

March 15, 2016



Ligand Partner Spectrum Pharmaceuticals Receives FDA Approval of EVOMELA™ (melphalan) for Injection

Ligand to receive \$6 million milestone related to EVOMELA's approval

SAN DIEGO-- **Ligand Pharmaceuticals Incorporated (NASDAQ: LGND)** announces that Spectrum Pharmaceuticals, Inc. (NASDAQ: SPPI), a biotechnology company with fully integrated commercial and drug development operations with a primary focus in hematology and oncology, received approval from the U.S. Food and Drug Administration (FDA) of EVOMELA™ (melphalan) for use in two indications: 1) as a high-dose conditioning treatment prior to hematopoietic progenitor (stem) cell transplantation (ASCT) in patients with MM, and 2) for the palliative treatment of patients with MM for whom oral therapy is not appropriate. This is the first product to be FDA approved for the high-dose conditioning indication in MM. Spectrum plans to launch EVOMELA with its existing sales force.

"We extend congratulations to our partner Spectrum Pharmaceuticals on achieving FDA approval for EVOMELA in these two indications and look forward to the commercial launch of this product," said John Higgins, Chief Executive Officer of Ligand. "Through partnerships such as this one, Ligand is able to share in the economic success of important, innovative new drugs across a range of indications and patient populations."

Spectrum Pharmaceuticals licensed global development and commercialization rights to EVOMELA from Ligand Pharmaceuticals in March 2013. Spectrum assumed responsibility for completing the pivotal Phase 2 clinical trial, and was responsible for filing the New Drug Application (NDA). Under the license agreement, Ligand received an upfront fee and earned a \$6 million milestone payment on EVOMELA approval, as well as royalties on net sales.

About Multiple Myeloma

Multiple myeloma is a systemic malignancy of plasma cells that accumulate in the bone marrow, usually associated with monoclonal antibody secretion, and results in bone marrow failure and bone destruction. It is the second most common hematologic disease with nearly 30,000 new cases projected in the U.S. in 2016 and more than 11,000 deaths annually (American Cancer Society Stats, 2016). The rate of ASCT for patients with MM is growing by approximately 3.3% annually.

Melphalan is the most commonly used IV agent for high-dose conditioning for patients undergoing ASCT for MM. The current IV melphalan market is approximately \$100 million annually, with predominant use in ASCT; EVOMELA is the only intravenous melphalan product that is approved for use in the high-dose conditioning indication.

About EVOMELA™

EVOMELA was approved by the FDA based on its bioequivalence to the standard melphalan formulation (Alkeran) in a Phase 2 clinical study (Aljitawi et al., Bone Marrow Transplant, 2014) via the 505(b)(2) regulatory pathway. EVOMELA has been granted Orphan Drug Designation by the FDA for its use as a high-dose conditioning regimen for patients with MM undergoing ASCT.

EVOMELA's new melphalan formulation does not contain propylene glycol. The use of the Captisol® technology to reformulate also contributes to the 4-hour admixture stability of EVOMELA at room temperature. This is in addition to the 1-hour stability of reconstituted EVOMELA drug product at room temperature and 24-hour stability at stability at refrigerated temperature (5°C).

Please see the Important Safety Information below and the full prescribing information, including BOXED WARNINGS, for EVOMELA at www.evomela.com.

Important Safety Information

WARNING: SEVERE BONE MARROW SUPPRESSION, HYPERSENSITIVITY, and LEUKEMOGENICITY

- **Severe bone marrow suppression with resulting infection or bleeding may occur. Controlled trials comparing intravenous (IV) melphalan to oral melphalan have shown more myelosuppression with the IV formulation. Monitor hematologic laboratory parameters.**
- **Hypersensitivity reactions, including anaphylaxis, have occurred in approximately 2% of patients who received the IV formulation of melphalan. Discontinue treatment with EVOMELA for serious hypersensitivity reactions.**
- **Melphalan produces chromosomal aberrations *in vitro* and *in vivo*. EVOMELA should be considered potentially leukemogenic in humans.**

Contraindications

- History of serious allergic reaction to melphalan.

Warnings and Precautions

- Nausea, vomiting, diarrhea, or oral mucositis may occur. Provide supportive care using antiemetic and antidiarrheal medications as needed.
- Hepatic disorders ranging from abnormal liver function tests to clinical manifestations such as hepatitis and jaundice have been reported after treatment with melphalan. Hepatic veno-occlusive disease has also been reported. Monitor liver chemistries.
- EVOMELA can cause fetal harm when administered to a pregnant woman. Advise females of reproductive potential to avoid pregnancy during and after treatment with EVOMELA. If this drug is used during pregnancy or if the patient becomes pregnant

while taking this drug, advise the patient of potential risk to the fetus.

- Melphalan-based chemotherapy regimens have been reported to cause suppression of ovarian function in premenopausal women, resulting in persistent amenorrhea in approximately 9% of patients. Reversible or irreversible testicular suppression has also been reported.

