

RIKEN Structural Genomics Initiative

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In Japan, structural genomics efforts were conceptualized in 1995, and began with the Protein Folds Project at the RIKEN Institute in April, 1997 and was then transferred to the newly established RIKEN Genomic Sciences Center (GSC) in October, 1998. Another project focused on *Thermus thermophilus*, (the Structurome Project, proposed by S. Kuramitsu also in 1995) began in October, 1999 at the RIKEN Harima Institute at SPring-8, and the two structural genomics projects at RIKEN are now being combined as the RIKEN Structural Genomics Initiative. We focus on determining the three-dimensional structure type, or the topology ('fold'), of a functional domain, as the total number of folds should be smaller than that of the total number of protein families. In addition, it may be possible to correlate each fold with a small number of molecular function(s).

For structure determination, we plan to use both X-ray crystallography and NMR spectroscopy. For this purpose, a new NMR facility with 600, 800, and 900 MHz NMR instruments is now established. To select the target proteins, mouse and plants full-length cDNAs collected by other groups at RIKEN GSC are clustered on the basis of amino acid sequences into families, and the families with no experimentally determined structures are selected. Next, families of particular biological interest are prioritized. For production of protein samples, we are planning to use cell-free protein synthesis method.