

May 1, 2017

MilliporeSigma's Mobius® 2,000-liter Single-use Bioreactors to Expand Avid Bioservices' Manufacturing Capabilities

- **Technology allows Avid to meet increased demand for clinical and commercial manufacturing services at Myford facility**
- **Industry-leading design provides flexibility, scalability, ease-of-use**

Billerica, Massachusetts, May 1, 2017 — [MilliporeSigma](#) and Avid Bioservices, Inc., today announced that Avid will upgrade its Myford clinical and commercial manufacturing facility with multiple Mobius® 2000-liter single-use bioreactors from MilliporeSigma. The new bioreactors, to be installed in mid-2017, provide Avid with the latest technology while expanding the company's manufacturing capacity. Avid is a wholly owned subsidiary of Peregrine Pharmaceuticals, Inc. (NASDAQ: PPHM) (NASDAQ: PPHMP).

"An integral part of our complete single-use offering, Mobius® bioreactors help companies like Avid move toward the goal of fully disposable manufacturing," said Udit Batra, Member of the Executive Board, [Merck KGaA, Darmstadt, Germany](#) and CEO, MilliporeSigma. "We will continue to support Avid as it upgrades its facility to help customers advance molecules into the clinic and to market so that patients have better access to life-enhancing drugs."

Single-use technology is becoming increasingly popular in the industry. The market for single-use bioprocessing is estimated to reach \$5.9 billion by 2024, according to [Transparency Market Research](#). More than 90 percent of biopharma facilities use single-use technologies, according to [Bioplan Associates](#).



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"We ran a competitive process and chose the MilliporeSigma Mobius® 2,000-liter single-use bioreactor system because it offers technical and ease of use advantages over competing single-use systems," said Steven W. King, President, Avid Bioservices. "The confidence in the choice has only been further reinforced by our experience to date with the Mobius® system up to the 1000-liter scale as part of a pilot program. Adding the Mobius® technology to expand Avid's Myford biomanufacturing capacity highlights our commitment to offer customers the latest single-use equipment and flexible solutions." King added that the first 2,000-liter pilot batch is planned for later this month.

Traditionally, biopharmaceutical companies used large stainless steel vessels in multi-story buildings, requiring substantial investment and rigorous setup. With single-use disposable equipment, customers get improved batch turnaround times, reduced risk of product cross-contamination, decreased capital costs and have less equipment to clean. MilliporeSigma's single-use technology helps accelerate customers' molecules to market, improve productivity, and ensure supply continuity.

"The planned installation of MilliporeSigma's Mobius® 2000-liter bioreactors opens new opportunities for current and future Avid customers who require greater manufacturing capacity," King added. "We have already secured customer commitments for the 2,000-liter capacity as soon as it is installed in our Myford facility and believe the advanced technology it offers will be a key factor in continuing to grow our Contract Development and Manufacturing Organization business."

Avid has installed the appropriate systems at its Myford facility in Orange County, California to allow integration of MilliporeSigma's Mobius® bioreactors. The 40,000-square foot Myford facility was designed to accommodate a fully disposable biomanufacturing process for late Phase III clinical and commercial biologics production. The facility can operate multiple bioreactors simultaneously, improving manufacturing capacity and efficiency.

MilliporeSigma's Mobius® stirred tank bioreactor portfolio, with sizes ranging from 3- to 2000-liters, offers flexibility, scalability and ease-of-use. [Mobius® bioreactors](#)

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support GMP production and allow customers to optimize, streamline and accelerate drug development and production.

About Avid Bioservices, Inc.

Avid Bioservices, a wholly owned subsidiary of Peregrine Pharmaceuticals, provides a comprehensive range of process development, high quality cGMP clinical and commercial manufacturing services for the biotechnology and biopharmaceutical industries. With over 15 years of experience producing monoclonal antibodies and recombinant proteins in batch, fed-batch and perfusion modes, Avid's services include cGMP clinical and commercial product manufacturing, purification, bulk packaging, stability testing and regulatory strategy, submission and support. The company also provides a variety of process development activities, including cell line development and optimization, cell culture and feed optimization, analytical methods development and product characterization. For more information about Avid, please visit www.avidbio.com.

About Peregrine Pharmaceuticals, Inc.

Peregrine Pharmaceuticals, Inc. is a biopharmaceutical company committed to improving the lives of patients by delivering high quality pharmaceutical products through its contract development and manufacturing organization (CDMO) services and through advancing and licensing its investigational immunotherapy and related products. Peregrine's in-house CDMO services, including cGMP manufacturing and development capabilities, are provided through its wholly-owned subsidiary Avid Bioservices, Inc. (www.avidbio.com), which provides development and biomanufacturing services for both Peregrine and third-party customers. The company is also working to evaluate its lead immunotherapy candidate, bavituximab, in combination with immune stimulating therapies for the treatment of various cancers, and developing its proprietary exosome technology for the detection and monitoring of cancer. For more information, please visit www.peregrineinc.com.

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

The life science business of Merck KGaA, Darmstadt, Germany, which operates as MilliporeSigma in the U.S. and Canada, has 19,000 employees and 65 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 \$125 billion global life science industry.

Merck KGaA, 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 €15.0 billion in 2016. 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. The company 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.