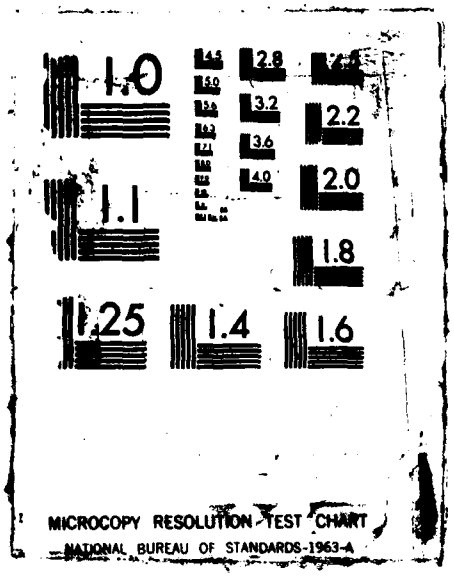
AD-A186 693 PROPERTIES OF STABILIZED SUB-MICRON PHOSPHOLIPID VESICLES(U) CALIFORNIA INST OF TECH PASADENA J D BALDESCHWIELER 29 MAY 87 ARO-23471.2-CH

1/1

UNCLASSIFIED DAAL03-86-K-0060

F/G 6/2

NL


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

MASTER COPY

DTIC FILE COPY FOR REPRODUCTION PURPOSE

(2)

REPORT DOCUMENTATION PAGE

AD-A186 693

1b. RESTRICTIVE MARKINGS

3. DISTRIBUTION/AVAILABILITY OF REPORT
Approved for public release; distribution unlimited.

4. PERFORMING ORGANIZATION REPORT NUMBER(S)

5. MONITORING ORGANIZATION REPORT NUMBER(S)
ARO 23471.2-CH

6a. NAME OF PERFORMING ORGANIZATION
California Institute of Technology

6b. OFFICE SYMBOL (If applicable)

7a. NAME OF MONITORING ORGANIZATION
U. S. Army Research Office

6c. ADDRESS (City, State, and ZIP Code)
Pasadena, CA 91125

7b. ADDRESS (City, State, and ZIP Code)
P. O. Box 12211
Research Triangle Park, NC 27709-2211

8a. NAME OF FUNDING/SPONSORING ORGANIZATION
U. S. Army Research Office

8b. OFFICE SYMBOL (If applicable)

9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
DAAL03-86-K-0060

8c. ADDRESS (City, State, and ZIP Code)
P. O. Box 12211
Research Triangle Park, NC 27709-2211

10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
Properties of Stabilized Sub-Micron Phospholipid Vesicles (Unclassified)

12. PERSONAL AUTHOR(S)
John D. Baldeschwieler

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM 4/15/86 TO 4/14/87	1987 May 29	4

16. SUPPLEMENTARY NOTATION
The view, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
Properties of stabilized sub-micron phospholipid vesicles

19. ABSTRACT (Continue on reverse if necessary and identify by block number)
See reverse side

DTIC ELECTE NOV 0 2 1987 S D

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT
☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS

21. ABSTRACT SECURITY CLASSIFICATION
Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL

22b. TELEPHONE (Include Area Code)

22c. OFFICE SYMBOL

DD FORM 1473, 84 MAR

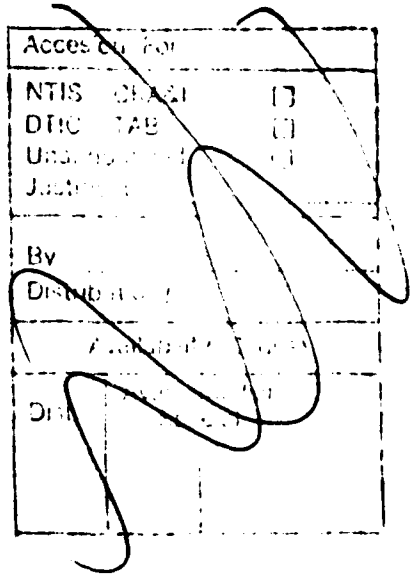
83 APR edition may be used until exhausted.
All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

