

THE FOCUS IS ON TRANSLATION



DEAR READERS,

»Translating findings from basic research into clinical practice is our central guiding principle. We have a clear mission here: We combine our expertise and that of our partners along the value chain into an integrated process that brings together science, technology, medical requirements and regulations while also ensuring that patient care is not overlooked.«

Among other things, this annual report highlights the successes we achieved together over the past year. These range from innovative therapeutic approaches and robust preclinical and clinical applications to efficient transfer structures for more quickly implementing new therapies, diagnostics and digital health solutions in clinical practice. Our work is characterized by transdisciplinary collaboration across the 4D spectrum (drugs, devices, diagnostics and data), by the intersection of science and industry, by responsible research and by a consistent focus on patient benefit.

The difficult external conditions made 2025 a challenging year for us. That we have been able to meet these challenges is due in no small part to the close collaboration with universities and university hospitals, our most important partners in the scientific community, as well as to the trusting collaboration with the pharmaceutical industry. This has enabled us to make significant progress in translational research ranging from patient-specific disease models and new therapeutic approaches to their successful clinical application and to data-driven drug discovery and innovative biomarker strategies. At the same time, we have strengthened our ability to respond flexibly and at scale to future pandemics with modular diagnostic platforms. Other highlights included the very positive intermediate evaluations at the Berlin and Munich/Penzberg locations and of course the opening of our new research building in Frankfurt and the groundbreaking ceremony in Penzberg.



Gerd Geißlinger
Executive Director of Fraunhofer ITMP

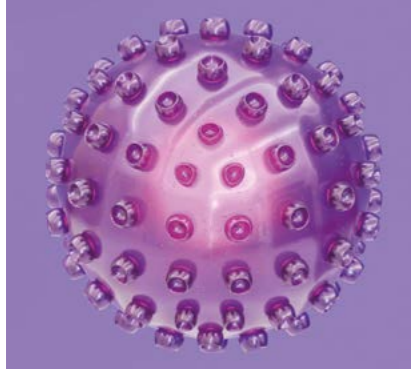
For us, translation as a guiding principle means more than simply implementing basic research in clinical practice. It means understanding causes and mechanisms, validating models, integrated data use and identifying barriers—whether these be technical, regulatory or economic. Only in this way can we develop safe, effective and affordable solutions that provide real value to patients.

I would like to thank our employees for their commitment and creativity. Their commitment is the key to our success and the positive developments. I would also like to thank our partners and sponsors who have supported us along the way.

I hope you find inspiration from these insights into our research and project work.

Sincerely,
Gerd Geißlinger

A handwritten signature in black ink, appearing to read 'Gerd Geißlinger'.



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PROFILE OF FRAUNHOFER ITMP



Fraunhofer ITMP new building at its Frankfurt site; © Wörner Traxler Richter Planungsgesellschaft mbH



Gerd Geißlinger
Executive Director
Fraunhofer ITMP



Frank Behrens
Deputy Institute Director
Fraunhofer ITMP



Lutz Zeitmann
Deputy Institute Director
Fraunhofer ITMP

The Fraunhofer Institute for Translational Medicine and Pharmacology ITMP was founded from the Translational Medicine and Pharmacology institute branch of Fraunhofer IME on January 1, 2021. The institute's focus is on the research and development of innovative methods for the early detection, diagnosis and therapy of diseases resulting from disturbed functions of the immune system.

The guiding principle of Fraunhofer ITMP is the realization of superior, innovative solutions for cost-intelligent diagnostics and therapy for the benefit of patients. Research topics range along the value chain from drug discovery, through highly specialized methods in preclinical research, to selected indication areas in clinical research. The effective transfer of innovative ideas from biomedical research to medical application and industry is at the core of its scientific objectives. Based on the 4D concept (linking drugs, devices, diagnostics and data), this idea and technology transfer is intended to enable, for example, novel diagnostic and therapy options as well as early detection and prevention options for immune-mediated and neurodegenerative inflammatory diseases.

Fraunhofer ITMP currently employs around 407 people at its sites in Frankfurt am Main, Hamburg, Göttingen, Berlin and Penzberg/Munich. The institute is divided into two cross-site research divisions: Drug Discovery and Preclinical Research, and Clinical Research. Employees are organized in agile matrix teams across sites and divisions into what are known as innovation areas. This organizational structure allows rapid adaptation to current problems and issues.

The institute has close research links with many institutes and hospitals at the University Medical Center of Goethe University Frankfurt am Main, the University Medical Center Hamburg-Eppendorf, the University Medical Center Göttingen, the Charité Universitätsmedizin Berlin, the Ludwig-Maximilians-Universität (LMU) and the LMU Medical Center Munich. In addition, it enjoys lively scientific exchange with other national and international universities and research institutions. The aim of the collaboration is to identify trends and developments at an early stage and to develop and implement new research approaches and technologies. This being the case, Fraunhofer ITMP sees itself as a strong partner both for university medicine for the consistent translation of research findings into application and for the pharmaceutical and biotechnological industry.

