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Frank Winkler receives the Brain Prize 2025

This year, the Brain Prize, the most valuable research prize in the neurosciences and neuromedicine, worth more than one million euros, honors pioneering work on nervous system-cancer interactions: Neurologist Frank Winkler, who researches at the Heidelberg Medical Faculty of the Heidelberg University and at the German Cancer Research Center (DKFZ) and treats patients with brain tumors at the Heidelberg University Hospital (UKHD), discovered that nerve cells in the brain communicate with brain tumor cells. This causes the disease to progress. The finding opens up completely new treatment approaches. He shares the prize with Professor Michelle Monje from Stanford University, USA. The award will be presented by the Danish King Frederik X in Copenhagen on May 28, 2025.

With the Brain Prize 2025, the Danish Lundbeck Foundation honors the groundbreaking research of Prof. Dr. Frank Winkler, a scientist and clinician in the field of neurology. Over the last 15 years, he has gained pioneering insights into the biology of incurable glioblastomas, highly aggressive brain tumors. He showed that the tumor cells interact with healthy nerve cells and receive signals from them – which fuels the invasive growth of the tumors. In addition, some tumor cells develop into pacemakers, which, together with the excitatory signals from the nerve cells, promote the formation of a mycelium-like tumor network in the brain. The network enables the tumor cells to communicate in a complex way and gives them enormous resistance to common therapies. Winkler's results open up starting points for new therapeutic strategies that are currently being tested in clinical trials. The prize will be presented in person by the Danish King Frederik X in Copenhagen on May 28.

Understanding of the biology of neurological cancers changed

“The most highly endowed prize in the neurosciences goes to Baden-Württemberg! I warmly congratulate Professor Frank Winkler on winning the Brain Prize 2025. This award once again demonstrates the excellence of our researchers, especially at the medical research hub of Heidelberg: here, university and non-university research institutions work together particularly successfully for the benefit of patients. Professor Winkler's research paves the way for new treatment approaches for previously incurable brain tumors. With our Health and Life Science Alliance innovation campus, we are creating a special framework for this cutting-edge research in the Rhine-Neckar region. As a federal state, we continue to do everything in our power to strengthen Baden-Württemberg as a center of science and health,” says Science Minister Petra Olschowski.

Prof. Winkler shares the 1.3 million euro Brain Prize with Professor Michelle Monje, who is researching inoperable brain tumors in children at Stanford University, USA. “Michelle Monje and Frank Winkler have independently changed our understanding of the biology of these neurological cancers,” said Professor Andreas Meyer-Lindenberg, Chair of the Brain Prize Selection Committee. ‘Together, Monje and Winkler have initiated a paradigm shift by incorporating neuroscience into cancer research, thus laying the foundation for what is now known as ’cancer neuroscience'.”

The interaction between the nervous system and cancer is increasingly coming into focus

The new research area of “Cancer Neuroscience” focuses on the interaction between the nervous system and cancer: What role does the nervous system play in the development and spread of a tumor? Do possible interactions influence the prognosis? Can these processes be stopped or used for therapies? “As a scientist and physician, I treat and care for patients with brain tumors every day and can scientifically test the hypotheses that arise from my direct experience with the disease in the clinic. This allows me to ask the right questions that are truly relevant to the underlying mechanisms of the tumor disease and to the patients themselves,” says Prof. Winkler, Managing Senior Physician at the UKHD's Department of Neurology. “I feel incredibly honored and grateful that this dual approach, which I have been pursuing with great passion for more than 15 years with numerous colleagues in the Heidelberg research community, is now receiving such great recognition.”

“The research area of cancer neuroscience will become even more important in future. This is because there are increasing indications that the nervous system plays an important role in the emergence and progression of cancerous diseases, also those outside the brain. In Heidelberg we have some of the world’s leading research groups in this field and, with our partners on the campus and in the region, we want to play a leading role in shaping this development, and to expand on it even more,” says Prof. Dr Michael Boutros, Dean of the Medical Faculty Heidelberg of Heidelberg University.