19. Abstract

The principal focus of research activity under the support Grant No. DAAL03-86-K-0060 has been the characterization of phospholipid vesicles formed with polymerizable disulfide phosphatidylcholines. Structures with the polymerizable groups in both the alpha and terminal positions of the side chain fatty acids have been synthesized and the resulting polymerized structures characterized. We have discovered that it is possible to produce very small and highly stable polymerized micellular structures using short chain phosphatidylcholines. Extremely stable phospholipid vesicles can be produced using long chain fatty acids polymerized in the alpha position.

We have also studied novel synthetic glycolipids incorporated into phospholipid vesicle structures. These synthetic glycolipids modify the lipid phase behavior substantially and produce vesicles which are stable to lyophylization. The details of these studies have been prepared for publication, and are given in the attached preprint entitled "Modification of Lipid Phase Behavior With Membrane Bound Cryoprotectants" by Raymond P. Goodrich, Tracy M. Handel, and John D. Baldeschwieler.



ARO 23471.2-CH

PROPERTIES OF STABILIZED SUB-MICRON PHOSPHOLIPID VESICLES

FINAL REPORT

DR. JOHN D. BALDESCHWIELER

May 29, 1987

U. S. ARMY RESEARCH OFFICE

GRANT NUMBER DAAL03-86-K-0060

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CALIFORNIA 91125

APPROVED FOR PUBLIC RELEASE;

DISTRIBUTION UNLIMITED

I. Statement of Problems Studied:

Submicron vesicles stabilized by disulfide polymerization, and using synthetic glycolipids have been characterized.

II. Summary of the Most Important Results:

The principal focus of research activity under the support Grant No. DAAL03-86-K-0060 has been the characterization of phospholipid vesicles formed with polymerizable disulfide phosphatidylcholines. Structures with the polymerizable groups in both the alpha and terminal positions of the side chain fatty acids have been synthesized and the resulting polymerized structures characterized. We have discovered that it is possible to produce very small and highly stable polymerized micellular structures using short chain phosphatidylcholines. Extremely stable phospholipid vesicles can be produced using long chain fatty acids polymerized in the alpha position.

We have also studied novel synthetic glycolipids incorporated into phospholipid vesicle structures. These synthetic glycolipids modify the lipid phase behavior substantially and produce vesicles which are stable to lyophylizationThe details of these studies have been prepared for publication, and are given in the attached preprint entitled "Modification of Lipid Phase Behavior With Membrane Bound Cryoprotectants" by Raymond P. Goodrich, Tracy M. Handel, and John D. Baldeschwieler.

III List of All Publications and Technical Reports Published:

1. Tracy M. Handel and John D. Baldeschwieler, Proceedings of the Chemical Defense Research Conference, Aberdeen Proving ground, MD. (1985). "Development of Microencapsulation Techniques Using Stabilized Phospholipid Vesicles".

2. Raymond P. Goodrich, Tracy M. Handel, and John D. Baldeschwieler, *Biochimica et Biophysica Acta* (submitted). "Modification of Lipid Phase Behavior With Membrane Bound Cryoprotectants".

Abstracts submitted to the Biophysics Meeting

1. "A Novel Synthetic Glycolipid for Assessing Lipid-Carbohydrate Interactions", Raymond P. Goodrich and John D. Baldeschwieler, California Institute of Technology, Dept. of Chemistry, Pasadena, CA 91125.

2. "Characteriz[illegible] of Disulfide Polymerized Phosphatidylcholines", Tracy M. Handel and John D. Baldechwieler, California Institute of Technology, Dept. of Chemistry, Pasadena, CA 91125.

IV. List of All Participating Scientific Personnel:

Dr. Sean Sullivan (postdoctoral research fellow)
Ms. Tracy Handel (graduate student)
Mr. Raymond Goodrich (graduate student)

END
DATE
FILMED
JAN
1988