News Release

Your Contact
gangolf.schrimpf@emdgroup.com
Phone: +49 6151 72-9591

September 4, 2019

David Alsteens Receives 2019 Heinrich Emanuel Merck Award for Analytical Science

- **Belgian chemist wins prestigious science award worth € 15,000**
- **Recognition of young researchers who develop new methods in chemical analysis**

Darmstadt, Germany, September 4, 2019 – Merck KGaA, Darmstadt, Germany, a leading science and technology company, presented Professor David Alsteens (33), Catholic University of Louvain (UCLovain), Louvain-la-Neuve, Belgium with the 2019 Heinrich Emanuel Merck Award for Analytical Science. The award ceremony took place during the analytical conference Euroanalysis at Istanbul University in Turkey.

"With his groundbreaking investigations revealing the molecular mechanisms established by viruses to hijack the cellular barrier and enter the cell, David Alsteens joins a prominent group of innovative Heinrich Emanuel Merck Award winners," said Klaus Griesar, head of Science Relations at Merck KGaA, Darmstadt, Germany. "Perhaps in the future, his research could be used to develop a new tool to quantify the effects of molecules that interfere with the entry of viruses, and thus support the development of new drugs against viral infections."

Alsteens has made a mark internationally through his work on the nanomechanics of living systems (published here in "Nature Nanotechnology"). He has conducted groundbreaking research on nanomechanical mapping of the first binding steps of a virus to animal cells using a combination of atomic force microscopy (AFM) with confocal microscopy. Alsteens has described his inventions in one granted patent and in a second filed patent.

Frankfurter Strasse 250
64293 Darmstadt · Germany
Hotline +49 6151 72-5000
www.emdgroup.com

Head of Media Relations -6328
Spokesperson: -9591 / -7144 /
-8908 / -55707

News Release

The winner is currently Research Associate at the Fund for Scientific Research and Professor at the Faculty of Bioscience Engineering at UCLouvain. He completed his Ph.D. thesis in nanobiotechnology at the Institute of Condensed Matter and Nanosciences of the UCLouvain in 2011and spent two years at ETH Zurich in Basel, Switzerland, as a post-doc.

The cell plasma membrane is a highly complex interface between the cell's interior, the cytoplasm, and the extracellular environment. It serves as a barrier as well as a versatile and essential signaling interface. Within this context, probing how ligands (peptides, drugs or viruses) interact with native membrane receptors in physiologically relevant conditions is of fundamental interest in many disciplines of biology, including cell biology, molecular biology, structural biology, biochemistry, and biophysics.

To address the question of how receptors in the cell wall interact with biomolecules (for example on the surface of a virus) Alsteens introduced the use of force-distance curve-based AFM, a technique to simultaneously image mammalian cells and quantify their dynamic binding properties to specific ligands. In addition, he recently combined the methodology with confocal microscopy to simultaneously monitor the cellular characteristics, for example cell state, distribution of cell surface receptors.

Alsteens' breakthrough was to simultaneously record the energy landscape of ligand-binding to specific receptors with high-resolution AFM imaging of cell surface in native conditions.

Since 1988, the Heinrich Emanuel Merck Award for Analytical Science has been recognizing scientists under the age of 45 whose work focuses on new methods in chemical analysis and the development thereof in applications aimed at improving the quality of human life, for example in fields such as life sciences, environmental protection and biosciences.

Apart from the award presented today, Merck KGaA, Darmstadt, Germany, recognizes science and scientists with many other awards. The latest addition to this is the Future Insight Prize, which was awarded for the first time this year in July 2019. Further research awards from Merck KGaA, Darmstadt, Germany, include,

among others, the Emanuel Merck Lectureship as well as Global Grants for Medical Education, the Emerging Biotech Grant Program, and the Displaying Futures Award.

Heinrich Emanuel Merck Award
Merck KGaA, Darmstadt, Germany, began granting the Heinrich Emanuel Merck Award in 1988 to mark the centennial of the first standardization of analytical methods by Dr. Karl Krauch, a Merck KgaA, Darmstadt, Germany, chemist. This list of the prizewinners documents the significance of the prize in the analytical sciences community, which has often laid the groundwork for important discoveries.

