

News Release

Your Contact

gangolf.schrimpf@emdgroup.com

Phone: +49 6151 72-9591

May 27, 2021

Merck KGaA, Darmstadt, Germany, Collaborates with TU Darmstadt and Tufts University on Bioreactor Designs to Enable Cultured Meat Production

- **Partners signed a three-year collaboration agreement to conduct fundamental research on next-generation, scalable bioreactor designs to support industrial-scale meat and seafood manufacture**
- **Tufts University to enable the production of whole muscle cultured meat with textile bioengineering**
- **Technical University (TU) of Darmstadt to apply industrial printing technology for the production of textured meat**
- **Projects will complement efforts by Merck KGaA, Darmstadt, Germany, to become a technology enabler for the cultured meat industry**

Darmstadt, Germany, May 27, 2021– Merck KGaA, Darmstadt, Germany, a leading science and technology company, today announced three-year collaborations with Tufts University, Massachusetts, USA, and Technical University (TU) of Darmstadt in Germany. While the cultured meat industry is gaining momentum, scaling up the production process and reducing the cost remain key challenges. The primary focus of the collaboration between Merck KGaA, Darmstadt, Germany, and the two universities will be the development of next generation, scalable bioreactor designs that can support meat and seafood manufacture on a commercial scale.

“As a leading supplier to the biopharmaceutical industry, we aim to accelerate the emerging cell-based meat industry and become a technology enabler, from R&D to the safe and efficient scale-up of production. The conceptual approaches developed



News Release

by Tufts University and TU Darmstadt are highly innovative. Both fit our strategy perfectly and complement our internal efforts in the areas of scaffolds, cell differentiation, bioreactors and bioprocess design,” said Thomas Herget, Head of the Silicon Valley Innovation Hub of Merck KGaA, Darmstadt, Germany.

Led by Professor David Kaplan, a team at Tufts University will apply textile bioengineering for the production of whole muscle meat. The aim of the project is to develop a system of techniques that will enable the large-scale construction of tissue engineered muscle and fat that will be safe for human consumption. The team plans to design and construct a bioreactor capable of producing the optimized cultured meat tissue fibers in a scalable manner.

“Led by the department of Biomedical Engineering, Tufts University has expanded its influence in the realm of cellular agriculture in recent years. From growing sustainable meat using caterpillar stem cells to enhancing the color and texture of cultured meat, our lab group continues to develop novel technologies for the cellular agriculture industry,” said Kaplan, Stern Family Professor of Engineering at Tufts University. “I am excited that our team will now cooperate with Merck KGaA, Darmstadt, Germany, to enable the production of structured meat products, building on our vast expertise in biomaterials, cells, and device designs.”

At the same time, Professor Andreas Blaeser’s team from the BioMedical Printing Lab at the Institute for Printing Science and Technology (IDD) and the Center for Synthetic Biology at TU Darmstadt will develop a screen printing process for large-scale production of multi-layered bioink sheets that can be matured into thick, structured meat slices. In contrast to conventional 3D-bioprinting approaches, screen printing enables sheet-to-sheet biofabrication at unmatched production speeds and with ultra-high printing precision.

“In this interdisciplinary project we will first develop a lab-scale printing process and tailor our existing bioink portfolio towards the requirements of meat production. In the next step, we will transfer the concept to an industrial and fully automated printing machine,” Blaeser said. “Our vision is to offer the established technical solution as an open innovation platform for future research on clean meat production. We believe that this approach will not only unite brilliant minds but will

News Release

also enable leaps in innovation and further accelerate development in this field of research as well as in the related industry.”

Both research groups at Tufts University and TU Darmstadt were the winners of the [2020 Research Grant](#) 'Bioreactor Designs for Cultured Meat'. Merck KGaA, Darmstadt, Germany, started awarding research grants for the first time in 2018, its 350th anniversary year. The submission deadline for this year's [2021 Research Grants](#) is August 31, 2021.

The focus of the interdisciplinary cultured meat team at Merck KGaA, Darmstadt, Germany, is on developing products and services that will enable a safe and scaled production of cultured meat. The joint projects with Tufts University and TU Darmstadt complement the research activities of the cultured meat team, which are led by the Silicon Valley Innovation Hub and the Innovation Center of KGaA, Darmstadt, Germany, in close collaboration with the company's Life Science business sector. To complement existing research and development in the company's three business sectors, the Innovation Center of KGaA, Darmstadt, Germany, aims to create new business for Merck KGaA, Darmstadt, Germany, outside of the current R&D scope. More information on the cultured meat innovation field can be found [here](#).

About Tufts University

Tufts University, located on campuses in Boston, Medford/Somerville and Grafton, Massachusetts, and in Talloires, France, is recognized among the premier research universities in the United States. Tufts enjoys a global reputation for academic excellence and for the preparation of students as leaders in a wide range of professions. A growing number of innovative teaching and research initiatives span all Tufts campuses, and collaboration among the faculty and students in the undergraduate, graduate and professional programs across the university's schools is widely encouraged.

About TU Darmstadt

TU Darmstadt is one of Germany's leading technical universities and a synonym for excellent, relevant research. We are crucially shaping global transformations – from the energy transition via Industry 4.0 to artificial intelligence – with outstanding insights and forward-looking study opportunities.

TU Darmstadt pools its cutting-edge research in three fields: Energy and Environment, Information and Intelligence, Matter and Materials. Our problem-based interdisciplinarity as well as our productive interaction with society, business and politics generate progress towards sustainable development worldwide.

Since we were founded in 1877, we have been one of Germany's most international universities; as a European technical university, we are developing a trans-European campus in the network, Unite! With our partners in the alliance of Rhine-Main universities – Goethe University Frankfurt and Johannes Gutenberg University Mainz – we further the development of the metropolitan region Frankfurt-Rhine-Main as a globally attractive science location.

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 electronics. Around 58,000 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 2020, Merck KGaA, Darmstadt, Germany, generated sales of € 17.5 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 Electronics. Since its founding in 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.