



FOR IMMEDIATE RELEASE

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CPEX Pharmaceuticals Announces Completion of Enrollment in Phase 2a Clinical Trial of Nasulin™

Exeter, NH, December 21, 2009 – CPEX Pharmaceuticals, Inc. (NASDAQ: CPEX) today announced that the ongoing Phase 2a clinical trial of Nasulin™, the Company's intranasal insulin candidate, has now completed enrollment. The study was initiated in February of this year and randomized 94 subjects. Results are expected at the end of the first quarter or beginning of the second quarter of 2010.

The Phase 2a, double-blind, placebo-controlled trial is being conducted at multiple centers across the U.S. The study is designed to evaluate the efficacy and safety of Nasulin™ versus placebo over a 6-week treatment period in Type 2 diabetics who are currently being treated with basal insulin and oral anti-diabetes agents. Efficacy, as measured by the proportion of time spent with normal glucose levels, or euglycemia, is being assessed using continuous glucose monitoring.

Earlier clinical studies of Nasulin™ indicated that CPEX's intranasal insulin candidate achieved a faster time to peak plasma insulin levels when compared to other approved rapid-acting insulin therapies, thereby more closely mimicking the natural response of the pancreas to meals. To date, Nasulin™ has also been well tolerated by approximately 300 clinical trial subjects with no drug-related serious adverse events observed. Results of additional clinical studies conducted using CPEX's Nasulin™ insulin therapy were recently featured in an oral presentation and four abstracts at the Annual Diabetes Technology Meeting, held in San Francisco last month.

About CPEX Pharmaceuticals

CPEX Pharmaceuticals, Inc is an emerging specialty pharmaceutical company focused on the development, licensing and commercialization of pharmaceutical products utilizing CPEX's validated drug delivery platform technology. CPEX has U.S. and international patents and other proprietary rights to technology that facilitates the absorption of drugs. CPEX has licensed applications of its proprietary CPE-215® drug delivery technology to Auxilium Pharmaceuticals, Inc. which launched Testim®, a topical testosterone gel, in 2003. CPEX is also developing a proprietary intranasal insulin product candidate, Nasulin™, which is currently in Phase 2 clinical trials. CPEX maintains its headquarters in Exeter, NH. For more information about CPEX, please visit www.cpexpharm.com.

Safe Harbor Statement under the U.S. Private Securities Litigation Reform Act of 1995:

This press release contains forward-looking statements, including, without limitation, statements regarding the prospects for results from CPEX's current Phase 2a trial of Nasulin™ and the potential benefits of Nasulin™ for patients with diabetes. These forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from future results expressed or implied by such statements. Factors that may cause such differences include, but are not limited to, risks associated with the following: clinical trials may not demonstrate the efficacy and safety of CPEX products, regulatory approvals may be delayed or not obtained, CPEX's dependence on obtaining agreements with other parties to conduct clinical trials and commercialize its product candidates that use its drug delivery technology, competition from other manufacturers of proprietary pharmaceuticals, CPEX's products may not achieve market acceptance or favorable reimbursement rates from health insurers, intellectual property litigation, and other uncertainties detailed under "Risk Factors" in CPEX's Annual Report on Form 10-K dated March 25, 2009 and subsequent periodic reports filed with the Securities and Exchange Commission. CPEX cautions investors not to place undue reliance on the forward-looking statements contained in this release. These statements speak only as of the date of this document, and CPEX undertakes no obligation to update or revise the statements, except as may be required by law.