THE FRAUNHOFER ITMP NETWORK



- Headquarters
- Institute site
- ⊠ Fraunhofer-project group

Frankfurt am Main

Translational Medicine and Pharmacology

Gerd Geisslinger | Frank Behrens

Our expertise lies in researching therapeutic and diagnostic innovations for immune-mediated diseases. We use state-of-the-art technologies and multi-omics approaches for biomarker discovery, develop predictive disease models to characterize drugs, use our pharmaceutical expertise to identify and optimize chemical and biological active ingredients, and translate findings into applications through clinical research projects. In clinical research, our core expertise lies in the design and quality-assured execution of clinical trials, as well as the early clinical development of drug candidates in our phase I unit. Our own biomaterial bank supports basic research into our key indications.

Hamburg

Discovery Research ScreeningPort

Philip Gribbon | Carsten Claussen

Our expertise lies in high-throughput drug discovery using high-quality compound and re purposing libraries (in silico and in vitro screening), which enables us to identify pharmacologically active compounds. A comprehensive portfolio of phenotypic and biochemical assays, as well as in vitro models based on induced pluripotent stem cells are used to investigate the mechanisms of action. We are also developing workflows to ensure the analysis of drug discovery data and the highest standards of FAIR data management, as well as algorithms and AI tools for the statistical analysis of patient cohorts in different medical indications, thus covering the broad field of medical data science with our range of services.

Göttingen

Translational Neuroinflammation and Automated Microscopy TNM

Stefan Jakobs | Martin Weber

We use innovative high- and super-resolution microscopy techniques to visualize sub-cellular structures at the nano scale. The automation of these techniques and innovative image analysis algorithms allows us to investigate the influence of pharmacologically active compounds on the nanostructure of (living) cells with high throughput. In various preclinical models, these compounds are examined for their in vivo efficacy within the central nervous system. A modern phase I unit as well as an

excellent interdisciplinary team guarantees the translation into the hospital and completes our portfolio in the research into new drug candidates for neuroinflammation.

Berlin

Immunology and Allergology IA

Torsten Zuberbier | Marcus Maurer

We research disease mechanisms in inflammatory, immune-mediated, neuroinflammatory and neurodegenerative diseases. We use bioanalytical high-throughput technologies such as omics methods to analyze biomolecules and pathomechanisms in patient samples that are involved in complex physiological and pathophysiological processes. We investigate identified target molecules (targets) and their modulators (drugs) in suitable in vitro, ex vivo and in vivo disease models of varying complexity, through to highly predictive models for the human and patient situation. The adverse outcome pathways, or undesirable influences on certain (patho-)mechanisms, can also be explored.

Penzberg/Munich

Immunology, Infection and Pandemic Research IIP

Michael Hoelscher | Andreas Wieser

We research the interactions between infectious agents and the immune system with the aim of improving the prevention, screening and early detection of future pandemics and optimizing the treatment of infectious diseases.

As part of epidemiological surveillance, we identify potential pathogens that could cause a pandemic. A modular system can be used to create sequencing data, antigens and antibodies for prototype strains, and develop suitable rapid test systems.

The establishment of multi-parameter diagnostic platforms is intended to improve the diagnosis of infectious diseases: Viral and bacterial pathogens can be detected at the same time and the status of the immune system or organ functions can be determined.

TOTAL BUDGET 2025

Budget

The **operating budget** in 2025 of Fraunhofer ITMP amounted to

€ 39.9 Mio.

(incl. start-up financing).



In addition, around

€ 3.4 Mio.

were invested in **equipment.**



Expenditure relating to **construction activities** for the new institute building in Frankfurt amounted to

€12.7 Mio.



Income

59 %

of the operating budget for the **contract research area** of the parent institute was financed by **external income.**



The **economic income** of

€ 5.3 Mio.

is at a good level.



Employees

At the **end of 2025**, a total of

407

people were employed at the Fraunhofer ITMP sites in Frankfurt am Main, Hamburg, Göttingen, Berlin and Penzberg/Munich.



The proportion of **women** (permanent staff incl. doctoral students) at Fraunhofer ITMP was

59 %



Theses

In 2025, a total of

97 %

academic theses were successfully completed by employees.



The percentage of **female graduates** was

51.4 %

Summary

Fraunhofer ITMP with its sites in Frankfurt am Main, Hamburg, Göttingen, Berlin and Penzberg/Munich recorded considerable growth in 2025 and was thus able to strengthen and expand health research at Fraunhofer in cooperation with excellent university locations.

ADVISORY BOARD

2025



The members of the advisory board advise the various bodies of the Fraunhofer-Gesellschaft as well as institute management and promote the connection of Fraunhofer ITMP to partners from industry, science and the public sector.

Fraunhofer ITMP's fifth annual advisory board meeting took place on October 22, 2025 in Frankfurt am Main. The Chair of the Advisory Board Iris Löw-Friedrich, the President of Goethe University Enrico Schleiff and the former Minister-president of the German state of Hesse Volker Bouffier addressed the board and praised the new facilities and the great dedication and especially the scientific and economic impact of Fraunhofer ITMP at its five locations. This was followed by a presentation of current developments in the Fraunhofer-Gesellschaft as well as innovative technologies and methods from the individual Fraunhofer ITMP locations.

As a representative of the executive board of the Fraunhofer-Gesellschaft, Ms. Brandt outlined the three-pillar framework strategy for the future viability of the economy and society. These pillars are based on a business

partnership with secure financing, technical innovation and an active dialogue and feedback strategy to promote a participatory corporate culture.

