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Sunesis Launches Phase 3 VALOR Trial of Vosaroxin in AML

– Randomized Trial Designed to Detect Significant Overall Survival Benefit –

SOUTH SAN FRANCISCO, Calif., (December 21, 2010) – Sunesis Pharmaceuticals, Inc. (NASDAQ: SNSS) today announced that the first patient has been randomized and dosed with blinded study treatment in its pivotal Phase 3 VALOR trial of vosaroxin, the company's lead drug candidate, in combination with cytarabine in patients with first relapsed or refractory acute myeloid leukemia (AML). The VALOR trial is a multinational, randomized, double-blind, placebo-controlled, pivotal trial which is expected to enroll 450 evaluable patients at leading sites in the U.S., Canada, Europe, Australia and New Zealand.

"The initiation of VALOR marks the culmination of many years of work and is a gratifying moment for Sunesis in its ongoing efforts to develop a new therapeutic option for AML patients," stated Daniel Swisher, Chief Executive Officer of Sunesis. "AML is a challenging disease, especially for relapsed and refractory patients, yet in our robust Phase 2 program we have shown in this AML setting that vosaroxin plus a leading standard of care, cytarabine, exhibit a combination of efficacy and tolerability that has led to promising results. The support of key opinion leaders, top international trial sites, specialized service providers and a rigorously designed Phase 3 protocol should provide the VALOR trial with a strong foundation for operational success."

"Patients with relapsed or refractory AML have a poor prognosis and are often intolerant of or do not respond to currently available treatment options," said Farhad Ravandi, M.D., Associate Professor, Department of Leukemia, Division of Cancer Medicine, The University of Texas M. D. Anderson Cancer Center, and a principal investigator of VALOR. "Despite the unmet medical need, treatment standards have not appreciably changed in more than 30 years. Vosaroxin's differentiated treatment profile from the Phase 2 program is characterized by strong remission rates, low all-cause early mortality and long leukemia free survival, which have led to survival outcomes that compare favorably with published results for current treatment standards. The VALOR trial is a well designed, highly anticipated trial which should provide a clear understanding of vosaroxin's efficacy and safety profile when added to cytarabine in this disease setting."

Patients in the VALOR trial will be randomized one-to-one to receive in a blinded manner either vosaroxin or placebo on days one and four of each treatment cycle in combination with

cytarabine daily for five days of each treatment cycle. The trial's primary endpoint is overall survival. The VALOR trial employs an adaptive design that provides for a single interim analysis by an independent Data and Safety Monitoring Board (DSMB) which will meet to examine pre-specified efficacy and safety data sets and decide whether to implement a one-time sample size adjustment of 225 additional evaluable patients to maintain adequate power across a broad range of clinically meaningful and statistically significant survival outcomes. The interim analysis by the DSMB is expected to take place in mid-2012. For more information on VALOR please visit www.valortrial.com.

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 will be diagnosed and approximately 9,000 deaths from AML will occur 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, timing of interim analysis and results of the VALOR trial, and vosaroxin's effects, efficacy and safety profile as a single agent and in combination with cytarabine. Words such as "designed," "expected," "exhibit," "promising," "should," "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.