

EDITORIAL

The Era of Biodesign

The last century has seen an explosion of biological knowledge that started from the discovery of DNA structure. Technological advances on the atomic and molecular level analysis of biological phenomena changed the traditional fields of biology such as immunology, neurobiology, and cell biology into molecular-oriented sciences. Understanding biological phenomena to the level of molecules and atoms means that the phenomena are now on one's hands for modification and improvement by chemical and physical tools. As the findings of molecular and atomic design of biological machineries continue to expand, we can envisage a new century that will have an exciting potential for designer molecules and systems that can transform our views to see biological sciences.

Structural biology has played significant roles in the advancement of knowledge on atomic-level mechanisms behind enzyme catalysis, cellular signal transduction, molecular recognition, and supra-molecular machineries. The extent of the contribution made by structural biology can be exemplified by four novel prize awards during the past ten years in the same field. Now that the structural analysis procedures are well-formulated, their applications for discovery of key biological phenomena and/or structure-based engineering become more important than before. Rational drug design, protein design, and biosensor design are several emerging examples of structure-based engineering. Thus, the interconnection between disciplines of structural analysis and application areas is imperative for the new era of biology for design.

The journal Biodesign aims to promote the emerging research fields of designer biology that is based on the structural and functional analysis of biological phenomena. The journal emphasizes modification and improvement of biological substances as well as original analysis of biological structure and function. The analysis technologies covered by the journal include X-ray crystallography, NMR spectroscopy, electron microscopy, mass spectrometry, theoretical and geometrical bio-computation, single molecule studies, molecular bioimaging, and other biochemical/biophysical tools. By covering the broad area of analytical tools, we aim for the technical fusions to elucidate complex biological phenomena in sufficient detail for the novel design of bio-inspired molecules and systems. Thus, the journal is a forum for discussion of recent results on biological structure/function, bioimaging, biosensor, biotherapeutics, drug design, protein design, and biosystems design.

Seong Eon Ryu
Editor, Biodesign