Investor and Media Inquiries:
David Pitts
Argot Partners
212-600-1902

Eric Bjerkholt
Sunesis Pharmaceuticals Inc.
650-266-3717

Sunesis Pharmaceuticals Announces Management Promotions

SOUTH SAN FRANCISCO, Calif., (October 2, 2012) – Sunesis Pharmaceuticals, Inc. (NASDAQ: SNSS) today announced two management promotions, effective October 1, 2012. Deborah A. Thomas, Ph.D., has been promoted to Vice President, Regulatory Affairs and Gene C. Jamieson has been promoted to Vice President, Chemistry, Manufacturing and Controls (CMC).

Adam Craig, M.D., Ph.D., M.B.A., Executive Vice President, Development and Chief Medical Officer of Sunesis, commented, "Debbie and Gene have been integral members of Sunesis' management team, each contributing to the rigorous and successful conduct of our Phase 3 VALOR trial of vosaroxin in acute myeloid leukemia. As we look to full enrollment of VALOR in 2013, and anticipated unblinding of the trial in the first half of 2014, Regulatory Affairs and CMC will be critical components of our commercialization efforts. I congratulate Debbie and Gene on their well-deserved promotions, and look forward to their valued insights and leadership during this exciting time."

Dr. Thomas joined Sunesis in November 2011 as Executive Director, Regulatory Affairs. She has over 20 years of biotechnology and pharmaceutical industry experience, with broad-based expertise in toxicology, project leadership and regulatory affairs. Dr. Thomas came to Sunesis from BiPar Sciences, where she was Vice President, Regulatory Affairs, providing strategic input into their clinical development plans and serving as that company's primary point of contact to the FDA. Prior to BiPar, Dr. Thomas served in various management positions at Genentech, Inc. from 1990 to 2007, most recently as Senior Director, Department of Clinical Regulatory Affairs. Dr. Thomas was awarded a B.S. in Microbiology and Ph.D. in toxicology from the University of Kentucky.

Mr. Jamieson joined Sunesis in December 2010 as Executive Director, CMC. He brings over 30 years of experience to the Company, with expertise in CMC, Quality Control, Stability and Quality Assurance, and related expertise in regulatory affairs and product development, including assembly/authoring of multiple regulatory submissions. Mr. Jamieson joins Sunesis from AllyCMC, a CMC services company, where he served as Principle Partner. Previously, he was Executive Director of Product Development at Jazz Pharmaceuticals and Vice President, Pharmaceutical Sciences, at NeurogesX. Mr. Jamieson was awarded a B.S. in Chemistry from the Northern Illinois University.

About VALOR

VALOR is a Phase 3, randomized, double-blind, placebo-controlled, pivotal trial in patients with first relapsed or refractory AML. The trial's target enrollment is 675 patients at more than 100 leading sites in the U.S., Canada, Europe, Australia and New Zealand. The VALOR trial is currently enrolling patients, who are 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. The trial's primary endpoint is overall survival. For more information on the VALOR trial, please visit www.valortrial.com.

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. Both the U.S. Food and Drug Administration (FDA) and European Commission have granted orphan drug designation to vosaroxin for the treatment of acute myeloid leukemia. Additionally, vosaroxin has been granted fast track designation by the FDA for the potential treatment of relapsed or refractory acute myeloid leukemia in combination with cytarabine.

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 approximately 13,780 new cases of AML and 10,200 deaths from AML in the U.S. in 2012. Additionally, it is estimated that the prevalence of AML across major global markets (U.S., France, Germany, Italy, Spain, United Kingdom, and Japan) is over 50,000. 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 Sunesis' expectations regarding the completion and the design, conduct, progress and results of the VALOR trial. Words such as "anticipates," "will," "enables," "continued" 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 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 development and commercialization of vosaroxin, 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 June 30, 2012, Sunesis' Annual Report on Form 10-K for the year ended December 31, 2011 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.