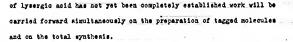
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Outline of Prejosed Study of the Metabolism of d-Lysergic Acid

Diethylamid.

Studies of the metabolism of d-lysergic acid disthylamid (LSD) are complidated by the fact that the effective doses are in micogram quantities. Tagging the molecule with radioactive or with stable isotopes therefore assumes an extraordizary importance since only by this means ... is there any likelihood of obtaining information in a relatively short time. The over-all plan will be to incorporate into the molecule suitable atoms to serve as tags and to administer it to experimental animals in whose tissues the tagged atoms can be identified after various tius periods. By combining several methods of tagging, deductions can be mode as to the fate of the intact molecule or certain fragments of it. This approach requires the coordinated work of a term representing experts from a number of fields. We are fortunate enough to have such a group of trained individuals representing pharmacology, biochemistry, synthetic organic chemistry, and biophysics. The individuals will be named in the sections below in which the activities of the first year of the program are described in broad terms.

Synthesis of LSD and related compounds. The chemical nature of the compound makes it a difficult one to work with. Enowledge of the metabolism of LoD may be gained either by studies of this molecule suitably tagged or by studies of lysergic soid or various derivatives in which isotopes have been introduced at proven locations. Since the structure .



Page 2

Several isotopes show ; romise as possible tags for use in the LSD molecule. Radiocarbon: (carbon 14) and tritium (hydrogen 3) are of exceptional interest because these two elements make up a large part of the molecule. Both can be obtained with very high specific activity and therefore may be able to supply sufficient radioactivity so that microgram quantities can be traced in the body. Heavy nitrogen (nitrogen 15) has many advantages; however, as a ring element, synthesising it into the molecule will be an exceptionally dificult featy.

The synthetic chemical program is under the direction of Dr.

The budget for the synthetic program totals \$7000 and is divided as follows: Safary for **seriors**, \$4500; stipend for graduate student, \$1500; expanses, \$1000.

<u>Ketabolism of LSD and related commonds</u>. The problem is to discover what the body does with LSD. The percentages of a dose of LSD retained in many other organs and tissues of the body will be measured. The pattern of excretion is important. Information as to what chemical alterations are induced by the metabolic activity of cells in the central nervous system or in the liver or in the ruscle vill be sought. / Because it is possible that the clinically notive form is not the molecule that is administered, a search will be made for fragments of the molecule and then if possible a basic body of information will be developed about the metabolism of lysergic acid, perhaps by chemical studies of related molecules. Microtechniques such as paper chromatography may prove to be important. The use of histological radioeutographs should be investigated. Decause of the ability of this molecule to produce schizophrenic-like disorganization in normal humans, the concentration of LSD in the central mervous system will of course have a prime interest. One task will be to discover whether concentration differences axist in various parts of the central merrous system.

The total budget for the netabolism program is \$18,500 and is allotted as follows: Staries, **************, \$5500, *************, \$3000, *************, \$500; apparatus, \$5000; expenses, \$2000; travel, \$500; contingency, \$2000.

Whe over-all budget is thus \$23,500 jus the allowance for university overhead.

Page 3.



MEMORANDUM FOR: THE RECORD

SUBJECT

: Addendum to Subproject 17 and 46

1. The purpose of this addendum is to set forth the mutual administrative responsibilities of the contractor and sponsor.

 The above subprojects represent the research program of Dr. Williams financed under MULIRA, covering the period of 22 October 1955 through 31 October 1955.

3. All of the summary accounting of modes received from the Aund. Also, they requested the return of any unexpended funds received under a grant from the Fand.

 Title to any permanent equipment purchased by funds granted the University shall be retained by the University in Lieu of higher overshead rates.

5. It was mutually agreed that documentation and accounting for travel expenses which are reinformable by the University shall conform with the accepted practices of that Institution.

 It was agreed that technical reports reflecting the progress of the research program shall be submitted at mitually acceptable intervals.

SIDNEY GOTTLIEB Chief TSS/Chemical Division APPROVED: Chief, TSS

Distribution: Orig & 2 - TSS/CD



DRAFT

31 October 1954

MEMORANDUM FOR: THE RECORD

SUBJECT

Original Only

Extension of Time for Froject MKULTRA, Subproject 17

Subproject 17 expires on 31 October 1954. As the work has not yet been completed, an extension of one year is hereby authorized. At the present time no additional funds are required.

APPROVED :

ief. TSS/Chemical Division



CERTIFICATE

March 31, 1954

17-5

This is to certify that I have today received Cashier's check No. M139447 **Cashier Cashier and Cashier**

March 31, 1954

This is to certify that I have today received Cashier's check No. M139442

C≯

17-6 MEMORANDUM RECEI MAR 3 1 1954 DATE TC: FROM: SUBJECT: I hereby acknowledge receipt of the following: CHECK HUSSAN THE AMOUNT OF \$420.00 RECEIVED. signed copy(les) of this receipt Please return SIGNATURE OF RECIPIENT nuch 31 DATE RECEIVED FORM NO. 38-68 -

19 March 1954

NEMORANDUM FOR: CEIEF, FIRANCE DIVISION - 400 000 000 VIA:

TSS/Bulget Officer

SUBJECT

Subproject 17, Project MRULITA, Invoice # 2, Alletment 4-2502-10

Invoice # 2 for Subproject 17 of Project HXULTRA is 1. attached. This invoice is the final one to be submitted under Subproject 17 and when paid, constitutes complete payment of this project. It is requested that poyment be made by two cashier's checks whie out to the order of " the the in the smounts of \$18,700.00 and \$748.00. The checks should be sent to Chief, TSS/CD through TGS/Budget Officer by 1 April 1954.

