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Sunesis Announces Participation in Cardiff University Sponsored Phase 2/3 Trial Evaluating Vosaroxin in Newly Diagnosed Elderly AML and High-Risk MDS Patients

SOUTH SAN FRANCISCO, Calif., December 12, 2011 – Sunesis Pharmaceuticals, Inc. (Nasdaq:SNSS) today announced participation in a Phase 2/3 randomized, controlled, multicenter trial evaluating novel treatment regimens against low dose cytarabine (LD Ara-C), a commonly used treatment of elderly patients with acute myeloid leukemia (AML) and high-risk myelodysplastic syndrome (MDS). This trial, known as the Less Intensive 1 (LI-1) Study, is being conducted by the United Kingdom's National Cancer Research Institute (NCRI) Haematological Oncology Study Group under the direction of Professor Alan K. Burnett, Head of Haematology, Department of Medical Genetics, Haematology & Pathology at Cardiff University School of Medicine. Two regimens containing Sunesis' lead drug candidate, vosaroxin, have been selected as investigational treatment arms in this study.

The LI-1 study employs what is termed a "Pick a Winner" trial design, as described in the journal Blood (R. Hills, A. Burnett, 2011 118: 2389-2394), and is designed to efficiently evaluate a number of promising investigational treatments versus LD Ara-C in elderly AML or MDS patients who are not candidates for intensive chemotherapy. The trial will enroll patients over the age of 60 with AML or high-risk MDS and randomize them to one of a number of treatment regimens: LD Ara-C (control); single-agent vosaroxin; vosaroxin combined with LD Ara-C; or to other experimental therapies considered for inclusion in the comparison. The current highlights of the protocol can be found at http://www.controlled-trials.com/ISRCTN40571019.

All treatment options will be evaluated in a randomized Phase 2 design with key endpoints including complete remission (CR), 12 month survival, and overall survival. There is an initial target of at least 50 patients entering each comparative arm. Treatment arms that are exhibiting promising results on the basis of CR or survival parameters are expected to continue enrolling into a Phase 3 portion of the trial with up to a total of 200 patients enrolled per arm with a primary endpoint of overall survival. There is the potential to treat up to 400 newly diagnosed AML and high-risk MDS patients with a vosaroxin containing induction regimen in the LI-1 trial, either as a single-agent or combined with LD Ara-C.

"An enduring lack of options exists for the treatment-intolerant elderly AML and MDS patient, creating a significant need for the development of therapies that are both effective and tolerable," stated Professor Burnett. "The 'Pick a Winner' design provides a platform for rapidly assessing new treatments that have the potential to make clinically useful improvements in this challenging disease. In a prior study, single-agent vosaroxin has demonstrated anti-leukemic activity and favorable tolerability in elderly AML patients. Vosaroxin has also showed a good

activity/tolerability profile in combination with cytarabine in a relapsed/refractory patient population, which is a synergy that we previously showed in the lab. These outcomes provide the rationale for incorporating two vosaroxin arms into the LI-1 study."

"The inclusion of vosaroxin in this groundbreaking study is important validation of the results from our Phase 2 REVEAL-1 trial of single-agent vosaroxin in newly diagnosed elderly AML patients with poor prognostic factors," stated Daniel Swisher, Chief Executive Officer of Sunesis. "This trial allows for the continued development of vosaroxin in this underserved patient population, while we focus our internal resources on the completion of our pivotal Phase 3 VALOR trial of vosaroxin in first relapsed or refractory AML patients."

REVEAL-1 Trial in Elderly AML Patients

The REVEAL-1 trial, a Phase 2 dose optimization trial of single-agent vosaroxin, evaluated 113 previously untreated, elderly AML patients who were unlikely to benefit from standard induction chemotherapy. In the trial, 82 percent of patients had two or more adverse risk factors, including age greater than 70, intermediate or unfavorable cytogenetics, and secondary AML. Median age for patients in the trial was 74 years. The REVEAL-1 trial included three dosing schedules. As previously reported, for Schedule C (72 mg/m^2 of vosaroxin on days one and four), median overall survival was 7.7 months, one year survival was approximately 38%. The 30- and 60-day all-cause mortality rates were 7% and 17%, respectively. The most common grade 3 or higher non-hematologic adverse events included reversible upper GI mucosal inflammation and infection.

About Vosaroxin

Vosaroxin is a first-in-class anti-cancer quinolone derivative,(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.

About AML

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 there will be 12,950 new cases of AML and approximately 9,050 deaths from AML in the U.S. in 2011. 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 www.sunesis.com.

This press release contains forward-looking statements, including statements related to the design, conduct and results of the LI-1 trial, the execution of the VALOR trial, and vosaroxin's efficacy and safety profile as a single agent and in combination with cytarabine. Words such as “participation,” “promising,” “provide,” “selected,” “evaluate,” “expected,” “continue,” “significant,” “need,” “rapidly,” ”demonstrated” 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 results of these risks and uncertainties, which include, without limitation, risks related to Sunesis' need for substantial additional funding to complete the development and commercialization of vosaroxin, risks related to Sunesis' ability to raise the capital that it believes to be accessible and is required to fully finance the VALOR trial, the risk that raising funds through lending arrangements may restrict our operations or produce other adverse results, the risk that Sunesis' development activities for vosaroxin could be otherwise 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 supply of the active pharmaceutical ingredients required for the conduct of the VALOR trial, the risk of third party opposition to granted patents related to vosaroxin, and the risk that Sunesis' proprietary rights may not adequately protect vosaroxin. These and other risk factors are discussed under "Risk Factors" and elsewhere in Sunesis' Quarterly Report on Form 10-Q for the quarter ended September 30, 2011, Sunesis' Annual Report on Form 10-K for the year ended December 31, 2010 and Sunesis' 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.