

**Press release 9 / 2021**

**ACADEMY OF SCIENCES AND HUMANITIES IN HAMBURG**

Hamburg, 29 September 2021

**Fabian Theis is awarded the Hamburg Science Prize 2021**

**Fabian Theis, Director of the Institute of Computational Biology and one of the leading figures at Helmholtz Zentrum München, is awarded the Hamburg Science Prize 2021. The Academy of Sciences and Humanities in Hamburg is honouring this Professor of Mathematics at the TU of Munich as a pioneer in the field of Artificial Intelligence in biomedical applications, above all in the area of single-cell biology. The prize of 100,000 euros is endowed by the Hamburgische Stiftung für Wissenschaften, Entwicklung und Kultur Helmut und Hannelore Greve. The prize will be awarded on 12 November 2021 in the Hamburg Rathaus under the auspices of the First Mayor of the Free and Hanseatic City of Hamburg.**

Prof. Dr. Dr. Fabian Theis uses Artificial Intelligence (AI) and Big Data analysis procedures to answer biomedical questions. With his research he has made an essential contribution to the development of innovative biomedical AI-based methods. Fabian Theis is a leader in his field not just in Germany, but world-wide. He is one of the few researchers whose discoveries have led directly to clinical applications, for example in the treatment of skin diseases or of diabetic retinopathy. For the automated diagnosis of this eye disease, the research group around Theis at his Institute of Computational Biology in the Helmholtz Zentrum München, in collaboration with the Eye Clinic of the Munich University Hospital and that of the Technical University of Munich (TUM), developed a screening algorithm that was published in 2020, which needs 75 percent fewer annotated data, i.e. data with specialist commentary, and is able to carry out diagnoses at the same level of performance as specialist staff. “The limited availability of annotated data is a major challenge for medicine,” Theis stressed. “We have therefore made it our goal to develop methods that require fewer data and which are therefore suitable for clinical use.”

“Fabian Theis applies AI across biomedical research, healthcare and precision medicine. He has successfully demonstrated the enormous value of AI-based technologies in a number of applications and thus has fulfilled the expectations of AI in medicine: to reform prevention, diagnostics and therapy and to open the way to the medicine of the future.” This was the comment of the Chair of the Jury and President of the Academy of Sciences and Humanities in Hamburg, Prof. Dr. Edwin J. Kreuzer. “With the Hamburg Science Prize 2021 we honour his pathbreaking work in the field of AI in biomedical applications, above all in the area of single-cell biology.”

“Fabian Theis is a pioneer of Artificial Intelligence in biomedicine. He drives the transformation of future medicine by his discoveries and inventions into the direction of predictive and preventive medicine,” stated Prof. Dr. med. Matthias H. Tschöp, CEO at Helmholtz Zentrum München. “His exceptional capabilities in research, his high interdisciplinary approaches as well as his groundbreaking applications have been established him as leading visionary mind within the biomedical research area.”

“The use of Artificial Intelligence and Machine Learning in medicine offers the opportunity to improve the diagnosis and therapy of diseases,” said Hamburg’s First Mayor Dr. Peter Tschentscher, the Patron of the Hamburg Science Prize. “In Fabian Theis the Academy of Sciences and Humanities in Hamburg is

honouring an exceptional scientist, who is a leader in the field of bio-informatics and whose research has made possible major advances in the clinical use of AI-based systems. I congratulate Fabian Theis on the Hamburg Science Prize 2021 and wish him continued great success in his research and in the planned collaboration with the University Medical Research Center Hamburg-Eppendorf (UKE).“

### **The Prize-winner**

Prof. Dr. Dr. Fabian Theis studied Mathematics and Physics at the University of Regensburg. After graduating with degrees in both subjects, he earned one doctorate at the University of Regensburg in Physics and another a year later in Computer Science at the University of Granada. As a postdoc he was, among other things, Bernstein Fellow at the Bernstein Center for Computational Neuroscience at the Max Planck Institute for Dynamics a Self-Organisation in Göttingen. In 2008 Theis gained his “Habilitation” in Biophysics at the University of Regensburg. From 2007 to 2013 he headed the Working Group “Computational Modeling in Biology” at the Helmholtz Zentrum München and was Associate Professor in the Mathematical Faculty of the TUM.

