

Report of the Organizing Committee of the Asilomar
Conference on Recombinant DNA Molecules

In its report to the Assembly of Life Sciences of the National Research Council (Science 185:303 (1974)), the Committee on Recombinant DNA Molecules urged that an international meeting of involved scientists from throughout the world be convened to review scientific progress in this area and to discuss appropriate ways to deal with the potential biohazards of recombinant DNA molecules. The Asilomar Conference on Recombinant DNA Molecules met during February 24-27, 1975, at the Asilomar Conference Center in Pacific Grove, California. This report, drafted by the Organizing Committee* (Paul Berg, Chairman, David Baltimore, Sydney Brenner, Richard Roblin and Maxine Singer), summarizes the organization, proceedings and recommendations of the Conference.

The Conference was sponsored by the U.S. National Academy of Sciences with financial support from the National Cancer Institute of the National Institutes of Health and the National Science Foundation. Besides providing the administrative and travel costs needed to organize the meeting, these funds paid the travel and living expenses for many of the U.S. and foreign participants.

To ensure both the greatest opportunity for effective discussions of the relevant scientific issues and the most frank and searching analysis of the potential risks, attendance at the Conference was limited. Individuals receiving invitations from the Organizing Committee were a) chosen by the chairmen responsible for the scientific and discussion sessions, b) presently engaged in or contemplating researches with recombinant DNA molecules and c) experts who could provide special information and insight to the question of assessing and dealing with the potential hazards of such work. Though official representation from U.S. as well as foreign scientific and governmental agencies was not sought, many of these organizations were informed as to those that had been invited to participate in the Conference.

Of the 155 participants, 83 were from U.S. research, governmental and industrial institutions, 51 were from comparable organizations outside the U.S. and 21 represented the lay and scientific news media. (Appendix A provides the names and affiliations of participants.)

Though there would have been some advantages to publishing the Proceedings of the Conference, the Organizing Committee chose not to pursue this course. Instead, the presentations and discussions were recorded on audio tape; these recordings, therefore, provide a verbatim record of the transactions. Inasmuch as the Conference participants were assured that the recordings would be used for archival purposes only, we propose that the seven reels of audio tape and their diaries (Appendix B) should be retained by the Academy for future reference and that their copying or distribution be proscribed.

The Conference program (Appendix C) focused on five subject areas: Ecology of plasmids and enteric bacteria; molecular biology of prokaryote plasmids and their use for molecular cloning; synthetic recombinants involving animal virus DNAs; synthetic recombinants involving eukaryote DNAs; and ethical and legal concerns arising from work on synthetic recombinant DNAs. The responsibility for organizing the formal presentations and the panel-led discussions in each subject area was given to a group of four to six individuals organized by a program chairman. (Subsequently the working groups assigned the first two subject areas merged and functioned as a single group for purposes of program preparation and presentation.) Each group met once or twice prior to the Conference to select speakers and discussors, to organize their formal scientific presentations and to draft working papers for distribution and use at the Conference (Appendices D, E, F). Our intent was to permit the experts in each area to select and organize the presentations most relevant to the scientific and biohazard issue. Moreover, these groups were encouraged to prepare written statements containing propositions and recommendations for assessing and dealing with the real and possible biohazards. These planning groups also met with other participants during the Conference to explore the implications and consequences of

their recommendations. Several unscheduled "workshops" were also held during "free" times to design and plan construction of safer cloning vehicles (plasmids and phages) and safer bacterial hosts (see Appendix G). The nearly unanimous acceptance of the recommendations emerging from the Conference indicates that these unscheduled events were useful and germinal.

The task of summarizing the views and conclusions developed at the Conference was accepted by the Organizing Committee. A statement, entitled "Provisional Statement of the Conference Proceedings" (Appendix H) was drafted at the end of the third day of the Conference and served as the working document for the discussion during the final session of the meeting. As expected, the conclusions and recommendations offered in the document elicited contrary views, particularly as to the assessment of the risks and how to deal with them. Each section of the provisional statement was debated, suggestions for deletions, additions, and modifications in the wording were considered and in the end the Conference participants voted by hands for adoption or rejection of the various amended propositions. Left unchallenged, and supported by the overwhelming majority of the participants, was the recommendation that most of the research with synthetic recombinant DNAs could proceed provided that the experiments were performed under conditions which ensure a minimum of risk to the experimenters and the public at large. Moreover, there was virtually unanimous acceptance of the principle that adequate containment, both physical and biological, must be considered an essential feature of each particular experimental protocol. At the meeting's end it was agreed that the Organizing Committee would redraft the statement so that it would reflect the discussions and positions adopted by the balloting at the Conference as well as views offered by written submissions following the Conference.

The agreed upon principles, together with more specific recommendations and guidelines, are included in a revised statement entitled "Summary Statement of the Asilomar Conference on Recombinant DNA Molecules" (Appendix I). Inasmuch as section 5 of the Provisional

Statement of the Conference Proceedings (Appendix H) was not discussed by the participants and because the proposal is appropriate primarily to United States institutions, it has been omitted from the revised summary statement. But we believe a proposal as to how compliance with any promulgated containment guidelines could be monitored would be useful. Accordingly, we have included an outline for a plausible model of how such a monitoring process could function (Appendix J).

We recommend that the statement designated Appendix I be published as quickly as possible in appropriate scientific journals, e.g., Science, Nature and the Proceedings of the National Academy of Sciences, and that the statement also be distributed to the Conference participants as soon as its contents have been approved by the Academy's review process.

* Though Dr. Niels Jerne was appointed a member of the Organizing Committee, he did not participate in the pre-Conference activities and was unable to attend the Conference; consequently he did not share in writing this report.