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News Release

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MilliporeSigma to Develop Next-Generation Purification Processes with International Vaccine Institute

- **Company to provide expertise on clarification and purification**
- **Collaboration will improve manufacturing processes to deliver greater yield, allowing higher recovery and providing higher purity vaccines**

Billerica, Massachusetts, June 28, 2016 — [MilliporeSigma](#) has entered a research agreement with the [International Vaccine Institute](#) (IVI) of Seoul, South Korea to help develop more robust, scalable vaccine manufacturing processes. MilliporeSigma will provide funding and expertise in the areas of clarification and purification.

The IVI is a nonprofit international organization committed to the discovery, development and delivery of safe, effective and affordable vaccines for global public health. The new collaboration between MilliporeSigma and IVI is aimed at improving the manufacturing process to deliver greater yield, allowing higher recovery and purer vaccines. Many vaccine manufacturers in the United States and Western Europe face also high manufacturing costs, and the partnership aims to address these challenges.

“Complex manufacturing processes along with poor yield and recovery result in vaccines that are not easily affordable by resource-challenged countries,” said Udit Batra, Member of the Executive Board, Merck KGaA, Darmstadt, Germany and CEO, MilliporeSigma. “Through our partnership with IVI, we will help create a more



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modern, scalable and robust manufacturing process, which in turn will help increase access to life-saving vaccines in developing countries.”

IVI was founded on the belief that the health of children in developing countries can be dramatically improved through access to new and improved vaccines, according to Jerome Kim, M.D., Director General of IVI. “We expect that our collaboration with MilliporeSigma will result in important dividends to a large population of people with unmet medical needs,” said Kim. “This partnership will help us better address the vaccine needs of low- and middle-income countries and ultimately contribute to our mission.”

Initially, the project will focus on a vaccine for typhoid, with the goal of applying findings to the processes for pneumococcal, meningococcal, haemophilus, staphylococcus, streptococcus B and other conjugated polysaccharide vaccines.

With a rapidly expanding pipeline of conjugated polysaccharide vaccines, the global pharmaceutical industry needs next-generation processes for clarification and purification to ensure high-quality, affordable vaccines. Through this partnership with IVI, MilliporeSigma will apply its industry-leading technologies and expertise to this challenge, which in turn will help optimize other vaccine manufacturing processes.

This initiative is part of MilliporeSigma’s corporate responsibility program which focuses on expanding access to high-quality healthcare, especially in low- and middle-income countries. As part of this initiative, MilliporeSigma leverages its expertise and collaborates with strong partners to develop solutions for patients in these geographies.

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About the Life Science Business of Merck KGaA, Darmstadt, Germany

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The life science business of Merck KGaA, Darmstadt, Germany, which operates as MilliporeSigma in the U.S. and Canada, has 19,000 employees and 72 manufacturing sites worldwide, with a portfolio of more than 300,000 products enabling scientific discovery. Udit Batra is the global chief executive officer of MilliporeSigma.

Merck KGaA, Darmstadt, Germany completed its \$17 billion acquisition of Sigma-Aldrich in November 2015, creating a leader in the \$130 billion global life science industry.

Merck KGaA of Darmstadt, Germany is a leading company for innovative and top-quality high-tech products in healthcare, life science and performance materials. The company has six businesses – Biopharmaceuticals, Consumer Health, Allergopharma, Biosimilars, Life Science and Performance Materials – and generated sales of € 12.85 billion in 2015. Around 50,000 employees work in 66 countries to improve the quality of life for patients, to foster the success of customers and to help meet global challenges.

Merck KGaA, Darmstadt, Germany is the world's oldest pharmaceutical and chemical company – since 1668, the company has stood for innovation, business success and responsible entrepreneurship. Holding an approximately 70 percent interest, the founding family remains the majority owner of the company to this day. Merck KGaA, Darmstadt, Germany holds the global rights to the name and the trademark "Merck" internationally except for the United States and Canada, where the company operates as EMD Serono, MilliporeSigma and EMD Performance Materials.