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Six Clusters of Excellence for the University of Tübingen

Tübingen achieves remarkable success and has good chance of maintaining its University of Excellence title – Top research in three areas to be sustained from other sources of support.

On Thursday, the German Research Foundation (DFG) in Bonn announced that under the German government's Excellence Strategy the University of Tübingen will receive funding for six Clusters of Excellence starting on January 1, 2026. This includes three existing clusters whose funding has been renewed. Under the Excellence Strategy guidelines, the University of Tübingen can now apply for the second funding line to renew its status as one of Germany's Universities of Excellence.

The President of the University of Tübingen, Professor Dr. Dr. h.c. (Dōshisha) Karla Pollmann, responded to the news from Bonn: "The decision to fund "GreenRobust", "HUMAN ORIGINS" and "TERRA" as new Clusters of Excellence in Tübingen in the future attests to the University of Tübingen's leading position in these fields of research and confirms the belief that there is enormous potential in each of these clusters. At the same time, renewed funding for the three existing clusters, "Controlling Microbes to Fight Infections" (CMFI), "Image-guided and Functionally Instructed Tumor Therapies" (iFIT) and "Machine Learning: New Perspectives for Science", shows that outstanding research has been conducted at our University in recent years. I offer my congratulations and thanks to all the researchers and professional support staff who have contributed to today's success for their enormous commitment, perseverance, and solidarity on this long road to success."

She said the decision was also an honor for the partners included in these clusters without whom this success would not have been possible – including the University of Hohenheim and Heidelberg University which cooperate in the GreenRobust cluster together with the Max Planck Institute for Biology Tübingen; the University of Hohenheim is a cooperation partner in the TERRA cluster together with the Senckenberg Nature Research Society, Frankfurt. The Max Planck Institute for Biology, Tübingen continues to be involved in the Cluster CMFI, in HUMAN ORIGINS the Max Planck Institute for Evolutionary Anthropology; the Senckenberg Centre for Human Evolution and Palaeoenvironment, Tübingen; iFIT collaborates with the German Cancer Research Center in the Helmholtz Association, the National Center for Tumor Diseases SouthWest (Tübingen/Stuttgart-Ulm), the German Cancer Consortium, the Dr. Margarete Fischer-Bosch Institute of Clinical Pharmacology and the Natural and Medical Science Institute (NMI); the partners of the cluster Machine Learning are the Max Planck Institute for Intelligent Systems, the Max Planck Institute for Biological Cybernetics, the ELLIS Institute Tübingen, the The Leibniz Institute for Knowledge Media (IWM), and the African Institute for Mathematical Sciences (AIMS) Kigali, Rwanda. The President also thanked the state Ministry of Science, Research and the Arts. "Many other areas in which research is conducted at the highest level will benefit from the high profile of the Clusters of Excellence at our University," said the President. "At the same time, this is also a mandate for the entire university to continue working hard on the development of the university and to bring strong results into society. Despite all the joy, today's decisions bring with them immense challenges for us to meet the many expectations."

The President also praised the efforts of those who worked on the further three applications – Bionic Intelligence for Health" (BI4H), "Critical Proximities," "The Fe|male Brain" –, who were not able to celebrate success today. "These fields – thanks to their success in the preliminary application phase – have proven in a long competition that they pursue innovative approaches. Because all cluster applications are aligned with the University's research priorities, we will examine the funding formats offered by the German Research Foundation, the EU, the German government or the state of Baden-Württemberg to see if they can provide follow-up funding to continue the valuable work in these areas to ensure their efforts were not in vain."

Following a highly successful first selection round in February 2024, the University of Tübingen was invited to submit full proposals for a total of six new Clusters of Excellence in the respective funding line as well as applications for extensions to the three existing clusters. Therefore, Tübingen was represented with nine research projects at the application stage. Universities that have got at least two Clusters of Excellence may apply for the "University of Excellence" status and extra funding within the Excellence Strategy funding line.

Building on this latest success, the University management and all University members are now focusing on this next stage of the Excellence Strategy. The University is currently compiling its report for reevaluation as a University of Excellence, in order to submit it by August 1. "The success of the clusters, which are thematically aligned with the university's main areas of research, is a mandate for us to further develop other areas of the university. Our aim is to further develop research, teaching

and innovation university-wide," said President Pollmann. "Research is at the heart of the Excellence Strategy, yet at the same time, the University also plans to further develop teaching and learning as well as knowledge transfer at the highest level in the future." A DFG committee will decide in March 2026 whether the University of Tübingen will be able to maintain its status as a University of Excellence from 2027 onwards.

