Press Release by the German Society for Immunology (DGfI)

Prof. Dr. med. Thomas Boehm receives the German Immunology Award of the DGfI

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For his groundbreaking work in the field of the development of the immune system, the German Society for Immunology (DGfI) awards the German Immunology Prize 2020 to Professor Dr. med. Thomas Boehm, Director at the Max-Planck Institute of Immunobiology and Epigenetics in Freiburg. The prize should actually have been presented during the joint annual conference of the DGfI and the ÖGAI in Hanover on 09.09.20. Since this conference had to be cancelled due to the pandemic, the award ceremony will now take place during the ECI conference in Belgrade in September 2021.

For many years, Professor Thomas Boehm has been one of the leading immunologists worldwide with his outstanding scientific achievements in the field of molecular mechanisms of the development of the immune system. His research focuses on the development and function of the thymus and T cells, as well as the evolution of the adaptive immune system. With his quite daring hypotheses, he has repeatedly challenged supposedly established paradigms and as a result has opened up completely new perspectives on the function and regulation of the immune system. This is also confirmed by current high-ranking publications, in which processes of thymus-dependent T-cell development are described not only in mouse models, but in a whole range of animal species, from the simplest vertebrates (e.g. lampreys) to humans. This diversity of animal models has repeatedly provided Thomas Boehm and his colleagues with new insights into the fascinating evolution of the immune system, which is characterised in jawed vertebrates by the first appearance of specialised "lymphopoietic" tissues with T- and B-like cells, considered to be ancestors of the mammalian T- and B-lymphocytes. In contrast, in more primitive jawless vertebrates (e.g. lampreys), the genetic mechanisms that enable a large repertoire of structurally different antigen receptors to develop, appear to have developed largely independently. They are correspondingly different in comparison to more recently evolved jawed vertebrates, up to primates and humans.

"In the short format of a press release, only a few highlights from the wealth of the pioneering work by Professor Boehm can be mentioned," says Prof. Dr. Thomas Kamradt, President of the German Society of Immunology. Not only the discovery of the mutation in T-cell-deficient "nude" mice, but also the mechanism of "sexual parasitism" in deep-sea anglerfish, which was published in the journal Science in 2020, caused a particular stir among scientific colleagues. The male literally has to "bite" into the female, attach itself permanently, for reproduction purposes - not only at the price of giving up whole organs and blood circulation, but also some immune recombination genes - tolerance at the highest level, so to speak. But that is not all. His out of the box thinking can also be seen in the fact that Thomas Boehm has devoted himself to the immunology underlying the observation that we sometimes cannot stand somebody. Based on his mechanistic studies in fish and mice, he found that we humans could actually tell – from the body odour of other people – which peptide ligands of human leukocyte antigens (HLA) are made accessible to olfactory sensory cells. Self-peptides in the

context of their cognate HLA alleles are apparently perceived in certain brain regions as less fragrant than "perfume-like" foreign peptides. So when people "sniff out" each other, there could be more to it than they might have thought: namely a sensory influenced partner selection based on the functional link between the immunogenetics of HLA polymorphisms and the olfactory evaluation of the corresponding peptide ligands.

With this impressive variety of not only groundbreaking, but to a large extent even revolutionary findings on the evolution and regulation of the adaptive immune system, it is not surprising that some of Thomas Boehm's discoveries, e.g. those on the evolutionary mechanisms of the adaptive immune system, have already found their way into international immunology textbooks. "The groundbreaking work from Boehm's laboratory is not only based on scientific acumen and experimental-methodological excellence, but also testifies to his extraordinary ability to think outside the box, to question paradigms and thus to break completely new immunological ground - quite contrary to current doctrine," says Thomas Kamradt, explaining the decision for this award winner, adding that "with Thomas Boehm, a great role model for young scientists is honoured".

Prof. Dr. med. Thomas Boehm has been Director at the Max-Planck Institute of Immunobiology and Epigenetics in Freiburg since 1998, where he heads the department "Development of the Immune System". He was previously Professor at the German Cancer Research Centre, DKFZ, in Heidelberg from 1995 to 1997, having served as Professor of the Medical Faculty at the University of Freiburg before. Prof. Boehm spent his post-doctoral period from 1987 to 1991 in the Laboratory of Molecular Biology in Cambridge, England, to where he went after finishing his clinical/experimental post-doctoral training in paediatrics and biological chemistry from 1982 to 1986 at the medical faculty of the University of Frankfurt, where he had also completed his medical studies.

About the German Immunology Award

The German Immunology Award is the highest scientific award of the German Society of Immunology (DGfI). It is endowed with 10.000 EUR.

The prize is awarded to an internationally renowned person who has contributed with outstanding achievements to the elucidation of basic immunological principles and/or to the translation of basic research into clinical application. Further information can be found at www.dgfi.org.

The German Immunology Award is made possible by a generous donation from AbbVie Germany. The awardee is selected by the DGfI Executive and Advisory board.

Press contact:
Deutsche Gesellschaft für Immunologie e. V.
Charitéplatz 1
10117 Berlin

Dr. Ulrike Meltzer/Theresa Hoppe
Tel.: +49 30 28460 648
Email: mail@dgfi.org