

BUDGET -- for each of three years, beginning July 1, 1971

Projected Expenditures: Direct Costs only

(These figures are intended to indicate a scale and style of effort. The details of any long range research budget must be subject to periodic review to allow for unpredictable opportunities and disappointments-- in the content of the research, and in the availability of the most crucial ingredient, the professional and technical people to do the work. )

	% requested here*	\$ requested here
Allan Duffield, Ph.D. Medical Research Scientist Assistant Project Leader (Organic Chemistry)	30	3000
Wilfred Pereira, Ph.D. Research Associate Chemistry	100	15000
Walter Reynolds Electronic Engineer (for mass-spec. systems)	50	9000
Julie Hwang Scientific Computer programmer	100	13000
Virginia Bacon Research Assistant (Biochemistry)	50	5000
Laboratory Supplies and Expense		5000
		<hr/> 50000.
	x 3 years:	\$150,000.

\* All of these had been our payroll under 100% NASA support.

Related projects under Prof. Lederberg's direction are supported by grants from NIH to the extent of about \$45,000 per year direct costs, and a like amount can probably be continued for this area from an umbrella grant from NASA expected to be about \$240,000. However, the larger part of the latter must now be concentrated on space-related instrumentation. Nevertheless this gives us a facility for developing and maintaining advanced methods of assay whose reproduction cost would be many times the specific investments here requested.

<u>Organic Chemistry</u>	<u>NASA</u>	<u>Dendral</u>	<u>NIH</u>
Bacon	10,329		
Duffield	3,000	10,000	7,000
Technician		2,400	
Hwang	12,008		
Pereira	13,188		
Reynolds	9,935	8,000	
Sanchez (Dish)	2,671		
Solomon	10,550		
Steed	9,875		5,317
Stefik		6,000	
Wegmann	11,904		
Wyche	7,708		
Machinist (Est.)	6,000	500	
<b>Plus Secretarial/Administrative Support</b>			
Allan	1,033	600	827
Stuedeman	6,554	600	400
	<u>104,755</u>	<u>28,100</u>	<u>13,544</u>
Staff Benefits 15.2%	15,925	4,271	1,735*
Other 46% Items	18,358	0	2,372
Indirect Cost @ 46%	56,632	12,926	468
Nn 46% items	17,560	0	8,312
	<u>\$213,228</u>	<u>\$45,297</u>	<u>\$26,381</u>

Remainder

Machinist	10,308
Jerabek	7,708
Levinthal	7,088
Pearson	6,918
Stuedeman	2,000
Veizades	<u>17,572</u>
	\$51,594

\*Unassigned salary

Hjelmeclawel 2900

## Program of Research on

## Molecular Genetics and Environmental Influences Related to Cancer

The Department of Genetics is involved in a number of studies that we highly pertinent to the problem of cancer, from both a therapeutic and prophylactic point. In my own view, the latter is by far the most efficient approach to the prevention of cancer; but this should not be taken as any derogation of the indispensable role of many other scientists to find ways to deal with the human tragedies implicit in the disease to which many lives are already committed.

The particular areas of research for which we now require further support are:

- 1) The modification of DNA by specific pollutants, particularly chlorinated hydrocarbons.
- 2) The perfection of assay methods for assessing the potential hazard of environmental chemicals with respect to the modification of DNA.
- 3) The development and application of automated methods of chemical analysis of body fluids and secretions, with a view to
  - a. discovering individual differences in the metabolism of common nutrients (like tryptophan) that are already under suspicion as potential sources of mutations and of cancer, &
  - b. discovering the intake of substances (food additives, drugs, other environmental additives --including byproducts of smoking and air pollution) to which little attention has been directed so far, but which may behave like the metabolic deviations mentioned in a. An excellent prototype of this would have been the discovery of cyclohexylamine and of its N-hydroxyl derivatives in the urine of a small, increasing part of the population as an index of their intake of nitrosocyclamates. There is little doubt that the procedures we are developing would have been capable of detecting such an output.

:  
:  
Address to Mr. Ribert Murray, President  
Center for Interaction,  
901 First City National Bank Building  
Houston, Texas 77002

:  
:  
:  
MUMFORD : February 12 1971 proposal for support of  
genetics work

The Department of Genetics is involved in a number of studies that we believe to be highly pertinent to the problem of cancer, from both a therapeutic and preventive standpoint. In my own view, the latter is by far the most efficient approach to the control of cancer; but this should not be taken as any derogation of the indispensable efforts of many other scientists to find ways to deal with the human tragedies implicit in the tumors to which many lives are already committed.

The modification of DNA by specific pollutants, particularly chlorine

- 2) The perfection of assay methods for assessing the potential hazard of environmental chemicals with respect to the modification of DNA.
- 3) The development and application of automated methods of chemical analysis of body fluids and secretions, with a view to
  - a. discovering individual differences in the metabolism of common nutrients (like tryptophan) that are already under suspicion as potential sources of mutations and of cancer, &
  - b. discovering the intake of substances (food additives, drugs, other environmental additives --including byproducts of smoking and air pollution) to which little attention has been directed so far, but which may behave like the metabolic deviations mentioned in a. An excellent prototype of this would have been the discovery of cycl hexylamine and of its N-hydroxyl derivatives in the urine of an increasing part of the population as an index of their intake of cyclamates. There is little doubt that the procedures we are developing would have been capable of detecting such an output.