The following Clusters of Excellence will receive the German government's Excellence sponsorship from 2026:

Controlling Microbes to Fight Infections (CMFI): New Strategies

Trillions of microorganisms live naturally in and on our bodies – in microbial communities known as microbiomes. These are essential for bodily functions and for our health. However, opportunistic, antibiotic-resistant pathogens (ARBPs) also originate from the microbiome. They cause millions of deaths every year – and that trend is rising. Antibiotic resistance has been increasing for years, yet there are hardly any commercial antibiotic development programs. The medical advances of the 20th century are under threat. We may be facing a post-antibiotic era in which antibiotics are no longer effective. The Controlling Microbes to Fight Infections (CMFI) Cluster of Excellence investigates mechanisms of microbiome dynamics and uses them to develop strategies for the prevention and treatment of bacterial infections.

In the second funding phase, the cluster is pursuing an intensified, integrative research approach to microbiome control. Biological, medical, chemical and computer-aided research will record complex interactions of potentially dangerous bacteria with more beneficial microorganisms and the host, and seek ways of harnessing them for new approaches to treatment. The aim is to prevent and tackle difficult-to-treat infections with antibiotic-resistant bacterial pathogens using new methods and active agents.

During the first funding phase, CMFI researchers discovered novel antimicrobial substances naturally produced by the organisms in our microbiomes. In studies, one of the newly discovered substances was able to specifically eliminate the methicillin-resistant bacterium Staphylococcus aureus (MRSA) – a common hospital germ.

The Cluster's spokesperson is Professor Andreas Peschel of the Tübingen Interfaculty Institute of Microbiology and Infection Medicine. The two deputy spokeswomen are Professor Heike Brötz-Oesterhelt, also from the Tübingen Institute, and Professor Ruth Ley, Director of the Max Planck Institute for Biology, Tübingen, with the University Hospitals also playing an important role.

GreenRobust: understanding robustness in plants from molecules to ecosystems

Plants are the foundations of life on earth. To ensure their survival, they have evolved strategies to cope with changes in their environment. In particular, they have developed sophisticated mechanisms to maintain their functions in the face of disturbances – a capacity termed "robustness". With the human impact on our planet growing day by day, it is crucial to understand the underpinnings and limits of plant resilience if we are to develop effective, knowledge-based strategies that help maintain plant ecosystems and ensure agricultural productivity.

The GreenRobust cluster of excellence combines the expertise of the Universities of Tübingen, Heidelberg, and Hohenheim to understand how plants achieve robustness in light of an ever-changing environment. The cluster focuses on the investigation of robustness against climatic and biotic disturbances across various levels of biological organization, from molecules to populations, in a selected group of species from environmentally and agriculturally important plant families. GreenRobust will generate a wealth of data on plant robust behavior, which will be made available to the scientific community, and use network theory and artificial intelligence to develop and test models that describe the mechanisms of plant robustness.

The cluster's spokesperson is Professor Rosa Lozano-Durán from the University of Tübingen's Center for Plant Molecular Biology. Co-spokespersons are Professor Karl Schmid from the Institute of Plant Breeding, Seed Science and Population Genetics at the University of Hohenheim, and Professor Thomas Greb from the Centre for Organismal Studies at Heidelberg University.

HUMAN ORIGINS: A paradigm shift in the study of human evolution

In the 21st century, new research methods and approaches have revolutionized both the study of human origins and our understanding of them. We now know that several hominin species – representing a previously unimaginable diversity of human ancestors – not only coexisted in time and space, but also interbred repeatedly, contrary to the prevailing definition of species. Previous assumptions about evolutionary trends - such as an increase in brain size over time - are now in doubt in light of new data. A new approach is therefore required that can match the rapid pace of methodological developments; an approach which seeks new evidence and closes gaps in the hitherto fragmentary investigation of fossil and archaeological finds. The integration of biological, cultural, and ecological factors into the analysis of finds enables researchers to recognize previously unseen connections and to develop new theories.

This cluster of excellence is based on three interlinked, diachronic thematic complexes: systematics and evolutionary relationships, the evolution of human cognition, and the evolution of the human ecological niche. Building on these three themes, HUMAN ORIGINS looks at the past five million years of human evolution and explores questions that are fundamental to both knowledge and society, including: where did we come from and how did we become what we are now? how did it come about that we, Homo sapiens, are the only hominin species still around today? HUMAN ORIGINS is set to help bring about a paradigm shift in the study of human evolution.

