster University. Their term of office is four years; a reappointment is possible. The Advisory Board consists of distinguished experts with specific, outstanding and broad expertise in the relevant scientific fields.

Most importantly, the Scientific Advisory Board is responsible for the **second step** of the assessment procedure – the Peer Review of all project proposals in every funding format (see below) submitted as part of the annual grant application process. The funding recommendation is of central importance to the quality of the funded projects. As a rule, it is binding for the allocation of internal funds.

Unlike reviewers of scientific journals or grant applications from external funding agencies, the members of the external Scientific Advisory Board are not anonymous to the applicants for funding. However, brief oral presentations of the project proposals enable all reviewers present to make a consensus recommendation for the entire panel in a final closed-door committee meeting. Therefore, a funding recommendation or rejection is not personal. Anonymity is valued highly.

This review process has been continuously improved at the IZKF since the start of funding in 1996. It essentially reflects the recommendations developed by the Science Council in its position paper published in 2017 for an efficient and transparent selection of research proposals with a high review quality.

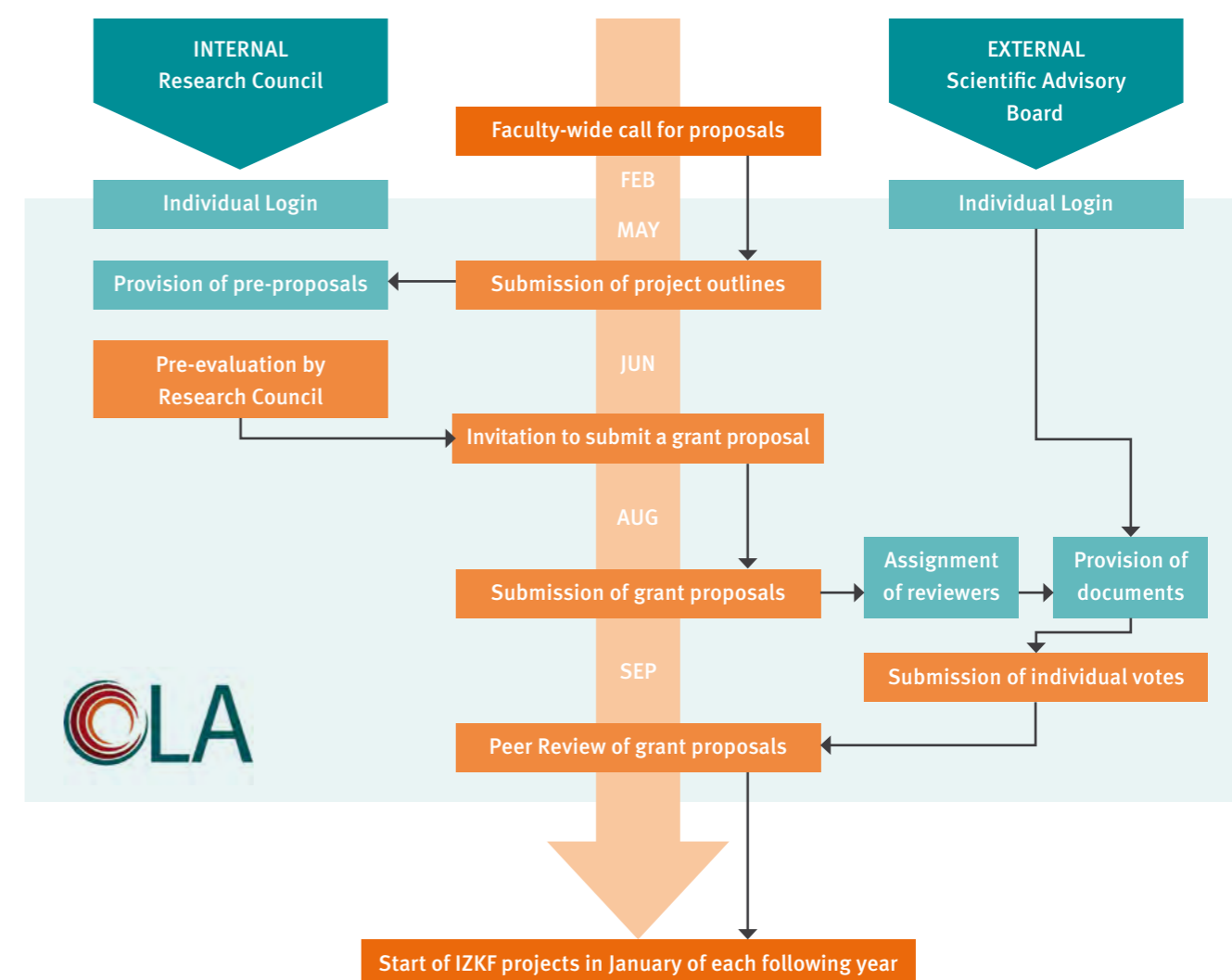


Figure 2: The two-step Peer Review Process

CHAIRPERSONS OF THE SCIENTIFIC ADVISORY BOARD SINCE 1996



Prof. Joachim R. Kalden (†)
Erlangen
1996 – 2005



Prof. Manfred P. Dierich
Innsbruck
2005 – 2009



Prof. Reinhold E. Schmidt (†)
Hannover
2009 – 2017



Prof. Andreas Radbruch
Berlin
since 2018

INTERVIEW WITH TWO CHAIRPERSONS OF THE SCIENTIFIC ADVISORY BOARD

Prof. emer. Reinhold E. Schmidt (†) was the former Director of the Department Clinical Immunology and Dean of the Hannover Biomedical Research School (HBRS) at the MHH in Hannover. He was member of the Scientific Advisory Board since 2005 and its chairperson from 2009 to 2017. This Interview was held on the occasion on the ending of his chairmanship in 2017. The IZKF Münster mourns the death of Prof. Schmidt, who passed away in January 2022 at the age of 70. We would like to pay tribute to his memory.



Dear Professor Schmidt, you have been member of the Scientific Advisory Board for over 15 years and its chairperson for 8 years. What was your motivation to carry out this honorary work for such a long time?

The IZKF Münster and the Medical Faculty of the University of Münster have a strong scientific reputation and conduct cutting-edge research on areas such as inflammation, infection, and imaging, all of which I am passionate about. That, at least, is what motivated me to join this Advisory Board. The good preparation of the projects that had to be evaluated, as well as the well-organised review procedure in collaboration with colleagues on site, has made many years of work possible and very pleasant.

Only a few members of the Advisory Board have changed during your term. What role does the stability of a peer-review board play in a faculty-internal institution's ongoing development?

The stability of our Advisory Board is especially essential to me because it is the only means to monitor progress of individual programmes, projects, and people over time. It also makes it possible to see the outcomes of consultations and decisions, as well as steer developments in new, desired directions if necessary, and receive feedback on such changes. This is critical for the competence of the experts as well as for the projects and the IZKF.

In 2017, the Science Council (WR)¹ suggested in a guideline to establish an efficient two-stage review process, to carefully prepare the processes and to carry out pre-reviews and pre-sorting. Established processes should be questioned frequently as a prerequisite for high quality and transparency. Was the IZKF a pioneer in this area?

The IZKF's two-stage assessment approach is undoubtedly extremely valuable because it allows for a double quality control and, more importantly, by independent reviewers. Because this has never been carried out before at other institutions, the IZKF Münster has played a pioneering role in this area.

Prof. Andreas Radbruch is Director of the German Rheumatism Research Centre (Deutsches Rheuma-Forschungszentrum DRFZ; a Leibniz-Institute) in Berlin and member of the Scientific Advisory Board since 2005. In 2018, he succeeded Prof. Schmidt as chairperson of the Board.

Dear Professor Radbruch, what is your motivation to carry out this honorary work for such a long time?

My passion has been and still is to share my enthusiasm for biomedical research with young talents and help them to develop original and relevant research lines. Unfortunately, in Germany's educational curricula for medical students, there is often little room for scientific training, and career options for medical scientists, that is students of natural sciences in medical faculties, are limited. The IZKF Münster has developed into a unique umbrella structure for basic and translational biomedical research, a training ground for clinician and medical scientists in science and networking. I am proud to have been part of this endeavour. Last, but not least, I have always enjoyed the project presentations as such. Mostly they were inspiring and entertaining; I did learn a lot myself.

Where do you see the limits of the evaluation process by the Scientific Advisory Board?

I see the emphasis in "... advisory ...", giving applicants and the board feedback from an outside perspective. On the other hand, an advisory board cannot give advice on what is not presented. At the IZKF, I sometimes feel the overwhelming enthusiasm of the applicants for basic research, less so for translating results into diagnostic or therapeutic tools changing the life of the patients. Or as Gottfried Wilhelm Leibniz would have said "theoria cum praxi". To this end, the programmes SEED.projects and ClinicStarT have been established. It would be great, if we could develop them into a competitive smashing success in the future.

How do you rate the assessment procedures at the IZKF?

The assessment procedures have evolved quite a bit over time and by now, I would consider them as pretty sophisticated, as far as the involvement of the scientific advisory board is concerned. By nature, I cannot comment on the preselection procedure by the IZKF Research Council. When it comes to the comparative evaluation of the preselected projects, the scientific advisory board takes great care to provide a fair assessment. Apart from the scientific quality, an important criterion is the chance that the project can deliver data underpinning a successful DFG grant application. Since the IZKF funds are limited, this sometimes leads to rejection of great, but very preliminary projects. A pity!



What development perspective do you see for the IZKF Münster?

In general, Münster has been a front-runner with the concept of "cells in motion", and a logical development would be to understand "cells in context", a single-cell based holistic view on diseases, in the tradition of Rudolf Virchow and his "Cellularpathologie". The IZKF can play a crucial role in the speedy acquisition and mastering of the required cutting-edge technologies, then developing them into core facilities for the entire faculty. The IZKF would also provide a flexible platform for innovative research, enabling competitive and high risk/high gain research and providing the decisive kick to be able to acquire external funding. Beyond the important role of established biomedical research centres in Münster, the IZKF as an overarching structure can provide the support needed for original research "out-of-the-box" thinking, interdisciplinary interactions and networking, and translation of innovative concepts into clinical practice.

¹ WR. Begutachtungen im Wissenschaftssystem. Position paper, Drs. 6680-17, October 2017.

MEMBERS OF THE EXTERNAL SCIENTIFIC ADVISORY BOARD OF THE IZKF MÜNSTER

(1996–2022)

52 internationally well-recognised scientists served the IZKF Board as members of the External Scientific Advisory Board in the past 25 years. Most importantly, they were responsible for the peer review of project proposals within the annually grant application procedure.

Name (alphabetical order)	Institution, University / Univ. Medicine, City, Country Code	Member	
		from ...	to ...
Prof. Dr. Claus R. Bartram	Institut für Humangenetik, Ruprecht-Karls-Universität Heidelberg	2005	2007
Prof. Dr. Philipp Beckhove	Leibniz-Institut für Immunotherapie (former Regensburger Centrum für Interventionelle Immunologie, RCI), Regensburg	2018	current
Prof. Dr. Michael Böhm	Klinik für Innere Medizin III (Kardiologie, Angiologie u. internistische Intensivmedizin), Universitätsklinikum des Saarlandes, Homburg/Saar	2005	2010
Prof. Dr. Axel Brakhage	Leibniz Institut für Naturstoff-Forschung und Infektionsbiologie / Hans Knöll Institut (HKI), Jena	2018	current
Prof. Dr. Matthias Brandis (emer.)	Abteilung für Kinderheilkunde, Universitätsmedizin, Albert-Ludwigs-Universität Freiburg	2000	2005
Prof. Dr. Dr. Thomas Braun	Abteilung Experimentelle Kardiologie, Max Planck-Institut für Physiologische und Klinische Forschung Bad Nauheim	2005	2017
Prof. Dr. Rudi Busse (†)	Institut für Physiologie I (Kardiovaskuläre Physiologie), Johann Wolfgang Goethe-Universität Frankfurt	2000	2007
Prof. Dr. Manfred Dierich	Institut für Hygiene, Medizinische Universität Innsbruck, A	1996	2009
Prof. Dr. Rainer Dietz (†)	Medizinische Klinik mit Schwerpunkt Molekulare und Klinische Kardiologie, Franz-Volhard-Klinik Berlin	2000	2005
Prof. Dr. Ulrich Dirnagl	Abteilung für Experimentelle Neurologie, Charité Universitätsmedizin Berlin	2008	2013
Prof. Dr. Alexander Enk	Hautklinik, Ruprecht-Karls-Universität Heidelberg	2009	2013
Prof. Dr. Dr. h.c. Herta Flor	Institut für Neuropsychologie und Klinische Psychologie, Zentralinstitut für Seelische Gesundheit Mannheim	2016	2021
Prof. Dr. Alexander Flügel	Institut für Multiple Sklerose-Forschung und Neuroimmunologie, Universitätsmedizin Göttingen, Georg-August Universität Göttingen	2018	current

Bold = Chairman of the Scientific Advisory Board



Name (alphabetical order)	Institution, University / Univ. Medicine, City, Country Code	Member	
		from ...	to ...
Prof. Dr. Ulrich Förstermann	Institut für Pharmakologie, Johannes Gutenberg-Universität Mainz	2000	2005
Prof. Dr. Arnold Ganser	Klinik für Hämatologie, Hämostaseologie, Onkologie und Stammzelltransplantation, Medizinische Hochschule (MHH) Hannover	2000	2009
Prof. Dr. Detlev Ganten	Max-Delbrück-Centrum für Molekulare Medizin Berlin	1996	2000
Prof. Dr. Friedrich Götz	Institut für Mikrobielle Genetik, Eberhard-Karls-Universität Tübingen	2009	2013
Prof. Dr. Matthias Goebeler	Klinik für Dermatologie, Venerologie und Allergologie, Universitätsklinikum Würzburg, Julius-Maximilians-Universität Würzburg	2018	current
Prof. Dr. Thomas Gudermann	Walther-Straub-Institut für Pharmakologie und Toxikologie, Medizinische Fakultät, Ludwig Maximilian Universität (LMU) München	2021	current
Prof. Dr. Christof R. Hauck	Lehrstuhl für Zellbiologie, Universität Konstanz	2011	2020
Prof. Dr. Lutz Hein	Institut für Experimentelle und Klinische Pharmakologie und Toxikologie, Albert-Ludwigs-Universität Freiburg	2012	2013
Prof. Dr. Rob Henning, MD	Clinical Pharmacology, Faculty of Medical Sciences, University of Groningen, NL	2014	current
Prof. Dr. Susanne Herold	Schwerpunkt Infektiologie, Medizinische Klinik II, Universitätsklinikum Gießen, Justus-Liebig-Universität Gießen	2019	current
Prof. Dr. Dr. h.c. Hanjörg Just (emer.)	Medizinische Klinik III (Kardiologie und Angiologie), Albert-Ludwigs-Universität Freiburg	1996	2000
Prof. Dr. Dr. h.c. Joachim R. Kalden (emer.) (†)	Medizinische Klinik III (Klinische Immunologie und Onkologie), Friedrich Alexander-Universität Erlangen	1996	2005
Prof.‘in Dr. Dörthe M. Katschinski	Institut für Herz- und Kreislaufphysiologie, Universitätsmedizin Göttingen, Georg-August Universität Göttingen	2018	current
Prof. Dr. C. James Kirkpatrick	Institut für Pathologie, Johannes Gutenberg-Universität Mainz	1996	2000
Prof. Dr. Jürgen Knop (emer.)	Hautklinik, Johannes Gutenberg-Universität Mainz	2000	2005
Prof. Dr. Heyo K. Kroemer	Institut für Allgemeine Pharmakologie, Ernst-Moritz-Arndt-Universität Greifswald	2009	2011
Prof. Dr. Klaus Lechner (emer.) (†)	Klinik für Innere Medizin I (Hämatologie/Hämostaseologie), Universitätsklinik Wien, A	1996	2000
Prof. Dr. Peter Lipp	Institut für Molekulare Zellbiologie, Universität des Saarlandes Homburg/Saar	2009	2021
Prof. Dr. Hans K. Müller-Hermelink (emer.)	Pathologisches Institut, Julius Maximilians-Universität Würzburg	1996	2000

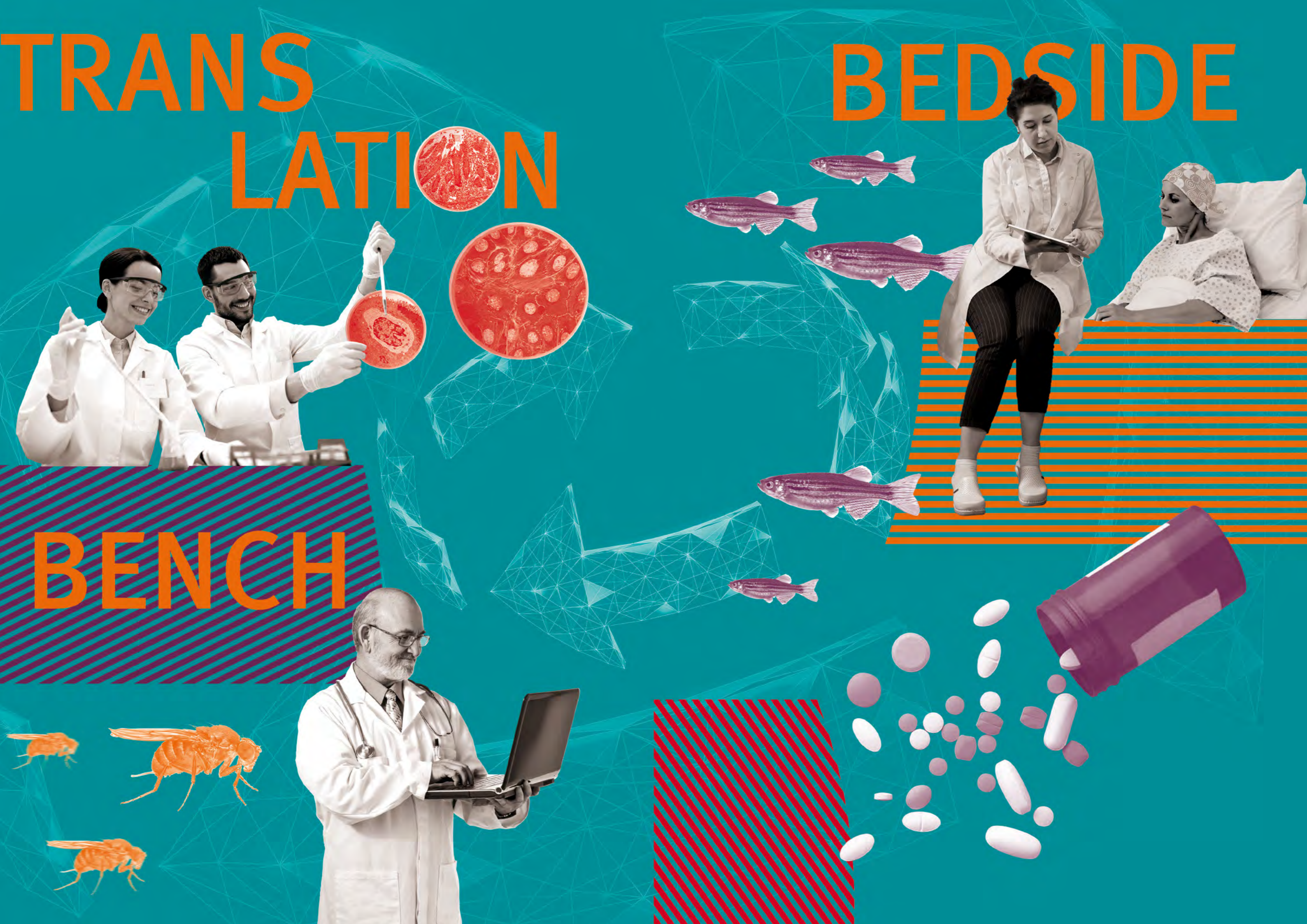
Name (alphabetical order)	Institution, University / Univ. Medicine, City, Country Code	Member	
		from ...	to ...
Prof. Dr. Dr. Robert Nitsch	Institut für Mikroskopische Anatomie und Neurobiologie, Johannes Gutenberg-Universität Mainz	2011	2016
Prof. Dr. Martin Paul	Hauptamtlicher Dekan, Charité Universitätsmedizin Berlin	2008	2011
Prof. Dr. Andreas Peschel	Interfakultäres Institut für Mikrobiologie und Infektionsmedizin, Eberhard-Karls-Universität Tübingen	2014	2017
Prof. Dr. Dr. Hans-Michael Piper	Physiologisches Institut, Justus Liebig-Universität Gießen	2008	2009
Prof. Dr. Andreas Radbruch	Deutsches Rheuma-Forschungszentrum Berlin	2005	current
Prof. Dr. André Reis	Institut für Humangenetik, Friedrich Alexander-Universität Erlangen	2009	2017
Prof. Dr. Dirk Ruiter (emer.)	Institut für Pathologie und Hauptamtlicher Dekan, Radboud University Nijmegen, NL	2000	2009
Prof. Dr. Wolfgang Schaper (emer.)	Max Planck-Institut für Physiologische und Klinische Forschung Bad Nauheim	1996	2000
Prof. Dr. Georg Schett	Medizinische Klinik 3 (Rheumatologie und Immunologie), Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg	2021	current
Prof. Dr. Reinhold E. Schmidt (emer.) (†)	Klinik für Rheumatologie und Immunologie, Medizinische Hochschule (MHH) Hannover	2005	2017
Prof. Dr. Erwin J. Schöpf (emer.) (†)	Universitäts-Hautklinik, Albert-Ludwigs-Universität Freiburg	1996	2000
Prof. Dr. Karl-Friedrich Sewing (emer.) (†)	Institut für Allgemeine Pharmakologie, Medizinische Hochschule (MHH) Hannover	1996	2000
Prof. Dr. Indira Tendolkar	Department of Psychiatry and Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Centre, Nijmegen, NL	2021	current
Prof. Dr. Gerd Utermann (emer.)	Institut für Biologie und Humangenetik, Medizinische Universität Innsbruck, A	1996	2005
Prof. Dr. Kurt von Figura (emer.)	Zentrum Biochemie und Molekulare Zellbiologie, Abteilung Biochemie II, Georg-August-Universität Göttingen	2000	2005
Prof. Dr. Jürgen Wehland (†)	Abteilung Zellbiologie, Helmholtz-Zentrum für Infektionsforschung Braunschweig	2009	2010
Prof. Dr. Wolfgang Weidner (emer.)	Urologische Klinik, Justus-Liebig-Universität Gießen	1996	2000
Prof. Dr. Cornelius Weiller	Klinik für Neurologie und Neurophysiologie, Universitätsklinikum Freiburg	2005	2007
Prof. Dr. Otmar D. Wiestler	Institut für Neuropathologie, Rheinische Friedrich-Wilhelms-Universität Bonn	2000	2007
Prof. Dr. Ulf Ziemann	Zentrum für Neurologie und Hertie-Institut für Klinische Hirnforschung, Eberhard-Karls-Universität Tübingen	2014	current



TRANS LATION

BEDSIDE

BENCH



FROM MODELS AND MODEL ORGANISMS TO PATIENTS

THE IZKF AS A BRIDGE BETWEEN BASIC AND CLINICAL RESEARCH

Prof. Volker Gerke, Institute of Medical Biochemistry, IZKF Chairman 2012–2018



received by basic scientists. Just imagine where medical and clinical science would be without such seminal discoveries as neurotransmitters, growth factors and hormones, antibodies and the concepts of innate and adaptive immunity, ion channels and GPCRs, the genetic control of embryonic development, cell compartmentalisation and intracellular trafficking, computer tomography and MRI, to name a few. Thus, clinical science towards diagnosing and treating diseases benefits enormously from basic biomedical science, which typically employs different model systems ranging from cell culture and simple organisms such as yeast and *Drosophila* to more complex organismic models, e.g. zebra fish and mouse.

The IZKF Münster was designed as an instrument funding high quality science at the Medical Faculty. From the very beginning, the IZKF has promoted the idea of supporting clinical applications also through the funding of basic research employing cells and model organisms. Eventually, this led to close cooperations between basic and clinical scientists, a major goal of the IZKF. Many such examples have seen IZKF funding in the last 25 years and it would be too time and space consuming to discuss them all. Nonetheless, a few should be mentioned as they have been of conceptual importance in the past and also can be considered visionary for the future development of the IZKF.

Ground-breaking fundamental work on the characterisation of Shiga-toxin producing enterohemorrhagic *E. coli* (EHEC), funded among other things by the IZKF, allowed the group of Helge Karch (Institute of Hygiene) to quickly identify the origin of the 2011 European *E. coli* O104:H4 outbreak (see, for example¹).

Biochemical approaches combined with the use of genetic mouse models enabled the group of Johannes Roth (Institute of Immunology) to characterise the receptor for

The understanding of fundamental disease-causing mechanisms and thus the possibility to successfully translate scientific results into clinical applications requires a detailed knowledge of the underlying biological and biochemical principles. Moreover, improved diagnostic and treatment options depend on the development of novel techniques and methods. Thus, basic research towards the general understanding of biological mechanisms and their visualisation and manipulation is a prerequisite for successful and meaningful clinical research.

Prime examples of this dogma are the Nobel prizes for Physiology or Medicine that have been awarded mainly to scientists for their research on such basic principles and methods. As a matter of fact, more than 70% of the Nobel prizes for Physiology or Medicine of the past 50 years were

“Basic research towards the general understanding of biological mechanisms and their visualisation and manipulation is a prerequisite for successful and meaningful clinical research.”

Prof. Volker Gerke

the extracellular alarmins S100A8/A9 and also target these molecules for the diagnosis and treatment of autoimmune disorders (see, for example²). Likewise, my own group (Institute of Medical Biochemistry), employing isolated human neutrophils as model, identified the long sought-after receptor for the anti-inflammatory protein annexin A1 paving the way to future therapies of inflammatory reactions (see, for example³).

Also employing mouse models as well as cultivated human cells, the groups of Heinz Wiendl and Sven Meuth (Department of Neurology) could show that endothelial potassium channels

play an important role in the regulation of immune cell migration across the blood-brain barrier and thus represent targets for the treatment of diseases such as multiple sclerosis where blood-brain barrier integrity is compromised (see, for example⁴).

Coming from a different background and using *Drosophila melanogaster* as a model system, Maja Matis and her group (Institute of Cell Biology) identified a novel role of microtubules in the organisation of cell polarity and epithelial morphogenesis and also developed tools to acutely manipulate microtubules likely to be relevant in clinical settings in the years to come (see, for example⁵).

Importantly, the IZKF also supported novel methodical approaches that are likely to benefit clinical translation and thus represent another direction of future developments. In one example, Klaus Dreisewerd and his colleagues (Institute of Hygiene) advanced matrix-assisted laser desorption mass spectrometry towards imaging the chemical nature of tissue samples (see, for example⁶).

Moving on to novel diagnostic concepts, the groups of Lydia Sorokin (Institute of Physiological Chemistry and Pathobiochemistry) and Michael Schäfers (Department of Nuclear Medicine) developed site-specifically labeled ligands of matrix metalloproteinases that can be used to visualise increased enzyme activity in mouse models of immune cell extravasation into the brain. Together with Heinz Wiendl (Department of Neurology), it could be shown to diagnose lesions in patients suffering from multiple sclerosis (see, for example⁷).

Together, these examples illustrate that the important role of the IZKF in funding not only patient-oriented but also basic research has led to many seminal discoveries and more importantly a bridging of fundamental and clinical science and thereby translation of findings into clinical applications. This path should be continued and we will see more of this success in the years to come.

¹ Karch H, Denamur E, Dobrindt U, Finlay BB, Hengge R, Johannes L, Ron EZ, Tønnum T, Sansonetti PJ, Vicente M (2012) The enemy within us: lessons from the 2011 European *Escherichia coli* O104:H4 outbreak. *EMBO Molecular Medicine* 4 (9): 841–848.

² Vogl T, Tenbrock K, Ludwig S, Leukert N, Ehrhardt C, van Zoelen MA, Nacken W, Foell D, van der Poll T, Sorg C, Roth J (2007) Mrp8 and Mrp14 are endogenous activators of Toll-like receptor 4, promoting lethal, endotoxin-induced shock. *Nature Medicine* 13 (9): 1042–1049.

³ Walther A, Riehemann K, Gerke V (2000) A novel ligand of the formyl peptide receptor: annexin I regulates neutrophil extravasation by interacting with the FPR. *Molecular Cell* 5 (5): 831–840.

⁴ Bittner S, Ruck T, Schuhmann MK, Herrmann AM, Moha ou Maati H, Bobak N, Göbel K, Langhauser F, Stegner D, Ehling P, Borsotto M, Pape HC, Nieswandt B, Kleinschnitz C, Heurteaux C, Galla HJ, Budde T, Wiendl H, Meuth SG (2013) Endothelial TWIK-related potassium channel-1 (TREK1) regulates immune-cell trafficking into the CNS. *Nature Medicine* 19 (9): 1161–1165.

