

DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
PUBLIC HEALTH SERVICE

## GRANT APPLICATION

TYPE		PROGRAM	LEAVE BLANK	
REVIEW GROUP		NUMBER		
COUNCIL (Month, Year)		FORMERLY		
		DATE RECEIVED		

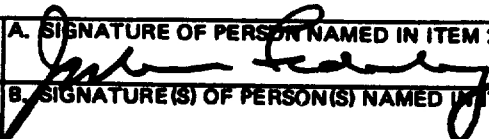
TO BE COMPLETED BY PRINCIPAL INVESTIGATOR (Items 1 through 7 and 15A)

1. TITLE OF PROPOSAL (Do not exceed 63 typewriter spaces) Resource Related Research - Computers and Chemistry (RR-00612 renewal)	
2. PRINCIPAL INVESTIGATOR	
2A. NAME (Last, First, Initial) Lederberg, Joshua	3. DATES OF ENTIRE PROPOSED PROJECT PERIOD (This application) FROM 5/1/74 THROUGH 4/30/77
2B. TITLE OF POSITION Professor and Chairman	4. TOTAL DIRECT COSTS REQUESTED FOR PERIOD IN ITEM 3. \$1,639,456
2C. MAILING ADDRESS (Street, City, State, Zip Code) Department of Genetics Stanford University Medical Center Stanford, California 94305	5. DIRECT COSTS REQUESTED FOR FIRST 12-MONTH PERIOD \$488,267
2D. DEGREE Ph.D.	6. PERFORMANCE SITE(S) (See Instructions) Department of Genetics Department of Chemistry, and Department of Computer Science Stanford University
2E. SOCIAL SECURITY NO. [REDACTED]	
2F. TELEPHONE DATA Area Code 415 TELEPHONE NUMBER 321-1200 EXTENSION Ext. 5801	
2G. DEPARTMENT, SERVICE, LABORATORY OR EQUIVALENT (See Instructions) Department of Genetics	
2H. MAJOR SUBDIVISION (See Instructions) School of Medicine	
7. Research Involving Human Subjects (See Instructions) A. <input type="checkbox"/> NO B. <input type="checkbox"/> YES Approved: C. <input checked="" type="checkbox"/> YES - Pending Review Date	8. Inventions (Renewal Applicants Only - See Instructions) A. <input checked="" type="checkbox"/> NO B. <input type="checkbox"/> YES - Not previously reported C. <input type="checkbox"/> YES - Previously reported

TO BE COMPLETED BY RESPONSIBLE ADMINISTRATIVE AUTHORITY (Items 8 through 13 and 15B)

9. APPLICANT ORGANIZATION(S) (See Instructions) Stanford University Stanford, California 94305 IRS No. 94-1156365 Congressional District No. 17	11. TYPE OF ORGANIZATION (Check applicable item) <input type="checkbox"/> FEDERAL <input type="checkbox"/> STATE <input type="checkbox"/> LOCAL <input checked="" type="checkbox"/> OTHER (Specify) <u>Private, non-profit University</u>
10. NAME, TITLE, AND TELEPHONE NUMBER OF OFFICIAL(S) SIGNING FOR APPLICANT ORGANIZATION(S) c/o Sponsored Projects Office Telephone Number (s) (415) 321-2300 X2883	12. NAME, TITLE, ADDRESS, AND TELEPHONE NUMBER OF OFFICIAL IN BUSINESS OFFICE WHO SHOULD ALSO BE NOTIFIED IF AN AWARD IS MADE K. D. Creighton Deputy Vice Pres. for Business and Finance Stanford University Stanford, California 94305 Telephone Number (415) 321-2300 X2883
	13. IDENTIFY ORGANIZATIONAL COMPONENT TO RECEIVE CREDIT FOR INSTITUTIONAL GRANT PURPOSES (See Instructions) 01 School of Medicine
	14. ENTITY NUMBER (Formerly PHS Account Number) 458210

15. CERTIFICATION AND ACCEPTANCE. We, the undersigned, certify that the statements herein are true and complete to the best of our knowledge and accept, as to any grant awarded, the obligation to comply with Public Health Service terms and conditions in effect at the time of the award.

