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Preface

This volume documents the proceedings of a major international conference on DNA Repair Mechanisms, held at Keystone, Colorado in February 1978. The meeting was one of the 1978 ICN–UCLA Winter Symposia on Molecular and Cellular Biology, sponsored by ICN Pharmaceuticals, Inc., and organized through the Molecular Biology Institute of the University of California, Los Angeles.

The conference marked the fourth anniversary of the first comprehensive international meeting on the subject of DNA repair held at Squaw Valley, California in 1974. That meeting generated a great deal of enthusiasm and catalyzed many significant collaborative ventures among the nearly 200 participants. In the ensuing years the field has more than doubled in number of researchers and in the rate of proliferation of new information and publications on the subject. This surge of interest is due in part to the increased evidence that many types of repairable damage in DNA are also highly mutagenic and carcinogenic. Procedures for measuring the repair of damaged DNA have become refined and new ones have been developed in the past several years. In addition, new pathways for the repair of DNA damage by excision have been discovered and error-prone bypass modes have been elucidated. Enough new repair enzymes have been isolated and characterized that it has become imperative that a rational nomenclature be developed. Much more is known about the hereditary disease *Xeroderma pigmentosum* with respect to its deficiency in several DNA repair modes and evidence for repair defects in other human hereditary diseases is being established. DNA repair currently represents one of the most active fields of investigation in the overlapping spheres of molecular biology and clinical research on human genetic deficiency and aging.

The 1978 meeting was attended by nearly 400 participants. The format for the meeting included some novel aspects as well as the more traditional symposium style. An overall perspective on the field of DNA repair was provided in plenary sessions in which 17 speakers outlined current areas of active investigation and important problems in the field. Then, selected questions formed the focus of 13

workshop sessions coordinated by designated experts representing various views and approaches to the respective problems. Poster sessions were utilized to facilitate the presentation of new data from additional participants.

It is important that researchers in DNA repair periodically have the opportunity to gather at a conference of this sort. The field includes scientists in the diverse disciplines of biochemistry, genetics, photobiology, radiology, and environmental biology. Workers in these disciplines are affiliated with different national and international scientific societies and the field of DNA repair derives benefits from these multiple associations. However, it also requires multidisciplinary gatherings such as this conference to promote the free interchange of information essential to the advancement of the field.

This volume includes papers from the plenary session speakers and the workshop participants as well as short summaries by the workshop session conveners, describing the current state of agreement and dispute on specific topic areas. We have additionally included a number of manuscripts from a selected group of poster contributors. Difficult decisions had to be made because of the space limitations in the volume and we sincerely regret that we were unable to include papers from more of the excellent poster presentations. In choosing these we tried to include documentation of important new findings, theories, and approaches to complement the material covered in the other papers and have, wherever possible, stressed the availability of multiple biological systems of DNA repair and mutagenesis research. Finally, the volume includes contributions from the two keynote lecturers, Paul Howard-Flanders and Bruce Ames.

We have arranged the papers in the volume roughly according to their organization in the meeting, with an attempt to group plenary session contributions together with the relevant workshop and poster manuscripts. We hope that the result represents a logical and comprehensive treatment of the rapidly moving field of DNA repair as of early 1978.

We wish to acknowledge the financial sponsorship for this meeting provided predominantly by contracts with the U.S. Department of Energy and by the National Institutes of Health (in particular the National Cancer Institute, National Institute on Aging, National Institute on Child Health and Development, National Institute on Allergies and Infectious Diseases and the Fogerty International Center). We also solicited support from many major chemical and drug companies because of the obvious relationship of this conference topic to carcinogenic chemicals in the environment. We are pleased that the following companies were able to respond with support and we appreciate the commitment to scientific enquiry and concern expressed by these private organizations: E. I. du Pont de Nemours and Co., Merck and Co., Eli Lilly, and Hoffman–La Roche.

We appreciate the excellent suggestions and help we received from many of our colleagues in assembling the program for this meeting. Finally we are indebted to Fran Stusser and her staff and to the Keystone administration for their generally efficient handling of the arrangements for the meeting.

Philip C. Hanawalt
Errol C. Friedberg

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