⁵ Singh A, Saha T, Begemann I, Ricker A, Nüsse H, Thorn-Seshold O, Klingauf J, Galic M, Matis M (2018) Polarized microtubule dynamics directs cell mechanics and coordinates forces during epithelial morphogenesis. *Nature Cell Biology* 20 (10): 1126–1133.

⁶ Soltwisch J, Kettling H, Vens-Cappell S, Wiegelmann M, Mühling J, Dreisewerd K (2015) Mass spectrometry imaging with laser-induced postionization. *Science* 348: 211–215.

⁷ Gerwien H, Hermann S, Zhang X, Korpos E, Song J, Kopka K, Faust A, Wenning C, Gross CC, Honold L, Melzer N, Opdenakker G, Wiendl H, Schäfers M, Sorokin L (2016) Imaging matrix metalloproteinase activity in multiple sclerosis as a specific marker of leukocyte penetration of the blood-brain barrier. *Science Translational Medicine* 8 (364): 364RA152.

THE IZKF MÜNSTER FUNDING FORMATS

Based on the guidelines of the former Federal Ministry of Research and Technology (BMFT) for the “Establishment of interdisciplinary clinical research centers in university hospitals” from 1993, the basic funding profile of the IZKF Münster was already defined in the first grant application for establishing the centre. Three main tasks are of central interest and defined in the IZKF statutes:

- (a) Promotion of cutting-edge research through appropriate formats.
- (b) Promotion of young scientists, with focus on the future generation of clinician scientists.
- (c) Acquisition and implementation of cutting-edge technologies in service units (Core Units) as well as development of new methodologies.

In order to offer funding opportunities to many faculty members and to initiate or promote interdisciplinary cooperation between the different fields of medicine, strict funding principles were established in the early years.

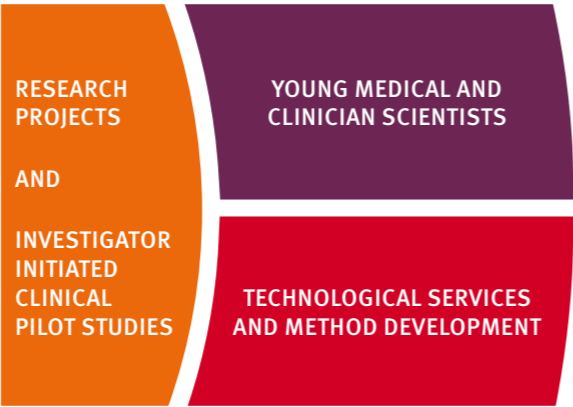


Figure 3: Central tasks of the IZKF

Principles of Funding	Goals
<ul style="list-style-type: none">› One research project per leadership position› IZKF membership only for the duration of active funding› Acquisition of qualified third-party funding, in particular from DFG, NIH or ERC as a prerequisite› As quality criteria, published preliminary work and a high level of innovation are required.› Project proposals possible for all research foci of the Medical Faculty	<ul style="list-style-type: none">› Participation of as many institutions and working groups as possible› Motivating faculty members to apply for qualified external funding› International visibility and competitiveness› Interdisciplinary work in partially annually changing composition within the research foci› Promotes networking between institutions
<p>Adaptation of the funding formats</p> <ul style="list-style-type: none">› IZKF regular projects (since 1996, annual call)› Clinical Research Award (2009 – 2012)› Clinical Translation Research Projects (CTRP; 2013 – 2016)› Clinical Translation Start Trials (CST; new since 2018)	<ul style="list-style-type: none">› Flexible programmes enable response to changing external or internal circumstances› Support of the IZKF for the structural development of the Medical Faculty› IZKF as a motor for innovative, internationally recognised clinical research (basic and patient-oriented research)
<p>Bonus for transferring an IZKF research project to external DFG funding</p> <p>Extension of funding for 6 months if a project-relevant DFG application (equivalent to ERC or NIH) is submitted by the deadline</p>	<ul style="list-style-type: none">› Incentive for the submission of DFG grant proposals or other high-ranking grants at defined times› Increasing awareness about the importance of external funding for the faculty in the national competition

Furthermore, the overarching strategy of the IZKF Münster has placed a strong emphasis on the individual promotion of young researchers from the very beginning. On the one hand, doctoral students and post-doctoral researchers are given the opportunity within the very well-equipped research projects to develop excellent preliminary work for their own careers. On the other hand, the promotion of independent junior research groups is stipulated in the objectives according to §1 (4) of the statutes. Initially, the leadership positions for junior research groups were filled with excellent scientists after an international call for applications. Since 2012, priority in funding has been given to the faculty’s own junior medical staff. Specifically in the Clinician Scientist funding format SEED.projects, research-enthusiastic doctors in specialist training gain comprehensive scientific expertise in addition to clinical experience in patient care through independent project funding in clinical and experimental medical research. Due to changing requirements within the Medical Faculty of Münster, the junior staff concept has thus been adapted several times over the past 25 years.

- › Research Rotation Programme (internal allocation, 1996 – 2016)
- › Funding established postdocs (Forschungsgruppen, after external tendering, 1998 – 2010)
- › SEED.projects (internal tendering for Junior Clinician Scientists, since 2012)

Method development projects are a special format of research project funding. These are highly technical projects that focus on the validation and development of special technologies rather than mechanistic problems. They are evaluated independently during the annual review process. In most cases, they are supported for a period of two years.

There are no calls for Core Units. These extensive concepts for high-throughput procedures or technical improvements must be broadly supported by research projects of the IZKF and additional active research groups of the Medical Faculty in order to receive IZKF funding.

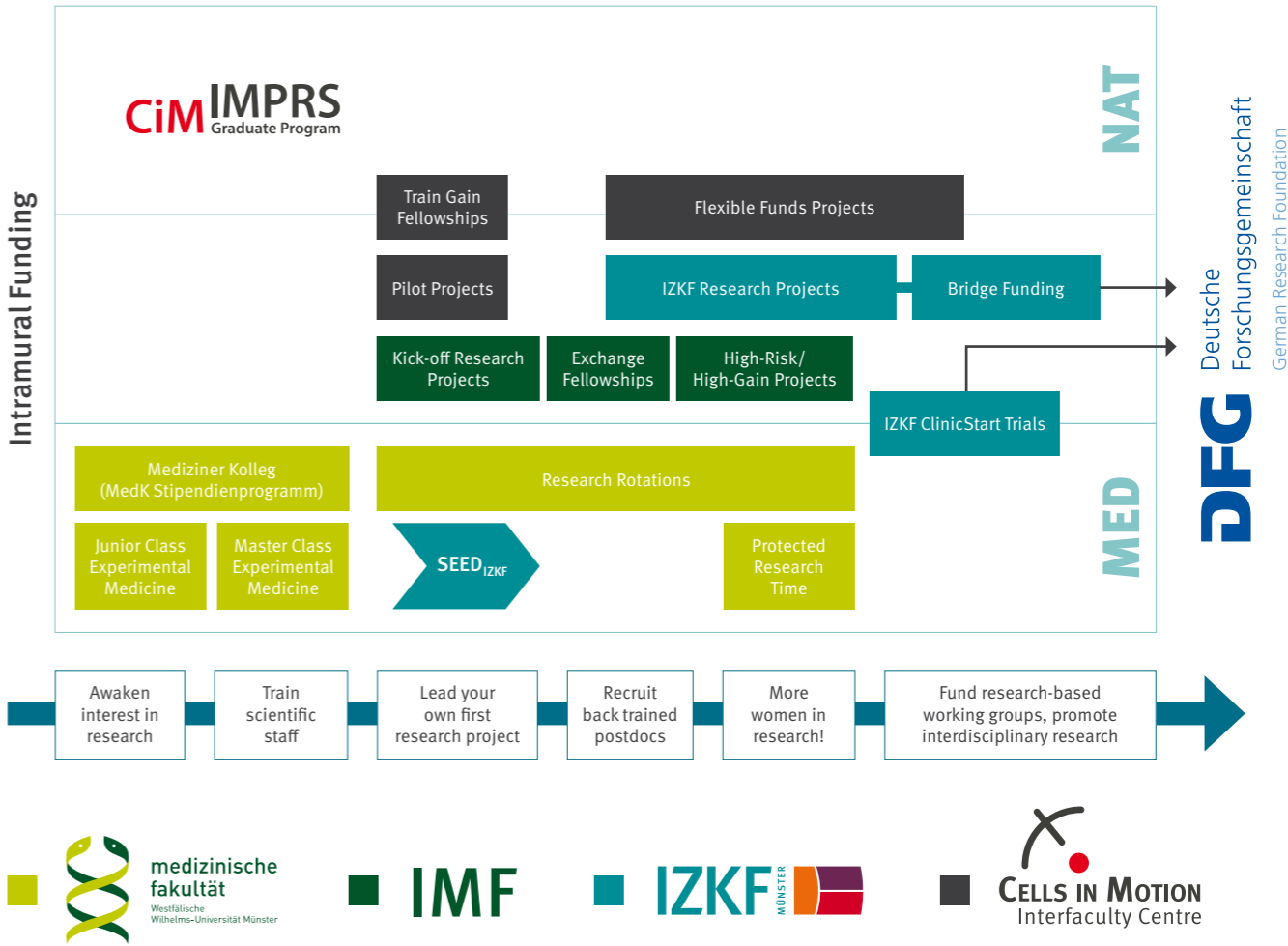


Figure 4: Integration of IZKF funding formats into the funding offers of the Medical Faculty

IZKF RESEARCH PROJECTS

IZKF NORMALVERFAHREN

FUNDING OF INNOVATIVE RESEARCH IDEAS
PROGRAMME CALL ANNUALLY SINCE 2005
(AFTER BMBF FUNDING)

The “backbone” of the IZKF Münster and main funding format since 1996 are the IZKF Research Projects, an equivalent to the “Sachbeihilfe” funding format offered by the DFG. Likewise, research projects are characterised by a high scientific quality and an innovative research topic. They should be in line with the research priorities of the IZKF Münster.

When evaluating the funding applications, special weight is given to the specific preliminary work (publications) of the applicants and successful acquisition of qualified third-party funding. During the application process, the new projects are assigned to a suitable research focus based on the actual composition of topics. Since many research topics can be assigned to two different focus areas, this promotes networking between the scientists of the respective institutions.

GUIDELINE	DETAILS
Aim	Promotion of innovative research approaches with high scientific quality and originality to strengthen clinical and basic biomedical research at the Medical Faculty Münster. Contribution to the acquisition of third-party funding for the Medical Faculty by transferring the successfully processed research approaches to the DFG's third-party funding programme.
Equipment	Maximum funding volume per project of EUR 110.000 per year for 3 years including personnel (i.e. postdoc, PhD student or technical staff) and consumables, as justified by the work programme.
Application requirements	All full-time scientists employed at the Medical Faculty, beginning at the PhD level are eligible to apply; published preliminary work and third-party funding are prerequisites; only one project outline/application round/researcher may be submitted.
Selection process	Two-step peer review process as outlined above. Call for applications at the beginning of February; if funding is recommended, start of project on January 1st of the following year.
Grants	A funding budget of about 1,0 million euros is available for this format per year (approx. 9–11 new projects can be included annually).
Applications	Since 2005, 511 project proposals were submitted; 245 research projects were funded, corresponding to a funding rate of 48%.
Perspective	The transfer of an IZKF-funded project into another third-party funded project (preferably DFG, NIH or ERC Consolidator Grant) is expected. An extension of 6 months is granted for this purpose if approval appears promising based on the results obtained.

“The efficient administration of the IZKF as well as the flexible use of funds enable not only project funding, but also the various instruments for promoting young researchers. These are of great importance especially in today's times of economic pressure in the hospitals.”

Prof. Reinhold E. Schmidt
Chairman of the Scientific Advisory Board 2009–2017 († 2022)

A catalogue of all IZKF research projects is available on the IZKF Homepage under: www.medizin.uni-muenster.de/izkf

ANNUAL APPROVAL RATES FOR IZKF RESEARCH PROJECTS

48 %
Average approval rate

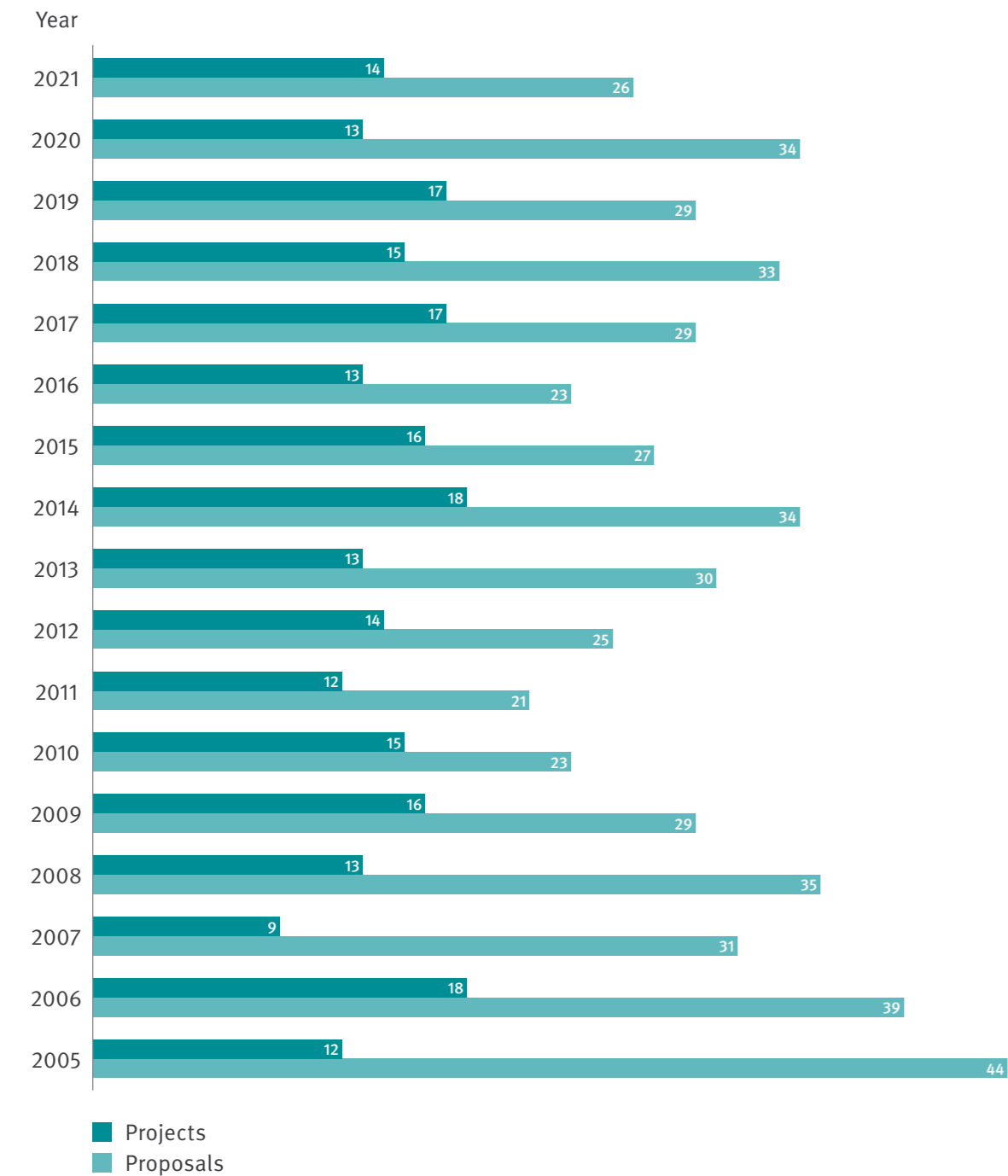


Figure 5: Analysis of funding rates in the Research Projects format
Comparison of submitted project sketches and approved projects per year (after 2-step peer review procedure).



RETURN POSITIONS FOR GERMAN POSTDOCS

FUNDING BY THE BMBF AS PART OF THE
GOVERNMENT PROGRAMME “GESUNDHEITSFORSCHUNG 2000”
PROGRAMME CALL FOR PROPOSALS 1998 – 2000

The special programme “Rückkehrstellen für deutsche Postdoktoranden” of the BMBF was designed for IZKF universities and was aimed at young scientists who wanted to resume their career at a German research institution after having spent at least one year abroad in a high-tech country (USA, Australia, Europe, Japan). The BMBF advertised it four times through the IZKF between 1998 and 2000.

GUIDELINE	DETAILS
Aim	Return of young top-level scientists to a research laboratory of the IZKF universities to continue their career after a stay abroad.
Equipment	Personnel position for max. 2 years, consumables about 10.000 DM p.a. (Δ 5.113 EUR), travel grants from IZKF central funds.
Application requirements	At least 1-year research stay in a high-tech country, age under 35 years, German citizenship or centre of life in Germany.
Selection process	Two-stage application procedure (presentation of applicants to internal selection committee of the IZKF; research proposal to the BMBF Project Management Agency, which made a selection via external review); third-party funding of the selected candidates by the BMBF.
Grants	6 Return Projects were granted for the IZKF Münster, i.e. 46% of all approvals; total funding budget 690.313 EUR.
Applications	A total of 39 applications (IZKF Münster 12, 31%) were submitted to the BMBF, of which 16 were approved (IZKF Münster 7, 58% of Münster applications). A total of 13 returnees were funded. The programme was discontinued in summer 2000.
Perspective	The IZKF have taken on a pioneering role for the returnee programme of the state of North Rhine-Westphalia. Based on the consistently positive experience, since 2007 the “Programm zur Förderung der Rückkehr des wissenschaftlichen Spitzennachwuchses aus dem Ausland” has been offered to outstanding young scientists who want to return to a university in NRW to establish a junior research group, with up to 1.25 million euros each over five years.

Project Number	Project Leader	Title	from ...	to ...	RF*	Participating Institutions
Rück/001/99 01KX9820/B	König	Massenspektrometrische Untersuchungen zur Struktur und Funktion der Kohlenhydratketten in Glykoproteinliganden von E- und P-Selektin	04.99	03.01	CU	Institute of Medical Physics and Biophysics
Rück/002/99 01KX9820/D	Echtermeyer	Funktion des Heparansulfat-Proteoglykans Syndecan-4 in der Wundheilung	09.99	08.01	2	Institute of Physiological Chemistry and Pathobiochemistry
Rück/003/00 01KX9820/H	Göpfert	Extrazelluläres Adenosintriphosphat als purinerges Signalmolekül im kardiovaskulären System	07.00	06.02	1	Institute of Clinical Chemistry and Laboratory Medicine
Rück/004/00 01KX9820/I	Naskar	Anwendung neuroprotektiver Substanzen bei experimenteller Induktion von Glaukom	09.00	08.02	3	Institute of Experimental Ophthalmology
Rück/005/00 01KX9820/J	Heusipp	Charakterisierung <i>in vivo</i> exprimierter Gene von Yersinia enterocolitica und ihrer Rolle für die Pathogenität	11.00	10.02	2	Institute of Infectiology (ZMBE)
Rück/006/01 01KX9820/K	Rössig	Entwicklung von tumorspezifischen T-Zell-Rezeptorchimären für die adoptive Immuntherapie von Tumoren der Ewing-Familie	01.01	09.02	1	Department of Pediatric Hematology and Oncology

* RF = Research Focus

IZKF FUNDING ESTABLISHED POSTDOCS (IZKF FORSCHUNGSGRUPPEN)

FUNDING OF OUTSTANDING ESTABLISHED
POSTDOCTORAL RESEARCHERS
INTERNATIONAL CALLS ON A SPECIFIED TOPIC (1997–2007)

According to a study conducted by the Association of Clinical Research Centres (ACRC) in 2001 (see page 72), there was a scarcity of financing opportunities in Germany for ambitious individuals in the late postdoctoral phase (i.e., between the ages of 35 and 45 years). That is why the majority of these advanced scientists chose to travel abroad, with a low return rate. As a result, the IZKF Münster's funding model for established postdocs included group leader jobs in the aforementioned age bracket.

The research groups were assigned to an institute or clinic and worked independently without being accountable to the clinic director. The group leaders were essentially relieved of their clinical duties and could thus devote themselves entirely to research. In this way, the institution in question received an active research group and in return had to provide the necessary infrastructure.

GUIDELINE	DETAILS
Aim	Scientific qualification of ambitious scientists and targeted expansion of the selected research field.
Equipment	Personnel position for max. 5 years, consumables about 10.000 EUR p.a. , travel grant from IZKF central funds.
Application requirements	Applicants were expected to have a MD degree or a PhD in life sciences and a track record of peer-reviewed publications, extramural funding and an active research programme.
Selection process	The research groups were advertised on a topic that promised outstanding, innovative research for one or more of the IZKF research areas. The IZKF Research Council was involved in selecting the most suitable topic. The most suitable candidate was chosen after an international call for proposals and evaluation by the IZKF Scientific Advisory Board.
Grants	Six groups were funded with a total funding budget of 4.5 million EUR.
Perspective	The goal of this initiative was to create a high-quality competition for a group leader position amongst outstanding young scientists, who would bring fresh core competences to the faculty along with their enthusiasm for the advertised research topic. Despite promising career opportunities, the programme was discontinued due to a lack of applications. All group leaders left the Medical Faculty after the end of their project, as there were no opportunities for tenure-track positions.

“IZKF-funding greatly facilitated pursuing my research projects parallel to my responsibilities in patient care. Moreover, the interdisciplinary nature of the IZKF was always inspiring and broadened my view on scientific problems.”

Prof. Christoph Bremer,
Independent Research Group at the Department of Clinical Radiology,
Since 2009 Medical Director of the St. Franziskus-Hospital Münster

Project Number	Project Leader	Title	from ...	to ...	RF*	Participating Institutions
FG/001/98	Prehn	Control and pathophysiology of apoptosis	01.98	12.02	2	IZKF Münster
FG/002/01	Knecht	Hemispheric specialization for language	06.01	05.06	3	Department of Neurology
FG/003/03	Bremer	Molecular imaging in tumor diagnostics	07.03	06.08	CU	Department of Clinical Radiology
FG/004/03	Konrad	Neurobiology of learning and pathophysiology of impaired learning in affective and psychotic disorders	08.03	07.09	3	Department of Psychiatry and Psychotherapy
FG/005/03	Tenbrock	Transcriptional regulation of CREM alpha and the effect on target gene expression in immune cells	07.03	06.08	2	Department of General Pediatrics
FG/006/08	Lohr	Intracellular calcium dynamics and its role in the axonal growth promoting effect of olfactory ensheathing cells (OECs)	04.08	03.10	3	Institute of Physiology I – Neurophysiology

* RF = Research Focus

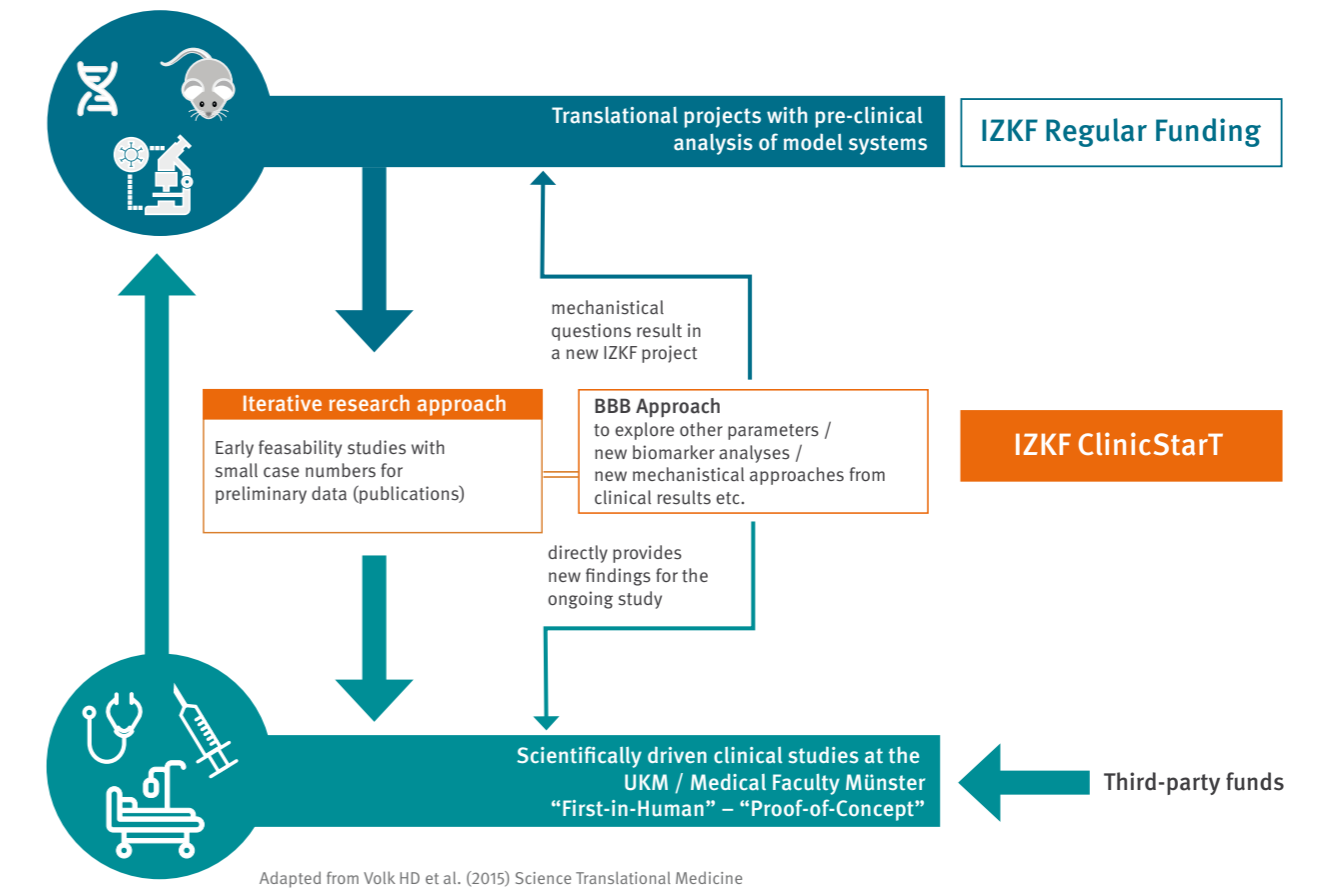
IZKF CLINICAL TRANSLATION START TRIALS (CLINICSTART)

FUNDING OF CLINICAL PILOT STUDIES
(UPGRADED FROM THE PREVIOUS CLINICAL TRANSLATIONAL RESEARCH PROJECTS, CTRP)
PROGRAMME CALL ANNUALLY SINCE 2018

In order to strengthen patient-centred clinical research, the IZKF Münster funds time-limited innovative concepts and science-driven own ideas (“Investigator-initiated trials”, IITs) for clinical trials, which are intended to close the funding gap between findings from basic research and patient-centred research and to bring the findings into clinical trials. The fundamental goal of this new IZKF funding format is to increase the implementation of early IITs/pilot studies in

the Medical Faculty. Therefore, after the two-year funding phase, the results from the pilot studies should ideally provide direct preliminary work for clinical studies financed externally by qualified third-party funding. Proof of efficacy of a therapeutic, diagnostic, or prognostic method is a key prerequisite for submitting successful applications to third-party funding bodies such as the DFG, BMBF, or “Deutsche Krebshilfe”.

GUIDELINE	DETAILS
Aim	Strengthening patient-centred clinical research by funding of innovative concepts and science-driven own ideas in pilot studies (“Investigator-initiated trials”, IITs).
Equipment	Start-up funding for clinical trials financed by third-party funds; maximum funding volume EUR 200.000 for 2 years with flexible use of funds. A further EUR 40.000 are possible for an experimental pilot project derived from the study.
Application requirements	High scientific originality and quality as well as direct clinical relevance are necessary for all studies. Study proposals must fit into the research priorities of the IZKF; published preliminary work on the topic and at least one ongoing third-party funding are basic requirements. Preliminary work must plausibly indicate a clinical application of the findings obtained from basic research.
Selection process	Regulatory classification of the study idea through a study consultation by a Coordination Centre for Clinical Trials is required before submitting a proposal.
Grants	Two-step peer review process as outlined above. Call for applications at the beginning of February; start of the pilot study dependent on the positive vote of the ethics committee and, if necessary, other contractual regulations. Funding volume of about EUR 250.000 is available for this format per year.
Applications	Since the first call for proposals in 2018, 4 pilot studies have been funded in this format.
Perspective	No perspective possible yet.