The spokeswoman is Professor Katerina Harvati-Papatheodorou, Head of Palaeoanthropology at the Senckenberg Centre for Human Evolution and Palaeoenvironment. Co-spokespersons are Professor Christopher Miller, Head of Geoarchaeology, and Professor Nicholas Conard, Head of Early Prehistory and Quaternary Ecology.

Image-Guided and Functionally Instructed Tumor Therapies (iFIT)

Despite intensive efforts, around a third of all solid tumors are diagnosed at an advanced, often metastatic stage. Such mostly incurable cancers are the focus of the iFIT Cluster of Excellence. iFIT stands for a networked cancer research and therapy development approach that combines three main research areas of the University of Tübingen's Faculty of Medicine: functional identification of therapeutic target structures, academic drug development and molecular tumor therapies; immunology and immunotherapies; molecular and functional multiparametric imaging.
In the first funding period, iFIT enabled tumor biological processes to be characterized in greater depth and new targets for molecular and immunological cancer therapeutics and diagnostics to be identified. In the future, the iFIT cluster will further expand academic drug development in order to be able to develop highly innovative cancer therapeutics and diagnostics for initial application in humans.

The success of iFIT to date has contributed to the University of Tübingen becoming a new branch of the National Center for Tumor Diseases (NCT), which promotes early clinical trials. This collaboration allows academically developed cancer drugs to be tested more quickly in clinical trials. This ultimately will help to improve the prognosis of cancer patients.

Spokesperson for the cluster is the oncologist Professor Lars Zender, Medical Director of Medical Oncology and Pulmonology (Internal Medicine VIII). The deputy co-spokespersons are the immunologist Professor Juliane Walz, Head of Peptide-Based Immunotherapy at the University Hospital; and Professor Bernd Pichler, Director of Preclinical Imaging and Radiopharmacy and of the Werner Siemens Imaging Center.

Machine Learning: New Perspectives for Science

The field of machine learning has developed rapidly in recent years. This opens up promising opportunities for science to improve the predictive power of models and better to predict climate change, for example. The Cluster of Excellence “Machine Learning: New Perspectives for Science” was launched in 2019. In the first funding period, its researchers used machine learning techniques to gain new insights into very different fields of science: for example, they expanded their knowledge of the fundamental building blocks of the brain or deepened their understanding of gravitational waves in physics.

However, machine learning methods still have weaknesses in terms of their reliability, robustness and interpretability. In the second funding period, the cluster will seek to further develop such methods and integrate automated learning processes into overall academic work processes. The researchers will demonstrate the potential of this approach in a wide range of disciplines and, for example, identify causes of disease progression or clarify the dynamics of quantum systems.

The spokespersons are Ulrike von Luxburg, Professor of Informatics, and Philipp Berens, Professor of Neuroscience and director of the Hertie Institute for AI in Brain Health. The Cluster's partners, along with the University of Tübingen, are the Max Planck Institute for Intelligent Systems, the Max Planck Institute for Biological Cybernetics, the ELLIS Institute Tübingen, the Leibniz-Institut für Wissensmedien, and the African Institute for Mathematical Sciences (AIMS).

TERRA: Interactions between geosphere and biosphere in a changing world

Vital resources such as drinking water and the air we breathe are created by interactions between the Earth’s geo- and biosphere. Understanding these interactions in detail is therefore essential for the well-being of humankind. The current human impact on ecosystems is unprecedented, but the underlying laws of nature always apply. The TERRA Cluster of Excellence will investigate how geo-biosphere interactions both respond to and influence environmental change. TERRA tests the hypothesis of whether the geosphere’s diversity stabilizes the biosphere and, vice versa, whether the biosphere’s diversity stabilizes the geosphere – and asks: if this is the case, how?

TERRA stands in the established Tübingen tradition of joint research in the geosciences and life sciences, and includes researchers from the University of Hohenheim and the Senckenberg Society for Nature Research in Frankfurt. TERRA pursues an integrative approach, combining fieldwork, experiments, and data studies analyzing different periods of the Earth's history.

TERRA’s representatives are Professors Michaela Dippold, Kira Rehfeld and Olaf Cirpka, all of whom teach and conduct their research at the University of Tübingen’s Geoscience and Environment Research Centre (GUZ).

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Further information

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