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Novel Protein Nanoparticles ‘Shape’ the Future of Disease

Wednesday May 14, 2008

Research Triangle Park, N.C. — Researchers at the University of North Carolina-Chapel Hill (UNC) have granted an exclusive license to Liquidia Technologies for a protein particle fabrication method that could greatly expand the reach of protein therapeutics. Proteins are large organic molecules that perform highly specific and complex functions in the body, making them an ideal instrument to diagnose and cure disease. However, protein solubility, distribution, stability, and aggregation have hampered the development of this therapeutic class.

Using a nano-fabrication process known as PRINT[®] (Particle Replication in Non-Wetting Templates), the researchers formed protein particles of pure insulin and albumin, as well as albumin particles containing therapeutics such as siRNA and paclitaxel. These particles are designed with a predetermined size and shape profile that may optimize protein stability, solubility, and concentration, while minimizing inter-particle forces that cause aggregation.

“We expect this discovery to dramatically expand the capability and efficacy of existing protein therapeutics,” said Joseph DeSimone, Liquidia founder and professor of chemistry and chemical engineering at UNC. “Design of protein particles in such a way that affords control over size and shape, and preserves protein biofunctionality, has never before been accomplished.”

Unlike previous techniques, which have produced “polydisperse” particle mixtures with sizes ranging from hundreds of nanometers to tens of microns, the PRINT process forms particles of uniform size and shape. Liquidia Technologies has obtained a worldwide license to all rights for the PRINT platform and is working with partners to design protein particle therapeutics for effective delivery to the lung and other targets.

“This technology has the unique opportunity to overcome the challenges associated with protein therapeutics and contribute to the development of highly specific therapeutics for a wide range of diseases,” says Liquidia CEO, Neal Fowler. “Having recently led a company that specializes in developing and commercializing biologics, I have a great appreciation and excitement for the new biotherapeutic opportunities that the PRINT platform may enable.”

DeSimone and Jennifer Kelly, a graduate student in DeSimone’s lab, led the research effort at UNC. Their work was published in the April 23 issue of the *Journal of the American Chemical Society*.

About Liquidia - Liquidia Technologies Inc. is a privately-held nanotechnology company that designs, develops, and manufactures precisely engineered particles and films for a wide variety of life and materials science applications. Within life sciences, Liquidia is focused on the development of Engineered Drug Therapies™ for nucleic acid delivery, and highly targeted therapeutics for the treatment of cancer and other diseases. The company was founded in 2004 on the discoveries of Professor Joseph DeSimone and colleagues at the University of North Carolina, Chapel Hill and is located in Research Triangle Park, North Carolina. For additional information, please visit www.liquidia.com.

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