Project Number	Project Leader	Title	from ...	to ...	RF	Participating Institutions
CST/001/19	Zarbock / Roth	Biomarker-guided implementation of glutamine to reduce the occurrence of AKI after cardiac surgery (Glacé-Trial)	09.19	08.21	2	Department of Anesthesiology, Intensive Care and Pain Therapy / Institute of Immunology
CST/002/19	Reinartz / Greve / Eich	Phase II Trial to assess the efficacy of low dose involved site radiation therapy (ISRT) with 20 Gy in localized indolent gastric or duodenal lymphoma	09.19	02.22	2	Department of Radiotherapy – Radiooncology
CST/003/22	Klotz / Vogl	Effects of a combined supplementation of conjugated linoleic acid (CLA) and probiotics (Vivomixx®/VSL#3) as add-on to a first-line immunotherapy in relapsing-remitting Multiple Sclerosis	07.22	06.24	3	Department of Neurology with Institute of Translational Neurology / Institute of Immunology
CST/004/22	Meersch / Roth	Finding a patient individualized strategy for the initiation of renal re-placement therapy (RRT) in critically ill patients with acute kidney injury (AKI) – an observational trial	01.22	12.23	2	Department of Anesthesiology, Intensive Care and Pain Therapy / Institute of Immunology

* RF = Research Focus

GENUINE TRANSLATIONAL RESEARCH – CHALLENGES OF INVESTIGATOR INITIATED TRIALS

INTERVIEW with Prof. Luisa Klotz, Vice Dean for research and young academics of the Medical Faculty



A new ranking of the VFA³ shows that German university medicine has fallen to fifth place in the international ranking of countries conducting clinical studies, in Europe behind Great Britain, The Netherlands and Spain. The reasons for this are the lack of a “study culture” and of infrastructure for conducting studies, the lack of resources and lengthy approval processes. What, in your opinion, needs to change in the research structure so that studies can be launched more quickly and easily?

In recent years, the regulatory requirements for clinical trials and the associated bureaucratic burden have risen continuously. This hurdle cannot, of course, be reduced. It is therefore all the more important to familiarise clinician scientists with these regulatory requirements for conducting clinical trials already at an early stage in their training, so that a realistic implementation of scientific ideas in a clinical trial is combined with realistic planning. Furthermore, it must be criticised that the funding structure for investigator-initiated studies in Germany is still very unsatisfactory, as the funding opportunities are essentially limited to two large public funding agencies. In each case, quite strict requirements are placed on the clinical study programmes to be funded, so that a number of scientifically good ideas do not match the requirements of these programmes and there is ultimately no funding offer for these kind of studies in Germany. Thirdly, the existing funding programmes often do not have the necessary flexibility in terms of the use of funding that is required in everyday clinical practice. In contrast to classical scientific projects, there are often relevant changes in the time schedule, which makes a flexible use of the available funds absolutely necessary.

Investigator initiated clinical trials are the cornerstones of academic translational research¹. In its recommendation paper, the DFG outlines the need for increased funding of early clinical studies (Phase-I-Trials, First-in-human), which is currently lacking in any public funding. Furthermore, existing infrastructures must be expanded and further developed, as the potential of studies from German university medicine is considered to be too low. Better structures could improve this. This has already been an important concern of a working group of the Senate Commission of the DFG in 2018².

“An early and structured development of methodological competences of clinician scientists for the planning and execution of clinical trials and especially investigator-initiated clinical studies is desirable.”

Prof. Luisa Klotz

Is there a diaspora of methodological competences for clinical trials in Münster university medicine? Should the development of methodological abilities be prioritised in specialty trainings or at an earlier stage?

I don't think this is a Münster-specific problem but is a problem at all German university centres. From my point of view, an early and structured development of methodological competences of clinician scientists for the planning and execution of clinical trials and especially investigator-initiated clinical studies is desirable. Here, a joint effort of the Centre for Clinical Studies (ZKS) and the large clinically translationally active clinical departments for a development of such a curriculum would be helpful. Furthermore, an active support by the respective clinical directors is essential in order to create the necessary “protected clinical research time” for the young scientific staff feasible. In addition, it would be desirable if young clinician scientists could acquire hands-on experience in the conduct of clinical studies as part of their residency training, however, this can certainly only be done on an individual basis in the respective clinical department.

According to the 2018 report by the Science Council, Germany does not fully utilize its potential in non-commercial or science-driven clinical studies.⁴ Where are the bottlenecks?

I believe that there are still far too few funding opportunities for investigator-initiated clinical trials in Germany. This is especially true for exploratory proof-of-concept studies. In addition, the costs for conducting such trials have increased significantly in recent years due to the constantly increasing regulatory burden, so that very high throughput costs are incurred for each clinical trial. So the problems are on the one hand on the side of funding opportunities, and on the other hand in the increasing need for the design of appropriate and straight-forward designed clinical trials, for which inevitably a high level of competence and experience in conducting clinical trials is required.

The IZKF were established in Germany in 1996 to strengthen structural requirements for clinical research and improve the quality by interdisciplinary research approaches. In cooperation with local coordination centres for clinical studies, which were initiated by a second structural funding programme by the BMBF, they should seek consensus in the organisation and implementation of investigator initiated trials as pilot projects.

The new instrument of the IZKF for funding of early clinical investigator-initiated clinical studies as well as the establishment of a university hospital early clinical trial unit both represent quite essential infrastructural conditions that have been initiated at the Medical Faculty Münster in recent years. Nevertheless, it must be stated that there is still room for improvement in terms of the financial scope of such grants and the number of projects that can be funded by such an instrument. In my view there is a need for a broader and more flexible range of funding opportunities in order to reduce the hurdle for successful planning, acquisition and implementation of early clinical studies in Münster. Moreover, it would be desirable to develop a structured consulting programme for discussion of emerging scientific ideas to increase the chances for their successful translation into a clinical trial, and this programme should not only cover the regulatory requirements (as is currently already provided by the ZKS) but also with regard to the feasibility of a realistic translation of the scientific question into a clinical study. A third key aspect is the necessity for a much more flexible use of the research funds made available. This is essential for a successful and realistic implementation of clinical studies into the clinical reality.

¹ Erkenntnisgeleitete Forschung stärken, von Wissensspeichern profitieren. Impulse der Deutschen Forschungsgemeinschaft für die 20. Legislaturperiode des Deutschen Bundestages. Mai 2021

² Klinische Studien. Stellungnahme der Arbeitsgruppe “Klinische Studien” der DFG-Senatskommission für Grundsatzfragen in der Klinischen Forschung. Oktober 2018

³ Verband forschender Arzneimittelhersteller. 2021. “Deutschland verliert bei klinischen Studien an Boden”. www.vfa.de

IMPACT OF IZKF FUNDING ON CLINICAL PRACTICE GUIDELINES

Several IZKF projects had a high translational potential and achieved results that were used directly or indirectly during development of clinical guidelines. Some outstanding examples are shown here.

IZKF RESEARCH PROJECT: D15/01

Pathomechanisms of vessel damage during leukocytoclastic vasculitis

Principal investigator: Prof. Cord Sunderkötter
Funding: 06/2001–05/2004

Clinical Practice Guidelines and international Consensus Reports:

Findings from this IZKF project have contributed to the vasculitis guidelines and the important international consensus on the nomenclature of cutaneous vasculitides (selected publications).

1. Sunderkötter CH et al. (2018) Nomenclature of cutaneous vasculitis: dermatologic addendum to the 2012 revised International Chapel Hill Consensus Conference Nomenclature of Vasculitides. *Arthritis Rheumatol* 70 (2): 171-184. doi: 10.1002/art.40375.
2. Sunderkötter C et al. (2018) Nomenklatur der kutanen Vaskulitiden – deutschsprachige Definitionen des Dermatologischen Anhangs zur Chapel Hill Consensus Conference. *J Dtsch Dermatol Ges* 16 (12): 1425-1433. doi: 10.1111/ddg.13703_g.
3. Basu N, ..., Sunderkötter C et al. (2010) EULAR points to consider in the development of classification and diagnostic criteria in systemic vasculitis. *Ann Rheum Dis* 69 (10): 1744-1750. doi: 10.1136/ard.2009.119032.

IZKF RESEARCH PROJECT: SUN2/019/07

Epidermal cytokine expression in experimental Leishmaniasis

Principal investigator: Prof. Cord Sunderkötter, PD Dr. Jan Ehrchen
Funding: 01/2007–10/2010

Clinical Practice Guideline:

Findings from this IZKF project have made contributions to the Leishmaniasis guideline.

1. Boecken G, Weitzel T, Sunderkötter C, et al. (2009) Diagnostik und Therapie der kutanen und mukokutanen Leishmaniasis in Deutschland [Diagnosis and therapy of cutaneous and musculoskeletal Leishmaniasis in Germany]. *J Dtsch Dermatol Ges* 7 Suppl 7: S1-38. German. doi: 10.1111/j.1610-0387.2009.07179.x.
2. Boecken G, Sunderkötter C et al. (2011) Germany Society of Dermatology; German Society of Tropical Medicine; German Society of Chemotherapy. S1-Leitlinie--Revision November 2010 Diagnostik und Therapie der kutanen und mukokutanen Leishmaniasis in Deutschland [Diagnosis and therapy of cutaneous and mucocutaneous Leishmaniasis in Germany]. *J Dtsch Dermatol Ges* 9 Suppl 8: 1-51. German. doi: 10.1111/j.1610-0379.2011.07820.x.

IZKF RESEARCH PROJECT: SCHU1/011/12

Genomics of human myocardial repolarisation

Principal investigator: Prof. Eric Schulze-Bahr
Funding: 01/2012–10/2015

Clinical Practice Guidelines and Consensus Reports (selection):

Research findings from this IZKF project have made contributions to relevant guidelines.

1. Schulze-Bahr E, Dettmeyer RB, Klingel K et al. (2021) Postmortale molekulargenetische Untersuchungen (molekulare Autopsie) bei kardiovaskulären und bei ungeklärten Todesfällen. *Kardiologie* 15, 176–193. <https://doi.org/10.1007/S12181-020-00438-5>
2. Schulze-Bahr E, Klaassen S, Abdul-Khaliq H, Schunkert H (2015) Gendiagnostik bei kardiovaskulären Erkrankungen – Positionspapier der Deutschen Gesellschaft für Kardiologie (DGK) und der Deutschen Gesellschaft für Pädiatrische Kardiologie (DGPK). [Molecular diagnosis for cardiovascular diseases]. *Kardiologie* 9: 213–243.
3. Priori SG, ..., Schulze-Bahr E et al. (2013) Heart Rhythm Society; European Heart Rhythm Association; Asia Pacific Heart Rhythm Society. Executive summary: HRS/EHRA/APHS expert consensus statement on the diagnosis and management of patients with inherited primary arrhythmia syndromes. *Europace* 15 (10): 1389-1406. doi: 10.1093/europace/eut272.

IZKF TRANSLATIONAL RESEARCH PROJECT: CTRP/007/13

Neurophysiological and molecular biological investigations into sensory processing of chronic pruritus with cutaneous and non-cutaneous causes in the cowhage model (PruriCow)

Principal investigator: Prof. Sonja Ständer, Prof. Esther Pogatzki-Zahn
Funding: 08/2013–12/2016

Clinical Practice Guideline:

Ständer S, Pereira M et al. (2020) IFSI-guideline on chronic prurigo including prurigo nodularis. *Itch* 5 (4): e42. doi:10.1097/itx.0000000000000042.

IZKF RESEARCH PROJECT: OM2/009/12

The role of cytoplasmic pre-assembly of axonemal components in primary ciliary dyskinesia

Principal investigator: Prof. Heymut Omran
Funding: 01/2012–10/2015

Clinical Practice Guidelines and Consensus Reports (selection):

Research activities led to the identification of new ciliopathies causing genes. Technologies that have been developed and validated within the IZKF projects are incorporated into clinical guidelines for the diagnosis of PCD. These technologies, especially the detection of axonemal proteins by immunofluorescence, are now used in expert centres worldwide. Furthermore, the research results have already found their way into various guidelines and consensus reports at the international level.

1. Cindrić S et al. (2020) SPEF2- and HYDIN-mutant cilia lack the Central Pair-associated Protein SPEF2, aiding Primary Ciliary Dyskinesia diagnostics. *Am J Respir Cell Mol Biol* 62 (3): 382-396. doi: 10.1165/rcmb.2019-0086OC.
2. Lucas JS et al. (2017) European Respiratory Society guidelines for the diagnosis of primary ciliary dyskinesia. *Eur Respir J* 49 (1): 1601090. doi: 10.1183/13993003.01090-2016.
3. Werner C, Onnebrink JG, Omran H (2015) Diagnosis and management of primary ciliary dyskinesia. *Cilia* 4 (1): 2. doi: 10.1136/archdischild-2013-304831.
4. Strippoli MP et al.; ERS Task Force on Primary Ciliary Dyskinesia in Children (2012) Management of primary ciliary dyskinesia in European children: recommendations and clinical practice. *Eur Respir J* 39 (6): 1482-1491. doi: 10.1183/09031936.00073911.

IZKF RESEARCH PROJECT: OM2/015/16

Molecular characterization of radial spoke composition and defects in primary ciliary dyskinesia

Principal investigator: Prof. Heymut Omran
Funding: 01/2016–10/2019



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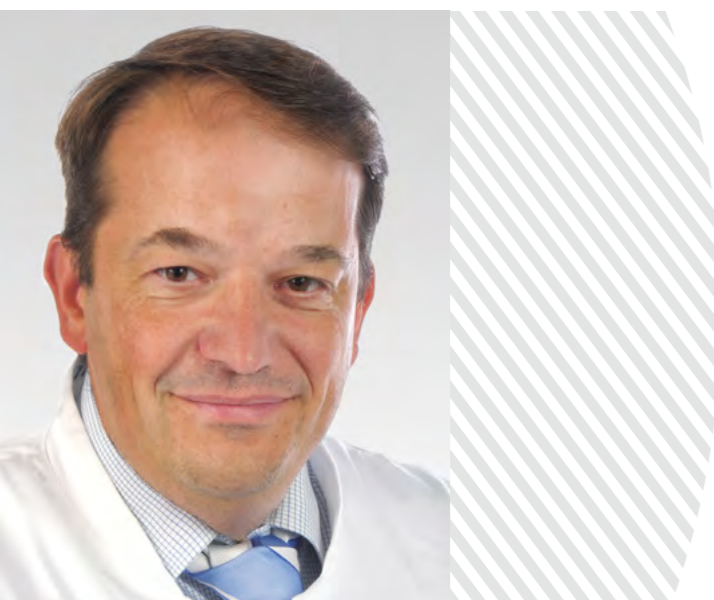
PROMOTING CLINICIAN SCIENTIST CAREERS

FROM RESEARCH ROTATIONS TO SEED.PROJECTS

Prof. Michael Schäfers, Member of the Clinician Scientist Board of the Medical Faculty

In memoriam of Professor Dr. med. Georg Peters, Chairperson 2005 – 2012 († 2018).

Scientific medical training was especially important to Prof. Peters. As IZKF chairperson, he was committed to establishing the Clinician Scientist Programme SEED.projects at the IZKF. Professor Schäfers was one of the first young Clinician Scientists to be awarded an IZKF Research Rotation in 1998.



ent disciplines and active in medical research and clinical medicine. Due to their dual training Clinician Scientists do have a unique and exclusive role in translational and clinical research and, therefore, for maintaining and fostering the innovation strength of academic medicine but also for multiple other areas of the life sciences. Pursuing a Clinician Scientist career, on the other hand, comes with significant challenges including sufficient, integrated and protected time for concomitant scientific and clinical training, a clear and reliable career perspective, visibility and acceptance amongst colleagues, the compatibility of a long and demanding dual training with family life, and many others. Over the past years, these often-unresolved issues have discouraged young physicians to invest in their research training early during their medical education; others start a scientific career but stop, especially during medical specialisation.

In recognition of this urgent dilemma, dedicated Clinician Scientist programmes supporting research-active physicians in tightly integrating both the clinical and the scientific training have been established at the Medical Faculty; pioneered by the IZKF *Rotational Position* programme as early as 1996, when the IZKF was established.

For 20 years, IZKF *Rotational Positions* provided flexible protected research time during the clinical training, typically for 12 months, to physicians that have already started a scientific career, e.g. as documented by a first scientific publication. The project had to be related to the research areas of the

IZKF. This Clinician Scientist career module has been very successful and supported 87 research-active physicians with a total of over 1.000 person months amounting to about 5.5 million EURO of IZKF funding (see Figure 6).

Until 2016, physicians from 20 clinical departments and institutes at the University Hospital Münster (UKM) were enrolled into the programme showing the broad interest of supporting talented Clinician Scientists across different disciplines. In 2009, the Medical Faculty gradually took over the Clinician Scientists Rotational Position programme from the IZKF and integrated it 2016 into its Clinician Scientist programme. This allowed focusing on a novel Clinician Scientist career module, the IZKF *SEED.projects*.

Since 2012, IZKF *SEED.projects* focus on promoting Clinician Scientists at more advanced stages of their careers, specifically to build up own research directions and the first independent research group. The programme includes funding for up to three years for highly talented Clinician Scientists from all clinical disciplines, which rotate into a preclinical or theoretical medical partner institute during their clinical specialisation training. This programme comes with a maximum in flexibility to accommodate protected research time ($\geq 50\%$), specialisation training and clinical duties. Since 2012, as many as 16 candidates have been granted a IZKF *SEED.project*; with women Clinician Scientists accounting for only 16% of the total. Analysing the reasons one finds that – as for many Clinician Scientists – women Clinician Scientists typically still miss flexibility in the concurrent scientific/clinical



“Due to their dual training Clinician Scientists do have a unique and exclusive role in translational and clinical research.”

Prof. Michael Schäfers

training that could address challenges that come with family planning and having children. Moreover, clear career perspectives are missing for Clinician Scientists.

In recognition of these needs and current deficits, the Medical Faculty has recently developed a consistent career path for Clinician Scientists that integrates and offers flexible career modules ranging from the very early level of the medical study (e.g. Medical College *MedK*; Master of *Experimental Medicine*) to clinical translational professorships (CTPs). IZKF *SEED.projects* are integral and important career modules of these career paths.

IZKF RESEARCH ROTATION POSITIONS

EXEMPTION FROM CLINICAL ROUTINE
FOR CLINICIAN SCIENTISTS
REGULAR CALLS (1996–2016)

The ‘Research Rotation’ funding format was a funding instrument for young physicians with fundamental scientific impetus, i.e. the first Clinician Scientist Programme in 1996. The exemptions from clinical routine were awarded as supplementary funds in the IZKF research projects approved by the Scientific Advisory Board. In principle, the rotation positions were open to all clinically active physicians from all areas of the university hospital who were interested in experimental scientific work, e.g. as part of their lecture qualification (habilitation).

GUIDELINE	DETAILS
Aim	Scientific qualification of young medical professionals through time off for research.
Equipment	8 personnel positions for a maximum of 12 months each; no consumables; contribution to a very well-equipped IZKF research project.
Application requirements	IZKF project leaders who submitted a supplementary application for a research rotation for the respective IZKF project were eligible to apply for funding.
Selection process	Informal short application to the board (meetings approx. 10 times a year) Assessment criteria: previous research experience and motivation of applicants; quality of scientific work programme; relation to the topic of the IZKF project; applicant's perspective.
Grants	In the last 20 years, a total of 98 grants have been awarded to 87 research-active physicians; total funding budget of about 5.5 million EUR (1996–2016). In the majority of cases, the young professionals were able to complete their habilitation or were successful in applying for their own IZKF research project.
Perspective	Since 2009, the faculty gradually took over this programme from the IZKF; in 2016, it was integrated into the Clinician Scientist programme of the Medical Faculty. The IZKF Münster has discontinued the funding format and focused on advanced Clinician Scientist funding formats (see SEED.projects).

RESEARCH ROTATION PROGRAMME 1996–2016

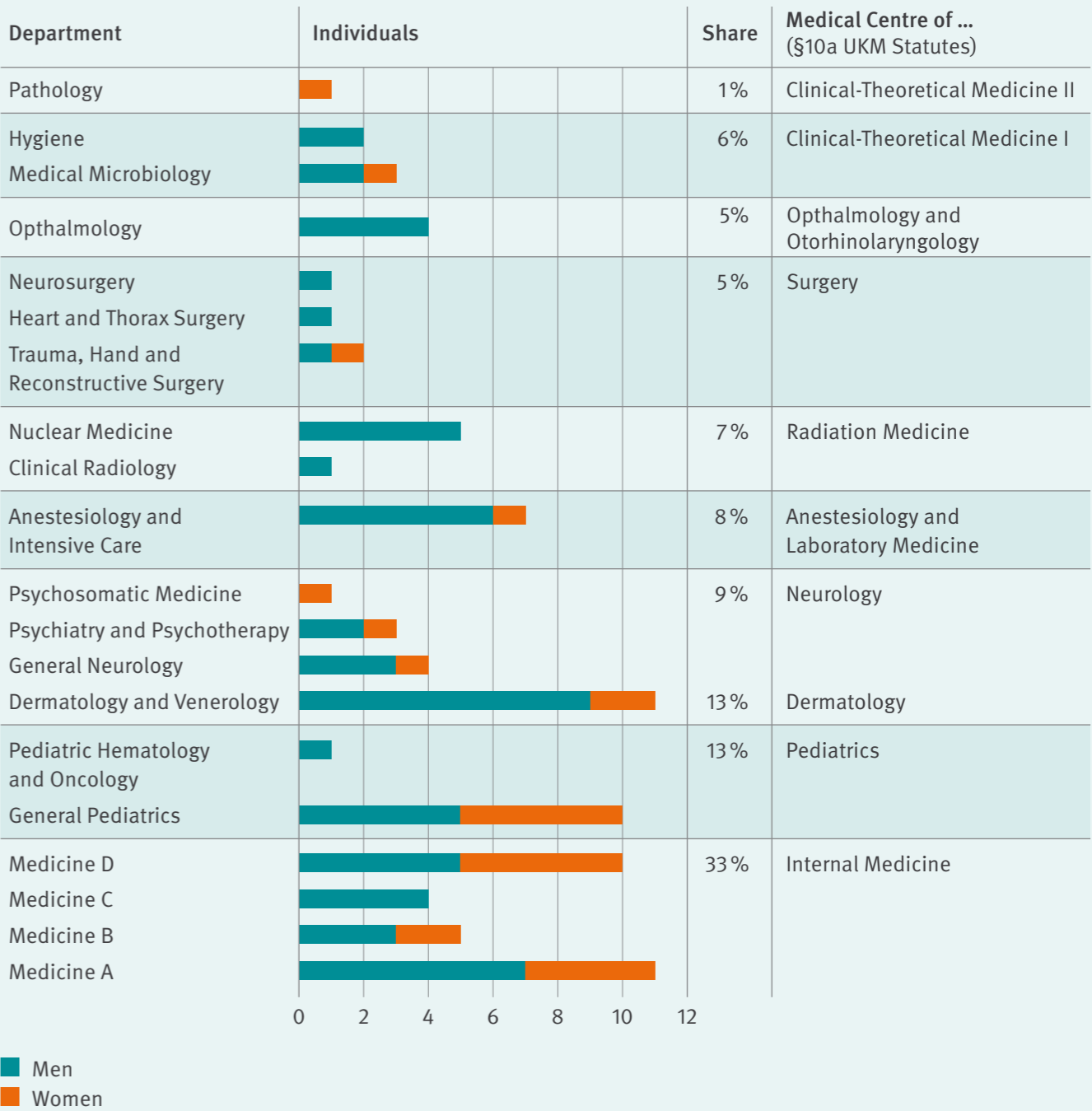


Figure 6: Research Rotation positions and participating institutions 1996–2016. The majority of exemptions were awarded to the clinics of internal medicine.

IZKF SEED.PROJECTS

ADVANCED RESEARCH ROTATION FOR CLINICIAN SCIENTISTS

FUNDING OF RESEARCH-ENTHUSIASTIC
DOCTORS WITH AN INDEPENDENT PROJECT
ANNUAL CALL FOR APPLICATIONS IN ACCORDANCE
WITH THE FACULTY'S CLINICIAN SCIENTIST PROGRAMME

The Clinician Scientist programme SEED.projects promotes especially talented young doctors having an interest in experimental scientific research, from the second year after obtaining the license to practice medicine. These young clinicians have the opportunity to rotate out of academic clinical medicine and to work on their own research in a small group of their own for 2–3 years at one of the preclinical or clinical-theoretical institutes. In exceptional cases and with special justification it is possible to perform this research rotation in a designated experimental department of the clinic.

The dispatching clinic commits itself to retain the personnel position unaltered in the same working area as a return option for the SEED project leader. The IZKF finances the research rotation and thus ensures that the position in the clinic is manned for up to three years. In justified cases, a flexible design of the rotation is possible. However, at least the first year must be continuously spent carrying out research work.

GUIDELINE	DETAILS
Aim	Targeted scientific and clinical qualification for clinician scientists interested in research during specialist training.
Equipment	Global budget of up to EUR 130.000 per year is available for each project (including the salary of the principal investigator). Remaining funds can be flexibly tailored according to the needs of the research project.
Application requirements	Eligible for application are medical doctors of all disciplines from the 2 nd year after obtaining their licence to practice with submitted or completed doctoral thesis and at least one own publication in first authorship. Basic science institutions participating in the programme ensure sufficient laboratory space with necessary equipment available for the project. In addition to clinical mentorship, the participating institutions are responsible for providing scientific programme mentoring.
Selection process	Two-step peer review process as outlined above.
Grants	A total funding volume of about EUR 780.000 per year is available for this format.
Applications	Since 2012, 16 clinician scientists have been funded, 4 of them female doctors (=25%). Four calls on professorships, partly external. Expenditures in this format 4,6 million EUR.
Perspective	This funding format is an important component of the Faculty's Clinician Scientist Programme.

Project Number	Project Leader	Title	from ...	to ...	RF	Participating Institutions
SEED/001/12	Rossaint	The role of growth-differentiation factor (GDF)-15 in platelet activation, thrombus formation and platelet-mediated inflammation	01.12	12.14	2	Department of Anesthesiology, Intensive Care and Pain Therapy / MPI for Molecular Biomedicine
SEED/002/12	Wennmann	Functional analysis of WWC protein family in epithelial cell polarity	02.12	12.14	2	Department of Medicine D / Institute of Medical Biochemistry
SEED/003/12	Bittner	The role of K2P channels (TASK1-3, TRESK) for intracellular signaling pathways in T lymphocytes	01.12	12.14	3	Department of Neurology / Institute of Physiology I – Neurophysiology
SEED/004/12	Buscher	The role of L-selectin topography in integrin activation and lymphocyte homing	04.12	12.13	2	Department of Anesthesiology, Intensive Care and Pain Therapy / Institute of Physiological Chemistry and Pathobiochemistry
SEED/005/15	Schmidt	The role of GABAergic transmission and chloride homeostasis in pain development and processing	01.15	12.17	3	Department of Anesthesiology, Intensive Care and Pain Therapy / Institute of Physiology I – Neurophysiology
SEED/006/15	Dlugos	Analysis of the regulation of the actin cytoskeleton in podocytes	01.15	12.17	2	Department of Medicine D / Institute of Cell Dynamics and Imaging
SEED/007/17	Schmidt-Pogoda	Leukocyte migration and endothelial integrity in cerebral ischemia	01.17	12.19	3	Department of Neurology / MPI for Molecular Biomedicine
SEED/009/17	Schütte-Nütgen	Interleukin 24 in renal ischemia-reperfusion injury: Analysis of the pathophysiological role and evaluation of potential therapeutic options	01.17	12.19	2	Department of Medicine D / Institute of Medical Biochemistry
SEED/010/19	Rolfes	The impact of the calcium-regulated K2p channel TRESK on T cell functions in experimental stroke	01.19	03.21	3	Department of Neurology
SEED/011/19	Opel	Individualised prediction of the clinical course of affective disorders by the use of integrated clinical and experimental data	01.19	12.21	3	Department of Mental Health / Institute of Translational Psychiatry
SEED/012/18	Margraf	Platelet production and migration in pulmonary induced inflammation and resolution	09.18	08.21	2	Department of Anesthesiology, Intensive Care and Pain Therapy / Group Vascular Inflammation and Platelets

Project Number	Project Leader	Title	from ...	to ...	RF	Participating Institutions
SEED/013/20	Balbach	BRD4 as novel epigenetic vulnerability of early T-cell precursor acute lymphoblastic leukemia (ETP-ALL)	01.20	12.22	1	Department of Pediatric Hematology and Oncology
SEED/014/20	Dorenkamp	The impact of monocyte / macrophage SHP-2 tyrosine phosphatase on diabetes-induced atherosclerosis progression	01.20	12.22	1	Department of Cardiology and Angiology / Department of Nuclear Medicine
SEED/015/20	Döser	Direct reprogramming of kidney mesenchymal cells into podocytes as a therapeutic strategy for chronic kidney disease	01.20	12.22	2	Department of Medicine D / MPI for Molecular Biomedicine
SEED/016/21	Heming	Understanding human immune-mediated neuropathies at single cell resolution	01.21	12.23	3	Department of Neurology / Institute of Medical Informatics
SEED/017/21	Wallmeier	Development and characterisation of a brain organoid model for a new autosomal recessive inherited defect of cortical malformation	01.21	12.23	3	Department of General Pediatrics / MPI for Molecular Biomedicine



In autumn 2022, the IZKF Münster will organise the 3rd Interdisciplinary Else Kröner Networking Symposium under the leadership of its SEED.projects group leaders in cooperation with the Collaborative Research Centres (CRC) 1009, 1450 and TR-128 and the Clinical Research Group (KFO) 342. The meeting follows the tradition of the IZKF-initiated network symposia in Würzburg 2019 and Jena 2021 and brings together physicians from all over Germany. This is to be the start of the new series of Else Kröner Symposia for clinician scientists and medical scientists at the Medical Faculty Münster, funded by the Else Kröner Fresenius Foundation.

