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Molecular biology enabled us to understand the structure and function of genes and proteins. However, many mysteries that contribute to various important biological phenomena should be solved, such as protein-protein interaction and the post-transcriptional modification of proteins. If we have the specific inhibitor of the responsible protein, we shall reveal these complex biological systems which have previously been considered difficult by molecular biology. RIKEN Natural Products Depository (NPDepo) is established to facilitate chemical biology. I will talk on the screening of small molecule inhibitors using the chemical array newly developed in NPDepo.

Human pirin is a Fe (II)-containing nuclear protein that is widely expressed in human tissues, but its function remains obscure. Here, we report the discovery of a small molecule, TPh A that binds to pirin from 20000 NPDepo compounds. We also determined the manner in which the small molecule bound to pirin by solving the co-crystal structure. Furthermore, knockdown of pirin by siRNA and treatment with the small molecule inhibited melanoma cell migration. Thus, inhibition of pirin by the small molecule has led to a greater understanding of the function of pirin.