



FOR IMMEDIATE RELEASE

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**CPEX Pharmaceuticals and Serenity Pharmaceuticals Announce
Collaboration on Drug Candidate for Urology Indication**

Serenity Files IND for Intranasal Drug Employing CPEX's Delivery Platform

Exeter, NH, August 4, 2008 – CPEX Pharmaceuticals, Inc. (NASDAQ: CPEX) and privately held Serenity Pharmaceuticals today announced that they are collaborating on an intranasal drug candidate for a urology indication. New York-based Serenity's drug candidate will be delivered using CPEX's patented drug delivery technology. Serenity believes the drug targets a potential worldwide market of \$2 - \$3 billion.

The collaboration between Serenity and CPEX began in September 2007 as a feasibility study and advanced to the signing of a development and license agreement in February 2008. Serenity has filed an Investigational New Drug (IND) application with the FDA to initiate Phase I clinical testing.

"We are delighted to be working with Serenity in a truly collaborative manner," said John Sedor, CPEX Pharmaceuticals' president and chief executive officer. "CPEX provided access to its intellectual property, developed the formulations, produced a pilot scale manufacturing process and prepared clinical and stability supplies. Our expertise in product and process development and Serenity's clinical expertise in specialty areas have quickly proven to be a complementary fit."

Dr. Samuel Herschkowitz, Serenity Pharmaceuticals' CEO, said, "We have been consistently impressed with CPEX's platform technology, its expertise and its infrastructure. From the beginning, we found CPEX to be an excellent partner, and we have made progress in advancing our drug from concept into Phase I development with their assistance. Based on the profile of their delivery platform and our current R&D pipeline, we are hopeful that we can collaborate with CPEX on additional drug candidates in the future."

Sedor said, "Including the launch of Serenity's Phase I trial, our CPE-215[®] drug delivery platform has formed the basis for the filing of three separate INDs, all of which represent diverse therapeutic areas: testosterone replacement, diabetes and urology. This diversity speaks to the broad applicability of our technology and its potential to effectively deliver pharmaceutically active peptides, peptidomimetics and proteins across a variety of membranes."

“Today’s announcement also demonstrates how we can capitalize on the value of our technology in ways that can increase our shareholder value,” Sedor continued. “We received a patent in late July 2007 that extended the coverage for our intranasal drug delivery technology utilizing CPE-215 beyond insulin. We signed an agreement to begin working with Serenity less than three months later. We believe this partnership is indicative of how our platform can generate opportunities for future potential revenue streams.”

About Serenity Pharmaceuticals

Serenity Pharmaceuticals is a privately held, New-York based start-up urology company.

About CPEX Pharmaceuticals

CPEX Pharmaceuticals, Inc. (NASDAQ: CPEX) is a specialty pharmaceutical company focused on the development, licensing and commercialization of pharmaceutical products utilizing CPEX’s validated drug delivery technology. CPEX has U.S. and international patents and other proprietary rights to technologies that facilitate the absorption of drugs. CPEX has licensed applications of its proprietary CPE-215[®] drug delivery technology to Auxilium Pharmaceuticals, Inc., which launched its Testim[®] topical testosterone gel on the U.S. market in 2003. CPEX also is developing an intranasal insulin product candidate, Nasulin[™], which is in Phase II 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 CPEX’s drug delivery technology, the possible pathway for approval of Serenity’s drug candidate, and the prospects for additional collaborations between the companies. 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 Serenity’s product, regulatory approvals may be delayed or not obtained, our dependence on Serenity to conduct clinical trials and commercialize its product that uses our drug delivery technology, Serenity’s product may not achieve market acceptance, competition from other manufacturers of proprietary pharmaceuticals, intellectual property litigation, the unpredictability of patent protection, and other uncertainties detailed under “Risk Factors” in CPEX’s Registration Statement on Form 10 dated June 17, 2008 in connection with the distribution of CPEX’s common stock to stockholders of Bentley Pharmaceuticals. 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. CPEX specifically disclaims responsibility for statements by Serenity and information describing Serenity and its business other than the collaboration agreement with CPEX.

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