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Sunesis Receives FDA Fast Track Designation for Vosaroxin in AML

SOUTH SAN FRANCISCO, Calif., (February 23, 2011) – Sunesis Pharmaceuticals, Inc. (NASDAQ: SNSSD) today announced that vosaroxin, the Company's lead drug candidate, has been granted Fast Track designation by the U.S. Food and Drug Administration (FDA) for the potential treatment of relapsed or refractory acute myeloid leukemia (AML) in combination with cytarabine.

The Fast Track designation process was developed by the FDA to facilitate the development and expedite the review of new therapies that are intended to treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs. Specifically, Fast Track designation allows for the possibility of a "rolling submission," or submission of individual sections as they become available, for a marketing application and provides eligibility for a priority (six month) review period by the FDA.

Vosaroxin was granted orphan drug designation by the FDA for the treatment of AML in 2009. Orphan drug designation is granted by the FDA Office of Orphan Drug Products to novel drugs or biologics that treat a rare disease or condition affecting fewer than 200,000 patients in the U.S. The designation provides eligibility for a seven-year period of market exclusivity in the U.S. after product approval and an exemption from user fees.

Patients with first relapsed or refractory AML are currently enrolling in a Phase 3 trial of vosaroxin, known as VALOR. The VALOR trial is a multinational, randomized, double-blind, placebo-controlled, pivotal trial of vosaroxin in combination with cytarabine, which is expected to enroll 450 evaluable patients at leading sites in the U.S., Canada, Europe, Australia and New Zealand.

"Vosaroxin's Fast Track designation, along with its orphan drug designation, highlights the urgent need for new therapeutic options for patients with first relapsed or refractory AML," stated Daniel Swisher, Chief Executive Officer of Sunesis. "We are encouraged by the initial roll out of the VALOR trial and are highly focused on its successful prosecution. We look forward to opening new sites around the world and rapidly and efficiently accruing patients into VALOR."

About VALOR

VALOR is a Phase 3, randomized, double-blind, placebo-controlled, pivotal trial in patients with first relapsed or refractory AML. The trial is expected to enroll 450 evaluable patients at leading sites in the U.S., Canada, Europe, Australia and New Zealand. VALOR is currently open for enrollment and patients will be randomized one-to-one to receive either vosaroxin on days one and four in combination with cytarabine daily for five days, or placebo in combination with cytarabine. Additionally, the VALOR trial employs an innovative, adaptive trial design that allows for a one-time sample size adjustment by the DSMB at the interim analysis to maintain adequate power across a broad range of clinically meaningful and statistically significant survival outcomes. The trial's primary endpoint is overall survival. For more information on VALOR please visit www.valortrial.com.

About Vosaroxin

Vosaroxin, formerly known as voreloxin, is a first-in-class anticancer quinolone derivative, or AQD, a class of compounds that has not been used previously for the treatment of cancer. Vosaroxin both intercalates DNA and inhibits topoisomerase II, resulting in replication-dependent, site-selective DNA damage, G2 arrest and apoptosis. Sunesis is currently enrolling patients in the VALOR trial, a multinational, randomized, double-blind, placebo-controlled, pivotal Phase 3 clinical trial of vosaroxin in combination with cytarabine in a relapsed/refractory AML patient population.

About Acute Myeloid Leukemia

AML is a rapidly progressing cancer of the blood characterized by the uncontrolled proliferation of immature blast cells in the bone marrow. The American Cancer Society estimates that 12,330 new cases of AML were diagnosed and approximately 9,000 deaths from AML occurred in the U.S. in 2010. Additionally, it is estimated that prevalence of AML is approximately 25,000 in the U.S. AML is generally a disease of older adults, and the median age of a patient diagnosed with AML is about 67 years. AML patients with relapsed or refractory disease and newly diagnosed AML patients over 60 years of age with poor prognostic risk factors typically die within one year, resulting in an acute need for new treatment options for these patients.

About Sunesis Pharmaceuticals

Sunesis is a biopharmaceutical company focused on the development and commercialization of new oncology therapeutics for the treatment of solid and hematologic cancers. Sunesis has built a highly experienced cancer drug development organization committed to advancing its lead product candidate, vosaroxin, in multiple indications to improve the lives of people with cancer. For additional information on Sunesis, please visit http://www.sunesis.com.

This press release contains forward-looking statements, including statements related to the design, conduct, and progress of the VALOR trial. Words such as "encouraged," "expected*," "look forward to," "will" and similar expressions are intended to identify forward-looking statements. These forward-looking statements are based upon Sunesis' current expectations. Forward-looking statements involve risks and uncertainties. Sunesis' actual results and the timing of events could differ materially from those anticipated in such forward-looking statements as a result of these risks and uncertainties, which include, without limitation, risks and uncertainties related to Sunesis' need for substantial additional funding to complete the development and commercialization of vosaroxin, the risk that unfavorable economic and market conditions may make it more difficult and costly to raise additional capital, the risk that Sunesis' development activities for vosaroxin could be halted or significantly delayed for various*

reasons, the risk that Sunesis' clinical studies for vosaroxin may not demonstrate safety or efficacy or lead to regulatory approval, the risk that data to date and trends may not be predictive of future data or results, the risk that Sunesis' nonclinical studies and clinical studies may not satisfy the requirements of the FDA or other regulatory agencies, risks related to the conduct of Sunesis' clinical trials, risks related to the manufacturing of vosaroxin, and the risk that Sunesis' proprietary rights may not adequately protect vosaroxin. Risk factors related to Sunesis and its business are discussed under "Risk Factors" and elsewhere in Sunesis' Quarterly Report on Form 10-Q for the quarter ended September 30, 2010 and other filings with the Securities and Exchange Commission. Sunesis expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein to reflect any change in the company's expectations with regard thereto or any change in events, conditions or circumstances on which any such statements are based.