Adverse Reactions

- The most common adverse reactions observed in at least 50% of patients with multiple myeloma treated with EVOMELA were neutrophil count decreased (100%), white blood cell count decreased (100%), lymphocyte count decreased (98%), platelet count decreased (98%), diarrhea (93%), nausea (90%), fatigue (77%), hypokalemia (74%), anemia (66%), and vomiting (64%).
- In a single-arm clinical study, twelve (20%) patients with multiple myeloma who received EVOMELA conditioning for ASCT experienced a treatment emergent serious adverse reaction. The most common serious adverse reactions (>1 patient, 1.6%) were pyrexia, hematochezia, febrile neutropenia, and renal failure.
- In a randomized clinical trial studying the palliative treatment of patients with multiple myeloma, severe myelotoxicity (WBC $\leq$ 1,000 and/or platelets $\leq$ 25,000) was more common in the IV melphalan arm (28%) than in the oral melphalan arm (11%).

Drug Interactions

- No formal drug interaction studies have been conducted. When nalidixic acid and IV melphalan are given simultaneously, the incidence of severe hemorrhagic necrotic enterocolitis has been reported to increase in pediatric patients.

Use in Specific Populations

- It is not known whether melphalan is present in human milk. Because many drugs are excreted in human milk and because of the potential for serious adverse reactions in nursing infants from melphalan, breastfeeding is not recommended during treatment with EVOMELA.
- Advise females of reproductive potential to avoid pregnancy, which may include the use of effective contraception methods, during and after treatment with EVOMELA.
- For Palliative Treatment, consider dose reduction for patients with renal impairment receiving EVOMELA.

About Captisol®

Captisol is a patent-protected, chemically modified cyclodextrin with a structure designed to optimize the solubility and stability of drugs. Captisol was invented and initially developed by scientists in the laboratories of Dr. Valentino Stella at the University of Kansas' Higuchi Biosciences Center for specific use in drug development and formulation. This unique technology has enabled eight FDA-approved products, including Amgen's Kyprolis®, Baxter International's Nexterone®, Spectrum Pharmaceuticals' EVOMELA™, and Merck's NOXAFIL IV. There are more than 30 Captisol-enabled products currently in clinical

development.

About Ligand Pharmaceuticals

Ligand is a biopharmaceutical company focused on developing or acquiring technologies that help pharmaceutical companies discover and develop medicines. Our business model creates value for stockholders by providing a diversified portfolio of biotech and pharmaceutical product revenue streams that are supported by an efficient and low corporate cost structure. Our goal is to offer investors an opportunity to participate in the promise of the biotech industry in a profitable, diversified, and lower-risk business than a typical biotech company. Our business model is based on doing what we do best: drug discovery, early-stage drug development, product reformulation, and partnering. We partner with other pharmaceutical companies to leverage what they do best (late-stage development, regulatory management, and commercialization) to ultimately generate our revenue. Ligand's Captisol® platform technology is a patent-protected, chemically modified cyclodextrin with a structure designed to optimize the solubility and stability of drugs. OmniAb® is a patent-protected transgenic animal platform used in the discovery of fully human mono- and bispecific therapeutic antibodies. Ligand has established multiple alliances, licenses, and other business relationships with the world's leading pharmaceutical companies, including Novartis, Amgen, Merck, Pfizer, Celgene, Gilead, Janssen, Baxter International, and Eli Lilly.

Follow Ligand on Twitter @Ligand_LGND.

Forward-Looking Statements

This news release contains forward-looking statements by Ligand that involve risks and uncertainties and reflect Ligand's judgment as of the date of this release. These include statements regarding the timing of the commercial launch of EVOMELA, the size and growth of the patient population for MM, the size of the potential market for IV melphalan products, and Ligand's potential revenue under its license agreement with Spectrum Pharmaceuticals. Actual events or results may differ from our expectations. For example, there can be no assurances that Spectrum Pharmaceuticals will successfully launch EVOMELA and the patient population may be smaller than anticipated. The failure to meet expectations with respect to any of the foregoing matters may reduce Ligand's stock price. Additional information concerning these and other important risk factors affecting Ligand (including Ligand's current reliance on revenues based on sales of Promacta® and Kyprolis®, and various risks to which Ligand's Captisol® cyclodextrin operations are subject) can be found in Ligand's prior press releases available at www.ligand.com as well as in Ligand's public periodic filings with the Securities and Exchange Commission, available at www.sec.gov. Ligand disclaims any intent or obligation to update these forward-looking statements beyond the date of this press release, except as required by law. This caution is made under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995.

View source version on businesswire.com:

<http://www.businesswire.com/news/home/20160315005683/en/>

Ligand Pharmaceuticals Incorporated

Todd Pettingill

investors@ligand.com

(858) 550-7500
or
LHA
Bruce Voss
bvoss@lhai.com
(310) 691-7100

Source: Ligand Pharmaceuticals Incorporated