

Structural Proteomics using NMR in RIKEN Structural Genomics/Proteomics Initiative

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RIKEN Structural Genomics/Proteomics Initiative (RSGI) (<http://www.rsgi.riken.jp>) was organized by RIKEN Genomic Sciences Center and Harima Institute at SPring-8 in 2001. RSGI has been integrated into the National Project on Protein Structural and Functional Analyses (“NPPSFA” or “Protein 3000”), organized by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), as one center of the program for comprehensive studies. We are now focusing on proteins involved in phenomena of biological and medical importance. Both NMR spectroscopy and X-ray crystallography are used for protein structure determination. To accelerate the NMR analysis, we have constructed the large-scale NMR facility housing 40 high-field NMR spectrometers, and developed several key technologies such as a high-yield cell-free protein synthesis system for high-throughput and automated production, a software package, KUJIRA, for the systematic and interactive NMR data analysis, and the program CYANA for automated structure calculation. We determined 75 structures in 2002 fiscal year, and 207 structures in 2003 fiscal year, respectively, by NMR spectroscopy.

Keywords: NMR spectroscopy, structural proteomics, cell-free protein synthesis