

INTRODUCTION

Building on the DNA Revolution

Some 50 years ago, a group of pioneering researchers in Cambridge, United Kingdom, nudged biology into the molecular world. Images of Watson and Crick have personified molecular biology to the general public in a way that has never been equaled (see the Perceptions in Science Essay, p. 255). The announcement of the structure of DNA fundamentally changed not only our basic understanding of the flow of information within the cell but also the scope and direction of investigations in biology. This special issue explores both research revolutions.

The opening News story by Pennisi (p. 278) describes the remarkable laboratory where modern biology was born. Next follows a brief look at how the understanding of DNA and its function has evolved over the ensuing years (p. 282). As Snyder and Gerstein describe in a Perspective on our changing concept of the gene (p. 258), much remains to be learned.

The project to sequence the human genome represented biology's first foray into "big science." In pioneering this new direction, the National Institutes of Health, Wellcome Trust, and Department of Energy (DOE) faced unique challenges, as Collins *et al.* recount on p. 286. One promising avenue of research to emerge from that project is DOE's ambitious "Genomes to Life" program. As Frazier *et al.* describe (p. 290), its goal is to understand the molecular machines and systems acting within microbes and microbial communities, and then try to harness them to solve global problems such as the need for clean energy. As part of this effort, DOE intends to create user facilities that will serve as bridges between large and small laboratories.

In the quest for improved therapeutics, Strausberg and Schreiber (p. 294) describe the

National Cancer Institute's plan for an Initiative in Chemical Genetics that will facilitate the development of small-molecule inhibitors based on genomic information. On p. 295, Jiménez-Sánchez describes progress toward creating an Institute of Genomic Medicine in Mexico. It is an effort to help ensure that the fruits of the genomic revolution will not increase the divide between developed and developing countries and will be used to help the neediest populations.

—BARBARA R. JASNY AND LESLIE ROBERTS

CONTENTS

NEWS

278 A Hothouse of Molecular Biology

282 DNA's Cast of Thousands

VIEWPOINTS

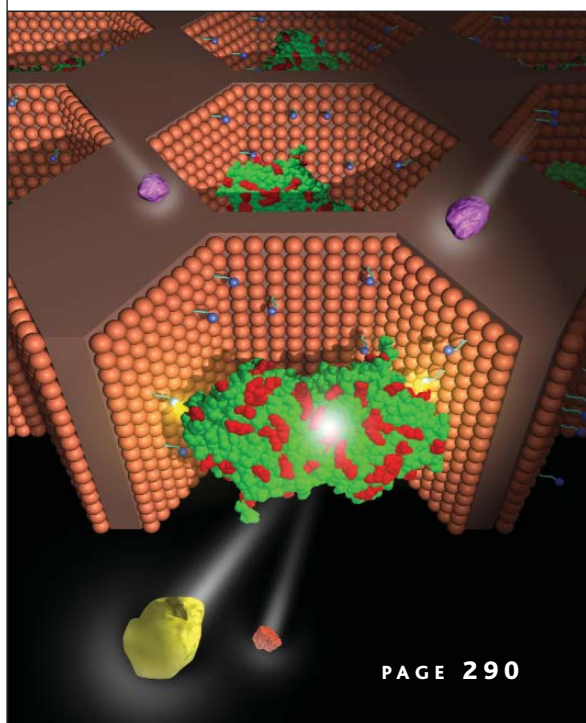
286 The Human Genome Project: Lessons from Large-Scale Biology
F. S. Collins *et al.*

290 Realizing the Potential of the Genome Revolution: The Genomes to Life Program
M. E. Frazier *et al.*

294 From Knowing to Controlling: A Path from Genomics to Drugs Using Small Molecule Probes
R. L. Strausberg and S. L. Schreiber

295 Developing a Platform for Genomic Medicine in Mexico
G. Jiménez-Sánchez

Related Editorial on p. 213, Perceptions in Science Essay on p. 255, and Perspective on p. 258.



PAGE 290

Science