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DIVISION OF BIOMEDICAL SCIENCES

RIVERSIDE, CALIFORNIA 92521-0121

March 19, 1990.

William F. Raub
Acting Director,
National Institute of Health
Room 126, Building 1
9000 Rockville Pike
Bethesda, MD 20892

Dear Mr. Raub :

I am writing to express my extreme concern with the policy of science funding in the USA. I have recently learned that my grant application to the National Institute of Health (NIH) scored 155, which is the score given to outstanding-excellent projects. Nevertheless, I was very sorry to learn that my application is not going to be funded because of the lack of resources from NIH. I am an assistant professor struggling with tenure and all implications inherent to this process. With this lack of support to my project I will not be able to train postdoctoral scientists. I will not be able to attract and direct to scientific research talented graduate students. I will not be able to strengthen the areas of science and research which made this country big, serious and respected. I will not be able to prevent the evasion of talented students that do not want to remain in the Universities, Research Institutes because of the lack of support and opportunities and stimulus. I will not be able to continue my studies that modestly contribute to the progress of human knowledge. I will not be able to teach medical students at a level that made Medicine in this country the most advanced one in the world. I will not be able to contribute to revert the decline in the USA competitiveness.

At the same time that I am frustrated, depressed and sad about my news from NIH, I learned that a controversial project of Human Genome Project is being launched. This is being called the "*Big Science Project*". It amounts to $200,000,000 per year for the next 15 years. And of course, this figure will be severely inflated in the close future. The rationale for this project is controversial. Its goals are highly questionable and several scientific articles had raised serious objections. What is this project going to do ?

The Human Genome Project will provide little or no creative intellectual training. It will simply result at most, in the formation of an army of technicians skilled only in obtaining DNA sequences and entering the results in data bases. It is a mechanical, boring task that not only do not praise creativity, dedication and the progress of scientific knowledge but also, will not necessarily promote the understanding of human diseases as the advocates of the project claim. Also, the money involved in the Project will be diverted to companies to develop (not to create concepts or reasoning) equipment !

In my specific grant application I requested on average less than $100,000 a year. I would be training two postdoctoral fellows, two graduate students and paying 25% of my salary in addition to a technician's salary. Not only the allocation of funds to "*small*" science has always produced important insights in biomedical

research but, the multiplicative effect of forming generations of intelligent human beings is more efficient. Each postdoctoral fellow coming out of my laboratory will in his/her turn fecundate other areas of science and

other brains. This small, rigorous, efficient process explains the success of the US. Unfortunately, there is not much money involved in it and so it lacks the title of "*BIG*" science.

The process of intellectual formation of a scientist is not and cannot be industrialized. Each mind has its own pace. Each mind has its own process of development, maturity and creativity.

Try to imagine: with less than $100,000/year I would be able to direct and form four intellectually independent scientists. Could you figure out how many people could be attracted to science with the $200,000,000/year from the Human Genome Project.

As a person that wakes up every morning and goes to the laboratory to work, I can tell you that the perspectives for science in our country are not good. We fight to attract students to a scientific career. We spend a lot of time in looking for funding sources. We spend a lot of time in writing grant applications. And all this, on behalf of an ideal, a dedication and an intellectual satisfaction.

I urge you to analyze in detail the origins, objectives and the importance of the Human Genome Project for the scientific development of the nation. I also urge you to study its implications to human disease. Our progress in understanding human disease had been very successful without having a data bank of human genes. Moreover, there is a huge step in identifying the defective gene and the cure of a disease. Several examples illustrate this last statement (Cystic Fibrosis, Muscular Distrophy, etc.). Those illness had their gene identified a long time ago. Yet, we do not know the physiology of those illness.

If you dedicate some time to the meditation of some points that I have barely scratched in this letter I will feel myself fully justified in having written it.

Thank you for reading this letter.

Yours sincerely.

Samuel Cukierman, M.D., Ph.D.