In 2013, Theis, born in 1976, took over the leadership of the Institute of Computational Biology at the Helmholtz Zentrum München and has since then held the Chair of Mathematical Modelling of Biological Systems at the Technical University of Munich. In addition, Fabian Theis is Scientific Director of the Helmholtz Artificial Intelligence Cooperation Unit (Helmholtz AI) of the Helmholtz Association and founded the Munich School for Data Science, which decisively strengthens support for younger scientists in the area of Data Science.

His research has been honoured with numerous awards. Thus, for example, Theis was part of an interdisciplinary team that was awarded the Erwin Schrödinger Prize, the Stiferverband Science Prize, for new methods that make it possible to describe cell populations in a more differentiated way and to predict the development of individual blood cells.

Theis works as Adjunct Faculty at Northwestern University in the USA und as Associate Faculty at the Wellcome Sanger Institute in the UK. He is involved in leading roles in various research initiatives and networks, such as, since 2017, the Human Cell Atlas Initiative.

The prize money from the Hamburg Science Prize will be used by Theis for a cooperation project with the UKE in the area of Deep Learning.

### **The Hamburg Science Prize**

The Hamburg Science Prize 2021 was dedicated to the topic “Artificial Intelligence in Medicine.” So-called Artificial Intelligence and its subfield Machine Learning are of great importance in many sectors. Especially in Medicine and Medical Technology it is expected that Machine Learning will be able to make an important contribution to caring for people medically in a more individual way. Above all in healthcare great opportunities are seen in using Machine Learning to maintain and care for health in better and more cost-effective ways. The paramount aim is to support doctors in their decision-making on diagnosis and treatment, and the power to decide continues to lie with the doctor. Machine Learning supplements human thought. The Jury received seven nominations. Those nominated were proposed by universities and, especially, university hospitals in Germany and abroad.

The Hamburg Science Prize is awarded every two years and was offered for the seventh time in 2021. At 100,000 Euros it is the financially largest prize awarded by a German Academy of Sciences. The previous topics and prize-winners:

- 2009 “Infection research”: Prof. Dr. Stefan Ehlers, Research Center Borstel and Kiel University (CAU)

- 2011 “Energy research”: Prof. Dr. Ferdi Schüth, Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr
- 2013 “Dementia research”: Prof. Dr. Mathias Jucker, Hertie Institute for Clinical Brain Research (HIH), Tübingen
- 2015 “Nanosciences”: Prof. Dr. Roland Wiesendanger, Department of Physics, Universität Hamburg
- 2017 “Energy efficiency”: Prof. Dr. Xinliang Feng, Center for Advanced Electronics, TU Dresden, and Prof. Dr. Dr. h. c. mult. Klaus Müllen, Max Planck Institute for Polymer Research, Mainz
- 2019 “Rare genetic diseases”: Prof. Dr. Jutta Gärtner, Klinik für Kinder- und Jugendmedizin of the University Medical Center Göttingen (UMG)

Free image material is available for download at:

<https://www.awhamburg.de/aktuell/presse/pressemitteilungen/detailseite/09-2021-fabian-theis-erhaelt-den-hamburger-wissenschaftspreis-2021.html>

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**The Academy**

The Academy of Sciences and Humanities in Hamburg has as its members outstanding scientists and scholars in all disciplines from northern Germany. It helps to intensify the collaboration across subjects and between universities and other scientific and scholarly institutions. It promotes research on questions of importance for the future of society and fundamental scientific problems and it takes as its special task the promotion of dialogue between science and the public. The basic funding of the Academy is financed by the Free and Hanseatic City of Hamburg. The President of the Academy is Prof. Dr.-Ing. habil. Prof. E.h. Edwin J. Kreuzer. The Academy of Sciences and Humanities in Hamburg is a member of the Union of the German Academies of Sciences and Humanities.