

News Release

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European Space Agency and Merck KGaA, Darmstadt, Germany, Expand Cooperation

- **Successful collaboration extended by a further two years**
- **Partnership to include the future topics Biosensing and Biointerfaces**
- **Clean Meat and Liquid Biopsy technologies are further areas of focus**
- **Cross-sectional topics to be addressed span digitalization, artificial intelligence, data analytics, virtual reality, and innovation processes**

Darmstadt, Germany, May 2, 2019 – Merck KGaA, Darmstadt, Germany, a leading science and technology company, and the European Space Agency (ESA) today signed a Letter of Intent to extend by a further two years their cooperation agreement from 2016. The two partners will continue to cooperate intensively in the fields of innovation, digitalization and materials research. With respect to innovation, the focus will be on the fields of Biosensing and Biointerfaces, Clean Meat and Liquid Biopsy technologies.

“It is our goal to continue and intensify the exchange between ESA and us in a targeted manner,” said Kai Beckmann, CEO Performance Materials and member of the Executive Board of Merck KGaA, Darmstadt, Germany. “Scientific progress is the key to improving the lives of millions of people. Partnerships, such as this one with ESA, help to accelerate this progress and thus to achieve objectives faster.”



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“The profile and strategic interests of both organizations complement each other superbly,” said Rolf Densing, Director of Operations and Head of the European Space Operations Center (ESOC) at ESA. “This allows both partners to openly share and make use of synergies in terms of competences, methods and tools.”

Merck KGaA, Darmstadt, Germany, and ESA began cooperating in 2011 and had most recently extended their partnership in 2016. The focus of the agreement signed today is on the following topics:

Innovation: Future projects will be derived from the three strategic innovation fields of the Merck KGaA, Darmstadt, Germany, Innovation Center (Biosensing and Biointerfaces, Clean Meat and Liquid Biopsy technologies). The aim is to make contributions that will further the development of human space exploration.

Moreover, both partners will further share their experience and competence in the area of innovation processes, for instance, in stimulating innovation in both organizations in the context of the Innovation Center of Merck KGaA, Darmstadt, Germany, or via the newly established managerial position of Innovation Officer on the ESA side.

The topic of Biosensing and Biointerfaces focuses mainly on the interface between biology and digitalization. By applying data analysis tools, faster and more precise (remote) monitoring and treatment will be enabled in numerous disease areas. The focus of Clean Meat is on the biotechnology required to produce genuine meat grown in vitro. The third innovation field targets technological solutions to overcome unresolved challenges in the liquid biopsy workflow to detect diseases sooner and more readily.

Digitalization: Digitalization offers significant potential for ESA and Merck KGaA, Darmstadt, Germany. Both organizations therefore aim to continue the exchange between their scientists and engineers on new and innovative technologies such as automation and autonomy concepts, artificial intelligence, cloud computing, simulation, and Big Data, and virtual reality methods for laboratory and exploration activities on both sides.

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Materials Research: The development of new, high-performance materials is a core activity of ESA and Merck KGaA, Darmstadt, Germany. Potential collaboration fields include liquid crystal technologies, coatings, and semiconductors.

Beyond the specific development of innovations, an intensive dialogue on future topics is also part of the collaboration. For example, in recent years, a series of events and activities have taken place. These include a co-hosted hackathon as well as a presentation by German ESA astronaut Thomas Reiter for selected scientists at Merck KGaA, Darmstadt, Germany in Darmstadt. At the Innovation and Leadership in Aerospace Conference in 2018 in Berlin, Kai Beckmann and Rolf Densing were members of a panel discussion entitled "[Space meets Non-Space](#)". As the only non-space industry partner, Merck KGaA, Darmstadt, Germany, participated for the second time in a cross-industry challenge at ESA's second [Space Exploration Masters](#) last year. The topic of the winning team was use of bioreactors in space to solve the problem of having an autonomous food and oxygen supply at a lunar base.

About ESA

The European Space Agency (ESA) provides Europe's gateway to space.

ESA is an intergovernmental organisation, created in 1975, with the mission to shape the development of Europe's space capability and ensure that investment in space delivers benefits to the citizens of Europe and the world. ESA has 22 Member States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom, of whom 20 are Member States of the EU.

ESA has established formal cooperation with seven other Member States of the EU. Canada takes part in some ESA programmes under a Cooperation Agreement. By coordinating the financial and intellectual resources of its members, ESA can undertake programmes and activities far beyond the scope of any single European country. It is working in particular with the EU on implementing the Galileo and Copernicus programmes.

ESA develops the launchers, spacecraft and ground facilities needed to keep Europe at the forefront of global space activities.

Today, it develops and launches satellites for Earth observation, navigation, telecommunications and astronomy, sends probes to the far reaches of the Solar System and cooperates in the human exploration of space. Learn more about ESA at www.esa.int

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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

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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.