SIGNATURES (Signatures required on original copy only. Use ink, "Per" signatures not acceptable)	A. SIGNATURE OF PERSON NAMED IN ITEM 2A 	DATE APR 26 1973
	B. SIGNATURE(S) OF PERSON(S) NAMED IN ITEM 10	DATE

## SECTION 1

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
PUBLIC HEALTH SERVICE

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PROJECT NUMBER

## RESEARCH OBJECTIVES

NAME AND ADDRESS OF APPLICANT ORGANIZATION

Stanford University, Stanford, California 94305

NAME, SOCIAL SECURITY NUMBER, OFFICIAL TITLE, AND DEPARTMENT OF ALL PROFESSIONAL PERSONNEL ENGAGED ON PROJECT, BEGINNING WITH PRINCIPAL INVESTIGATOR

Lederberg, Joshua,	[REDACTED]	Professor of Genetics, Department of Genetics
Djerassi, Carl,	[REDACTED]	Professor of Chemistry, Department of Chemistry
Feigenbaum, Edward,	[REDACTED]	Professor of Computer Science, Dept. of Computer Sci
Buchanan, Bruce,	[REDACTED]	Research Computer Scientist, Dept. of Computer Scien
Duffield, Alan,	[REDACTED]	Research Associate, Department of Genetics
Pereira, Wilfred,	[REDACTED]	Research Associate, Department of Genetics
Rindfleisch, Thomas	[REDACTED]	Research Associate, Department of Genetics
Smith, Dennis,	[REDACTED]	Research Associate, Department of Chemistry
Sridharan, Natesa,	0	Research Associate, Department of Computer Science
Hammerum, Steen	0	Research Associate, Department of Chemistry

TITLE OF PROJECT

Resource Related Research - Computers and Chemistry

USE THIS SPACE TO ABSTRACT YOUR PROPOSED RESEARCH. OUTLINE OBJECTIVES AND METHODS. UNDERSCORE THE KEY WORDS (NOT TO EXCEED 10) IN YOUR ABSTRACT.

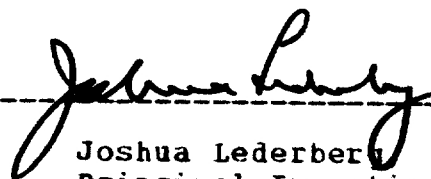
The objectives of this research program are the development of innovative computer and biochemical analysis techniques for application in medical research and closely related aspects of investigative patient care. We will apply the unique analytical capabilities of gas chromatography/mass spectrometry (GC/MS) and Carbon(13) Nuclear Magnetic Resonance Spectrometry (CMR) with the assistance of data interpreting computer programs utilizing artificial intelligence techniques, to investigate the chemical constituents of human body fluids in a variety of clinical contexts. Specific subtasks of this program include; 1) the application of artificial intelligence techniques to programs capable of interpreting mass spectra from basic principles as well as extending mass spectral theory by analysis of solved spectrum-structure examples, 2) the extension of GC/MS data systems incorporating an increasing level of automation and allowing the directed collection of specialized information, 3) the application of GC/MS techniques to analyze body fluids such as urine and blood, and to relate detected metabolic abnormalities to clinically observable disease states, and 4) the application of CMR techniques to assist in the determination of chemical structure.

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The undersigned agrees to accept responsibility for the scientific and technical conduct of this project and for provision of required progress reports if a grant is awarded as the result of this application.

APR 26 1973

Date

  
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Joshua Lederberg  
Principal Investigator

RESOURCE-RELATED RESEARCH: COMPUTERS AND CHEMISTRY  
(RR-00612 - Renewal Application)

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