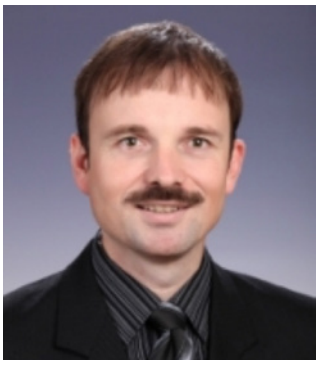
ATTILA TÓTH



Hungarian biologist

Results for the Talentum Prize 2022 nomination: Positive inotropic drugs may limit diastolic function leading to reduced cardiac output.

Title of his presentation: Gains and losses upon improving cardiac contractility

Date of his presentation: 7 april 2022. 10:30-10:55

CAREER

Attila Tóth is head of the cardiovascular research laboratory at the University of Debrecen. His research group focuses on the regulation of vascular blood flow and the treatment of cardiovascular diseases.

Attila Tóth graduated as a biochemist from the Molecular Biology programme at the University of Debrecen. During his PhD studies, he investigated the biochemical properties of the enzyme myosin phosphatase, which plays a key role in blood vessel contraction, at the University of Debrecen. Subsequently, he spent two years at the National Institute of Health, Bethesda, Maryland, the largest life sciences research institute in the United States, in the laboratory of Peter M. Blumberg. There he was involved in the development of molecules targeting the capsaicin receptor (TRPV1). On his return to Hungary, he established his own laboratory at the Department of Clinical Physiology, Institute of Cardiology, University of Debrecen, where he initially worked on the vascular biology of the capsaicin receptor. In recent years, he has turned his interest towards translational research. This has involved investigating the effects of new drug candidates emerging in cardiology practice on the one hand, and research on the renin-angiotensin-aldosterone system and the efficacy of therapy on the other.

Among his most important achievements, he has demonstrated the functional presence of the capsaicin receptor in arterial smooth muscle cells. He was the first to describe the substantial contribution of the capsaicin receptor to the contraction of blood vessels and the maintenance of blood pressure. In translational research, their research has three main directions. One is to elucidate the role of angiotensin-converting enzymes, which play a key role in cardiovascular disease. This has shown that angiotensin-converting enzyme 1 (ACE) is inhibited by albumin in the blood; and that angiotensin-converting enzyme 2 (ACE2) levels are associated with cardiovascular disease severity. Of particular relevance to this line of research is that ACE2 is a cellular receptor for the pandemic coronavirus, which may play a role in determining COVID-19 mortality. Another major goal of their research is to investigate drug candidates that can enhance myocardial contractility. They have made original progress in the study of the molecule omecamtiv mecarbil (pronounced omekamtiv mecarbil). In this series of experiments, omecamtiv mecarbil was shown to induce effects involving changes in myocardial morphology, slowing of contraction and reduction of myocardial contractility. Finally, their third area of research is aimed at improving the efficacy of cardiovascular therapy. The importance of this is that less than half of cardiovascular patients take their medicines properly, which is a serious barrier to effective treatment and a major contributor to the appalling mortality statistics in Hungary. Their work involves developing methods to estimate the effectiveness of medication from blood samples, a technique that can be used to optimize the dose of medication prescribed to patients.

PROFESSIONAL ACHIEVEMENTS

1995 – OTDK 1st Prize
1997 – OTDK 2nd Prize
2001-2003 – Fogarty Fellowship, NIH, Bethesda, Maryland, USA
2003- Head of Cardiovascular Laboratory, University of Debrecen
2005-2008 – János Bolyai Postdoctoral Fellowship
2011-2014 – János Bolyai Postdoctoral Fellowship
2014 – Doctorate of HAS (Hungarian Academy of Sciences)
2016 – appointed University Professor
2020 – Master Teacher Gold Medal