



The MPCS CrystalCard

Novel CrystalCards™ Produce 3D Protein Structures from Nanovolume Samples

Bainbridge Island, WA, October 21, 2008 – deCODE biostructures, Inc. and Emerald BioSystems, Inc. have announced the publication of a manuscript describing the novel Microcapillary Protein Crystallization System (MPCS™) and associated CrystalCards™ for 3D protein structure determination from nanovolume samples. This technology decreases the cost of gene-to-structure research at its most critical process, protein crystallization. Protein crystals are required for determining 3D structures of protein molecules and their bound ligands to improve the understanding of biological function at the atomic level and to accelerate the drug discovery process. The MPCS utilizes CrystalCards™, plastic microfluidic devices designed to prepare and store approximately 800 individual nanovolume crystallization experiments that produce Diffraction-Ready™ protein crystals. The peel-apart nature of the CrystalCards allows the researcher to remove crystals from the microfluidic device for X-ray diffraction data collection using standard laboratory equipment and techniques. The CrystalCards are also sufficiently X-ray transmissive to allow *in situ* X-ray diffraction data collection from crystals held in devices placed directly within the X-ray beam.

The development of the MPCS and the CrystalCards was carried out by the Accelerated Technologies Center for Gene to 3D Structure (www.ATCG3D.org) a specialized center within Protein Structure Initiative 2. It has been a collaborative effort between deCODE biostructures and the University of Chicago, where the microfluidic technology was originally conceived of in the laboratory of Prof. Rustem Ismagilov, along with development partners Siloam Biosciences, LLC (Cincinnati, OH) and thinXXS Microtechnology (Zweibrücken, Germany). Emerald BioSystems is commercializing the MPCS technology and holds an exclusive licensed patent portfolio in the field of microfluidic protein crystallization (US Patents 7,129,091, 6,409,832 and patents pending).

“In recent years crystallographers have embraced large robotic instruments to orchestrate the many steps needed to prepare protein crystallization experiments,” said Peter Nollert,

Director of Emerald BioSystems. “With the CrystalCards our customers can replace complicated machinery with a plastic consumable. Low volume crystallization is just starting to impact researchers that deal with upstream processes such as protein expression and purification. These fields nicely complement Emerald’s cell-free expression and purification products.”

Lance Stewart, Principal Investigator of the ATCG3D and co-investigator of the Seattle Structural Genomics Center for Infectious Disease (SSGCID) said “The CrystalCards have been crucial in advancing the SSGCID structure determination pipeline for difficult targets. Our researchers have essentially leapfrogged the often tedious and slow optimization process using only very small amounts of protein sample. This has saved weeks of work and resulted in the first 1.7 Angstrom structure of the methionine-R-sulfoxide reductase of *Burkholderia pseudomallei*, a Gram-negative pathogenic bacterium that causes Melioidosis, a rare but often fatal infectious disease of the lungs and skin. The MPCs is the result of an excellent collaboration with Dr. Ismagilov at the University of Chicago, from which we have successfully translated plug-based crystallization methods from the lab to real products.”

A free copy of the manuscript, published today in *Acta Cryst.* (2008). D64, 1116-1122) “*The plug-based nanovolume Microcapillary Protein Crystallization System (MPCS)*” along with more information about the MPCs and the CrystalCards including movies of protein crystallization experiments taking place inside the CrystalCards can be found at www.emeraldbiosystems.com.

About Emerald BioSystems

Emerald BioSystems, a sister company of deCODE biostructures, is a leading provider of sophisticated laboratory automation, bioinformatics software, reagent kits and plasticware products to structural biologists. Emerald’s research tools accelerate the gene-to-protein-structure determination process through advanced computer aided gene design, automated cell-free protein expression, protein purification, and crystallization. A high level of efficiency for protein crystal generation can be achieved using Emerald’s system of database application controlled instrumentation to support production, storage and monitoring of crystallization experiments. With the MPCs, Emerald adds an exciting new microfluidics-based product to its extensive product portfolio covering consumables, software and instrumentation. The MPCs™ and CrystalCards™ are available through Emerald BioSystems, Inc., on the web at www.emeraldbiosystems.com.

About deCODE biostructures

deCODE biostructures, Inc., is a wholly-owned subsidiary of deCODE genetics providing contract research services to pharmaceutical companies, biotechnology companies, academic institutions, and government facilities. deCODE biostructures and sister company deCODE chemistry take a collaborative approach to pharmaceutical research services through a seamless integration of chemistry and biology capabilities including protein production, multifaceted structural studies, lead identification, *ex vivo* and *in vivo* assays, cGMP manufacturing and regulatory capabilities which furnishes

accelerated timelines for moving molecules from the concept and into the clinic. Visit deCODE chemistry & biostructures on the web at www.decodechembio.com.

Funding Acknowledgments

deCODE gratefully acknowledges funding from the NIGMS-NCRR co-sponsored PSI-2 Specialized Center Grant U54 GM074961 which supported development of the MPCs and CrystalCard technology through the Accelerated Technologies Center for Gene to 3D Structure (www.ATCG3D.org).

deCODE also gratefully acknowledges funding from the National Institute of Allergy and Infectious Disease (NIAID) which supports the Seattle Structural Genomics Center for Infectious Disease (www.SSGCID.org) through Contract HHSN266200700057C.

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