AD-A126 139 GORDON RESEARCH CONFERENCE ON DRUG CARRIERS IN BIOLOGY AND MEDICINE 12-16.. (U) RHODE ISLAND UNIV KINGSTON T M CHANG ET AL. FEB 83 DAMD17-82-G-9505 1/1

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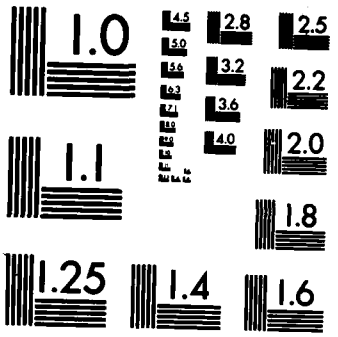

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GORDON RESEARCH CONFERENCE ON DRUG CARRIERS IN BIOLOGY AND MEDICINE

PROCEEDINGS

T.M.S. Chang, Chairman

C.R. Alving, Vice-Chairman

February 1983

(Conference dates July 12-16, 1982)

Supported by

US Army Medical Research and Development Command
Fort Detrick, Frederick, MD 21701

Grant No. DAMD17-82-G-9505

Gordon Research Conferences
University of Rhode Island
Kingston, RI 02881

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A126 139 / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) GORDON RESEARCH CONFERENCE ON DRUG CARRIERS IN BIOLOGY AND MEDICINE	5. TYPE OF REPORT & PERIOD COVERED PROCEEDINGS-- July 12-16 1982
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) T.M.S. Chang, Chairman; C.R. Alving, Vice-Chairman	8. CONTRACT OR GRANT NUMBER(s) DAMD17-82-G-9505
9. PERFORMING ORGANIZATION NAME AND ADDRESS Gordon Research Conferences, University of Rhode Island, Kingston, RI 02881	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Medical Research and Development Command, Fort Detrick, Frederick, MD 21701	12. REPORT DATE February 1983
	13. NUMBER OF PAGES 11
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report) Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Drug carriers

Biology

Medicine

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

Report includes listing of participants and topics discussed at the Gordon Research Conference on Drug Carriers in Biology and Medicine, held July 12-16, 1982, at Plymouth State College-South, Plymouth, New Hampshire 03264.

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PROCEEDINGS OF GORDON RESEARCH CONFERENCE

DRUG CARRIERS IN BIOLOGY AND MEDICINE

July 12-16, 1982
PLYMOUTH STATE COLLEGE-SOUTH, PLYMOUTH, N.H. 03264

Chairman; T.M.S. Chang, Vice-Chairman: C.R. Alving

CONTENTS:

Monday, July 12

Artificial Cells as Carriers; T.M.S. Chang, Session Chairman

T.M.S. Chang, from Artificial Cells and Organs Research Centre, McGill University, 3655 Drummond Street, Montreal, PQ, Canada H3G 1Y6, started the session by introducing the areas of artificial cells as carriers.

A.P. Jarvis, Jr., from Damon Biotech., 115-4th Avenue, Needham Heights, MA 02194, then discussed their studies on microencapsulation of plasma cells for monoclonal antibodies production including methodology.

A.M. Sun, from Islet & Hormone Research, Connaught Research Institute, 1755 Steeles Ave. West, P.O. Box 1755, Station "A", Willowdale, ON, Canada M2R 3T4, discussed their research on implantation of microencapsulated islet cells in diabetic rats, demonstrating that this can control blood glucose for up to three months.

D. Terman, from Department of Medicine, Immunology, Baylor College of Medicine, Houston, TX 77030, discussed their successful preliminary clinical trials of plasma perfusion over protein A collodion charcoal for breast cancer and reviewed their clinical results.

T.M.S. Chang, from Artificial Cells and Organs Research Centre, McGill University, 3655 Drummond Street, Montreal, PQ, Canada H3G 1Y6, discussed two of the areas of research on artificial cells. The present status of artificial cells for the treatment of uremic patients has already reached the stage for large scale industrial production for large scale clinical trial. The use of artificial cells in liver failure has been analyzed in laboratory and animal studies.

Biological Cells as Carriers; G.M. Ihler, Session Chairman

G.M. Ihler, from Department of Medical Biochemistry, Texas A&M University, 110 Herman Heep Building, College Station, TX 77843, discussed their research on the potential uses of erythrocytes as carriers for drugs, enzymes and DNA with emphasis on studies on DNA for possible applications in genetic engineering.

R. Green, from Scripps Clinic and Research Foundation, 10666 North Torrey Pines Road, La Jolla, CA 92037, discussed their results obtained with red cell ghost for delivery of iron chelators.

