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VOLUME LXXX

21st Century Genetics
Genes at Work

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Director of the Biological Laboratory 1924 to 1936
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Foreword

The year 2015 marked the sesquicentennial anniversary of Gregor Mendel's landmark 1865 presentation of his paper "Experiments on Plant Hybridization," which laid the groundwork for modern genetics. Seminal discoveries throughout the 20th century followed, not least of which was the demonstration that chromatin carried traits, the formalization of the concept of the gene as the hereditary unit, the discovery of DNA as the hereditary material, the discovery of the double helix structure of DNA, and the elucidation of many mechanisms now known to operate to express and protect the hereditary material in its nuclear, cellular, and organismal context. The year also marked the 125th anniversary of Cold Spring Harbor Laboratory as well as the 80th Cold Spring Harbor Laboratory Symposium on Quantitative Biology, the preeminent and storied series of landmark meetings initiated by Reginald Davenport in 1933. It therefore seemed fitting to focus this year's Symposium on 21st Century Genetics: Genes at Work to provide a current synthesis of genetic mechanisms and genome/chromosome biology. The decision to plan the 2015 Symposium on this theme reflects the enormous research progress achieved in recent years, and it was intended to provide a broad synthesis of the current state of the field, setting the stage for future discoveries and application.

Opening night speakers included Robert Tjian (HHMI and UC Berkeley) on probing transcription regulation by single-molecule imaging; Denis Duboule (EPF Lausanne, Switzerland), who spoke about long-range regulation during development and evolution; Ron Evans (Salk Institute for Biological Studies) on nuclear receptors—feast, famine, and physiology; and Angelika Amon (Massachusetts Institute of Technology), who addressed the effects of aneuploidy on cellular fitness and tumorigenesis. Svante Pääbo (Max Planck Institute for Evolutionary Anthropology, Germany) addressed The Genetic Legacy of Neanderthals in an outstanding Dorcas Cummings Lecture for Laboratory friends, neighbors, and Symposium participants in advance of the annual dinner parties. Susan Gasser provided a masterful Summary at the conclusion of the Symposium immediately before the final banquet.

This Symposium was attended by almost 350 scientists from universities around the country and the world, and the program included 65 invited presentations and 135 poster presentations. To disseminate the latest results and discussion of the Symposium to a wider audience, attendees were able to share many of the Symposium talks with their colleagues who were unable to attend using the Leading Strand video archive. A collection of interviews by Rhiannon Macrae (Cell Press), Guy Riddihough (*Science*), Richard Sever (CSHL Press), Jiaying Tan (Cell Press), Jan Witkowski (CSHL Banbury Center), and Eytan Zlotorynski (*Nature Reviews Molecular Cell Biology*) with leading experts in the field were arranged during the Symposium, are distributed as free video from the Cold Spring Harbor Symposium interviews website, and are included in these proceedings as Conversations at the Symposium following the scientific papers.

We thank Val Pakaluk, Mary Smith, and Ed Campodonico and his staff in the Meetings & Courses Program for their assistance in organizing and running the Symposium and John Inglis and his staff at Cold Spring Harbor Laboratory Press, particularly Jan Argentine, Inez Sialiano, and Kathleen Bubbeo. Contributions from the following companies and foundations provide core support for the Symposium and the Cold Spring Harbor meetings program: Agilent Technologies, Bristol-Myers Squibb Company, Genentech, Life Technologies (part of Thermo Fisher Scientific), Monsanto Company, and New England BioLabs. Financial support from the corporate sponsors of our meetings program is essential for these Symposia to remain a success, and we are most grateful for their continued support.

Terri Grodzicker
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