Gerd Geisslinger, Executive Director of Fraunhofer ITMP and medical research officer of the Fraunhofer-Gesellschaft, presented current news from Fraunhofer ITMP: »We can look back on a very successful year for ITMP. Our new facilities enable even closer collaboration between our researchers in medicine, physical and life sciences, engineering and data analysis. This will enable us to transfer our research findings into clinical practice more quickly in the future and to contribute to forward-looking healthcare.« In this context, Gerd Geisslinger also spoke about the tremendous opportunities of digitalization that primarily involve more efficient data analysis. However, he also highlighted health policy and geopolitical challenges and the effects on price trends and supply shortages in Germany.

In the discussion, the advisory board agreed that key factors for success include favorable economic conditions as well as expanding the pool of specialists and promoting high-tech investments. In research, close collaboration between public and private institutions should be emphasized and technology transfer should be promoted. The usability of health data is an important factor for the future.

Members of the advisory board in the 2025 reporting year 5

Iris Löw-Friedrich ((Chair)
UCB Pharma GmbH, Monheim

Heyo Kroemer (Deputy Chair)
Chief Executive Officer Charité Universitätsmedizin, Berlin

Volker Bouffier
Minister-president of Hesse (ret.)

Klaus Cichutek
President of the Paul-Ehrlich-Institut (ret.), Langen

Carolin Daamen
Bristol Myers Squibb GmbH & Co. KGaA, Munich

Claudia Fleischer
Managing Director of Roche Diagnostics GmbH, Mannheim/
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Claudia Jentzsch
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Hessian Ministry of Science and the Arts (HMWK), Wiesbaden

Volker Lodwig
Roche Diagnostics GmbH (ret.), Mannheim

Tanja Ostersehlte
CEO, FIOS Invest GmbH, Munich

Enrico Schleiff
President of the Goethe University, Frankfurt am Main

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Deutschland GmbH

Matthias Tschöp
President of LMU Munich

Blanche Schwappach-Pignataro
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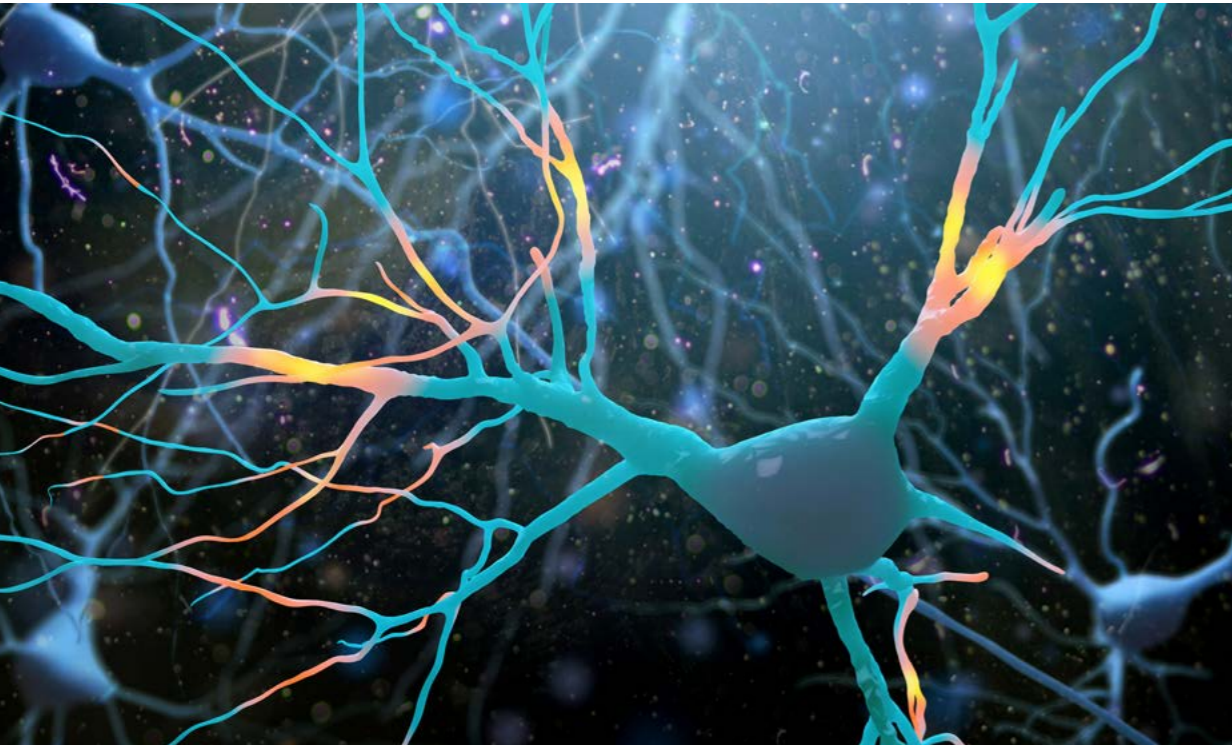
Fig.: The members of the Fraunhofer ITMP Board of Trustees at the annual meeting at the ITMP Headquarters in Frankfurt.
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RESEARCH

The Fraunhofer ITMP with its headquarters in Frankfurt am Main, currently has four additional institute locations in Hamburg, Berlin, Göttingen and Penzberg/Munich.