Close links between clinical practice and research accelerate the implementation of new findings

The findings of Professor Winkler and his team not only shed new light on glioblastomas, which have so far been incurable. They have also shown that a certain drug used to treat epilepsy can disrupt the communication between nerve and tumor cells. Winkler and his team are currently conducting a clinical trial to determine whether the drug can benefit patients with glioblastoma. "This is what translational research is all about – the rapid transfer of new research findings into clinical care. Heidelberg offers excellent conditions for this thanks to the close cooperation between the university and university hospitals and non-university research institutions such as the DKFZ," says Professor Dr. Dr. Jürgen Debus, Senior Medical Director of Heidelberg University Hospital (UKHD). "I warmly congratulate Professor Winkler on this great success at the interface between patient-oriented research and clinical practice."

Prof. Dr Frauke Melchior, Rector of Heidelberg University, underlines: "The groundbreaking studies by Frank Winkler connect in outstanding fashion patient-related research and clinical practice. This close interaction, so essential for successes in the health sector, is particularly fostered in our Innovation Campus, the Health + Life Science Alliance Heidelberg Mannheim. Members of the university, university hospitals and non-university institutions collaborate closely in the alliance, in order – in the nexus between research, hospital and medical technology – to introduce new scientific findings into medical care as rapidly as possible. Our warmest congratulations go to Frank Winkler on receiving this prestigious award."

2015 first scientific breakthrough: glioblastomas grow like a fungus in the brain

Glioblastomas are highly aggressive and, to date, incurable brain tumors. Despite surgery, chemotherapy, and radiotherapy, patients usually die within two years. Prof. Winkler and his research group at the Neuro-Oncology Clinical Cooperation Unit of UKHD and DKFZ discovered one reason for this 2015: the glioblastoma cells are connected to each other by long cell processes and grow like a fungal network into the healthy brain. On the one hand, this network cannot be completely removed by surgery, and on the other hand, the cells exchange important substances via these connections, thus protecting themselves from the damage caused by the therapy.

In 2019, Winkler, his team colleague Dr. Dr. Varun Venkataramani and Professor Dr. Thomas Kuner, head of the Department of Functional Neuroanatomy at the Institute of Anatomy and Cell Biology at the Heidelberg Medical Faculty of the Heidelberg University, published further groundbreaking findings: nerve cells in the brain establish contacts with the tumor cells of glioblastomas, transmit excitatory signals to them, and thus fuel the spread and networking of cancer cells in the brain. They also found that the cell-cell contacts are true synapses, which are structured exactly the same as the contact points between healthy nerve cells. They function in the same way and can also be inhibited by the same active substances. This opened the door to clinical applications.

For his outstanding work, Frank Winkler received the German Cancer Award in the category "Translational Research" in 2022 and the BIAL Award in Biomedicine in 2024.

"Cancer Neuroscience" at the European Center for Neuro-Oncology

Winkler's research is part of the collaborative research center "UNITE GLIOBLASTOMA – Overcoming Therapy Resistance of Glioblastomas (SFB1389)", which is coordinated from Heidelberg. The spokesperson is Prof. Dr. Wolfgang Wick from the Medical Faculty Heidelberg of the University of Heidelberg, Medical Director of the UKHD's Department of Neurology and Head of the UKHD and DKFZ's "Neuro-Oncology" clinical cooperation unit. He says: "The discovery that the nervous system plays a role in the resistance of glioblastomas, but also of other tumors in the brain and outside, could be an essential, previously missing piece in the understanding of tumor diseases that have not been sufficiently treatable so far. We will now pursue these aspects as a priority in the new European Center for Neuro-Oncology, which is funded by the Dietmar Hopp Foundation."

About the Brain Prize

The Brain Prize, awarded by the Lundbeck Foundation, is the largest neuroscience and neuromedical research prize in the world. It recognizes particularly innovative and far-reaching advances in all areas of brain research, from basic neuroscientific research to applied clinical research. Established in 2011, the Brain Prize has since been awarded annually to a total of 47 scientists from ten countries. The prize money of 10 million Danish crowns (1.3 million euros) is intended as personal prize money.

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Source: Heidelberg University Hospital (UKHD)

Further information

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