For more information and registration, please visit the website:
www.medizin.uni-muenster.de/cssmuenster



OVERVIEW OF APPROVED PROJECTS AND PARTICIPATING INSTITUTIONS

FUNDING FORMATS PER RESEARCH FOCUS

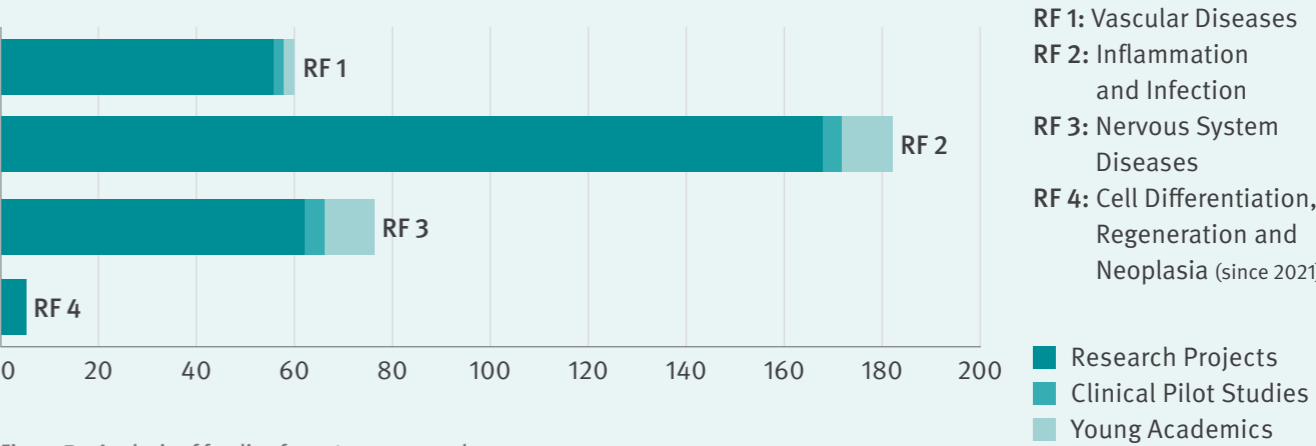
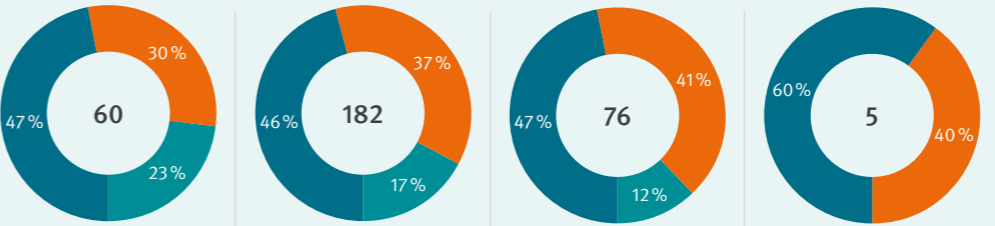


Figure 7a: Analysis of funding formats per research area.

PERCENTAGE OF APPROVED IZKF-PROJECTS
IZKF research projects/clinical translation formats/junior research groups/SEED.projects



PARTICIPATING INSTITUTIONS

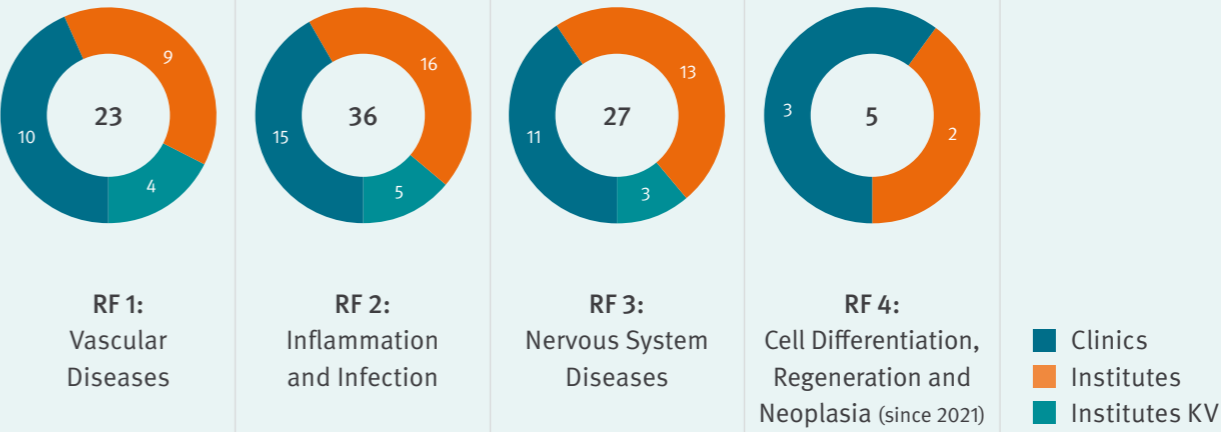


Figure 7b: Approved projects and participating institutions per research focus (RF) since 1996

IZKF IN NUMBERS

YOUNG TALENTS AND OUTPUT OF FUNDING 1996–2021

183

National and
international Awards

56

Invention Disclosures
from IZKF projects

132

Habilitations

23 % Proportion of women

688

Doctorates within
Research Projects

31 % at the Faculty of Biology

50 % at the Medical Faculty

1.606

Original Articles

40

Bachelor theses
(since 2011)

21

MedK Scholarships
(since 2015)

40

Granted Patents

190

Experts Reviews

199

Master and Diploma theses
in Research Projects

29 %
Proportion of women

87

59 % Habilitation rate

Clinician Scientists in the
IZKF Research Rotation Programme
(1997–2006)

42

Projects directly transferred
in DFG Funding (2004–2020)

11

Collaborative Research
Activities funded

IZKF TECHNOLOGY PLATFORM

TECHNOLOGICAL INNOVATIONS FOR THE MEDICAL FACULTY MÜNSTER

According to the BMBF's specifications, cross-focus and cross-project issues should represent the so-called "interdisciplinary cross-sections" of an IZKF. The methodological and technological service for all scientists should be a priority and support networking within the IZKF. A joint research infrastructure was not common at the medical faculties until then.

In line with this, the initial application of the IZKF Münster stipulated nine interdisciplinary cross-sectional projects to connect service tasks. These central service and functional areas played an increasingly research-stimulating role in the course of the consolidation phase of our centre. After technologies and know-how already existing in individual institutions were initially combined as so-called "Central Project Groups" (ZPGs; 1996–2001; see Tables below), strategic planning of the central service areas were made by the Executive Board in the course of the second funding period (from 1998). This was concluded in 2001 with an overall evaluation and reorganisation.

As a result, most ZPGs were terminated, methodologically demanding ZPGs were expanded and additional units with high-throughput technologies were introduced. All central service projects were renamed Core Units.

The acquisition of large-scale equipment or high-throughput processes that individual institutions and clinics would not have been able to afford owing to high prices and poor capacity utilisation proved to be effective in terms of service areas for supporting ambitious research programmes. Therefore, central IZKF funds were invested in new technologies by the Executive Board after prior consultation with the Scientific Advisory Board. As a result, it could be seen that a technologically excellently equipped location not only attracts external young scientists, but also stimulates those who had previously used more traditional methods. An increase in the technological standard here achieved a strong increase in the quality of the research ideas.

Outstanding examples of this strategy are the former Core Unit IFG (1) and the active Core Unit PIX (2).

(1) With the upcoming functional genomics as emerging technology for genome-wide analyses, the IZKF Board decided to invest in the new and promising Gene Chip technology in the year 2000. The IZKF Münster was the first university centre to install the Affymetrix Chip System. In so-called reference labs, the Affymetrix Gene Chip technology with a gene chip pool was established in the framework of the Biochip-Initiative NRW, giving the scientists of all IZKF access to this technology and the opportunity to purchase chips at a subsidised rate.

(2) Over the years, the Core Unit PIX has developed from a combination of various innovative imaging procedures for small animal diagnostics into an integrative multimodal unit consisting of individual preclinical imaging procedures. The proven expertise of the Core Unit heads and the access to state-of-the-art instruments, tracers and imaging technologies for all scientists enable innovative research ideas and support both biomedical research and translation into the clinical context.

In order to offer reliable conditions to all users of the Core Units and at the same time to standardise the conditions of the individual service units, binding 'Terms of Use' for the entire IZKF technology platform were enforced. In addition, standard operating procedures were implemented for the management of the Core Units and central invoicing was introduced. Later on, the IZKF Board and the scientific heads of the Core Units agreed on criteria for the publication of scientific results obtained from the experiments conducted, in particular with regard to the authorship of the Core Unit heads.

In 2015, the IZKF Board passed a decision that new Core Units will be evaluated for funding if there is a demand for innovative technologies and methods to be established at the Medical Faculty for use by IZKF members and the Faculty. Applications for new IZKF funded Core Units can be submitted outside of the advertised funding formats. Furthermore, Core Units should be innovation centres, where methods are further developed and the integration of new technologies is envisaged. CoreUnits that simply provide standard analytical methods should be transferred to the Medical Faculty's

IZKF TECHNOLOGY PLATFORM | DEVELOPMENT OF SERVICE PLATFORMS SINCE 2005

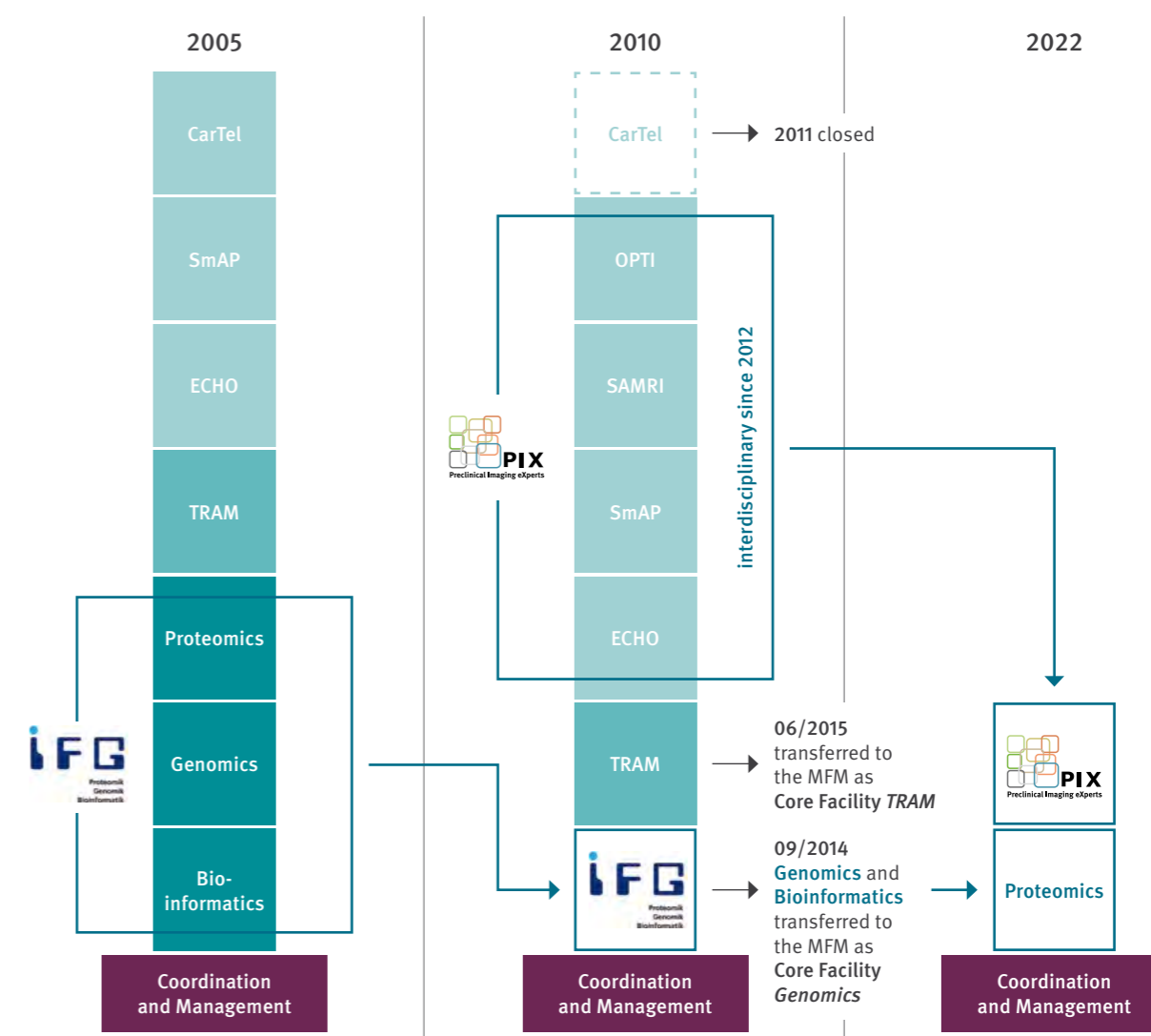


Figure 8: Development of service platforms since 2005 – The technological platform was reorganised in the recent decade to fulfill the needs of the faculty research community. PIX was formed by the merger of several separate animal-imaging subunits. The IFG's proteomic subunit became a separate Core Unit. TRAM, along with genomics and bioinformatics, which offered standard analytical procedures were entrusted to the Medical Faculty's jurisdiction.

jurisdiction. This strategy was implemented for the Core Unit *Transgenic Animal Models* and for the "Genomics" part of the Core Unit *Integrated Functional Genomics*.

Today, the IZKF Münster operates a technology platform committed to advancing research and providing state-of-the-art technology and instrumentation to scientists of the Medical Faculty, other WWU Münster faculties and external institutions. Researchers – especially the young academics – have access to a large instrument pool consisting of expensive high-end equipment and expert advice. Moreover, the Core Units

promote translational research by interacting closely with academia and industry, ensuring that the technology available is continuously updated. Lectures, workshops and practical courses are organised on a regular basis to keep users informed about current developments. The IZKF Scientific Office coordinates and supports these Core Units and oversees their smooth operation. Their overall performance is evaluated on a regular basis by the IZKF Board of Directors and the Scientific Advisory Board in order to maintain high standards and define the future direction and goals of the technology platform.

ZPGS (SET-UP AND CONSOLIDATION PHASE)

Facility No.	Unit / Title	Coordinator	from ...	to ...
CF/001	ZPG 1 / Biometric support of research areas	Prof. W. Köpcke Institute of Medical Informatics + Biomathematics	06.96	05.01
CF/002	ZPG 2 / Animal Experimental Medicine	Prof. K.-D. Richter Central animal facilities (ZTE)	06.96	05.01
CF/003	ZPG 3 / Molecular Biology	Prof. M.A. Schmidt Institute of Infectiology (ZMBE)	06.96	05.01
CF/004	ZPG 4 / Epidemiology	Prof. U. Keil Institute of Epidemiology + Social Medicine	06.96	05.01
CF/005	ZPG 5 / Morphological Methods	Prof. W. Wittkowski Institute of Anatomy	06.96	05.98
CF/006	ZPG 6 / Molecular Structural Analysis	Prof. F. Hillenkamp / Prof. J. Peter-Katalinic Institute of Medical Physics + Biophysics	06.96	05.01
CF/007	ZPG 7 / BIOMEIN Münster	Prof. M.A. Schmidt Institute of Infectiology (ZMBE)	06.96	05.01
CF/008	ZPG 8 / Transgenic Animal Models	Prof. C. Sorg / Prof. J. Brosius Institute of Experimental Dermatology / Institute of Experimental Pathology (ZMBE)	06.96	05.01
CF/009	ZPG 9 / Ultrastructure Research	Prof. M.M. Lerch / PD K.-P. Zimmer Department of Medicine B / Department of General Pediatrics	12.98	12.03

CORE UNITS (AFTER EVALUATION 2001)

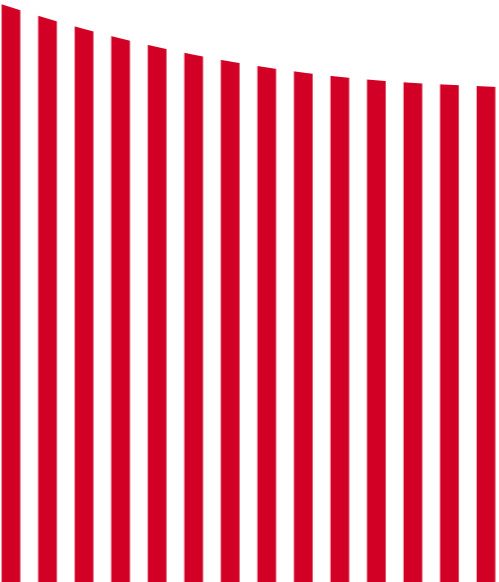
Facility No.	Core Unit / Title	Coordinator	from ...	to ...
CF/010	IFG / Integrated Functional Genomics	Prof. C. Sorg / Prof. S. Ludwig / Prof. M. Stoll IZKF Münster	06.01	09.14
CF/008	TRAM / Transgenic Animal Models (continued)	Prof. J. Brosius Institute of Experimental Pathology (ZMBE)	06.01	06.15
CF/011	CarTel / Small Animal Cardiology and Telemetry	Dr. P. Kirchhof / Dr. G. Mönnig Department of Medicine C – Cardiology/Angiology	06.01	08.11
CF/012	ECHO / Small Animal Echocardiography	Dr. J. Stypmann / Prof. K. Tiemann Department of Medicine C – Cardiology/Angiology	06.01	12.11
CF/013	SmAP / Small Animal PET	Prof. M. Schäfers Department of Nuclear Medicine	06.04	12.11
CF/014	OPTI / Small Animal Optical Imaging	Prof. C. Bremer Institute of Clinical Radiology	01.08	12.11
CF/015	SAMRI / Small Animal MRI	Prof. C. Faber Institute of Clinical Radiology	09.10	12.11
CF/016	PIX / Preclinical Imaging eXperts	PD Dr. S. Hermann (Coordinator) European Institute of Molecular Imaging (EIMI)	01.12	Ongoing
CF/017	Proteomics	Prof. S. König IZKF Münster	10.14	Ongoing

IZKF METHOD DEVELOPMENT PROJECTS

EXTRA FUNDING FOR TECHNOLOGICAL AND METHODOLOGICAL INNOVATIONS
NO REGULAR CALLS

With the emerging restructuring and associated technological upgrading of the Core Units, it became necessary to explore new approaches or develop new technologies, methods and devices that could be offered to all scientists in the faculty to strengthen innovation and quality of their research. The IZKF therefore established a new funding model that allows for these innovations to be implemented in a shorter time frame with a separate budget.

GUIDELINE	DETAILS
Aim	Establishing new and innovative research methods and tools for faculty-wide use or to be integrated in future Core Units of the IZKF Technology Platform.
Equipment	Funding volume per project according to the needs of the work programme; maximum EUR 110.000 per year for 2 years; flexible use of funds for personnel and consumables, as justified.
Application requirements	All full-time scientists working at the Medical Faculty, beginning at the PhD level are eligible to apply; published preliminary work and third-party funding are prerequisites; only one project outline/application round/researcher may be submitted. Method Development projects are not renewable as a rule.
Selection process	Two-step peer review process as outlined above. Applications are evaluated along with the call for regular project proposals (see above). Assessment criteria: previous research experience and motivation of applicants; quality of scientific work programme; technological benefit for the faculty.
Grants	So far, four projects have focussed on establishing new technologies as described below.



Z/001/02

EXPRESSION ANALYSIS OF MACROPHAGE SUBPOPULATIONS DURING TRANSMIGRATION AND DIAPEDESIS

Principal investigators: PD Dr. Johannes Roth and Prof. Clemens Sorg

Participating institution: Institute of Experimental Dermatology

Core Unit: Integrated Functional Genomics (IFG)

Funding period: 06/2001–05/2004

Technological / methodological innovation:

Methods for systems biology / Affymetrix Gene Chip Technology

Publication:

Viemann D, Goebeler M, Schmid S, Klimmek K, Sorg C, Ludwig S, Roth J (2004) Transcriptional profiling of IKK2/NF-kappa B- and p38 MAP kinase-dependent gene expression in TNF-alpha-stimulated primary human endothelial cells. Blood 103 (9): 3365-3373.

Z/002/07

DEVELOPMENT OF A GENOMIC OLIGONUCLEOTIDE ARRAY FOR FUNCTIONAL SYSTEMS BIOLOGY

Principal investigators: PD Dr. Carsten Müller-Tidow and Prof. Hubert Serve

Participating institution: Department of Medicine A – Hematology and Oncology

Core Unit: Integrated Functional Genomics (IFG)

Funding period: 07/2006–12/2007

Technological / methodological innovation:

Methods for systems biology / combination of chromatin immunoprecipitation (ChIP) with DNA microarray (chip) technology (ChIP-on-chip)

Publication:

Hoemme C, Peerzada A, Behre G, Wang Y, McClelland M, Nieselt K, Zschunke M, Disselhoff C, Agrawal S, Isken F, Tidow N, Berdel WE, Serve H, Müller-Tidow C (2008) Chromatin modifications induced by PML-RARalpha repress critical targets in leukemogenesis as analyzed by ChIP-Chip. Blood 111 (5): 2887-2895.

Z/004/17

PHOTOACOUSTIC IMAGING (PAI) TO NON-INVASIVELY CHARACTERISE ATHEROSCLEROTIC PLAQUES *IN VIVO*

Principal investigators: Prof. Michael Schäfers and Dr. Sven Hermann

Core Unit: Preclinical Imaging eXperts (PIX)

Funding period: 1/2017 to 12/2019

Technological / methodological innovation:

Direct visualisation of inflammatory activity in atherosclerotic lesions. After tests with various photoacoustic imaging protocols, preliminary data indicate that absolute quantification in vivo cannot be achieved with state-of-the-art PA technology using dye-based tracers. Further experiments are being conducted.

Publication:

Roll W, Markwardt NA, Masthoff M, Helfen A, Claussen J, Eisenblätter M, Hasenbach A, Hermann S, Karlas A, Wildgruber M, Ntziachristos V, Schäfers M (2019) Multispectral optoacoustic tomography of benign and malignant thyroid disorders – a pilot study. J Nucl Med 60 (10): 1461-1466.

Z/003/14

ANALYSIS OF GLYCOLIPID RECEPTORS OF MICROBIAL VIRULENCE FACTORS IN CELL CULTURES AND ORGANS USING IMAGING MASS SPECTROMETRY

Principal investigator: Prof. Klaus Dreisewerd

Core Unit: None.

Funding period: 01/2014–03/2016

Technological / methodological innovation:

Increasing the sensitivity and resolution of the MALDI-MS imaging (MALDI-MSI for matrix-assisted laser desorption/ionization mass spectrometry imaging); the high analytical potential of the new methodology, named MALDI-2, was transferred into two new DFG-funded research projects, to further develop the technique. Additionally a prototype of a “coolMALDI” instrument was developed.

Publications (selected):

Pirkl A, Meier M, Popkova Y, Letzel M, Schnapp A, Schiller J, Dreisewerd K (2014) Analysis of free fatty acids by ultraviolet laser desorption ionization mass spectrometry using insect wings as hydrophobic sample substrates. Anal Chem 86: 10763-10771.

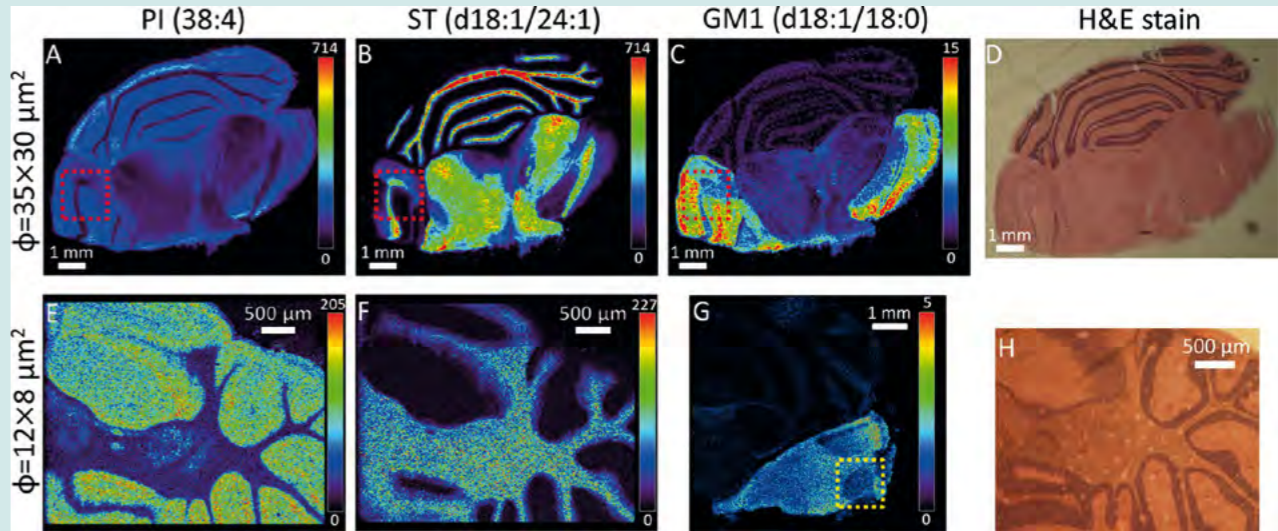
Soltwisch J, Kettling H, Vens-Cappell S, Wiegmann M, Müthing J, Dreisewerd K (2015) Mass spectrometry imaging with laser-induced postionization. Science 348: 211-215.

Niehoff AC, Schulz J, Soltwisch J, Meyer S, Kettling H, Sperling M, Jeibmann A, Dreisewerd K, Francesconi KA, Schwerdtle T, Karst U (2016) Imaging by elemental and molecular mass spectrometry reveals the uptake of an arsenolipid in the brain of Drosophila melanogaster. Anal Chem 88: 5258-5263.

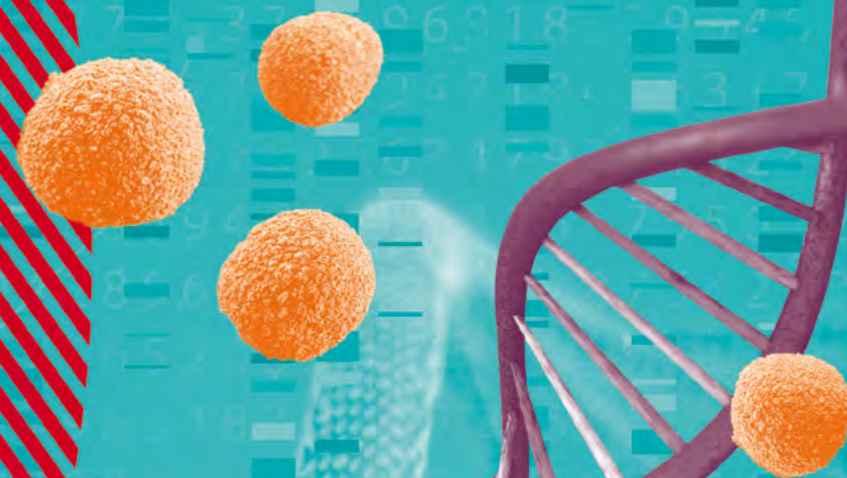
Patent pending:

Bookmeyer C, Soltwisch J, Dreisewerd K (2020) Desorptions-Ionenquelle mit Dotiergas-unterstützter Ionisierung (Aktenzeichen: DE 10 2020 120 394.2, Anmeldedatum: 03.08.2020).

Further nationalisations in China, USA and GB: Desorption Ion Source With Dopant-gas Assisted Ionization (CH 202110889226; US 17/392,592; GB 2110747).



MALDI-MS images acquired from coronal mouse brain slices. (A–C) Overview images obtained from a whole cross-section with a laser spot size of ~35 μm × 30 μm (step size: 50 μm × 50 μm). (E, F, and G) Images obtained from two brain slices with an effective laser spot size of 12 μm × 8 μm (step size, 15 μm × 10 μm). The images show the distribution of phosphatidylinositol PI (38:4, m/z 885.57), sulfatide ST (d18:1/24:1, m/z 888.65), and monosialotetrahexosylganglioside GM1 (d18:1/18:0, m/z 1544.87). All lipids were detected as [M – H]– species. (D, H) Hematoxylin and eosin (H&E) stains obtained from the tissue slices evaluated in A–C and E and F, respectively; the GM1 image in G was obtained from a different slice, containing GM1-rich cortex. © American Chemical Society, 2014.



HIGH-TECH



100

11

IZKF STRATEGY PROJECTS – ASSOCIATION OF CLINICAL RESEARCH CENTERS (ACRC) OF GERMAN UNIVERSITIES

The Association of Clinical Research Centres, an association of the eight IZKF of the German Medical Faculties, was founded in 1998 by the working group of their spokespersons. The aim of this association was to establish an umbrella organisation to strengthen the structural effectiveness and success of the IZKF in Germany. The coordinating ACRC head office, based in Münster, was funded by the BMBF from 01/2000 to 04/2003 and then co-financed by the IZKF until 2012.