RESEARCH



Transfer to Clinical Practice: a New Approach to Preventing Chemotherapy-Induced Neuropathic Pain

Basic research is the driving force behind the development of innovative therapeutic strategies. An illustrative example of this is paclitaxel-induced peripheral neuropathic pain (PIPNP), which paclitaxel causes in approximately 50% of cancer patients. Not only does this pain significantly impair quality of life, it also jeopardizes the continuation of life-saving chemotherapy. In the PrevTel study, we have succeeded in transferring laboratory findings to clinical practice.



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Identifying a therapeutic candidate

In preclinical mouse models, treatment with paclitaxel increases a lipid metabolite and enzyme CYP2J6. This lipid metabolite produced via CYP2J6 amplifies pain signals in nerve cells. By screening approved drugs in a library of substances at our Hamburg site, we identified telmisartan, an angiotensin II receptor antagonist, as a potent inhibitor of CYP2J6. In vivo studies in mice confirmed that telmisartan can significantly reduce the concentrations of the pain-inducing lipid metabolite, decreasing the severity of PIPNP. These preclinical results have established telmisartan as a highly promising candidate for treating PIPNP in cancer patients.



Transition to clinical use

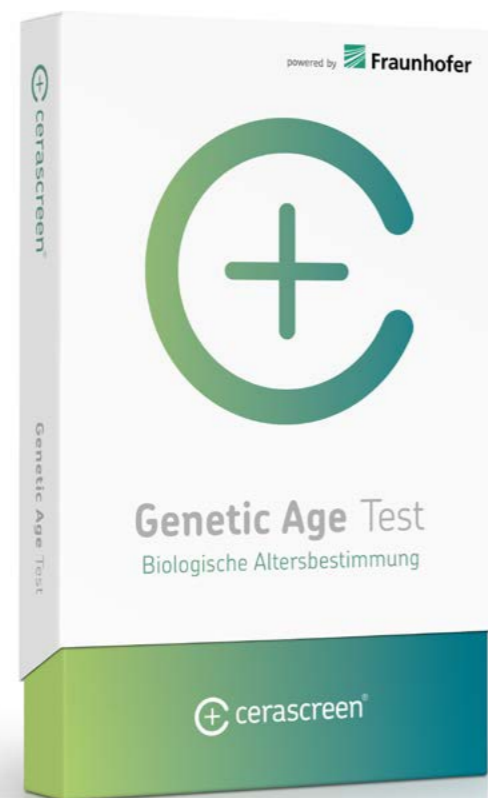
Based on this preclinical data, a Phase IIa trial (PrevTel) was conducted in the proof-of-concept initiative supported by the Fraunhofer-Gesellschaft and the Helmholtz Association. In this study, 35 adult breast cancer patients scheduled to receive paclitaxel chemotherapy were monitored over a period of 12 weeks. The primary goal was to evaluate the efficacy of telmisartan in preventing the new onset of PIPNP, measured by a DN4 pain score of <4. This score is specifically validated for assessing the progression of neuropathic pain. Key exclusion criteria included pre-existing neuropathic or other severe pain, so as not to falsify the assessment of neuropathic pain. We also gathered reports from patients regarding pain intensity, quality of life, tolerability and neurotoxic symptoms.

The PrevTel study indicated an incidence of PIPNP of 8.6%, significantly lower than the 35% reported in a later comparative study and approx. 50% from historical data for patients treated with paclitaxel. Telmisartan also proved to be well-tolerated, with an outstanding safety profile.

The clinical data from the PrevTel study confirms the preclinical hypothesis that telmisartan effectively prevents the development of PIPNP. The study thus demonstrates the successful transfer from basic research to clinical application (early clinical proof of concept) by providing evidence that telmisartan is effective as a preventive strategy against PIPNP in cancer patients treated with paclitaxel.

The next step would now be a larger study with a placebo control to further substantiate the clinical efficacy and to establish telmisartan as a treatment option for improving quality of life in cancer patients treated with paclitaxel.

RESEARCH



From Diagnostics to Prognostics: Biomarkers in Transition

Biomarkers are measurable biological characteristics that objectively represent the condition of biological systems, disease processes or therapeutic effects. They are a central tool in modern medicine and play a key role in translational research as well as in preclinical drug development. In drug discovery, biomarkers serve as objective selection criteria in biologically relevant models. They enable the validation of targets, the elucidation of molecular mechanisms and early assessment of the efficacy and safety of new substances. They thus contribute significantly to efficiency improvement and risk minimization along the process of drug development.

