

# Los Alamos

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

## memorandum

TO Distribution *mwb*  
FROM M. W. Bitensky, LSDO  
SYMBOL LS-DO-86-1.8-3  
SUBJECT WORKSHOP

DATE January 7, 1986

MAIL STOP/TELEPHONE M881/7-2690

MEETING JANUARY 6, 1986 (2:00 p.m.)

In attendance: Walter Goad, George Bell, Bob Moyzis, Ed Hildebrand, Scott Cram, Joe D'Anna, Lawrence Gurley and Mark Bitensky.

Subject: Workshop, perhaps in February to discuss the importance and feasibility of sequencing the whole human genome. The questions that were placed to us for consideration at such a Workshop by Dr. Delisi include the following:

1. What is the savings in time that could result in a major assault on the problem as compared with a "business as usual approach?"
2. What are the important benefits that would accrue from such a savings in time, including the biomedical, clinical, and fiscal perspectives?
3. What are the major scientific approaches that need to be considered?
4. Could the Workshop and feasibility group prioritize those scientific approaches?
5. Could a document be drafted, which would in effect represent the conclusions of the assembled body?

In our meeting on Monday at 2:00 p.m. a variety of estimates were considered with regard to the time saved. One of them, although not the only one, was based on the idea that current rates (roughly 5 million bases a year) would require in the order of a hundred to a thousand years for the sequencing of the genome. We all agreed that the number 5 million a year was probably going to soon accelerate perhaps even by a factor of 5. Even so the current rate of attack would require significantly more than a 100 years assuming no sudden explosive developments in sequencing technology or automation.

With regard to the second question of the importance of the time saved, which could in this instance be an order of magnitude or about 100 years since our estimates have centered about 10 years. There were many compelling retrospective arguments indicating how important it "would have been" to have learned about viruses and bacteria, or the circulation of the

blood, or antibiotics several decades sooner. Moreover, in terms of the human benefits especially with regard to patient care and basic research questions it was clear to us that the time saved would produce profound benefits although they are difficult to precisely define. A huge and compelling cost benefit (based on a modest percentage saving per annum of the National Health Care budget was also envisioned.)

No extensive discussion was held with regard to scientific approaches, prioritization and documentation although the group has already emphasized the importance of technology development especially for sequencing and automation.

A number of other details were discussed about the meeting. A potential time was selected as the 17th of February a Monday, which is Washington's birthday, and which would be taken as a working day with travel on the preceding Sunday. As to the duration of the meeting a length of 1 1/2 days seemed agreeable. The location gravitated toward Santa Fe and away from the Laboratory. With regard to the Chair of the Meeting; a joint Chairmanship seemed most attractive with Walther Goad as one element of this team and the other perhaps coming from the outside. With regard to the number of attendees it was agreed that if we had the ten best people in the world, plus Laboratory attendance we would have more than a powerful working group. No other modes of participation, such as, telephone or mail solicitations were deemed appropriate.

Other suggestions included the breaking up of the Workshop into specialized groups, which would address one or another of the questions and to use the evening of the 17th to draft the conclusions and progress accomplished on the first day. This would also mean having at hand some kind of transcription secretarial service in order to transcribe dictations and hand written drafts. Finally, requests were made for nominations of participants and all those in attendance promised to rapidly develop a list of likely candidates. In addition, the approach we are hoping to take is personal telephoning to see if we can each reach two or three of the participants and hope to secure participation of any where between 10 and 15 external luminaries. One should add that outstanding scientists from Europe or Asia will also be considered.

**Distribution:**

George Bell, T-DO, MS B210  
J. Fickett, T-10, MS K710  
W. Goad, T-10, MS K710  
C. Burks, T-10, MS K710  
R. Moyzis, LS-3, MS M886  
S. Cram, LS-4, MS M888  
E. Hildebrand, LS-3, MS M886  
Larry Deaven, LS-4, MS M888  
John Birely, ADCEL, MS A102 (Information only)  
Robert Selden, ADTCP, MS A112  
Lawrence Gurley, LS-1, MS M880  
Joe D'Anna, LS-3, MS M886