U. Sprandel, from Medical Polyclinic, University of Munich, Pettenkoferstraße 8a, D-8000 Munich 2, West Germany, discussed their work on the in vivo fate and effects of substances entrapped into erythrocyte ghosts.

Tuesday, July 13

Liposomes as Carriers, G. Gregoriadis, Session Chairman

G. Gregoriadis, from Medical Research Council, Clinical Research Centre, Watford Road, Harrow, Middlesex HA1 3UJ, U.K., described their research on control of liposomes in-vivo.

C. Nicolau, from Recherche CNRS, Centre de Biophysique Moleculaire, Avenue de la Recherche Scientifique, 45045 Orleans Cedex, France, discussed the possibility and possible mechanisms of liposomes for gene-transfer in-vivo.

G. Poste, from Smith Kline & French Laboratories, 1500 Spring Garden Street, P.O. Box 7929, Philadelphia, PA 19101, described the possibilities of liposome immunomodulators in modifying host defense. He also discussed the possible problems related to this approach.

S.H. Kuhn, from Department of Internal Medicine, University of Stellenbosch, Faculty of Medicine, P.O. Box 63, Tygerberg 7505, South Africa, described his collaborative work with Finkelstein and Weissmann on interaction of liposomes with leukocytes.

Antibodies Complexed Carriers, D. Papahadjopoulos, Session Chairman

D. Papahadjopoulos, from Cancer Research Institute, University of California, Parnassus Str. M-1282, San Francisco, CA 94143, discussed the possibilities and laboratory results of antibody-liposome targeting.

I.J. Fidler, from NCI- Frederick Cancer Center, P.O. Box B, Frederick, MD 21701, discussed their studies on liposomes in macrophage activation and eradication.

M. Trudel, from Centre de Recherche en Virology, Institut Armand Frappier, 531 Boul. des Prairies, P.O. Box 100, Laval-des-Rapides, PQ, Canada H7V 1B7, discussed their experimental work on liposome adsorbed viral protein for vaccine. Their conclusion is that this is promising but further work is required.

Wednesday, July 14

Carriers in Enzyme therapy, R.O. Brady, Session Chairman

R.O. Brady, from Developmental and Metabolic Neurology Branch, National Institutes of Health, Building 10, Room #d04, Bethesda, MD 20805, discussed the different strategies for targeting exogenous enzymes for effective replacement therapy in metabolic disorder. Their studies have included the modifications of enzyme molecules for possible targeting.

M. Poznansky, from Department of Physiology, University of Alberta, Edmonton, AB, Canada T6G 2H7, discussed their research on soluble-enzyme albumin polymer demonstrating that this can prevent immunological reaction and continues to act effectively.

F.F. Davis, from Department of Biochemistry, Rutgers, State University of New Jersey, P.O. Box 1059, Piscataway, NJ 08854, discussed enzyme therapy using soluble enzyme-polyethylene glucol conjugates. They have carried out clinical trials which showed promising results.

R.A. Chalmers, from Medical Research Council, Clinical Research Centre, Division of Inherited Metabolic Diseases, Watford Road, Harrow, Middlesex HA1 3UJ, U.K., discussed and compared the potential of hypo-osmotic and iso-osmotic erythrocyte ghosts and carrier erythrocytes as drug and enzyme carriers.

Microcapsules and Microspheres in Experimental Therapy; M. Poznansky, Session Chairman

D.L. Gardner, from Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201, discussed their studies on ingestable microencapsulated urease-zirconium phosphate for urea removal. Clinical trial has been initiated.

I. Sjöholm, from Uppsala Universitets, Biomedicinska Centrum, Institutionen for Farmaceutisk Biokemi, Biomedicum, Box 578, S-751 23 Uppsala, Sweden, discussed enzyme biodegradable microparticles in animal studies demonstrating effective in-vivo activites.

K.J. Widder, from Kendrew Biosystems, Inc., 11180 Roselle Street, Suite A, San Diego, CA 92121, discussed total remission in tumor-bearing rats treated with magnetically directed albumin microspheres. The tumors are implanted in the tails. Magnetic microspheres injected intraarterially in the tail are located by external magnetic field. This successfully suppressed tumor growth.

T. Kato, from Akita University, School of Medicine, Department of Urology, Akita 010, Japan, discussed target directed microcapsules for drug delivery for cancer therapy. They employed large microcapsules for local embolism to tumor site. Their large scale clinical results were promising.