Fig. p. 18: Translational biomarker screening clinic cycle, © Fraunhofer ITMP Hamburg, ScreeningPort

Fig. p. 19: Epigenetic age determination, © Cerascreen GmbH



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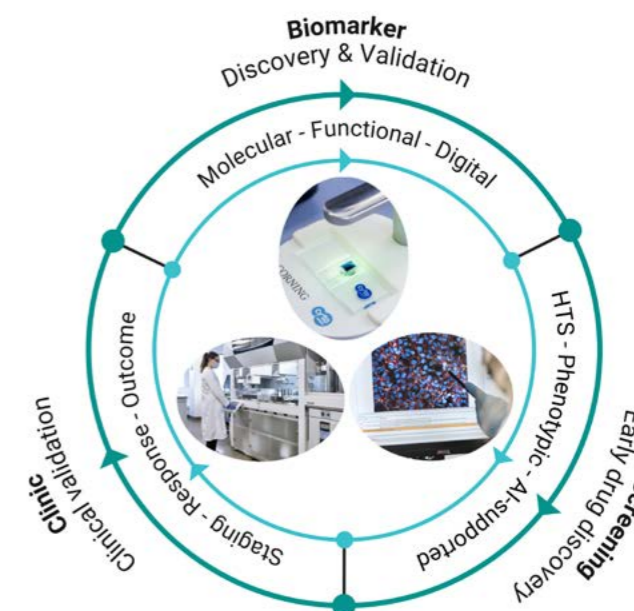


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Complex biomarkers as enablers of data-driven drug discovery

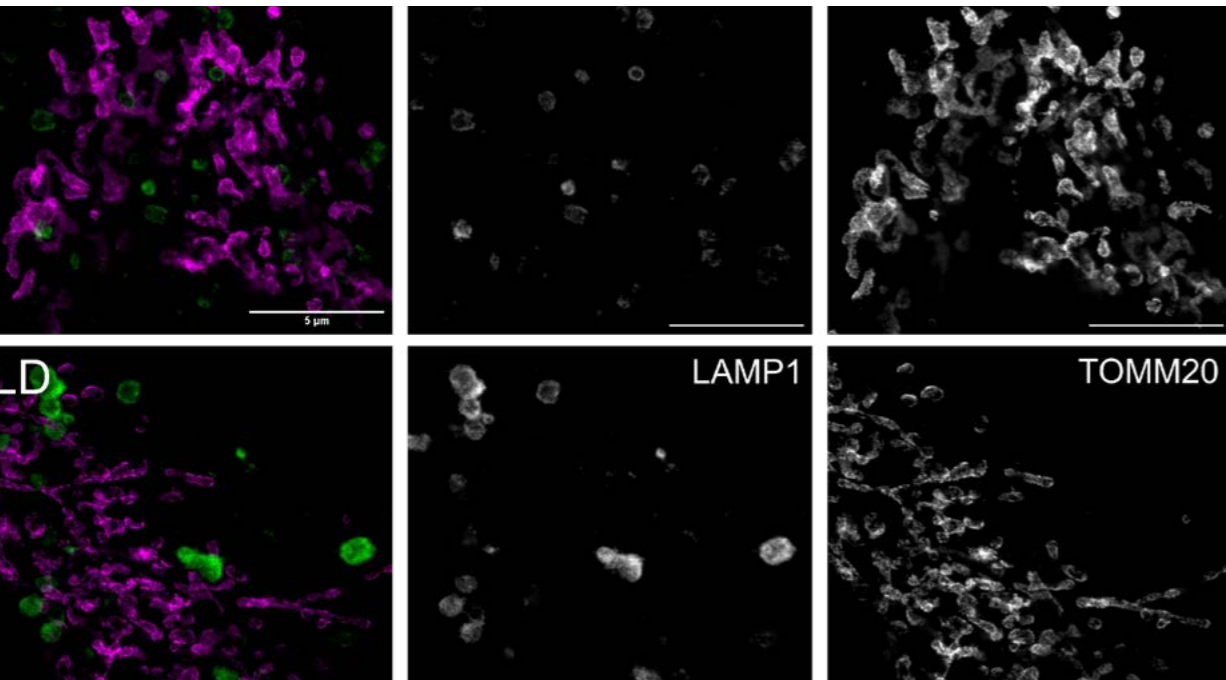
Complex biomarkers integrating molecular, cellular, functional and digital information are continually gaining in importance and acceptance. Combined with modern methods for data, AI and machine learning, they form the foundation of data-driven drug discovery. Biomarkers are thus becoming key parameters in data-driven models to generate and prioritize hypotheses and to enable their experimental validation. In the Immunobiomarkers research project, extensive work was performed at the Hamburg location, developing tools and workflows and building up expertise and datasets in a portfolio of application projects. The research focused on the one hand on a very broad range of indications, while supplementing traditional biomarkers with chemical domains on the other.



Epigenetic biomarkers: from a Fraunhofer patent to a data-driven application

The clinical partners also play a key role in one such transnational approach. One example of this collaboration is a feasibility study at the University Hospital of Bonn in which epigenetic and molecular markers are specifically implemented as the basis for data and AI-supported optimization of multi-target cancer therapies. Transcriptomic and proteomic signatures serve as functional biomarkers for characterizing tumor states, predicting treatment and stratifying patient subgroups. This is supplemented by the epigenetic age test developed and patented by Fraunhofer ITMP. This test was developed as a diagnostic kit and brought to market in collaboration with Cerascreen GmbH. It uses DNA methylation patterns to determine biological age and, in addition to diagnostic applications, it is implemented as a functional biomarker for the model-based analysis of biological states and treatment responses. The epigenetic markers are integrated with data on active ingredients and dose-responses and are fed into AI models to predict the efficacy, synergy and toxicity of drug combinations. These exemplify the integration of biomarker innovation, data analysis and translation in the direction of increasing use and acceptance of digital markers.