Former winners of the Heinrich Emanuel Merck Award are:

Name	Year	Institution, Country
Prof. Francesco Ricci	2017	University of Rome, Italy
Prof. Petra Dittrich	2015	ETH-Zürich, Switzerland
Prof. Aaron Wheeler	2012	University of Toronto, Canada
Prof. Luisa Torsi	2010	University of Bari, Italy
Dr. Alexander Makarov	2007	Thermo Fisher Scientific, Germany
Prof. Shuming Nie	2007	Emory University, Atlanta, USA
Prof. Yoshinobu Baba	2004	University of Tokushima, Japan
Prof. Jonathan V. Sweedler	2002	University of Illinois, USA
Prof. Norman Dovichi	2000	University of Alberta, Canada
Prof. Renato Zenobi	1998	ETH-Zürich, Switzerland
Prof. D. Jed Harrison	1996	University of Alberta, Canada
Prof. Andreas Manz	1996	Imperial College London, United Kingdom
Prof. Aviv Amirav	1993	University of Tel Aviv, Israel
Dr. Brian A. Bidlingmeyer	1990	Millipore Corporation, USA
Prof. Reinhard Niessner	1990	Technical University München, Germany
Prof. Mastaka Hiraide	1988	University of Nagoya, Japan
Prof. Otto S. Wolfbeis	1988	University of Graz, Austria

Heinrich Emanuel Merck (1794-1855)
Heinrich Emanuel Merck was a direct descendant of Merck's founder Friedrich Jacob Merck, who had received a privilege for a pharmacy—later known as Engel-Apotheke—in Darmstadt in 1668. Heinrich Emanuel Merck was occupied with research, which was unusual at the time. His teachers included the Erfurt pharmacist and reformer of the pharmaceutical field, Johann Bartholomaeus Trommsdorff, and the chemical analyst Martin Heinrich Klaproth, as well as the phytochemist Sigismund Friedrich Hermbstaedt. The latter two both lectured at the university in Berlin.
In 1816, Heinrich Emanuel Merck took over his father's pharmacy in Darmstadt, which his family had owned since 1668. Soon afterwards, Merck began working intensively on a new field of analytical chemistry at his lab in the pharmacy: alkaloids. His experiments to isolate and characterize the known alkaloids led to the start of bulk production in 1827, which enjoyed immediate success. In his „Cabinet of pharmaceutical and chemical innovations", Merck presented 16 alkaloids for scientific experiments to his fellow experts and doctors. Heinrich Emanuel Merck was well known among his customers for the purity of the alkaloids he sold.
In the year 1888 Dr. Carl Krauch (1853-1934), chief analytical chemist at Merck published the first analytical standard work, a narrow book titled "Testing chemical reagents for purity". In the same year, Merck announced that from now on, only reagents would be introduced to the market that complied with Krauch's purity criteria described in this book. This was the birth-hour of the reagents of guaranteed purity, and at the same time it was the beginning of modern thinking in analytical chemistry.

News Release

All Merck KGaA, Darmstadt, Germany, press releases are distributed by e-mail at the same time they become available on the EMD Group Website. In case you are a resident of the USA or Canada please go to www.emdgroup.com/subscribe to register for your online subscription of this service as our geo-targeting requires new links in the email. You may later change your selection or discontinue this service.

About Merck KGaA, Darmstadt, Germany
Merck KGaA, Darmstadt, Germany, a leading science and technology company, operates across healthcare, life science and performance materials. Around 52,000 employees work to make a positive difference to millions of people's lives every day by creating more joyful and sustainable ways to live. From advancing gene editing technologies and discovering unique ways to treat the most challenging diseases to enabling the intelligence of devices – the company is everywhere. In 2018, Merck KGaA, Darmstadt, Germany, generated sales of € 14.8 billion in 66 countries.
The company holds the global rights to the name and trademark "Merck" internationally. The only exceptions are the United States and Canada, where the business sectors of Merck KGaA, Darmstadt, Germany operate as EMD Serono in healthcare, MilliporeSigma in life science, and EMD Performance Materials. Since its founding 1668, scientific exploration and responsible entrepreneurship have been key to the company's technological and scientific advances. To this day, the founding family remains the majority owner of the publicly listed company.