

## Midwest Center for Structural Genomics cuts cost, time of protein characterization

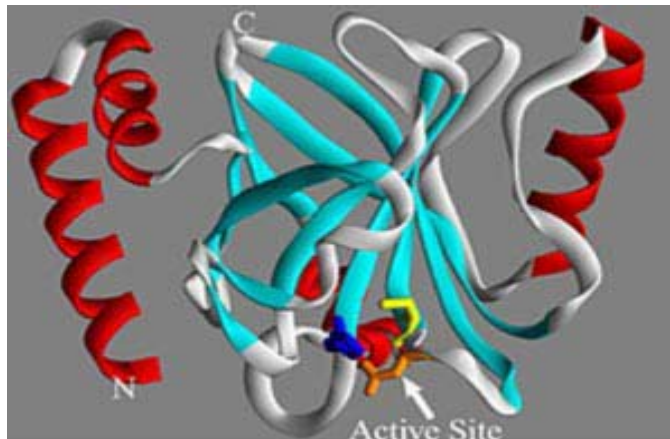
The Midwest Center for Structural Genomics (MCSG), based at Argonne National Laboratory, is automating methods to determine the atomic structures of proteins – the molecular machines of life – and is now churning them out in a production line that would make Midwesterner Henry Ford proud.

Structural information helps reveal the roles that proteins play in health and disease and can lead to new medicines and therapies for genetic and infectious diseases.

The MCSG is one of four large-scale centers of the Protein Structure Initiative (PSI), funded by the National Institute of General Medical Sciences. The PSI plan is to build a library of hundreds of unique proteins and then to use computers and the library to determine the structures of other proteins and their corresponding DNA sequences.

MCSG researchers have automated dozens of steps – from producing crystals to analyzing data – to quickly and efficiently characterize proteins at the Advanced Photon Source, the Western Hemisphere's most brilliant source of X-rays for research.

Funded in 2000, the center's initial goal was to cut the average cost of solving a protein from \$300,000 to \$50,000 and the average time from months and years to weeks and days. By developing innovative robotic approaches to all phases of the process, MCSG scientists have made dramatic progress: In fiscal year 2000, they solved 15 protein structures at an average cost of \$306,000 each; in 2005, they solved 141 structures at an average cost of only \$61,000. Today, they often solve a protein in less than a week from growing the initial crystal to final characterization.



*The structure of Sortase B, solved by scientists at the Midwest Center for Structural Genomics, provides new insights into the function of Staphylococcus aureus and Bacillus anthracis.*

In fiscal year 2006, the MCSG plans to determine 150 structures for less than \$60,000 each. The structures are contributed to the Protein Data Bank, where they are shared and used by the biology community.

From 2006 to 2011, the MCSG will focus on developing automated methods to produce thousands of proteins for analysis.

Members of the Midwest Center for Structural Genomics are Argonne, the European Bioinformatics Institute, Northwestern University, University College London, University of Texas, University of Toronto, University of Virginia and Washington University.

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