RESEARCH



Translational Research on Treating Lysosomal Disorders

By the European definition, fewer than five out of every 100,000 people are affected by a rare disease. Lysosomal disorders are among the most common forms. They affect all organ systems and are characterized by involvement of the nervous system with a dementia-like decline in motor, sensory and cognitive abilities as early as childhood. Links to defective lysosomal genes and proteins have also been described in neurodegenerative diseases in adults (Parkinson's disease, frontotemporal dementia). Options for treatment of the underlying causes are limited. There is a great need for research.



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Cellular pathology details aid in developing therapies

In many cases, different lysosomal disorders manifest similar symptoms and biomarker signatures despite being caused by different cellular defects (e.g., enzymes, transport proteins). ITMP TNM in Göttingen has used automated microscopy, including high-resolution microscopy, to examine seven different cell models generated with CRISPR/Cas9 representing various groups of lysosomal disorders. Similar pathological changes were observed in lysosomal morphology, size and positioning. All cell models also exhibited mitochondrial dysfunction. Together with a comparative multi-omics analysis of the cells, these results provide the basis for identifying intracellular target proteins with which targeted pharmacological modulation could represent a therapeutic approach for a wide range of lysosomal disorders.

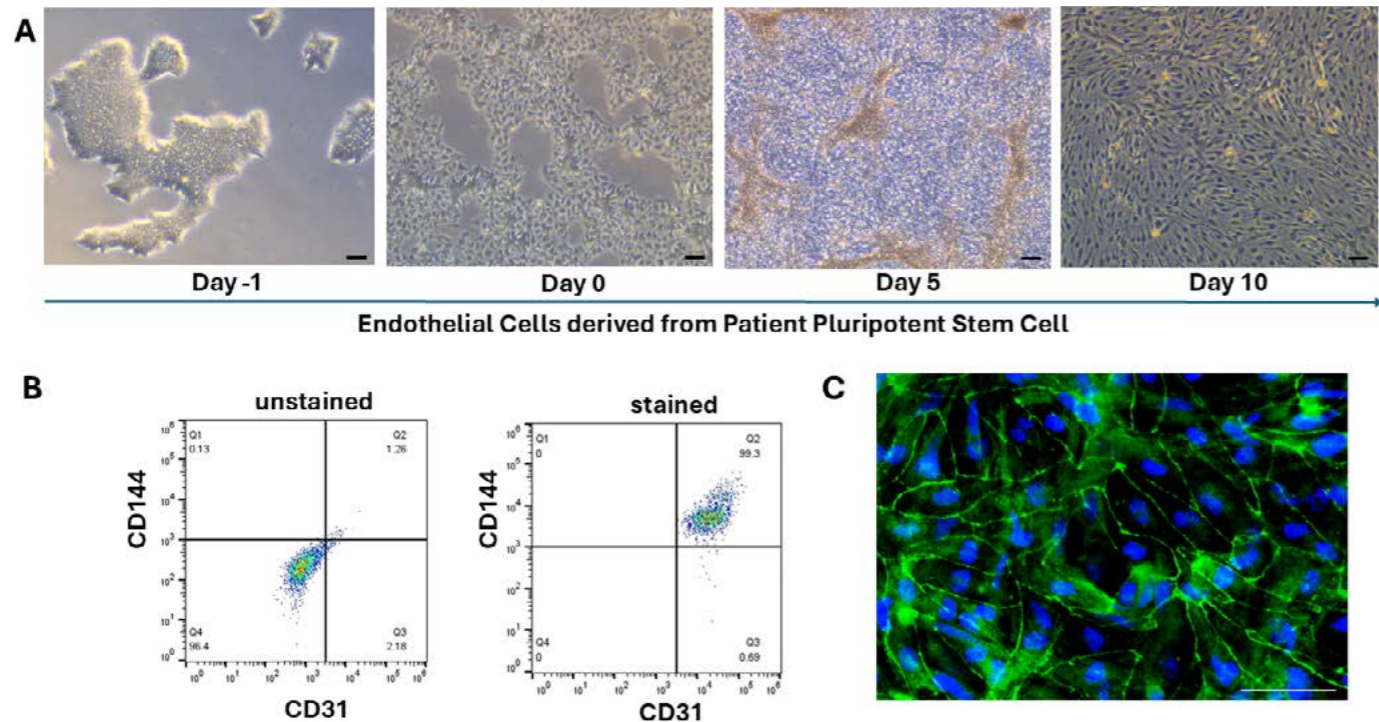
Drug repurposing as a possibility for new treatment methods

The rare lysosomal disorder of multiple sulfatase deficiency (MSD) is caused by a defect in the post-translational activation of lysosomal enzymes. Symptoms include developmental delays, liver and bone disorders, vision loss, epilepsy and the loss of motor and cognitive skills. Drug repurposing, i.e. the use of active ingredients that have already been approved or developed for a different indication, is a cost-effective and time-saving method for developing potential therapeutic approaches. An active ingredient discovered during screening of approved drugs for MSD is already in early-stage clinical trials.

As part of the EU REMEDI4ALL project and in collaboration with the Clinical Research Division at the Frankfurt am Main location, a drug approved for a different clinical application was also evaluated for its potential for MSD therapy. In a Phase III trial, six children with MSD are to be treated with a new formulation of the active ingredient.