Thursday, July 15

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Carriers for Controlled Release; R.S. Langer, Session Chairman

R.S. Langer, from Biochemical Engineering, Massachusetts Institute of Technology, Department of Nutrition and Food Science, Cambridge, MA 02139, described a number of macroscopic implantable drug release systems.

P.J. Blackshear, from Massachusetts General Hospital, Diabetes Unit, Boston, MA 02114, described drug delivery systems by implantable pump, a number of possible applications were described and discussed.

F. Lim, from Department of Pathology, Medical College of Virginia, Virginia Commonwealth University, MCV Station, Richmond, VA 23298, described microencapsulated insulin for control release studies. This is an in-vitro study only, demonstrating the feasibility for slow release.

C. Hoff, from Laboratory of Medical Biochemistry, Rockefeller University, 1230 York Avenue, New York, NY 10021, described glucose dependent insulin delivery system in which insulin can be released in increasing amounts by increase in glucose concentration.

H.J.-P. Ryser, from Boston University Medical Center, School of Medicine, 80 East Concord Street, Boston, MA 02118, described polycationic drug-carriers for modulation of intracellular drug release - mechanisms of this approach were discussed in detail.

Novel Carrier Systems, E.P. Goldberg, Session Chairman

E.P. Goldberg, from College of Engineering, Department of Materials Science MAE217, University of Florida, Gainesville, FL 32611, described tissue binding drugs for localized chemotherapy.

L.B. Wingard, from Department of Pharmacology, University of Pittsburgh, 620 Scaife Hall, Terrace and deSoto Streets, Pitssburgh, PA 15261, discussed immobilized anti-cancer drugs in cell surface action. This is an experimental approach where drug is immobilized to solid support. His result demonstrates a possible approach to analyze whether the drug being tested can carry out its action without entering the cells.

B. Erni, from Department of Microbilogy Biocenter, University of Basel, Klingelbergstr. 77, CH-4056 Basel, Switzerland, described some very preliminary studies on lipid vesicles incorporated with cell membrane transport carriers extracted from cell membranes.

Friday, July 16

Liposomes in Therapy and Diagnosis, C.R. Alving, Session Chairman

C.R. Alving, from Department of Membrane Biochemistry, Walter Reed Army Institute of Research, Washington, D.C. 20012, described their very successful results on the use of liposomes in leishmaniasis. During discussion, promising results on the use of liposomes in Malaria were summarized.

M.W. Fountain, from Liposome Company, 1-Research Way, Princeton Forrestal Center, Princeton, NJ 08540, described the successful use of liposomes in eradication of brucellosis in-vivo in animal studies.

W.E. Magee, from University of Idaho, Bacteriology/Biochemistry, Life Science Building, Room 14, Moscow, ID 83843, described the therapeutic efficacy of liposomes containing amphotericin B for fungal infections. These studies were carried out in animals.

V.J. Caride, from Hospital of St. Raphael, Yale University, Nuclear Medicine, 1450 Chapel Street, New Haven, CT 06511, discussed the possible use of liposomes in diagnostic imaging.

Closing Remarks

T.M.S. Chang thanked the speakers and session chairmen for their participation.

C.R. Alving, the 1984 Chairman of this Conference, discussed his general plan for the next conference.

GORDON RESEARCH CONFERENCES

DRUG CARRIERS IN BIOLOGY AND MEDICINE

JULY 12-16, 1982
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Chairman: T.M.S. Chang, Vice Chairman: C.R. Alving

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In vivo fate and effects of substances entrapped into erythrocytes	U. Sprandel Univ. Munich

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Liposome immunomodulators in modifying host defense	G. Poste Smith Kline & French Labs.
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Drug Carriers

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Carriers in Enzyme Therapy	R.O. Brady, Session Chairman Nat. Inst. of Health
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Comparison and potential of hypo-osmotic and iso-osmotic erythrocyte ghosts and carrier erythrocytes as drug and enzyme carriers	R.A. Chalmers M.R.C. Clinical Res. Ctr.
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Friday, July 16

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Liposomes in macrophage activation and eradication of metastasis	I.J. Fidler Fred. Cancer Res. Fac.
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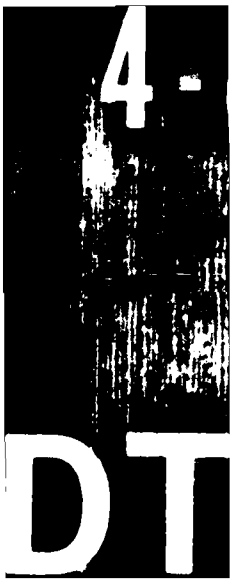
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