The main tasks of the ACRC were (a) the establishment of a selection procedure for the admission of further centres to the ACRC, (b) the organisation of national and international collaborative research projects, (c) the establishment of contacts with national and international funding organisations and industry, (d) the establishment and operation of a patent and licensing agency and (e) joint public relations work.

The work of the ACRC was highly recognised by policy makers in ministries and the Science Council (Wissenschaftsrat, WR) in the first years, when several ground-breaking ideas were implemented. Three of the most important examples will be mentioned here:

First, in 2001, a contract was negotiated between the eight university locations and the BMBF to establish a joint patent and licensing agency. This project started in January 2002 and established the basis for the Patent and Innovation Office of the Medical Faculty Münster.

Secondly, two ground-breaking strategy papers were published in 2003 on (I) future clinical research at medical faculties in Germany and (II) the incompleteness of the German promotion of young researchers. The Science Council¹



Association of Clinical Research Centers
of German Universities

strongly supported the recommendations of the ACRC to restructure medical studies in the sense of a modular structure and to introduce a “Research Career Development Award” in German university medicine.

Thirdly, the ACRC implemented quality criteria for a regular self-evaluation of existing IZKF as well as for the inclusion of further suitable centres in the circle of IZKF. The IZKF Jena was accepted into this accreditation procedure in 2001.

- › **ACRC Chairman:**
Prof. Joachim R. Kalden (†), IZKF Erlangen
- › **Deputy Chairman and Secretary General:**
Prof. Clemens Sorg, IZKF Münster
- › **ACRC Central Office | Scientific Manager:**
Dr. Franco H. Falcone (2000–2002)
Dr. Ursula Schlichter (2003–2005)
- › **ACRC Central Office | Assistant:**
Karen De Bruyne (2000–2005)

The ACRC Central Office moved to Leipzig in October 2005. The ACRC was terminated in 2012 due to various interests of the IZKF and different federal requirements.



Currently, the active IZKF of Aachen, Erlangen, Münster and Würzburg still benefit from the exchange of experiences and ideas concerning operative measures and implementation of new funding formats. They published their specific profiles in 2016 under a new label in a Special of the *DUZ Magazine (Deutsche Universitätszeitung)* “Bridging the gap between laboratory and clinic”.

In its pioneering role as a structure-promoting centre, the IZKF Münster has made an important contribution to the development of efficient research structures in the Medical

Faculty. Two of the so-called high-visibility strategy projects have an impact on the entire Faculty in their respective areas: the patent and innovation office Clinic Invent and the newly established Women-in-Science Network Medicine (see pages 74–79).



Impulsgeber für die Universitätsmedizin
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EVENTS OF THE ACRC WITH PARTICIPATION OF THE IZKF MÜNSTER

- › 1st Joint IZKF Symposium, Gut Havichhorst Münster, March 2002
- › ACRC Workshop “*Infection and Inflammation*”, Gut Havichhorst Münster, February 2003
- › ACRC Workshop “*Functional Genomics*”, Kloster Banz Würzburg, March 2004
- › ACRC Workshop “*Regenerative Medicine*”, Evangelische Akademie Meissen, March 2005
- › ACRC Symposium “*Cell-Cell- and Cell-Matrix-Interactions in Tumor Progression and Immunity*”, Welcome Hotel Bamberg, May 2006
- › ACRC Workshop “*Regenerative Medicine/Extracellular Matrix*”, Abtei Rolduc Kerkrade, March 2007

PUBLICATIONS OF THE ACRC WITH PARTICIPATION OF THE IZKF MÜNSTER

- › Publication series in the *Deutsche Zeitschrift für Klinische Forschung (DZKF)* – selected titles:
 - › Falcone FH (2001) Die Interdisziplinären Zentren für Klinische Forschung (IZKF) an deutschen Hochschulen – Ein expandierendes Erfolgsmodell. DZKF 9/10, page 4–7.
 - › Blass-Kampmann S (2002) Das IZKF im Klinikum der Westfälischen Wilhelms-Universität Münster – Klinische Forschung zu Chronischen Erkrankungen und überregionale Technologieplattform. DZKF 1/2, page 46–49.
 - › Sorg C; Schlichter U (2004) Strukturen verändern – Gründung der Interdisziplinären Zentren für Klinische Forschung – eine Erfolgsgeschichte. DZKF 5/6, page 21–24.
- › ACRC – “*Zur Zukunft der Klinischen Forschung an Medizinischen Fakultäten*”, 2003
- › ACRC – “*Zur Förderung des wissenschaftlichen Nachwuchses in der Medizinischen Forschung*”, Empfehlungen zur Einrichtung eines Research Career Development Award, 2003
- › Special “Brückenschlag zwischen Labor und Klinik”, Deutsche Universitätszeitung, Juni 2016

¹ WR, “Empfehlungen zu forschungs- und lehrförderlichen Strukturen in der Universitätsmedizin”, Drs. 5913/04, 2004.

University	Title (during BMBF funding) Funding period Chairperson*	Status 2022
IZKF Aachen	BIOMAT – Biomaterials and Material-Tissue Interaction for Implants (12/1995–12/2003) Prof. Christian Mittermayer	ongoing
IZKF Erlangen	Inflammatory Processes: Etiopathogenesis, Diagnostics and Therapy (10/1996–09/2004) Prof. Joachim R. Kalden	ongoing
ZMMK Köln	Molecular Medicine (12/1995–12/2003) Prof. Thomas Krieg	ongoing
IZKF Leipzig	Role of Cell-Cell and Cell-Matrix Interactions for Diagnostic and Therapeutical Strategies (12/1995–12/2003) Prof. Frank Emmrich	terminated
IZKF Münster	Chronic Disease (06/1996–05/2004) Prof. Clemens Sorg	ongoing
IZKF Tübingen	Cell Biology in Diagnosis and Therapy of Organ System Diseases (06/1996–06/2004) Prof. Michael Gregor	terminated
IZKF Ulm	Molecular Pathomechanisms of Inflammatory, Degenerative and Malignant Diseases (09/1996–08/2004) Prof. Frank Lehrmann-Horn	terminated
IZKF Würzburg	Pathogenesis of Vascular Diseases and Alterations of Immune Regulation (05/1996–04/2004) Prof. Hans K. Müller-Hermelink	ongoing
IZKF Jena**	Medicine 2000 (11/2001–10/2002) Prof. Achim Schneider	ongoing

* 1998 ** was included after accreditation in January 2001.

During further development of their individual profiles the IZKF abolished their topics for a better integration into the Medical Faculties.

Links to the other IZKF homepages:



THE IZKF AT GERMAN UNIVERSITIES



Interdisciplinary Centres for Clinical Research

- › Implemented in 1996 as the first structural funding measure of the BMBF’s “Health Research 2000” programme.
- › BMBF funding until May 2004; since then financed from faculty funds.
- › The aim was to strengthen the international visibility and recognition of clinical research on German university medicine.

A PATENT AND INNOVATION OFFICE FOR THE MEDICAL FACULTY MÜNSTER

The patent and innovation office Clinic Invent® of the Medical Faculty emerged from the BMBF-funded project “Klinik Patent” of the IZKF in Aachen, Erlangen, Jena, Cologne, Leipzig, Münster and Würzburg (BMBF 03VW1131, funding period 01.11.2001–31.12.2003). As early as 1998, the Association of Clinical Research Centres (ACRC) was ambitious to set up a tailor-made patent and licensing agency (PLA) for the IZKF in Germany. It was evident that only a PLA specialising in the life science sector could meet the requirements, because intensive support for medical scientists was needed to provide the necessary awareness for inventions or even patent-oriented research at German university hospitals. After three years of concept development and coordination between the seven participating medical faculties and the Fraunhofer Gesellschaft, the contract for the establishment of a joint PLA was signed between the eight partners and the BMBF in 2001. The “Klinik Patent” project started its work in January 2002 at the Fraunhofer Patent Office for German Research in Munich and was funded by the BMBF for two years.

After the amendment of Section 42 of the Employee Inventions Act (ArbErfG) and the associated abolition of the so-called university lecturer privilege in 2002, the Federal Ministry of Education and Research (BMBF) launched the nationwide funding programme “Innovation Offensive”. With this programme, the BMBF initiated the foundation of 21 PLAs in all federal states with the support of the BMBF, also building on existing structures. “Klinik Patent” was included in the programme as a “specialized PLA” and took on a special role, particularly because of its cross-national activities for certain university locations.

During the course of BMBF funding, the IZKF felt legally obligated to their state PLAs and left the joint project “Klinik Patent”. For this reason, the original project was further developed by the IZKF Münster into the patent and innovation office of the Medical Faculty from 2004 onwards and renamed “Clinic Invent”. The trademark Clinic Invent® was registered at the DPMA on February 18, 2010.

Today, Clinic Invent is a well-established stakeholder in the field of knowledge and technology transfer at the Medical Faculty and Münster University Hospital and offers scientists not only all-round support, but also a comprehensive range of services in all innovation-relevant fields.



GOALS:

- › Increasing the reputation and visibility for the inventors and the Medical Faculty Münster
- › Acquisition of new cooperation partners for the further development of inventions and generation of third-party funding
- › Increased acquisition of funding on the basis of inventions
- › Establishment of a spin-off culture at the Medical Faculty of the WWU and the UKM

RESPONSIBLE PERSONS:

IP Management:

Dr. Elke Benkhart
Dr. Marion Willenborg

IZKF Technology Transfer Officer:

Dr. Sabine Blass-Kampmann



Clinic Invent Team: (from the left) Marion Willenborg, Elke Benkhart, Sabine Blass-Kampmann

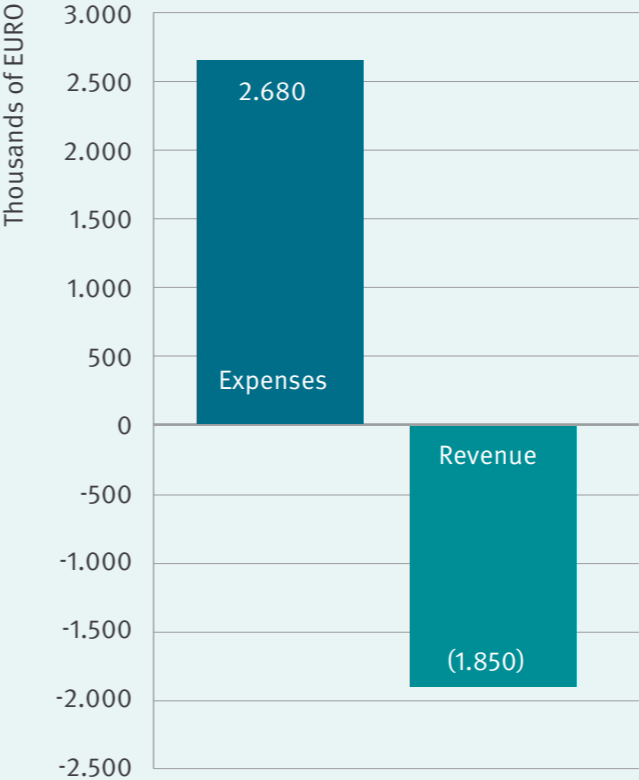
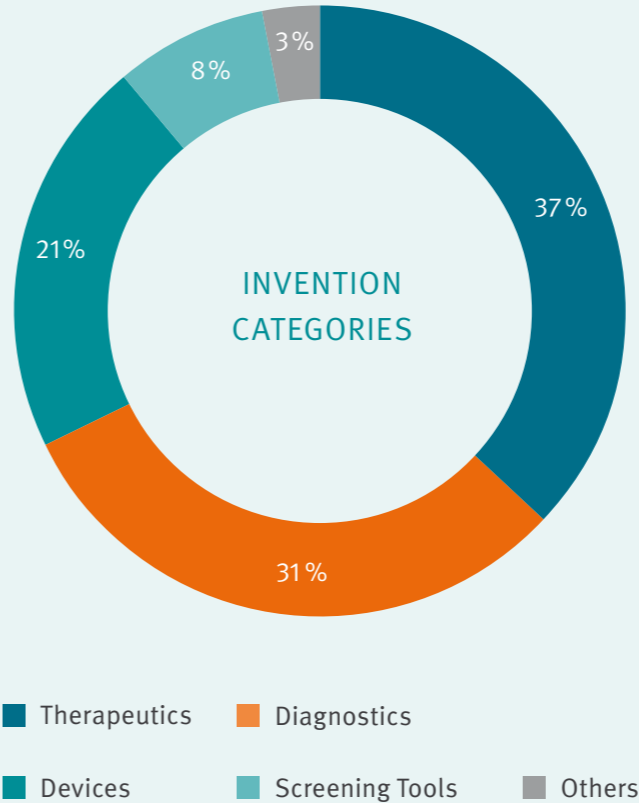


Figure 10: Cost-revenue relation 2012–2021
In the past 10 years, almost 70% of the expenses for patenting were covered by revenues.



WORK OUTPUT SINCE 2004 (STATUS 04/2022)

- Patent potential examined in about **40** IZKF grant applications per year
- Invention disclosures from the Medical Faculty per year: **~20**
- Patents granted: **56**
- Patent families: **124**
- Spin-off projects: **5**, of which **3** are active.
- New Spin-offs in progress: **4**

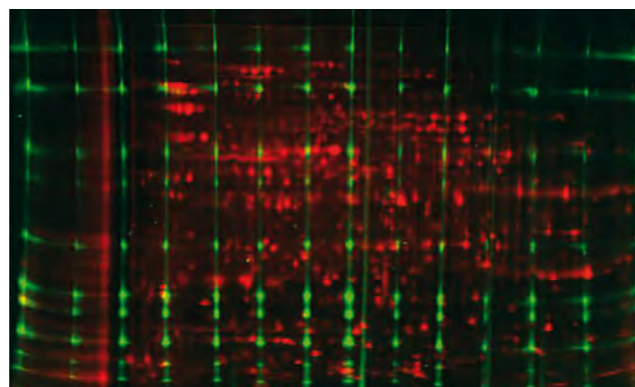
TRANSFER PRIZES OF THE WWU MÜNSTER

WWU TRANSFER PRIZE 2013/2014

COFGE – VERGLEICHENDE 2D-FLUORESZENZ-GELELEKTROPHORESE

Prof. Simone König / IZKF Münster
Cooperation partner:
SERVA Elektrophoresis GmbH, Heidelberg

False colour image generated by CoFGE – an award-winning technology developed in the Core Unit Proteomics. With this technique, the protein dots lie within a grid of so-called marker proteins. The grid serves as a reference. Using the software, the results of different runs can be compared in this way. The error rate when assigning the protein coordinates of different gels has fallen from seven to less than one percent.



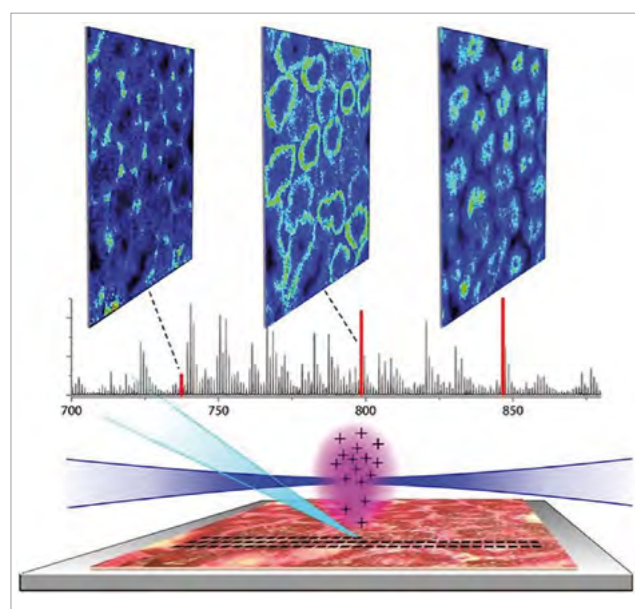
WWU TRANSFER PRIZE 2020/2021

TIMSTOF FLEX MALDI-2 – EIN BILDGEBENDES MASSENSPEKTROMETER FÜR DIE LEBENSWISSENSCHAFTEN

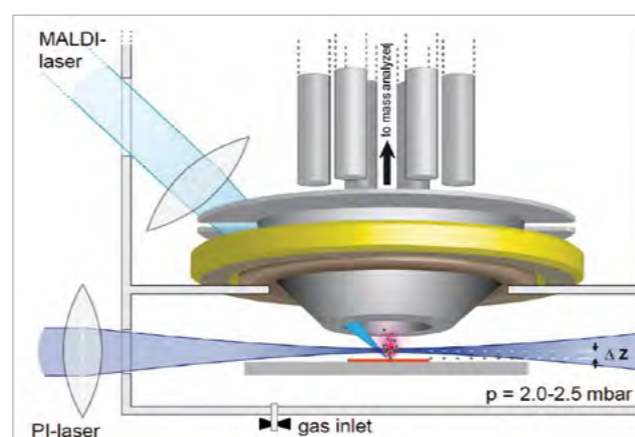
Prof. Klaus Dreisewerd und
Dr. Jens Soltwisch / Institute of Hygiene
Cooperation partner:
Bruker Daltonics GmbH & Co. KG, Bremen

Product Webpage: www.bruker.com/en/products-and-solutions/mass-spectrometry/timstof/timstof-flex-maldi-2

On the market since mid-2020.



Imaging modality of the MALDI-2. Graphics: W. Kramer | FZ UKM



The MALDI-2 principle:

Schematic drawing of the modified MALDI ion source of the Synapt G2-S mass spectrometer with primary MALDI and PI laser beams and shielding aperture. Published in: Soltwisch J et al (2015) Science 348 (6231): 211-215. doi: 10.1126/science.aaa1051.



WOMEN-IN-SCIENCE NETWORK IN THE MEDICAL FACULTY

The first grant application to the BMBF in 1994 was a male preserve. Only four of the 44 project leaders were female (9%; Fig. 10a). Nothing changed until the end of the BMBF funding. It was only in the last 10 years that a cultural change took place at the management levels of the Medical Faculty and at the working group level. More and more female scientists are taking advantage of the IZKF's funding opportunities. They implement their project ideas independently without assistance in tandem with a working group leader or institute director. Compared to the total number of approvals, they perform better than average with their project ideas. However, it was not until 2016 that the first woman scientist was elected to the IZKF Board.

As part of equal opportunity efforts, the Collaborative Research Centres SFB 656 and SFB 1009, the Cluster of Excellence CiM, and the IZKF decided to jointly organise workshops as early as 2012. This initiative gave rise to the "Gender Resource Pooling" ("Gendermittel Pooling"), a joint coordination office for all collaborative research centres at the University of Münster. The first International Women-in-Science Conference organised by the SFB 1009 and the IZKF Münster in 2018 showed that the topic met with great approval among female scientists, especially at the Medical Faculty.

The newly initiated bundling of the activities of the research alliances at the Medical Faculty sought to increase the exposure of women scientists by strengthening possibilities, opening up new potentials, and raising their visibility. In this regard, the IZKF has worked hard to foster collaboration between the research groups, the dean's office and the vice-dean for equal opportunities.



The "Women-in-Science Network Medicine" Münster (WiSNetMed), founded in October 2021, is a "bottom-up" initiative of the research alliances funded by the German Research Foundation (DFG), the IZKF Münster and the Inter-faculty Centre CiM at the Medical Faculty. The overarching goal of the "alliance of alliances" is to create good framework conditions for scientific and personal exchange between women from the various disciplines and to awaken and promote enthusiasm for research and the courage to pursue an academic career in medicine among women scientists in the late postdoc phase.

WHAT ARE THE AIMS OF WiSNetMed?

- › Internet platform to bundle all offers at the Medical Faculty and the University of Münster
- › Scientific lectures by established 'Role Models' within the framework of lecture series of the participating research associations
- › Informal regular network meetings "Ladies after Work"
- › A structured mentoring programme
- › International Women-in-Science Network conferences
- › Further education offers, workshops & trainings, especially on special topics of a career in university medicine



PRINCIPAL INVESTIGATORS (PI)

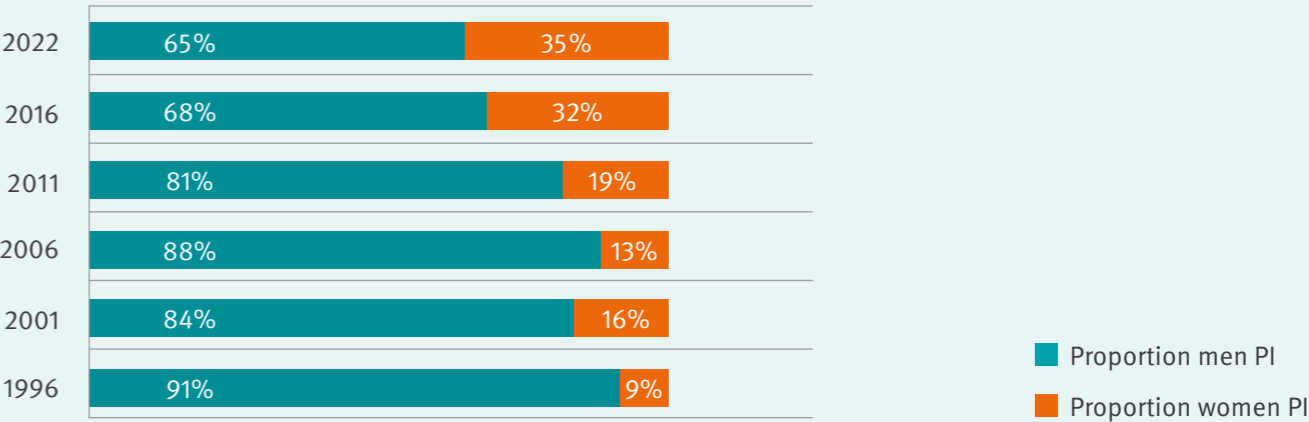


Figure 10a. The proportion of women principal investigators has quadrupled in 25 years.

WOMEN SCIENTISTS IN THE IZKF

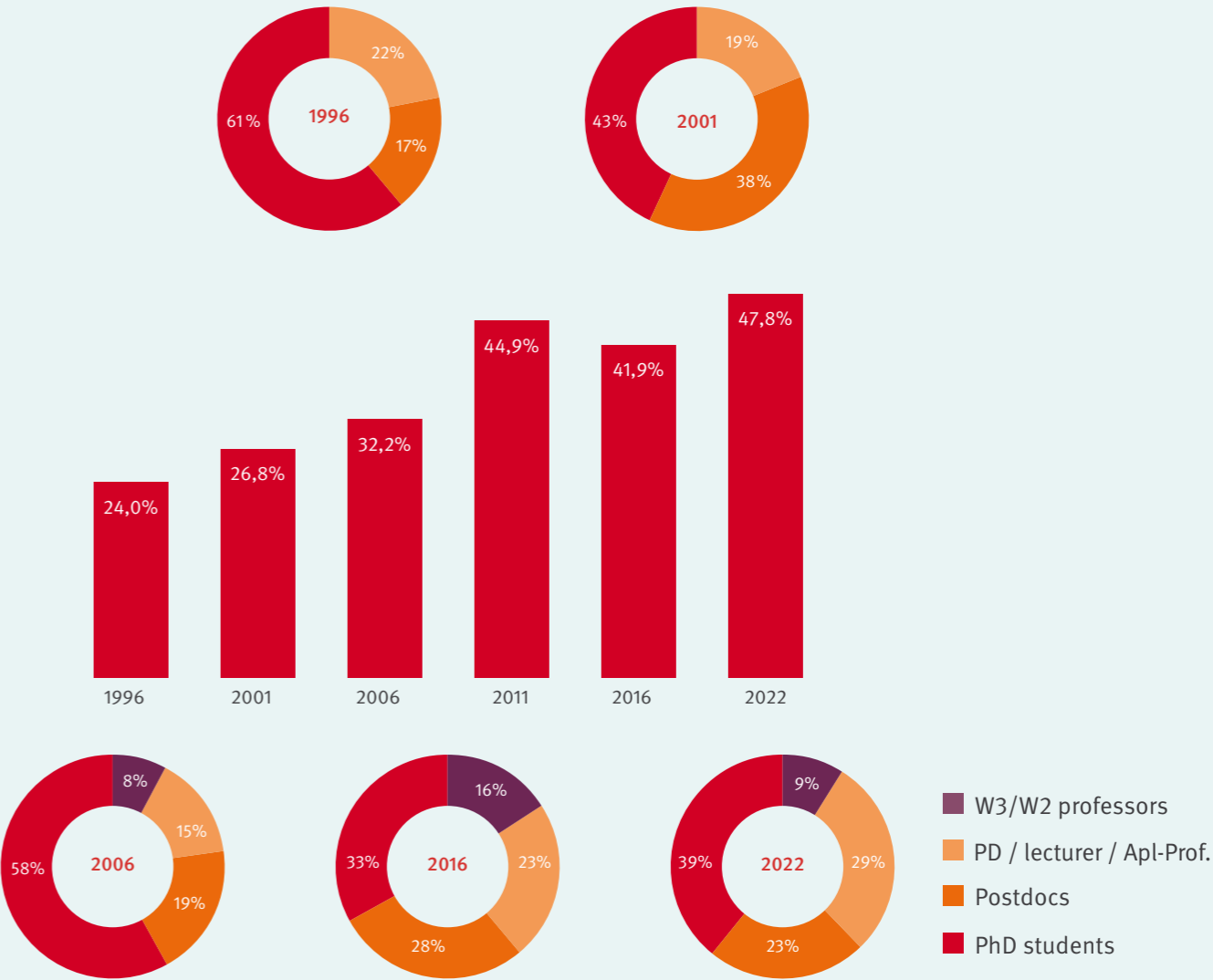


Figure 10b: The overall percentage has doubled in 25 years. The qualifications are also more evenly represented, although the proportion of women professors can still be improved.