Further treatment options are coming: A study in collaboration with the ITMP ScreeningPort in Hamburg has identified 56 additional active ingredients and substances as potential therapeutics. This is where the new CHAMPION project funded by the European Rare Disease Research Alliance (ERDERA), comes in, focusing on preclinical therapy trials for rare diseases using small molecules and biopharmaceuticals. As the project coordinator and in collaboration with an international consortium, ITMP TNM will validate the new potential active ingredients in disease models, investigate their cellular mechanisms and develop an appropriate formulation for treating MSD.

RESEARCH



Myoferlin Mutation in HAE – Development of a Patient-Specific Cell Model (MyFAEME project)

Hereditary angioedema with normal C1 inhibitor (HAE-nC1INH) is a rare genetic disorder characterized by recurrent swelling episodes. Understanding of the mechanisms causing this swelling remains inadequate. This is compounded by the fact that there are no established disease models with which this rare form of HAE can be systematically studied. This is where the MyFAEME project comes in.



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From the laboratory to a patient-specific testing platform

In the MyFAEME project, the research team led by Thomas Buttgerit and Yanyan Luo at the Fraunhofer ITMP in Berlin has developed an innovative model system to better understand a rare form of hereditary angioedema (HAE) with normal C1 inhibitor (HAE-nC1INH). The study started with a family whose members suffer from recurring episodes of swelling. A previously unreported variant in the myoferlin gene (MYOF G603D) was identified in these individuals. Myoferlin plays an important role in endothelial cells (vascular cells). Induced pluripotent stem cells (iPSCs) were generated from blood samples taken from the family in collaboration with the Berlin Institute of Health (BIH) to investigate the clinical suspicion that the kallikrein-kinin system (a modulatory system) is involved in the pathogenesis of the swelling episodes. These stem cells were then specifically converted to endothelial cells to replicate the processes occurring in blood vessels in the laboratory. The iPSC endothelial cells derived in this way exhibit a typical morphology and achieve a purity of over 95% (Fig. 1). In extensive functional tests, the team was able to demonstrate that the model replicates key elements of the kallikrein-kinin system. Following targeted activation, both kallikrein activity and the release of bradykinin—a signaling molecule that triggers swelling—can be measured.

In the first milestone of the project, it was demonstrated that cells with the MYOF-G603D mutation release significantly more bradykinin than control cells without this mutation. The model system enables the effects of this rare mutation on cellular metabolic processes to be directly studied for the first time. This provides key insight into the biological causes of recurrent swelling episodes in vitro.