IZKF IN NUMBERS

FINANCIAL ASPECTS

79,8 Mio EURO
total expenses (2005–2021)

4,86 Mio EURO annual budget
from the State Grant for Research and Teaching
as fixed in the budget of the Medical Faculty

48,9 Mio EURO
for research projects

9,6 Mio EURO
for young academics

12,1 Mio EURO
for Core Units

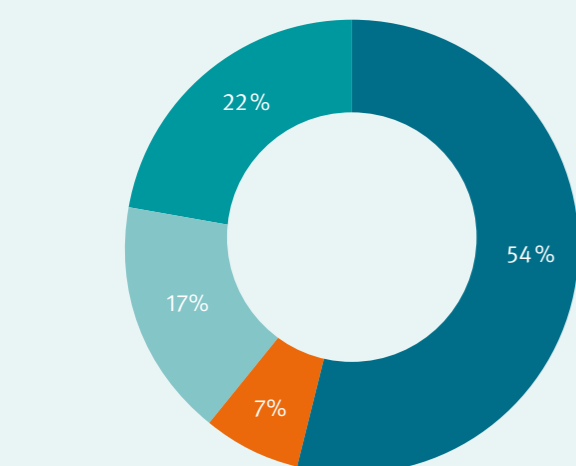
ACQUISITION OF THIRD-PARTY FUNDS BY IZKF SCIENTISTS

155,3 Mio EURO third-party funding
of IZKF scientists (2005–2021)

37,5 Mio EURO
individual research grants (DFG)

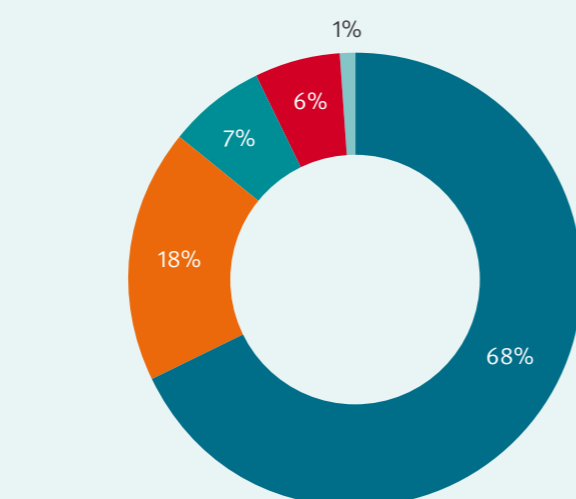
48,7 Mio EURO
research grants in
collaborative research centres (DFG)

TOTAL FUNDING OF THE MEDICAL CENTRES AND THEIR DEPARTMENTS SINCE 2005



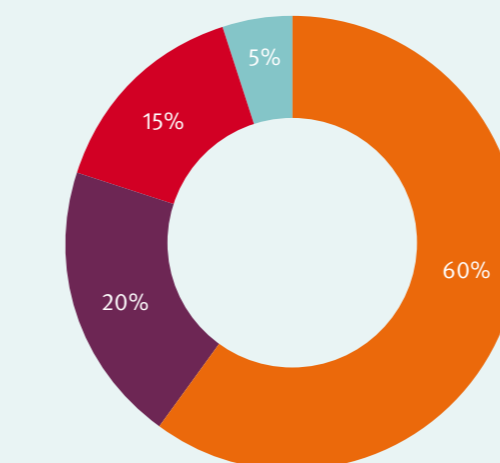
■ Clinical Departments
■ Clinical Theoretical Medicine
■ Theoretical Medicine
■ Preclinical Medicine

EXTERNAL FUNDING PROVIDERS (2005–2021)



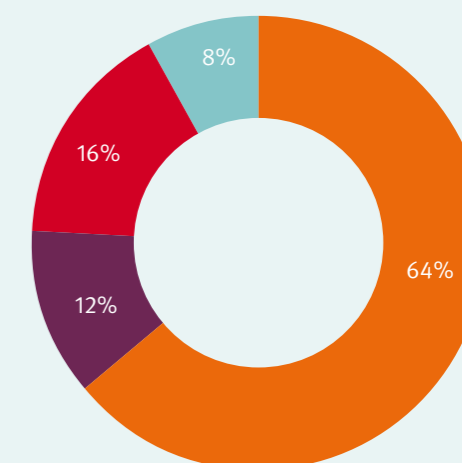
■ German Research Foundation (DFG)
■ Federal Ministry of Education and Research (BMBF)
■ European Union (EU)
■ Foundations
■ Industry and contract research

PLANNED EXPENDITURES ACCORDING TO IZKF STRATEGY PAPER 2004

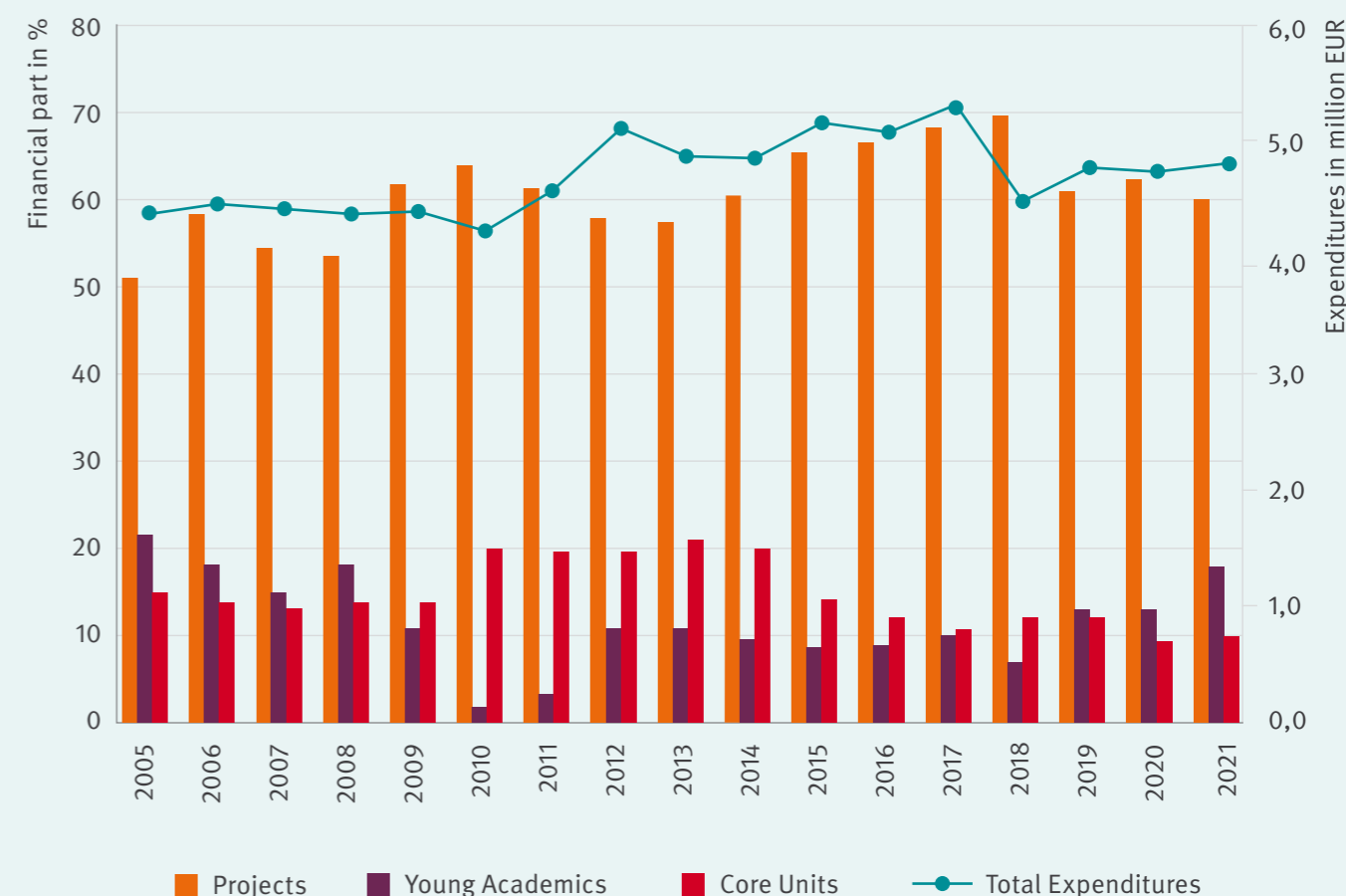


■ Projects ■ Young Academics ■ Core Units ■ Support / Central Funds

EXPENDITURES 2005–2021

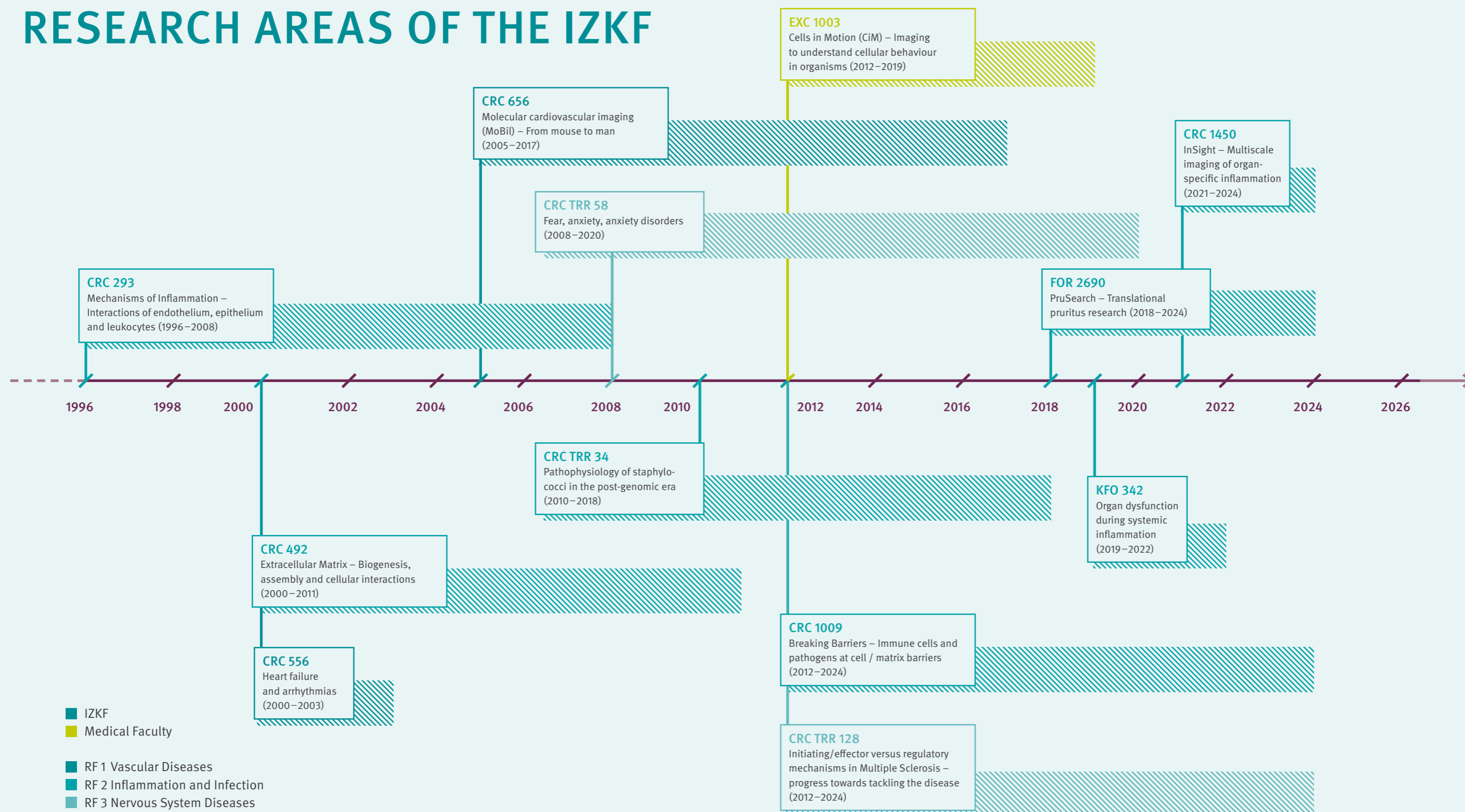


ANNUAL ALLOCATION OF FUNDS TO THE IZKF FORMATS



■ Projects ■ Young Academics ■ Core Units — Total Expenditures

COLLABORATIVE RESEARCH ACTIVITIES IN RESEARCH AREAS OF THE IZKF



RF = Research Focus | Status 05/2022

STRUCTURE OF THE IZKF

Organisationally, the IZKF Münster is an institutionalised collaborative research centre of the Medical Faculty of the University of Münster whose mission is to strengthen and promote outstanding clinical research. In accordance with its statutes and the rules of the Advisory Board agreed upon in 2004, the implementation of this mission is determined by the Centre's organs, namely the IZKF Board, the Research

Council of the Medical Faculty and the external Scientific Advisory Board of the IZKF. The IZKF Executive Board is responsible for all scientific and management issues. For all central administrative, structural and scientific coordinative tasks, the IZKF Scientific Office forms the central interface between the scientists, the various committees involved, the Dean's and the Rector's Office and, above all, with the UKM administration.

Legend:

INTERNAL ORGANISATION

The IZKF Münster has a democratic organisational principle: The General Assembly is the central body of the IZKF. It is made up of all IZKF principal investigators, financed scientific personnel, the heads of IZKF Core Units, and Spokespersons of Collaborative Research Centres (DFG) at the Medical Faculty. In organisational matters, every member has the right to vote. Each IZKF-funded project or Core Unit gets one vote in elections and decisions on membership admission and expulsion. The IZKF Executive Board members are elected for a three-year term, with one immediate re-election allowed. They manage the IZKF in every respect and represent it externally. The Executive Board is accountable to the General Assembly and is supported by a Managing Director. For transparency reasons, the Vice-Rector for Research of the University, the Dean of the Medical Faculty, the Medical Director and the Business Director of the University Hospital are ex-officio advisory members of the IZKF Board of Directors.

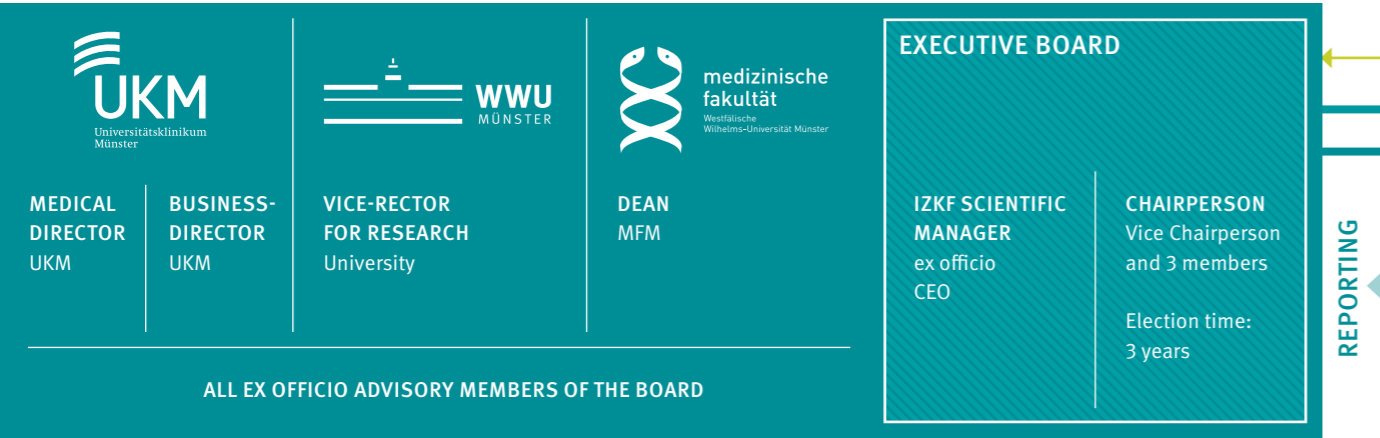
PEER-REVIEW AND ADVICE

The internal Research Council (nominated by the Medical Faculty Council) and the external Scientific Advisory Board (appointed by the Rectorate) are the two organs for assessment procedures of research applications. The Research Council is responsible for the preliminary assessment of project proposals and ensures transparent decisions within the faculty. It recommends which project outlines should be submitted as full proposals. The Executive Board delegates three members to the Research Council for the duration of its term of office, while the Medical Faculty Council nominates regular and deputy members as indicated.

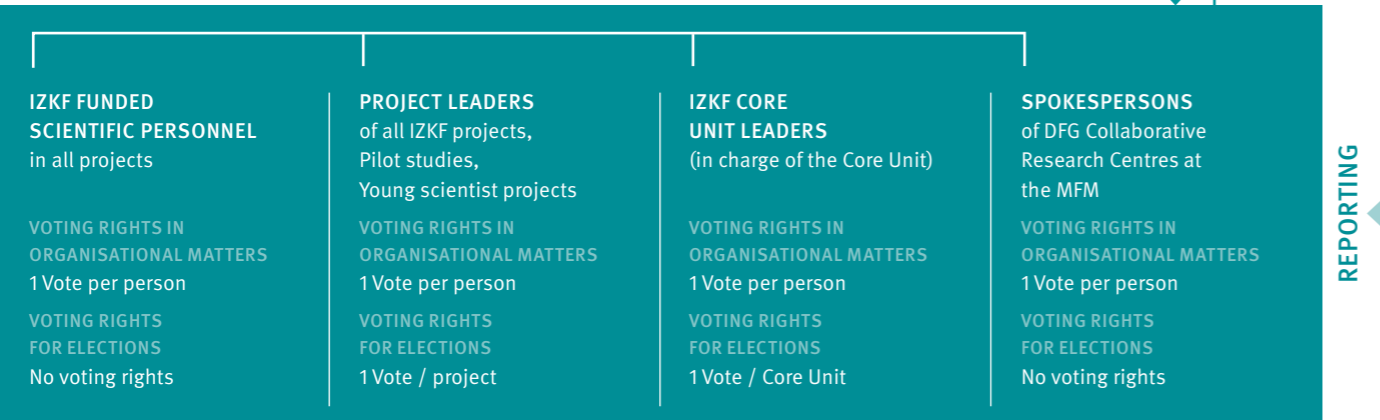
Twelve outstanding and experienced scientists with a broad spectrum of knowledge from the disciplines of the IZKF research areas form the external Scientific Advisory Board. The IZKF Board of Directors submits a proposal list via the Deanery to the Rectorate with recommendations for a balanced composition with basic researchers and clinical scientists. The Scientific Advisory Board's responsibilities include peer review of full project proposals, quality assurance of funding formats, and strategic advice to the IZKF Board.

Internal Organisation Structure

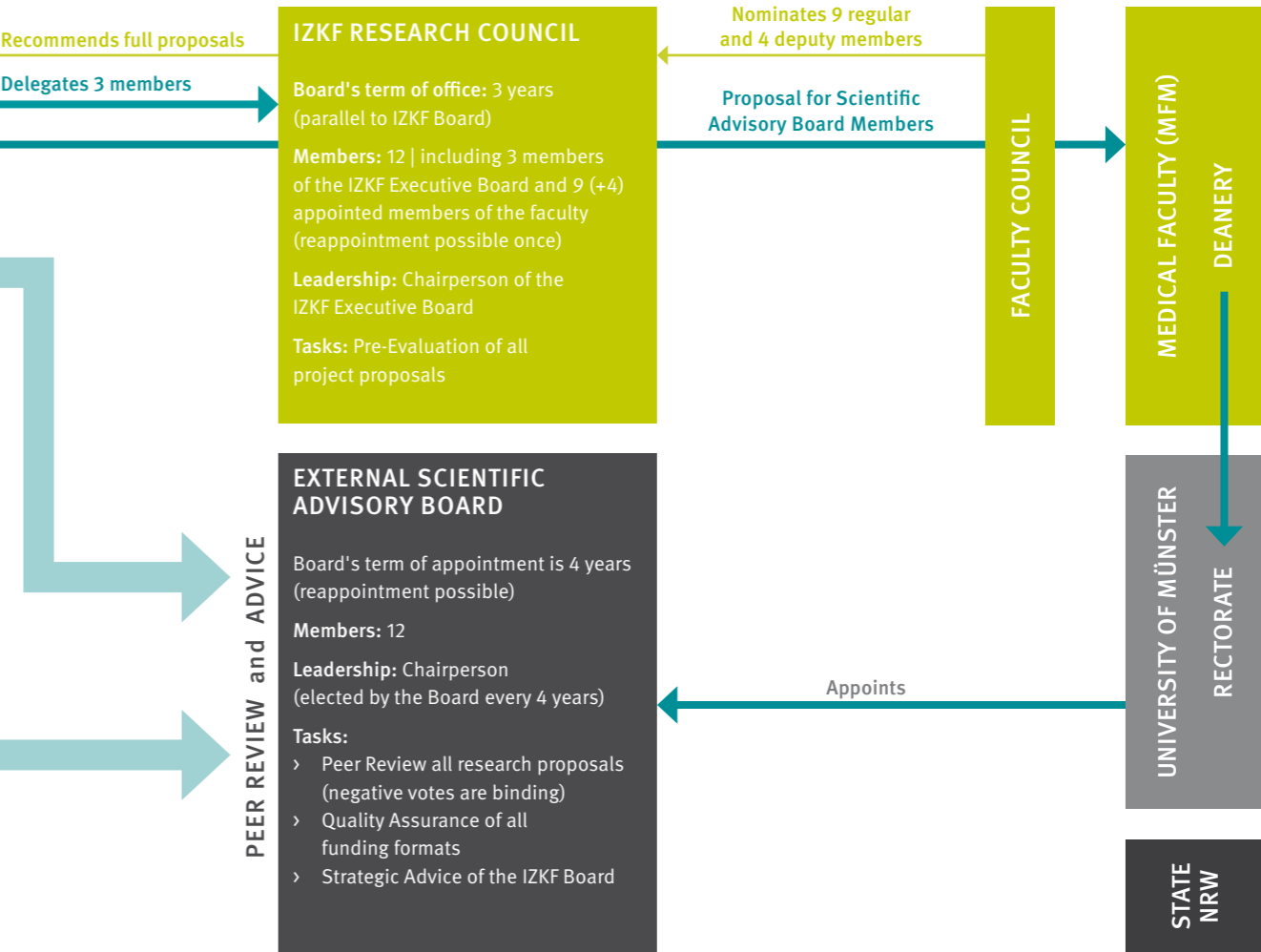
IZKF BOARD



MEMBER ASSEMBLY



Advice and Supervision



COMMITTEES AND BOARDS SINCE 1996

MEMBERS OF THE IZKF BOARD

The IZKF Board is composed of the “Executive Board” and the “statutory guests”. The General Assembly of the IZKF elects the Board for a term of three years; re-election is permitted once. Therefore, active membership in the IZKF is a prerequisite for participation in the Executive Board. The management in its entirety is the responsibility of the Board, which is supported by a Managing Director for this purpose. The principles of scientific management are laid down in rules of procedure.

According to the statutes of the IZKF, the Dean of the Medical Faculty, the Prorector for Research of the University of Münster, the Medical Director and the Administrative Director, later Business Director of the University Hospital are represented as “guests” qua office on the IZKF Board and have an advisory function. This organisation serves to ensure the transparency of the decisions taken.

Period	Executive Board	Statutory Guests (advisory)
1995 – 1997 Installation Board	Prof. Dr. J. van de Loo (Chair) Prof. Dr. C. Sorg (Vice-Chair) Prof. Dr. G. Breithardt Prof. Dr. M. Hoke Prof. Dr. E. Nieschlag	Prof. Dr. T.A. Luger (Dean MFM) Prof. Dr. Dr. O. Schober (Rectorate University) Prof. Dr. K.-H. Rahn (Medical Director UKM) M. Gotthardt (Administrative Director UKM)
1997 – 1999	Prof. Dr. C. Sorg (Chair) Prof. Dr. E. Harms (Vice-Chair) Prof. Dr. W. Schmitz Prof. Dr. G. Breithardt PD Dr. M. Herrmann	Prof. Dr. T.A. Luger (Dean MFM) Prof. Dr. N. Willich (Rectorate University) Prof. Dr. K.-H. Rahn (Medical Director UKM) M. Gotthardt (Administrative Director UKM)
1999 – 2001	Prof. Dr. E. Harms (Chair) Prof. Dr. W. Schmitz (Vice-Chair) Prof. Dr. H. Oberleithner Prof. Dr. G. Breithardt Prof. Dr. M.M. Lerch	Prof. Dr. C. Sorg (Dean MFM) Prof. Dr. N. Willich (Rectorate University) Prof. Dr. K.-H. Rahn (Medical Director UKM) M. Gotthardt (Administrative Director UKM)
2001 – 2003	Prof. Dr. E. Harms (Chair) Prof. Dr. W. Schmitz (Vice-Chair) Prof. Dr. T.A. Luger Prof. Dr. G. Peters Prof. Dr. J. Roth	Prof. Dr. C. Sorg (Dean MFM) Prof. Dr. N. Willich (Rectorate University) Prof. Dr. K.-H. Rahn (Medical Director UKM) M. Gotthardt (Administrative Director UKM)
2003 – 2006	Prof. Dr. C. Sorg (Chair) Prof. Dr. G. Peters (Vice-Chair) Prof. Dr. T.A. Luger Prof. Dr. P. Bruckner Prof. Dr. Dr. S. Thanos	Prof. Dr. H. Jürgens (Dean MFM) Prof. Dr. W. Berdel (Rectorate University) Prof. Dr. W. Kox (Medical Director UKM) Dr. M. Gotthardt (Administrative Director UKM)
2006 – 2009	Prof. Dr. G. Peters (Chair) Prof. Dr. T.A. Luger (Vice-Chair) Prof. Dr. F.U. Müller Prof. Dr. P. Bruckner Prof. Dr. H.-C. Pape	Prof. Dr. V. Arolt (Dean MFM) Prof. Dr. W. Schmitz (Rectorate University) Prof. Dr. N. Roeder (Medical Director UKM) Dr. C. Hoppenheit (Business Director UKM)

Period	Executive Board	Statutory Guests (advisory)
2009 – 2012	Prof. Dr. G. Peters (Chair) Prof. Dr. T.A. Luger (Vice-Chair) Prof. Dr. F.U. Müller Prof. Dr. V. Gerke Prof. Dr. H.-C. Pape	Prof. Dr. W. Schmitz (Dean MFM) Prof. Dr. S. Ludwig (Rectorate University) Prof. Dr. N. Roeder (Medical Director UKM) Dr. C. Hoppenheit (Business Director UKM)
2012 – 2015	Prof. Dr. V. Gerke (Chair) Prof. Dr. F.U. Müller (Vice-Chair) Prof. Dr. H. Karch Prof. Dr. T. Pap Prof. Dr. H. Wiendl / Prof. Dr. H.-C. Pape (2014)	Prof. Dr. W. Schmitz (Dean MFM) Prof. Dr. S. Ludwig (Rectorate University) Prof. Dr. N. Roeder (Medical Director UKM) Dr. C. Hoppenheit (Business Director UKM)
2015 – 2018	Prof. Dr. V. Gerke (Chair) Prof. Dr. H.-C. Pape (Vice-Chair) Prof. Dr. Dr. H. Karch Prof. Dr. T. Kuhlmann Prof. Dr. T. Pap / Prof. Dr. C. Rössig (2016)	Prof. Dr. W. Schmitz (Dean MFM) / Prof. Dr. M. Herrmann (Dean MFM; 2016) Prof. Dr. S. Ludwig (Rectorate University) / Prof. Dr. M. Stoll (Rectorate University; 2017) Prof. Dr. N. Roeder (Medical Director UKM) / Prof. Dr. Dr. R. Nitsch (Medical Director UKM; 2017) Dr. C. Hoppenheit (Business Director UKM)
2018 – 2021	Prof. Dr. S. Ludwig (Chair) Prof. Dr. T. Kuhlmann (Vice-Chair) Prof. Dr. Dr. U. Dannlowski Prof. Dr. J. Roth Prof. Dr. A. Zarbock	Prof. Dr. M. Herrmann (Dean MFM) / Prof. Dr. Dr. Dr. h.c. S. Meuth (int.Dean MFM; 2019)/ Prof. Dr. F.U. Müller (Dean MFM; 12/2019) Prof. Dr. M. Stoll (Rectorate University) Prof. Dr. Dr. R. Nitsch (Medical Director UKM) / Prof. Dr. Dr. h.c. H. van Aken (Med. Director UKM; 2019) Dr. C. Hoppenheit (Business Director UKM)
2021 – 2024	Prof. Dr. S. Ludwig (Chair) Prof. Dr. A. Zarbock (Vice-Chair) Prof. Dr. P. Dersch Prof. Dr. J. Groß Prof. Dr. F. Kiefer	Prof. Dr. F.U. Müller (Dean MFM) Prof. Dr. M. Stoll (Rectorate University) Prof. Dr. Dr. h.c. H. van Aken (Medical Director UKM) / Prof. Dr. A. Friedrich (Medical Director UKM; 2022) Dr. C. Hoppenheit (Business Director UKM)



Chairpersons since 2006: (from the left) Volker Gerke, Stephan Ludwig, Georg Peters (†)

THE IZKF EXECUTIVE BOARD



1: 1999 | 2: 2006 | 3: 2013 | 4: 2015 | 5: 2022

MEMBERS OF THE
IZKF RESEARCH COUNCIL
FORSCHUNGSRAT

The IZKF Research Council is responsible for the preliminary review of project proposals submitted by scientists at the Medical Faculty. According to §8 (1) of the IZKF statutes, the term of office of the Research Council is linked to that of the IZKF Board. The Faculty Council elects nine full members and four deputies of the Research Council for a term of three years. Immediate re-election is permitted once. It is also stipulated that extensive experience in scientific

peer review is mandatory for the IZKF Research Council members. Sixty-two members of the Medical Faculty served on the IZKF Research Council from 1996 until today as expert reviewers elected by the Faculty Council. Three members of the IZKF Board are delegated to this body, with the chairperson of the Board acting as the chairperson of the Research Council by virtue of his or her office. The scientific management of the IZKF accompanies the project selection process.

Name (alphabetical order)	Institution	Member	
		from ...	to ...
Univ.-Prof. Dr. V. Arolt	Department of Psychiatry and Psychotherapy	2012	2018
Univ.-Prof. Dr. H. Baumgartner	Department of Cardiology III	2009	2012
Priv.-Doz. Dr. H. M. Behre	Institute of Reproductive Medicine	1999	2003
Univ.-Prof. Dr. A. Bleckmann	Department of Medicine A	2021	current
Univ.-Prof. Dr. A. Bräuninger	Gerhard-Domagk-Institute of Pathology	2008	2012
Univ.-Prof. Dr. G. Breithardt	Department of Cardiology and Angiology	2003	2009
Univ.-Prof. Dr. B. Brinkmann	Institute of Legal Medicine	1996	2003
Univ.-Prof. Dr. P. Bruckner	Institute of Physiological Chemistry and Pathobiochemistry	1999	2003
Univ.-Prof. Dr. Dr. U. Dannlowski	Institute of Translational Psychiatry	2021	current
Univ.-Prof. Dr. U. Dobrindt	Institute of Hygiene	2018	2021
Univ.-Prof. Dr. Dr. h.c. W. Domschke	Department of Medicine B	1999	2003
Univ.-Prof. Dr. C. Faber	Department of Radiology – Experimental MRT group	2015	2021
Univ.-Prof. Dr. D. Föll	Department of Pediatric Rheumatology and Immunology	2012	2015
Univ.-Prof. Dr. V. Gerke	Institute of Medical Biochemistry (ZMBE)	2003 2018	2009 2021
Univ.-Prof. Dr. J. Groß	Institute of Biomagnetism and Biosignalanalysis	2021	current
Univ.-Prof. Dr. W. L. Heindel	Department of Radiology	1999	2012
Univ.-Prof. Dr. J. Herbst	Gerhard-Domagk-Institute of Pathology	2003	2006
Univ.-Prof. Dr. L. Hertle	Department of Urology	1996	2003
Univ.-Prof. Dr. F. Hillenkamp	Institute of Medical Physics and Biophysics	1999	2003
Univ.-Prof. Dr. Dr. Dr. h.c. U. Joos	Department of Cranio-Maxillofacial Surgery	1998	2003

Name (alphabetical order)	Institution	Member	
		from ...	to ...
Univ.-Prof. Dr. J. Kienast (†)	Bone Marrow Transplant Centre (KMT)	2003	2009
Univ.-Prof. Dr. L. Kiesel	Department of Obstetrics and Gynecology	2003	2009
Univ.-Prof. Dr. J. Klingauf	Institute of Medical Physics and Biophysics	2015	2021
Univ.-Prof. Dr. L. Klotz	Department of Neurology	2018	2021
Univ.-Prof. Dr. T. Kuhlmann	Institute of Neuropathology	2021	current
Univ.-Prof. Dr. W. Linke	Institute of Physiology II	2018	2021
Univ.-Prof. Dr. T. A. Luger	Department of Dermatology	2009	2015
Univ.-Prof. Dr. M. Meisterernst	Institute of Molecular Tumor Biology	2009	2015
Univ.-Prof. Dr. F. U. Müller	Institute of Pharmacology and Toxicology	2009 2015	2015 2021
Univ.-Prof. Dr. C. Müller-Tidow	Department of Medicine A	2009	2015
Univ.-Prof. Dr. H. Oberleithner	Institute of Physiology II	1999	2006
Univ.-Prof. Dr. H.-C. Pape	Institute of Physiology I	2006 2012	2009 2015
Univ.-Prof. Dr. H.-J. Pavenstädt	Department of Medicine D	2015	2021
Univ.-Prof. Dr. W. Paulus	Institute of Neuropathology	1999	2006
Univ.-Prof. Dr. J. Peter-Katalinic	Institute of Medical Physics and Biophysics	1999	2003
Univ.-Prof. Dr. G. Peters (†)	Institute of Medical Microbiology	1999 2012	2003 2018
Univ.-Prof. Dr. M.J. Raschke	Department of Trauma, Hand and Reconstructive Surgery	2018	2021
Univ.-Prof. Dr. E. B. Ringelstein	Department of Neurology	1998	2012
Univ.-Prof. Dr. J. Roth	Institute of Immunology	2009 2015 2021	2012 2018 current
Univ.-Prof. Dr. C. Rössig	Department of Pediatric Hematology and Oncology	2015	2021
Univ.-Prof. Dr. M. Schäfers	Department of Nuclear Medicine / EIMI	2006 2021	2012 current
Univ.-Prof. Dr. S. Schlatt	Centre for Reproductive Medicine and Andrology	2009 2021	2015 current
Univ.-Prof. Dr. M. A. Schmidt	Institute of Infectiology (ZMBE)	2003	2009
Univ.-Prof. Dr. H.-J. Schnittler	Institute of Anatomy and Vascular Biology	2012	2015
Univ.-Prof. Dr. St. Schulte-Merker	Institute for Cardiovascular Organogenesis and Regeneration	2021	current
Univ.-Prof. Dr. A. Schwab	Institute of Physiology II	2006 2015	2012 2018
Univ.-Prof. Dr. H. Serve	Department of Medicine A	2006	2008
Univ.-Prof. Dr. Dr. W. Sibrowski	Institute of Transfusion Medicine	1998	2003
Univ.-Prof. Dr. M. Simoni	Institute of Reproductive Medicine	2006	2008
Univ.-Prof. Dr. Dr. O. Söhnlein	Institute of Experimental Pathology (ZMBE)	2021	current

Name (alphabetical order)	Institution	Member	
		from ...	to ...
Univ.-Prof. Dr. L. M. Sorokin	Institute of Physiological Chemistry and Pathobiochemistry	2018	current
Univ.-Prof. Dr. R. Stange	Department of Regenerative Musculoskeletal Medicine	2021	current
Univ.-Prof. Dr. K. Steinbrink	Department of Dermatology	2021	current
Univ.-Prof. Dr. W. Stummer	Department of Neurosurgery	2012	2018
Univ.-Prof. Dr. C. Sunderkötter	Department of Dermatology	2015	2017
Univ.-Prof. Dr. D. Vestweber	MPI of Molecular Biomedicine – Vascular Cell Biology	2003 2012	2009 2017
Univ.-Prof. Dr. J. Vormoor	Department of Pediatric Hematology and Oncology	2003	2006
Univ.-Prof. Dr. J. Waltenberger	Department of Cardiology and Angiology	2012	2017
Univ.-Prof. Dr. P. Wieacker	Institute of Human Genetics	2008	2012
Univ.-Prof. Dr. H. Wiendl	Department of Neurology	2021	current
Univ.-Prof. Dr. N. Willich	Department of Radiotherapy – Radiooncology	1996	2003
Univ.-Prof. Dr. A. Zarbock	Department of Anaesthesiology, Intensive Care and Pain Therapy	2017	2020



THE SCIENTIFIC OFFICE OF THE IZKF 1996–2022

The IZKF Scientific Office is responsible for all science-related, structural and administrative requirements of an interdisciplinary centre. It acts as a central interface with a wide range of tasks between all areas of the IZKF, i.e. efficient research funding, professional technology management, transparent organisation of the review processes, flexible and short-term decision-making procedures, regular reporting, experienced meeting coordination and management, public relations and intellectual property management in cooperation with the Patent Office of the Medical Faculty.



(from the left) Carmen Rohenkohl, Dr. Sabine Blass-Kampmann, Björn Teichert, Dr. Rita Naskar, Karina Riemenschneider

Head of Scientific Office (CEO) Scientific Coordination & Management	Dr. Sabine Blass-Kampmann	Since 05/1998
Administrative Coordination	Dr. Peter Josten Dr. Rita Naskar	06/2002–10/2005 Since 04/2006
IT Administration Administration (First BMBF funding period)	Björn Teichert Dietrich Lemm	Since 09/2005 06/1996–01/1998
Administrative Assistance (full position) Administrative Assistance (part-time position)	Ruth Pagenkemper Carmen Rohenkohl (formerly Krybus) Andrea Kühn Ute Renzel Katja Kunterding-Röhrs Birte-Marie Blut Melanie Gövert Karina Riemenschneider	06/1996–12/2007 Since 01/2008 11/1999–11/2000 01/2001–07/2008 08/2009–02/2011 11/2012–02/2015 05/2015–12/2015 Since 05/2016
Student assistants	Thomas M. J. Baur Dennis Braun	09/2001–06/2004 07/2004–08/2008
Patent Office Clinic Invent / IP Management	Dr. Elke Benkhart Dr. Marion Willenborg	Since 06/2004 Since 06/2009

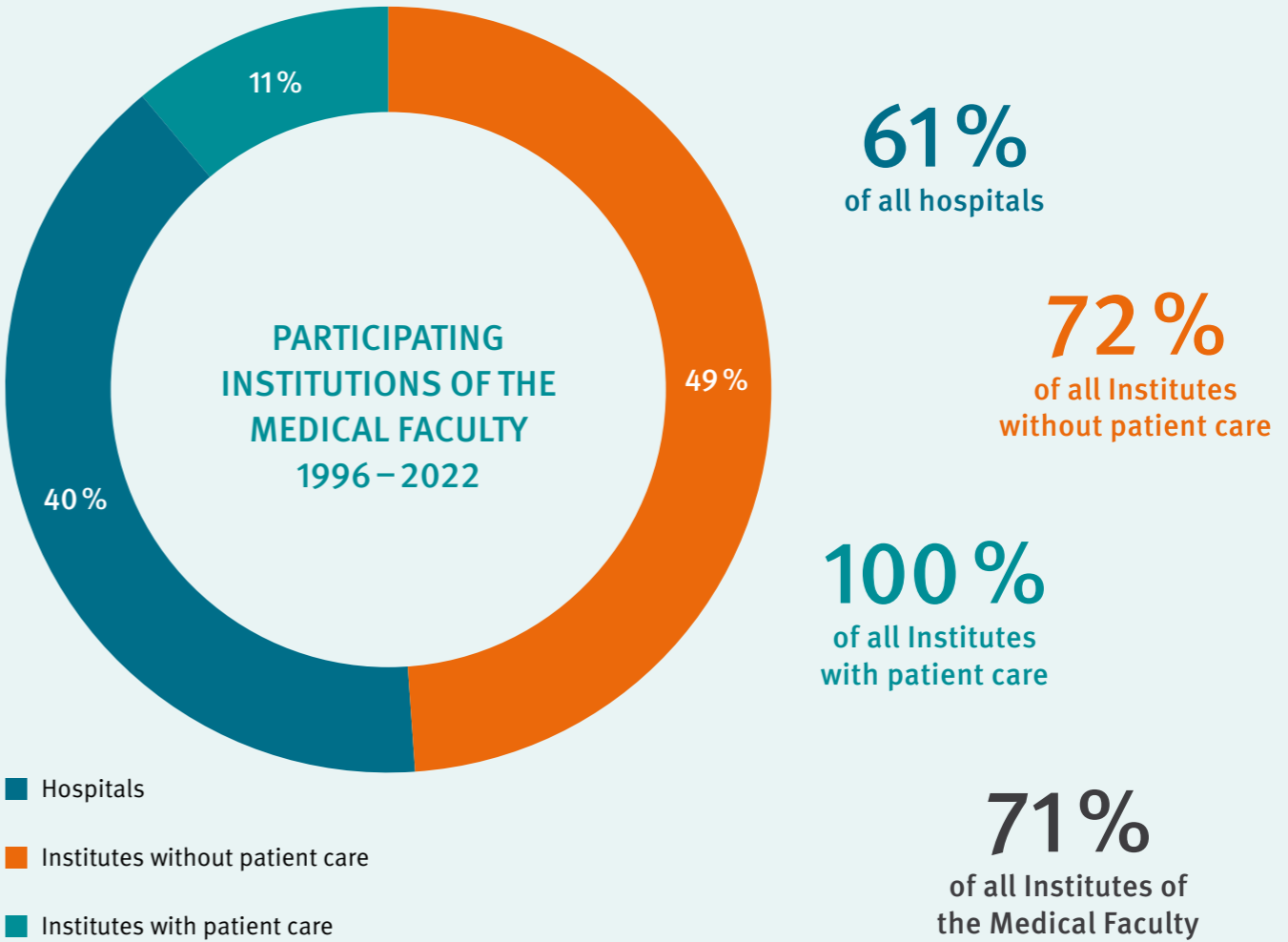
MEMBERS OF THE IZKF MÜNSTER 1996–2022

According to § 2 of the statutes, all Principal Investigators and scientific staff (doctoral students and postdocs) funded in all projects are members of the IZKF Münster. In addition, for strategic reasons, the chairpersons of Collaborative Research Centres and Clinical Research Units of the DFG are IZKF members during the funding period of the research networks.

Interdisciplinarity is one of the guiding principles of the IZKF. It is reflected in the thematic affiliation of the projects to the IZKF research areas. For this reason, during the peer-review process, research projects are assigned to the re-

search areas in terms of content, regardless of whether the researchers feel they belong to a particular focus area. Accordingly, during the course of the last 25 years several interdisciplinary, externally funded joint research activities, particularly collaborative research centres of the DFG (see above) have been initiated as a result of the interdisciplinary composition of the research priorities.

In total, 298 scientists from 58 hospitals and institutes have conducted research at the IZKF Münster over the past 25 years. Many of them have used the IZKF to launch their careers and are now full professors at German or foreign universities.



MEMBERS OF PARTICIPATING INSTITUTIONS

[academic grade during membership | Leadership of projects]
Funding reference numbers are indicated; for project titles and affiliation to the research areas see IZKF Homepage.

EUROPEAN INSTITUTE FOR MOLECULAR IMAGING (EIMI)

Faust, Andreas, Dr. rer. nat.	Fau2/014/17
Hermann, Sven, PD Dr. med.	Z/004/17, CU PIX
Jacobs, Andreas H., Prof. Dr. rer. nat.	SchwJ3/001/11
Kiefer, Friedemann, Prof. Dr. rer. nat.	Kief1/019/20

GERHARD-DOMAGK-INSTITUTE OF PATHOLOGY

August, Christian, Dr. med.	D20/01
Baba, Hideo Andreas, Dr. med.	B1/98
Böcker, Werner, Prof. Dr. med.	B1/96, D8/96
Brandt, Burkhardt H., PD Dr. rer. nat.	H1/01
Bürger, Horst, Prof. Dr. med.	H1/01
Dockhorn-Dworniczak, Barbara, PD Dr. med.	G2/99, H2/01
Poremba, Christopher, Prof. Dr. med.	H2/01
Schäfer, Karl-Ludwig, Dr. rer. nat.	G2/99
Schmid, Kurt Werner, Prof. Dr. med.	D8/96

INSTITUTE OF ANATOMY AND MOLECULAR NEUROBIOLOGY

Böckers, Tobias M., Prof. Dr. rer. nat.	F1/99, F8/01
Bockmann, Jürgen, PD Dr. rer. nat.	F1/99, F8/01
Missler, Markus, Prof. Dr. med.	Mi3/025/08, Mi3/004/19
Wittkowski, Werner, Prof. Dr. med.	ZPG5/96

INSTITUTE OF ARTERIOSCLEROSIS RESEARCH | LIFA
(non-funded members since 2001)

Engel, Thomas, Dr. rer. nat.	F6/01
Etzrodt, Dörte, Dr. agr.	Schu1/001/04
Rauterberg, Jürgen, Prof. Dr. rer. nat.	A2/96
Robeneck, Horst, Prof. Dr. rer. nat.	A2/96
Seedorf, Udo, Prof. Dr. rer. nat.	A4/96, B9/01

INSTITUTE OF BIOMAGNETISM AND BIOSIGNALANALYSIS

Dobel, Christian, PD Dr. rer. nat.	DO3/021/10
Groß, Joachim, Prof. Dr. rer. nat.	Gro3/001/19
Junghöfer, Markus, Prof. Dr. rer. nat.	Ju3/024/15
Pantev, Christo, Prof. Dr. rer. nat.	Pan3/008/07, CRA/005/11
Wolters, Carsten, PD Dr. rer. nat.	Ju3/024/15

INSTITUTE OF BIOSTATISTICS AND CLINICAL RESEARCH

Gerß, Joachim, Dr. rer. nat.	CRA/004/12
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INSTITUTE OF CELL BIOLOGY (ZMBE)

Betz, Timo, Dr. rer. nat.	Bet1/013/17
Matis, Maja, Dr. rer. nat.	Mat2/019/16, Mat1/027/21
Raz, Erez, Prof. Dr. rer. nat.	Raz2/029/09, Raz2/021/16
Schwamborn, Jens C., Dr. rer. nat.	SchwJ3/001/11
Vestweber, Dietmar, Prof. Dr. rer. nat.	C1/96, Vest2/006/04

INSTITUTE OF CELL DYNAMICS AND IMAGING

Wedlich-Söldner, Roland M., Prof. Dr. rer. nat.	Wed2/022/18
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INSTITUTE OF CLINICAL CHEMISTRY AND LABORATORY MEDICINE – CENTRAL LABORATORY

Assmann, Gerd, Prof. Dr. med.	A4/96, B7/99, B9/01, B13/01
Funke, Harald, PD Dr. med.	A5/96
Göpfert, Christian, Dr. med.	RÜCK/003/00
Rust, Stefan, Dr. rer. nat.	B7/99, B13/01
von Eckardstein, Arnold, PD Dr. med.	A3/96

INSTITUTE OF EPIDEMIOLOGY AND SOCIAL MEDICINE

Berger, Klaus, Prof. Dr. med.	CRA/001/10
Keil, Ulrich, Prof. Dr. med.	ZPG4/96

INSTITUTE OF EXPERIMENTAL DERMATOLOGY

Högger, Petra, PD Dr. rer. nat.	C5/96
Jänicke, Reiner U., PD Dr. rer. nat.	E9/01
Kerkhoff, Claus, PD Dr. rer. nat.	C15/99, C23/01, Ker3/086/04
Los, Marek, Dr. med.	E8/01
Manitz, Marie-Pierre, Dr. rer. nat.	C14/99
Nacken, Wolfgang, Dr. rer. nat.	C23/01, Na2/009/04
Schulze-Osthoff, Klaus, Prof. Dr. rer. nat.	C13/99, D13/99
Sorg, Clemens, Prof. Dr. rer. nat.	C5/96, ZPG8/96, C23/01, E8/01, Z/001/02, ZPG1 IFG

INSTITUTE OF EXPERIMENTAL OPHTHALMOLOGY

Heiduschka, Peter, PD Dr. rer. nat.	F7/01
Naskar, Rita, Dr. rer. nat.	RÜCK/004/00
Thanos, Solon, Prof. Dr. med. Dr. rer. nat.	E3/98, F5/01, Tha3/005/04, Tha3/002/09

INSTITUTE OF EXPERIMENTAL PATHOLOGY (ZMBE)

Brosius, Jürgen, Prof. Dr. rer. nat.	D11/99, F3/99, Bro3/054/04, ZPG8/98, ZPG2/01, CU TRAM
Hüttenhofer, Alexander, PD Dr. rer. nat.	F3/99, G6/01
Skryabin, Boris, Dr. med. Dr. rer. nat.	G6/01, Bro3/054/04, CU TRAM
Söhnlein, Oliver, Prof. Dr. med. Dr. rer. nat.	Soe1/001/22

INSTITUTE FOR GENETICS OF HEART DISEASES
FORMERLY MEDICAL CLINIC C

Schulze-Bahr, Eric, Prof. Dr. med.	Schu1/001/04, Schu1/031/07, Schu1/011/12
Seebohm, Guiscard, Prof. Dr. rer. nat.	See1/012/13

INSTITUTE OF HUMAN GENETICS

Dworniczak, Bernd, Prof. Dr. rer. nat.	B4/96
Horst, Jürgen, Prof. Dr. med.	B4/96
Tüttelmann, Frank, Dr. med.	CRA/003/10

INSTITUTE OF HUMAN GENETICS –
DIVISION GENETICS EPIDEMIOLOGY

Stoll, Monika, Prof. Dr. sc. hum.	CU IFG
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INSTITUTE OF HYGIENE

Berger, Petya, Dr. rer. nat.	Me2/015/22
Dobrindt, Ulrich, Prof. Dr. rer. nat.	Dob2/013/12, Dob2/022/16, Dob2/010/22
Dreisewerd, Klaus, Prof. Dr. rer. nat.	Z/003/14, Drei2/018/17
Friedrich, Alexander W., PD Dr. med.	Ka2/061/04, Müth2/028/10
Karch, Helge, Prof. Dr. rer. nat. Dr. h.c.	Ka2/061/04, Me2/023/08, Me2/021/12, Me2/010/16
Mellmann, Alexander, Prof. Dr. med.	Me2/023/08, Me2/021/12, Me2/010/16, Me2/015/22
Müthing, Johannes, Prof. Dr. rer. nat.	Müth2/028/10, Müth2/021/15
Soltwisch, Jens, Dr. rer. nat.	Drei2/018/17

INSTITUTE OF IMMUNOLOGY

Alonso Gonzalez, Noelia, Prof. Dr. rer. nat.	AlG2/026/22
Roth, Johannes, Prof. Dr. med.	D7/96, C16/01, Z/001/02, Fö2/026/04, Ro2/012/06, Ro2/004/10, Ro2/003/15, Ro2/023/19, Ro2/007/22, CST/004/22
Vogl, Thomas, Prof. Dr. rer. nat.	Vo2/014/09, Vo2/004/14, Vo2/011/19, CST/003/22

INSTITUTE OF INFECTIOLOGY (ZMBE)

Dersch, Petra, Prof. Dr. rer. nat.	De2/006/20
Heusipp, Gerhard, Dr. rer. nat.	RÜCK/005/00
Rüter, Christian, Dr. rer. nat.	Rüt2/002/16
Schmidt, M. Alexander, Prof. Dr. rer. nat.	D4/96, ZPG3/96, ZPG7/96, C17/01, SchMA2/027/08, SchMA2/014/13

INSTITUTE OF MEDICAL BIOCHEMISTRY

Ebnet, Klaus, Prof. Dr. rer. nat.	Eb2/028/09, Eb2/020/14
Gerke, Volker, Prof. Dr. rer. nat.	C6/96, A12/01, C22/01, Re2/033/04, Ge2/017/06, Ge2/016/10, Ge2/009/14, Bet1/013/17
Rescher, Ursula, Prof. Dr. rer. nat.	C22/01, Re2/033/04, Re2/039/07, Re2/017/10, Re2/026/15, Re2/022/20
Riehemann, Kristina, Dr. rer. nat.	C6/96

INSTITUTE OF MEDICAL INFORMATICS

Köpcke, Wolfgang, Prof. Dr. rer. pol.	ZPG1/96
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INSTITUTE OF MEDICAL MICROBIOLOGY

Becker, Karsten, Prof. Dr. med.	Hei2/042/04, Be2/023/11
Heilmann, Christine, PD Dr. rer. nat.	Si2/048/04, Hei2/042/04, Hei2/022/09, Hei2/027/14, Hei2/027/18
Herrmann, Mathias, PD Dr. med.	C8/96, B11/01
Kahl, Barbara C., Prof. Dr. med.	Kah2/024/09, Kah2/016/16
Kühn, Joachim, Prof. Dr. med.	C9/98, Küh3/064/04
Löffler, Bettina, Dr. med.	Si2/039/06, Löf2/030/10
Niemann, Silke, Dr. rer. nat.	Fau2/014/17
Peters, Georg, Prof. Dr. med.	C8/96, B11/01, C20/01, Si2/048/04, Löf2/030/10
Sinha, Bhanu, Prof. Dr. Dr. med.	C20/01, Si2/048/04, Si2/039/06
Uekötter, Andreas, Dr. med.	Keh1/037/07
von Eiff, Christof, Prof. Dr. med.	Hei2/042/04, Keh1/037/07

INSTITUTE OF MEDICAL PHYSICS AND BIOPHYSICS

Galic, Milos, Dr. rer. nat.	Ga3/016/21
Hillenkamp, Franz, Prof. Dr. rer. nat.	ZPG6/96
Klingauf, Jürgen, Prof. Dr. rer. nat.	Kli3/027/15, Kli3/025/20
Peter-Katalinic, Jasna, Prof. Dr. phil.	C10/98, H1/01, ZPG6 – Molekulare Strukturanalyse

INSTITUTE OF MEDICAL PSYCHOLOGY AND SYSTEMS NEUROSCIENCE

Straube, Thomas, Prof. Dr. rer. nat.	CTRP/008/13
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INSTITUTE OF MOLECULAR TUMOR BIOLOGY

Meisterernst, Michael, Prof. Dr. rer. nat.	Mei2/017/12
Rosenbauer, Frank, Prof. Dr. rer. nat.	Ros2/007/15

INSTITUTE OF MOLECULAR VIROLOGY (ZMBE) / INSTITUTE OF VIROLOGY

Börgeling, Yvonne, Dr. rer. nat.	Bör2/030/21
Brunotte, Linda, Dr. rer. nat.	Bru2/015/19
Ehrhardt, Christina, PD Dr. rer. nat.	Wix2/005/10, EhC2/006/15
Ludwig, Stephan, Prof. Dr. rer. nat.	Lud2/032/06, Lud2/010/11, Lud2/017/13, Lud2/008/17, Lud4/013/21, CU IFG
Wixler, Viktor, PD Dr. rer. nat.	Wix2/005/10

INSTITUTE OF MUSCULOSKELETAL MEDICINE

Hartmann, Christine, Prof. Dr. rer. nat.	Har2/002/14
Pap, Thomas, Prof. Dr. med.	Pap2/003/07, Pap2/015/12

INSTITUTE OF NEUROPATHOLOGY

Hasselblatt, Martin, Prof. Dr. med.	Ha3/016/11, Ha3/019/15, Ha3/017/20
Keyvani, Kathy, PD Dr. med.	F4/01
Kuhlmann, Tanja, Prof. Dr. med.	KuT3/006/11, KuT3/012/15, KuT3/007/20
Paulus, Werner, Prof. Dr. med.	D10/98, G4/01, Ha3/016/11

INSTITUTE OF PHARMACOLOGY AND TOXICOLOGY

Boknik, Peter, PD Dr. rer. nat.	B01/101/04
Gergs, Ulrich, Dr. rer. nat.	B01/101/04
Holtwick, Rita, Dr. rer. nat.	B12/01
Kirchhefer, Uwe, Prof. Dr. med.	Kih1/020/07
Knapp, Jörg, PD Dr. med.	A7/99, A13/01
Kuhn, Michaela, Prof. Dr. med.	B6/99, B12/01, Ku1/040/04
Lüß, Hartmut, PD Dr. med.	E6/98
Müller, Frank Ulrich, Prof. Dr. med.	B8/99, B14/01, Mü1/021/04, Mü1/004/07, Mü1/014/11, Mü1/011/17
Neumann, Joachim, Prof. Dr. med.	E6/98, A7/99, A13/01, B01/101/04
Schmitz, Wilhelm, Prof. Dr. med. Dr. h. c.	B1/96, B8/99, B14/01, Mü1/021/04, Mü1/004/07, Mü1/014/11

INSTITUTE OF PHYSIOLOGY I – NEUROPHYSIOLOGY
(incl. Institute of Experimental Epilepsy Research)

Budde, Thomas, Prof. Dr. rer. nat.	Bud3/005/07, Bud3/010/10, Bud3/001/16
Jüngling, Kay, Dr. rer. nat.	PaHC3/003/10, Jün3/003/17
Köhling, Rüdiger, PD Dr. med.	F2/99, G7/01
Lange, Maren Denise, Dr. rer. nat.	La3/013/20
Lohr, Christian, PD Dr. rer. nat.	FG6/08
Pape, Hans-Christian, Prof. Dr. rer. nat.	Hen3/003/06, PaHC3/003/10, PaHC3/001/15
Seidenbecher, Thomas, Dr. rer. nat.	Bud3/005/07

INSTITUTE OF PHYSIOLOGY II

Linke, Wolfgang A., Prof. Dr. rer. nat.	Li1/029/20
Mußhoff, Ulrich, PD Dr. rer. nat.	F2/99, G7/01
Oberleithner, Hans, Prof. Dr. med.	C11/98, A8/99, A9/01
Schneider, Stefan W., Dr. med.	C11/98, A8/99
Schnittler, Hans-Joachim, Prof. Dr. med.	A8/99
Schwab, Albrecht, Prof. Dr. med.	Schw2/030/08, Schw2/020/18

INSTITUTE OF PHYSIOLOGICAL CHEMISTRY
AND PATHOBIOCHEMISTRY

Bruckner, Peter, Prof. Dr. phil.	C4/96, Schae2/026/06
Eble, Johannes, Prof. Dr. rer. nat.	Ebl2/014/16, Ebl4/009/21
Echtermeyer, Frank Götz, Dr. rer. nat.	RÜCK/002/99, D18/01, Schae2/004/04
Kresse, Hans, Prof. Dr. med.	A2/96, D18/01
Pohlmann, Regina, Prof. Dr. rer. nat.	C12/98
Sorokin, Lydia, Prof. Dr. (PhD)	Schä2/020/09, So2/016/15

INSTITUTE OF REPRODUCTIVE MEDICINE
CENTRE OF REPRODUCTIVE MEDICINE AND ANDROLOGY

Cooper, Trevor G., Dr. rer. nat.	D1/96
Gromoll, Jörg, Prof. Dr. rer. nat.	Wi2/023/07
Nieschlag, Eberhard, Prof. Dr. med.	D1/96
Schlatt, Stefan, Prof. Dr. rer. nat.	Schl2/001/13
Strünker, Timo, Prof. Dr. rer. nat.	Str2/014/21
Wistuba, Joachim, Dr. rer. nat.	Wi2/023/07
Zitzmann, Michael, Prof. Dr. med.	CRA/003/10

INSTITUTE OF SPORTS MEDICINE

Mooren, Frank C., Prof. Dr. med.	D9/98, D21/01
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INSTITUTE OF TRANSLATIONAL PSYCHIATRY

Dannlowski, Udo, Prof. Dr. med. Dr. phil.	Dan3/012/17, Dan3/022/22
Hahn, Tim, Prof. Dr. rer. nat.	MzH3/020/20
Opel, Nils, Dr. med.	SEED/011/19

INTERDISCIPLINARY CENTRE FOR CLINICAL RESEARCH (IZKF)

König, Simone, Prof. Dr. rer. nat.	RÜCK/001/99, CU Proteomics
Prehn, Jochen H.M., PD Dr. rer. nat.	FG1/98

DEPARTMENT OF ANAESTHESIOLOGY,
INTENSIVE CARE AND PAIN THERAPY

Buscher, Konrad-Robert, Dr. med.	SEED/004/12
Kehrel, Beate, Prof. Dr. rer. nat.	A6/96, D14/99, B11/01, C21/01, Keh1/037/07
Margraf, Andreas, Dr. med.	SEED/012/18
Meersch, Melanie, Prof. Dr. med.	CST/004/22
Pogatzki-Zahn, Esther M., Prof. Dr. med.	CTRP/007/13, Pog3/027/20
Rossaint, Jan, Prof. Dr. med.	SEED/001/12, Ross2/010/18
Schmidt, Tobias, Dr. med.	SEED/005/15
Theilmeier, Gregor, PD Dr. med.	C21/01, The1/068/04
van Aken, Hugo K., Prof. Dr. med. Dr. h. c.	D14/99, C21/01, The1/068/04
Zarbock, Alexander, Prof. Dr. med.	Za2/001/10, Za2/001/14, Za2/001/18, CST/001/19