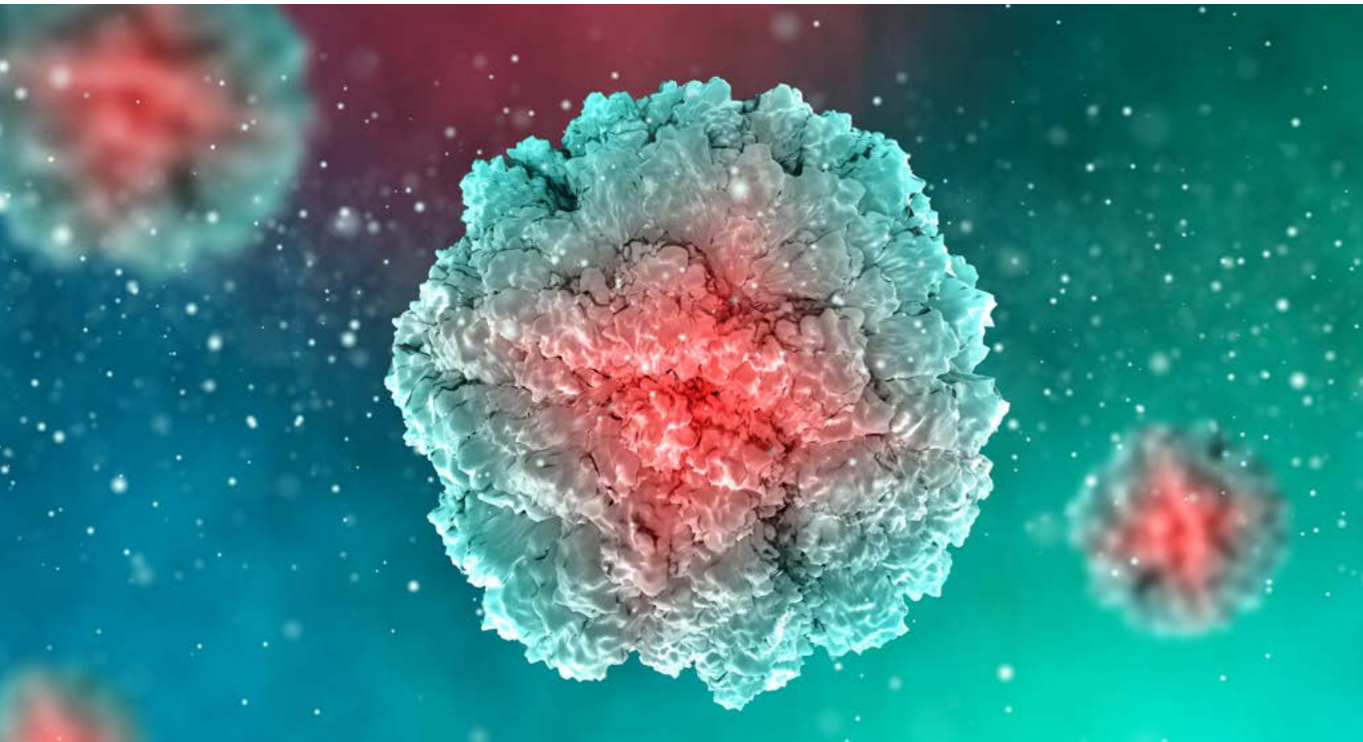
Pilot program for rare HAE variants

Based on these results, MyFAEME is pursuing two key goals. The first is to elucidate the cellular mechanisms by which the MYOF G603D mutation destabilizes the vascular barrier, facilitating swelling. The second goal is to investigate whether kallikrein inhibitors are capable of restraining the overactivation of the kallikrein-kinin system in the model and stabilizing the barrier function of the blood vessels. An industry partner is already using the system for preclinical efficacy testing.

MyFAEME serves as a pilot model for investigating myoferlin mutations in HAE-nC1INH and could potentially be applied to further rare mutations in HAE-nC1INH as well as to other genetically-induced vascular disorders. Over the long term, the project will provide the opportunity for those afflicted to make more informed, individual treatment decisions. It offers hospitals a valuable tool for diagnosing rare forms of HAE and provides a platform for early-stage preclinical research in the pharmaceutical industry.

Fig.: Differentiation and quality control of patient-specific induced pluripotent stem cells (iPSCs) in endothelial cells (ECs): (A) Typical stages of the EC differentiation strategy for iPSCs. (B) Expression of EC-specific markers CD144/CD31 in flow cytometry. (C) Immunostaining indicates the expression of tight junction protein ZO-1 (green); DAPI (blue) served to counterstain the cell nuclei. Scale bar: 100 μ m. © Fraunhofer ITMP | Yanyan Luo; Thomas Buttgerit

AUS DER FORSCHUNG



A Toolbox for Pandemic Preparedness: Diagnostic Platforms for Pathogen X

Globalization, urbanization and climate change create ideal conditions for new pandemics. In the Pandemic Preparedness 2 joint project, Fraunhofer ITMP in Penzberg/Munich, Roche Diagnostics and the Institute of Tropical Medicine at the LMU Medical Center in Munich are developing a modular diagnostic system funded by the Bavarian Ministry of Economic Affairs. Building on the Diagnostic Toolbox established in the previous project, this new project is now developing applications suitable for use in a pandemic, decentralized test formats and high-throughput methods for the rapid identification of new pathogens.



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From the priorities list to the diagnostic toolbox

The COVID-19 pandemic demonstrated that the rapid deployment of highly scalable diagnostic testing is crucial for controlling global outbreaks. A key element was the establishment of a dynamically updated database of potential pandemic pathogens based on international monitoring data, veterinary results and historical outbreaks. In parallel with this, a modular system of recombinant antigens and monoclonal antibodies was developed for prioritized pathogens ranging from flaviviruses to bacterial spore-forming organisms and human pathogenic fungi. The resulting immunoassays can be transferred to high-throughput platforms such as the Roche Elecsys® system.

From the laboratory to clinical practice (PaPrep2)

The goal is to use the toolbox to test and further develop the components developed in this collaboration in various diagnostic scenarios. Four key areas result from combination tests in central laboratories to point-of-care and at-home testing formats:

1. Multiplex testing for multiple pathogens in parallel

Developed antibodies and antigens such as those for yellow fever and West Nile virus, *Aspergillus* spp. or *Clostridioides difficile* are incorporated in new test designs. Multiplex assays are designed to detect multiple pathogens in parallel and enable smart and efficient diagnostics with context-dependent assessment algorithms.

2. Decentralized at-home tests

A second key point addresses decentralized sampling strategies. These include methods for sample collection in homes, AI-assisted self-collection procedures and new pre-analytical concepts (dried samples, analyte enrichment). These approaches are intended to enable early detection of chains of infection and to relieve the burden on healthcare systems.

3. High-throughput mapping of unknown pathogens

In a third area, epitopes and structural domains of pathogens are mapped using patient samples in vitro with AI-supported methods. The reactivity patterns are determined using next-generation sequencing, enabling the rapid identification of specific signatures of the host response, even for previously unknown pathogens (disease X).

4. Synthetic binding proteins without animal testing

In the fourth key area, binding proteins such as antibody derivatives are generated in vitro based on a similar experimental principle without requiring measures such as animal immunization. These molecules form the basis for serological antigen tests, provide control reagents or block nonspecific binding sites. They thus represent potential candidates for neutralizing therapeutic ligands.

By closely integrating academic, clinical and industrial research, PaPrep2 contributes significantly to strategic pandemic preparedness. With the help of Fraunhofer ITMP, Bavaria is positioning itself to drive forward-looking innovations to address future health crises, not simply waiting until the next pandemic strikes but starting today.

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Further information on projects, technologies and expertise as well as contact details of our institute can be found in German and English on the internet at: www.itmp.fraunhofer.de

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