DEPARTMENT OF CARDIOLOGY 1 | CARDIOLOGY AND ANGIOLOGY
FORMER DEPARTMENT OF MEDICINE C

Breithardt, Günther, Prof. Dr. med. Dr. h.c.	B1/96, A11/01
Dorenkamp, Marc, Dr. med.	SEED/014/20
Fabritz, Larissa, Dr. med.	Kih1/020/07
Haverkamp, Wilhelm, PD Dr. med.	ZPG4/01
Kirchhof, Paulus, Prof. Dr. med.	Ki1/099/04, ZPG4a/04, CU CarTel
Levkau, Bodo, PD Dr. med.	A11/01
Nikol, Sigrid, Prof. Dr. med.	B15/02, Nik1/032/08
Plenz, Gabriele, Dr. rer. nat.	A10/01
Sindermann, Jürgen, Dr. med.	A10/01
Stypmann, Jörg, Prof. Dr. med.	ZPG4/01, ZPG4a/04, CU ECHO
Tiemann, Klaus, PD Dr. med.	CU ECHO
Waltenberger, Johannes, Prof. Dr. med.	Wa1/008/12
Wichter, Thomas, Prof. Dr. med.	B10/01, Ki1/099/04

DEPARTMENT OF DERMATOLOGY

Beissert, Stefan, Prof. Dr. med.	Lo2/065/04, Lo2/017/07, LO2/004/11
Bruckner-Tudermann, Leena, Prof. Dr. med.	D5/96, D17/01
Brzoska, Thomas, Dr. med.	C7/96
Ehrchen, Jan, PD Dr. med. Dr. rer. nat.	Sun2/019/07, Eh2/019/11
Görge, Tobias, PD Dr. med.	Goe2/023/10
Hildebrand, Axel, Dr. med.	D5/96
Kulms, Dagmar, PD Dr. rer. nat.	Kul2/016/04
Loser, Karin, PD Dr. rer. nat.	Lo2/065/04, Lo2/017/07, Lo2/004/11, Lo2/004/16
Luger, Thomas, Prof. Dr. med. Dr. h. c.	C7/96, D5/96, D16/01, Stei2/103/04, Stei2/027/06, Stei3/034/09
Schwarz, Thomas, Prof. Dr. med.	D12/98, E10/01, Kul2/016/04
Ständer, Sonja, Prof. Dr. med. Dr. h.c.	CTRP/007/13
Steinhoff, Martin, Prof. Dr. med. Dr. rer. phys.	D16/01, Stei2/103/04, Stei2/027/06, Stei3/034/09
Sunderkötter, Cord, Prof. Dr. med.	C2/96, D15/01, Sun2/019/07, Eh2/019/11

DEPARTMENT OF MEDICINE A –
HEMATOLOGY, ONCOLOGY AND PNEUMOLOGY

Arteaga Paz, Maria Francisca, Dr. rer. nat.	Art1/019/18
Bäumer, Sebastian, Dr. rer. nat.	Bäu2/009/19
Berdel, Wolfgang E., Prof. Dr. med.	Rö1/009/15
Brandts, Christian, Dr. med.	Ser2/041/04, Ser2/038/06
Kessler, Torsten, Dr. med.	Kess2/023/04
Khandanpour, Cyrus, PD Dr. med.	Kha1/002/20
Kienast, Joachim, Prof. Dr. med.	B3/96
Koschmieder, Steffen, PD Dr. med.	Wi2/023/07
Mesters, Rolf, Prof. Dr. med.	Kess2/023/04
Mikesch, Jan-Henrik, Dr. med.	Mik4/015/21
Müller-Tidow, Carsten, Prof. Dr. med.	H4/01, Mül2/096/04, Mül2/018/07, Mül2/020/11, Z/002/07
Schliemann, Christoph, PD Dr. med.	Rö1/009/15
Serve, Hubert, Prof. Dr. med.	H4/01, Ser2/041/04, Ser2/038/06
van de Loo, Jürgen, Prof. Dr. med.	B3/96

DEPARTMENT OF MEDICINE B –
GASTROENTEROLOGY AND HEPATOLOGY

Bantel, Heike, Dr. med.	D13/99, E11/01
Domschke, Wolfram, Prof. Dr. med. Dr. h.c.	D4/96
Kucharzik, Torsten, Prof. Dr. med.	D4/96, Kuc2/018/06
Lerch, Markus M., Prof. Dr. med.	D9/98, G1/99, D21/01, H3/01, ZPG9/99, ZPG3/01
Lügering, Andreas, Dr. med.	Kuc2/018/06
Lügering, Norbert, PD Dr. med.	D3/96, D13/99
Schnekenburger, Jürgen, Dr. rer. nat.	G1/99, H3/01
Stoll, Reinhard, PD Dr. med.	D4/96

DEPARTMENT OF MEDICINE D – INTERNAL MEDICINE,
EMERGENCY MEDICINE, NEPHROLOGY AND RHEUMATOLOGY

Brand, Eva, Prof. Dr. Dr. med.	Bra1/001/08
Braun, Daniela, Dr. med.	Brau2/013/19
Ciarimboli, Giuliano, Prof. Dr. rer. nat.	Cia2/013/13
Dlugos, Christopher, Dr. med.	SEED/006/15
Döser, Markus Carl, Dr. med.	SEED/015/20
Gabriëls, Gert, Prof. Dr. med.	D19/01, Schl2/008/04
George, Britta, Dr. med.	Geo2/003/16, Geo2/004/22
Heidenreich, Stefan, Prof. Dr. med.	B5/96, D20/01
Hirsch, Jochen R., PD Dr. rer. nat.	D19/01
Krahn, Michael, Prof. Dr. med. vet. Dr. rer. nat.	Kr4/031/21
Pavenstädt, Hermann-Joseph, Prof. Dr. med.	Pa2/108/04, Pa1/011/08
Rahn, Karl-Heinz, Prof. Dr. med.	A1/96
Schaefer, Liliana, PD Dr. med.	D18/01, Schae2/004/04, Schae2/026/06
Schaefer, Roland M., Prof. Dr. med.	D18/01, Schae2/004/04, Schae2/026/06
Schlatter, Eberhard, Prof. Dr. rer. nat.	A1/96, B5/96, D19/01, Schl2/008/04, Cia2/013/13
Schütte-Nütgen, Katharina, Dr. med.	SEED/009/17
Wennmann, Dirk Oliver, Dr. med.	SEED/002/12

DEPARTMENT OF MENTAL HEALTH FORMER DEPARTMENT OF PSYCHIATRY AND PSYCHOTHERAPY

Alferink, Judith, PD Dr. med.	Alf3/018/16
Arolt, Volker, Prof. Dr. med.	Ju3/024/15
Domschke, Katharina, Dr. med.	Pan3/008/07
Engelien, Almut, Dr. med.	FG4/03 (Übergabe an Konrad, C.)
Konrad, Carsten, Dr. med.	FG4/03
Zhang, Weiqi, Prof. Dr. med.	Zha3/005/14
Zwanzger, Peter, Prof. Dr. med.	Do3/021/10

DEPARTMENT OF NEUROLOGY (WITH INSTITUTE OF TRANSLATIONAL NEUROLOGY)

Bittner, Stefan, Dr. med.	SEED/003/12
Breitenstein, Caterina, Dr. rer.soc.	Kne3/074/04
Flöel, Agnes, Dr. med.	Floe3/004/08
Groß, Catharina, Dr. rer. nat.	Kl3/010/19
Heming, Michael, Dr. med.	SEED/016/21
Heneka, Michael T., Prof. Dr. med.	Hen3/003/06
Hundehege, Petra, Dr. rer. nat.	Meu3/015/18
Kiefer, Reinhard, PD Dr. med.	G5/01, Kie3/071/04
Klotz, Luisa, Prof. Dr. med.	Kl2/015/14, Kl3/010/19, CST/003/22
Knecht, Stefan, Prof. Dr. med.	FG2/01, Kne3/074/04
Lünemann, Jan, Prof. Dr. med.	Lue2/013/22
Meuth, Sven G., Prof. Dr. med. Dr. rer. nat.	Meu3/010/12, Meu3/015/18
Meyer zu Hörste, Gerd, Prof. Dr. med.	MzH3/020/20
Minnerup, Jens, Prof. Dr. med.	Min3/003/21
Rolfes, Leoni, Dr. med.	SEED/010/19
Schäbitz, Wolf-Rüdiger, PD Dr. med.	Nik1/032/08
Schmidt-Pogoda, Antje, Dr. med.	SEED/007/17
Schwab, Nicholas, Dr. rer. nat.	Wie3/009/16
Stögbauer, Florian, PD Dr. med.	F6/01
Wiendl, Heinz, Prof. Prof. h.c. Dr. med.	Wie3/011/11, Wie3/009/16, Wie2/014/22
Young, Peter, PD Dr. med.	You3/016/06

DEPARTMENT OF NUCLEAR MEDICINE

Kopka, Klaus, Dr. rer. nat.	Ko1/031/04, Schä2/020/09
Schäfers, Klaus, Dr. ing.	B10/01
Schäfers, Michael, Prof. Dr. med.	B10/01, KO1/031/04, Schä2/020/09, Z/004/17, CU PIX
Schober, Otmar, Prof. Dr. med. Dr. rer. nat.	B1/96

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Behre, Hermann M., PD Dr. med.	A3/96
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DEPARTMENT OF OPHTHALMOLOGY

Eter, Nicole, Prof. Dr. med.	Et3/019/12
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DEPARTMENT OF OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY

Rudack, Claudia, Prof. Dr. med.	CRA/005/11
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DEPARTMENT OF GENERAL PEDIATRICS

Harms, Erik, Prof. Dr. med.	B2/96, D7/96, C16/01
Koch, Hans Georg, PD Dr. med.	B2/96
Omran, Heymut, Prof. Dr. med.	Om2/009/12, Om2/015/16, Om2/010/20
Rutsch, Frank, Prof. Dr. med.	Ru1/022/08, Ru3/006/13
Tenbrock, Klaus, PD Dr. med.	FG5/03
Viemann, Dorothee, Dr. med.	Fö2/005/06
Wallmeier, Julia, Dr. med.	SEED/017/21
Wolff, Johannes E. A., PD Dr. med.	C3/96
Zimmer, Klaus-Peter, PD Dr. med.	C19/01, ZPG9/99, ZPG3/01

DEPARTMENT OF PEDIATRIC HEMATOLOGY AND ONCOLOGY

Balbach, Sebastian, Dr. med. Dr. rer. nat.	SEED/013/20
Frühwald, Michael C., PD Dr. med.	G3/01
Kerl, Kornelius, PD Dr. med.	Kek4/016/22
Lanvers-Kaminsky, Claudia, Dr. med.	H2/01
Nowak-Göttl, Ulrike, Prof. Dr. med.	CRA/001/10
Rössig, Claudia, Prof. Dr. med.	RÜCK/006/01, Rö1/009/15
Vormoor, Josef, Prof. Dr. med.	E1/98

DEPARTMENT OF PEDIATRIC RHEUMATOLOGY AND IMMUNOLOGY

Föll, Dirk, Prof. Dr. med.	Fö2/026/04, Fö2/005/06, CRA/004/12, Fö2/018/20
Holzinger, Dirk, Dr. med.	CRA/004/12

DEPARTMENT OF PERIODONTOLOGY

Beikler, Thomas, Dr. med.	C18/01
Flemmig, Thomas Frank, Prof. Dr. med.	C18/01

DEPARTMENT OF PHONiatrics AND PEDAUdIOLOGY

am Zehnhoff-Dinnesen, Antoinette, Prof. Dr. med.	Cia2/013/13
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DEPARTMENT OF RADIOLOGY
FORMER INSTITUTE OF CLINICAL RADIOLOGY

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Faber, Cornelius, Prof. Dr. rer. nat.	Fa3/016/13, Fa2/014/18, CU PIX
Heindel, Walter L., Prof. Dr. med.	B1/98
Wildgruber, Moritz, Prof. Dr. med.	CU PIX-TOP

DEPARTMENT OF RADIOTHERAPY – RADIOONCOLOGY

Eich, Hans Theodor, Prof. Dr. med.	CST/002/19
Greve, Burkhard, Prof. Dr. rer. nat.	CST/002/19
Reinartz, Gabriele, Dr. med.	CST/002/19
Schuck, Andreas, Dr. med.	H2/01

DEPARTMENT OF GENERAL,
VISCERAL AND TRANSPLANTATION SURGERY

Dietl, Karl-Heinz, PD Dr. med.	E7/98, D20/01
Spiegel, Hans-Ulrich, Prof. Dr. med.	E7/98

DEPARTMENT OF THORAX,
HEART AND VASCULAR SURGERY

Scheld, Hans H., Prof. Dr. med.	B1/96
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DEPARTMENT OF TRAUMA,
HAND AND RECONSTRUCTIVE SURGERY

Fuchs, Thomas, PD Dr. med.	Ra2/109/04
Raschke, Michael, Prof. Dr. med.	Ra2/109/04

EXPERIMENTAL ANIMAL RESEARCH CENTRE
OF THE MEDICAL FACULTY (ZTE)

Richter, Klaus-Dieter, Prof. Dr. med. vet.	ZPG2/96
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IZKF MÜNSTER AS ORGANISER

SYMPOSIA, WORKSHOPS AND MORE

When the IZKF was established, the cooperation networks at the Medical Faculty merely “existed”, one could even say that they were encrusted and rather disciplinary closed. Despite spatial proximity, there were hardly any free communication opportunities. A study conducted by the Fraunhofer Institute for Systems and Innovation Research (Fraunhofer ISI) showed a relatively sharp separation between scientific and clinical content. In the interviews on communication structures, one participant commented at

the time “*a Saturday date for colloquia is disadvantageous because you never reach everyone*”.

In order to improve the communication structure, the IZKF published a calendar of events for the entire Faculty since 1998 – “**The yellow sheets**” – which, divided into external and internal scientific symposia, internal colloquia and seminars, continuing medical education events, etc., represented an institutionalised dissemination of information at the Medical Faculty. This calendar of events was later continued in digital form by the public relations office of the Deanery.

INTERNATIONAL IZKF LECTURE SERIES (1999–2012)

In 1999, the IZKF Münster introduced a regular IZKF Lecture series, which was intended to address all interested researchers in the faculty beyond the IZKF. Due to an abundance of lectures at the Medical Faculty, the Board of Directors decided to end this lecture series in 2012. The following renowned speakers were guests at the IZKF:

- › **Martin F. Kagnoff** / Laboratory of Mucosal Immunology, University of California, San Diego, La Jolla, USA
- › **Hermann Bujard** / Zentrum für Molekulare Biologie Heidelberg (ZMBH)
- › **Ed Conway** / Center for Molecular and Vascular Biology, Leuven, Belgium
- › **Nathalie Vergnolle** / Department of Pharmacology, University of Calgary, Canada
- › **Peter H. Krammer** / Deutsches Krebsforschungszentrum, Heidelberg
- › **Reinhard Fässler** / Max-Planck-Institute for Biochemistry, Martinsried
- › **Magdalena Götz** / Max-Planck-Institute of Neurobiology, Martinsried
- › **Jürg Tschopp** / Institute de Biochimie, University of Lausanne, CH
- › **José Omar Bustamante** / Millenium Institute of Nanosciences, Aracaju, Brazil
- › **Andreas Jacobs** / Max-Planck-Institute for Neurological Research, Köln
- › **Charles Berul** / Harvard Medical School and Children`s Hospital of Boston, USA
- › **Roderick J. Flower** / William Harvey Research Institute, London, UK
- › **Hans Hengartner** / Institute of Exp. Immunology, University Hospital Zürich, CH
- › **Chris Frith** / Functional Imaging Laboratory London, UK
- › **John Kearney** / Developmental & Clinical Immunology, Alabama at Birmingham, AL, USA
- › **Thomas Wirth** / Institute of Physiological Chemistry, University of Ulm
- › **Danilo Perotti** / Division of Human Cancer Genetics, Columbus, OH, USA
- › **Bernd Fleischmann** / Institute of Physiology I, Life & Brain Center, University of Bonn
- › **Stanley Nattel** / Cardiac Electrophysiology, University of Montreal, Canada
- › **Sabine Werner** / Institute of Cell Biology, ETH, Zürich, CH
- › **Peter Friedl** / Radboud University Nijmegen Medical Center, NL
- › **Andreas Reichenbach** / Paul-Flechsig-Institut für Hirnforschung, Leipzig
- › **Andreas Strecker** / Programme Director Life Sciences 2, DFG Bonn
- › **Thomas Schmitz-Rode** / Institute of Biomedical Technologies, University Hospital Aachen

“THINK OUTSIDE THE BOX” GUEST LECTURES AT ANNUAL SCIENTIFIC CONFERENCES

For more than 10 years, the annual scientific conferences of the IZKF Münster ended with a guest lecture from a different field of knowledge. These unique, generally non-specialist topic “Think outside the Box” lectures were inspiring to the IZKF scientists since they were given in a casual setting in an engaging style that sparked lively debates.

- 2010 Professor Johannes Wessels, Institute for Nuclear Physics, University of Münster**
Relativistic heavy ion experiments at the LHC particle accelerator (CERN, Switzerland)
- 2011 Professor Georg Peters, Institute for Medical Microbiology, University of Münster**
Danger from the invisible: Why do we need more infection research?
- 2012 Professor Gerd Althoff, Historical Seminar, University of Münster**
Blessed are those who persecute people – for the sake of justice
- 2013 Professor Michael Quante, Philosophic Seminar, University of Münster**
How fragile are dam-breaking arguments?
- 2014 Professor Robert (Rob) H. Henning, Faculty of Sciences, University of Groningen, NL**
Mammalian hibernation: A cool way to prevent organ damage
- 2015 Professor Metin Tolan, Faculty of Physics, Technical University of Dortmund**
James Bond in the sights of physics
- 2017 Professor Christian Weinheimer, Institute of Nuclear Physics, University of Münster**
Search for dark matter with XENON1T
- 2018 Professor Norbert Sachser, Institute of Behavioural Biology, University of Münster**
About the thinking, feeling and behaviour of animals
- 2019 Professor Martin Winter, Münster Electrochemical Energy Technology, University of Münster**
Battery research up to date: Between expectation and reality management

2020 and 2021 cancelled due to the pandemic.



Prof. Martin Winter



Prof. Metin Tolan

SYMPOSIA OF THE IZKF MÜNSTER

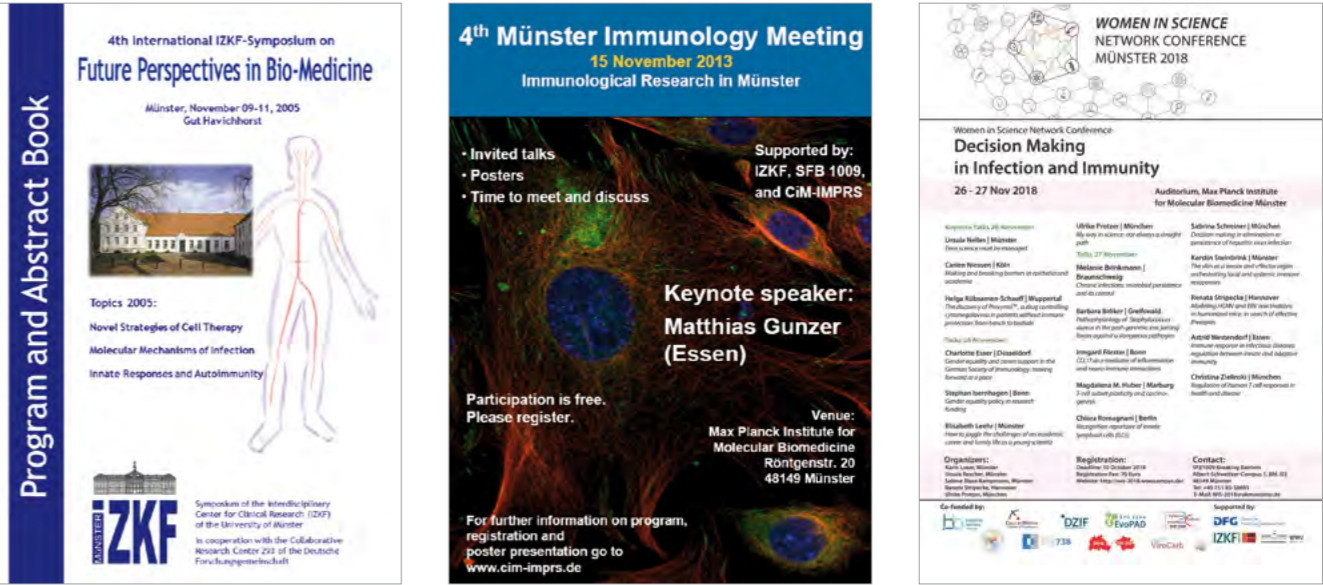
- › 1st International IZKF Symposium “*Biology of the Vessel Wall*”, Schloss of the University of Münster, September 1998
- › 2nd Technology Transfer Meeting of the IZKF with the Association of Research-Based Pharmaceutical Companies (Verband Forschender Arzneimittelhersteller; VFA) “*Cardiovascular Diseases*”, Gut Havichhorst Münster, May 2000
- › 2nd IZKF Symposium on “*Vascular Biology*”, Gut Havichhorst Münster, October 2000
- › 3rd IZKF Symposium on “*Vascular Biology*”, Gut Havichhorst Münster, October 2003
- › 4th International IZKF Symposium on “*Future Perspectives in Biomedicine*”, Gut Havichhorst Münster, November 2005
- › IZKF Münster Annual Meeting / IZKF Science Conference, Gut Havichhorst Münster, annually since 2007

TECHNICAL CONFERENCES AND WORKSHOPS

- › Q-TOF-User-Meeting, in cooperation with Company Micromass, Medical Faculty Münster, May 2000
- › Affymetrix Technology Day 2001 “*Application of Microarray Technology to Functional Genomics*”, Schloss Wilkinghege Münster, February 2001
- › 1st Seminar “*GeneChip Diagnostics*”, Medical Faculty Münster, March 2001
- › 2nd Seminar “*GeneChip Diagnostics*”, Medical Faculty Münster, March 2002
- › 1st IZKF Workshop “*Comparative Analysis of Protein Evolution*” (COPE 2002), Medical Faculty Münster, October 2002
- › 1st Münster Conference on “*Single Cell Analysis*”. Progress in Research and Technology, Schloss Wilkinghege Münster, November 2004
- › 2nd IZKF Workshop “*Molecular Imaging*”, Medical Faculty Münster, January 2005
- › 2nd Münster Conference on “*Single Cell Analysis*”. Progress in Research and Technology, 12/2005 (Annual Meeting of the Core Unit Integrated Functional Genomics, IFG; until 2013)
- › Münster “*Conference on Biomolecule Analysis*” – Annual meeting of the Core Unit Proteomics, Max-Planck-Institute for Molecular Biomedicine (since 2014)
- › “*Small Animal Imaging Workshop*” – The Mouse Imaging Academy (MIA) Münster, University Hospital Münster (annually since 2010)

THE IZKF MÜNSTER AS CO-ORGANISER (SYMPOSIA AND MEETINGS)

- › Partnering Meeting – Science and business in dialogue. New forms of cooperation in biomedical research. 1st Transfer Meeting of IZKF and BMBF with Association of Research-Based Pharmaceutical Companies (Verband Forschender Arzneimittelhersteller; VFA), Hotel Maritim Bonn, September 1999
- › NRW Symposium on “*BioChip Technology*”, in Cooperation with the *Ministerium für Schule und Weiterbildung, Wissenschaft und Forschung des Landes NRW* and the ZMMK Cologne, Center for Biochemistry and Physiology, University of Cologne, August 1999
- › International Workshop “*Future Perspectives in Nuclear Cardiology*”, Department of Nuclear Medicine Medical Faculty Münster, June 2000
- › 8th KBF Symposium “*Complexity in Medicine*”, Complexity of Health and Disease, Implications for Clinical Research and Information Management, German Aerospace Center (DLR) Cologne, September 2000
- › Joint Symposium of CRC 293 and IZKF Münster “*Molecular Mechanisms of Inflammation*”, Schloss Elmau, Elmau/Oberbayern, September/October 2002
- › Joint Symposium of the CRC 556 and IZKF Münster “*Heart Failure and Arrhythmias*”, Kolping Hotel Münster, May/June 2003
- › Final Symposium of CRC 293 “*Mechanisms of Inflammation: Interaction of Endothel, Epithel and Leukocytes*”, Gut Havichhorst Münster, December 2008
- › Münster Immunology Meeting, Max-Planck-Institute for Molecular Biomedicine, annually since 2010
- › NEUROVISIONEN 11 and 3rd Neuroinflammation Symposium Münster, University Hospital Münster, November 2015
- › Münster Symposium on Infection Biology, Max-Planck-Institute for Molecular Biomedicine, since March 2017
- › 1st International Women-in-Science Network Conference “*Decision making in infection and immunity*”, Max-Planck-Institute for Molecular Biomedicine, November 2018
- › 1st Inflammation and Imaging Symposium, Joint Symposium of the CRC 1009 and 1450, the KFO 342 and the IZKF Münster, Schloss of Münster University, November 2021



GENERAL IZKF PUBLICATIONS

Molecular Determinants of Health and Disease – 25th anniversary of the Interdisciplinary Centre for Clinical Research Münster (2021) Highlight Issue of Biological Chemistry 402 Issue 12.

- › Ludwig S, Blass-Kampmann S, Müller FU (2021) Molecular determinants of health and disease. Biol Chem 402 (12): 1479. doi: 10.1515/HSZ-2021-0390.
- › Willers M, Viemann D (2021) Role of the gut microbiota in airway immunity and host defense against respiratory infections. Biol Chem 402 (12): 1481-1491. doi: 10.1515/HSZ-2021-0281.
- › Boergeling Y, Brunotte L, Ludwig S (2021) Dynamic phospho-modification of viral proteins as a crucial regulatory layer of influenza A virus replication and innate immune responses. Biol Chem 402 (12): 1493-1504. doi: 10.1515/HSZ-2021-0241.
- › Al-Gburi S, Beissert S, Günther C (2021) Molecular mechanisms of vasculopathy and coagulopathy in COVID-19. Biol Chem 402 (12): 1505-1518. doi: 10.1515/hsz-2021-0245.
- › Schmaul S, Hanuschek N, Bittner S (2021) Astrocytic potassium and calcium channels as integrators of the inflammatory and ischemic CNS microenvironment. Biol Chem 402 (12): 1519-1530. doi: 10.1515/HSZ-2021-0256.
- › Pauli C, Kienhöfer M, Göllner S, Müller-Tidow C (2021) Epitranscriptomic modifications in acute myeloid leukemia: m⁶A and 2'-O-methylation as targets for novel therapeutic strategies. Biol Chem 402 (12): 1531-1546. doi: 10.1515/hsz-2021-0286.
- › Makowka P, Stolp V, Stoschek K, Serve H (2021) Molecular determinants of therapy response of venetoclax-based combinations in acute myeloid leukemia. Biol Chem 402 (12): 1547-1564. doi: 10.1515/hsz-2021-0288.
- › Sabat AJ, Pantano D, Akkerboom V, Bathoorn E, Friedrich AW (2021) *Pseudomonas aeruginosa* and *Staphylococcus aureus* virulence factors as biomarkers of infection. Biol Chem 402 (12): 1565-1573. doi: 10.1515/hsz-2021-0243.
- › Schwarz T, Schwarz A (2021) Controllers of cutaneous regulatory T cells: ultraviolet radiation and the skin microbiome. Biol Chem 402 (12): 1575-1581. doi: 10.1515/hsz-2021-0252.
- › Hailfinger S, Schulze-Osthoff K (2021) The paracaspase MALT1 in psoriasis. Biol Chem 402 (12): 1583-1589. doi: 10.1515/hsz-2021-0250.
- › Subramanyam SH, Tenbrock K (2021) The cAMP responsive element modulator (CREM) is a regulator of CD4 + T cell function. Biol Chem 402 (12): 1591-1596. doi: 10.1515/hsz-2021-0249.
- › Oberleithner H (2021) Quantifying salt sensitivity. Biol Chem 402 (12): 1597-1602. doi: 10.1515/hsz-2021-0206.
- › Peter-Katalinic J (2021) Life sciences and mass spectrometry: some personal reflections. Biol Chem 402 (12): 1603-1607. doi: 10.1515/hsz-2021-0244.



Deutsche Universitätszeitung (DUZ)

Blass-Kampmann S (2020) So läuft es bei uns: Interdisziplinäres Zentrum für Klinische Forschung an der WWU Münster. DUZ 09/20, S. 68.

Haerdle B (2021) Andere Probleme: Ein Netzwerk fördert gezielt biomedizinisch forschende Frauen in Münster. DUZ 12/21, S. 66-67.

Blass-Kampmann S, Ludwig S (2022) Mehr Frauen in Spitzenpositionen der Medizin! DUZ Special zu 25 Jahre IZKF Münster. Beilage zur DUZ 05/22.

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