The two involces covering this Subproject aggregate \$29, 2. 172.00 and represent the total expenditure to be mode under this Subproject. It is requested, therefore, that files on this Subproject be closed.

> SIDEN GOTTLIE Chief Chemical Division, 738

Attochments: Invoice # 2 - Subproject 17 Certifications

T33/CDr (19 Morch 1954)

Distribution: Addressee - Orig. & 2 v/attachments Comptroller - 1 -> T33/Bulget - 1 TS3/CD - 2 1 148.00 4/394 CHECK##139472IN THE AMOUNT OF \$ \$ 2100.00 RECEIVED.

WAR 2 1 1954

For services rendered in connection with MXULIRA Subproject 17. Detailed breakdown and receipta on file in TSS/CD.

Invoice

.

.\$19,448.00

ERTIFICATIONS (1) "It is hereby certified that this is Invoice No. 2 applying to Subproject 17 of Project MULITA, that technical performance by antis satisfactory, that the work is being accomplished in acsordance with the mutual agreement reached with an entry that - (been made. and a second 127 V. 1229 ... 100 0 H & 10 1 I Same and it is a lost in 1 44 . 18 m . 18 1 SIDESY GOPPLIKE Chief, TOS/CD to a clifficture station that has not (2) "It is hereby certified that this invoice applies to Subproject 17 under Project MULTRA which was duly approved and that the project is being carried out in accordance with the DD/P memoranium to DCI dated 3 April 1953, the DCI memorandum to DD/A dated 13 April 1953, and the DCI memorandum to the DD/A dated 19 June 1953. 14 St. 1240. 1 40 Dates earch Director (3) "It is hereby certified that the scope of the program of Subproject 17 of Project MILLINA has been approved. STOG. Sea 'Y ... I CERTIFY THAT FINING APP AT THANKS 02581 OBLIGATION P. CHARGE TO ALLOT 4-2502-10.001 MAR 2.2 INTR AVALUATION OF

Financial Statement for the LSD Project (Statement as of March 2, 1954.

ρ

| | Total Expenditures | Total Budget | Amount Remaining | · |
|------------------------|-----------------------|-----------------|---------------------|----|
| Salaries | 2,033.32 | 9,000.00 | 6,966.68 | |
| Permanent Iquipment | 1,921.25 | 5,000.00 | 3,078.75 | |
| Materials and Supplies | 137.09 | 2,000.00 | 1,862.91 | - |
| Travel | | 500.00 | 500.00 | -4 |
| Overhead | 2,550.00 | 2,550.00 | ~ | 15 |
| Contingencies | 450.00 | 2,000.00 | 1,550.00 | · |
| Dr | 1,136.31 | 7.000.00 | 5,863.69 | 3 |
| TOTAL | 8,227.97 | 28,050.00 | 19,822.03 | |

2 pyment

Total Received to date 7,012.50 Expenditures to date 8,227.97

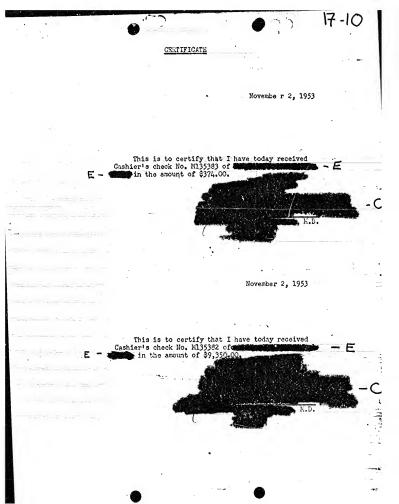
BALANCE

1,215.47 (deb11)

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since this

MEMORANDUM RECEIPT 2 Movember 1953 TO: TSSECD FROM: Budget/TSS 17 SUBJECT: Two Checks I hereby schnowledge receipt of the following: Check #1135382 in the amount of \$9,350.00 and check #1135383 in the amount of \$371,00 made payable to **experimentation** and the payable to **experimentation** and the amount 17, Project MAULTRA. signed copy(ies) of this receipt SIGN DATE RECEIVED RM NO: 38-66 MAR 1949



26 October 1953

ATTERY COTTLIER

XENORADOM FOR: CAISP, 7IEANUS DIVISION C - VIAL TOS/Budget Officer SUBJECT: Invoice No. 1, Subgroject 17, Project MOLITIA - C

Invoice Ho. 1 for Subproject 17 of Project MCMITAN is strached. It is requested that payment be made by two cashier's checks in the amounts of \$9,350.00 and \$374.00 made out to **Institute Street**. The ---checks should be sent to Chief, CD/TH3 through TE3/241get Officer not later than 30 October 1953.

MEMORANDUM RECEIPT

A 151 .

2 November 1953

DATE RECEIVED

TO: TSSECD -

. . .

FROM: Budget/TSS ...

SUBJECT: Two Checks

I hereby acknowledge receipt of the following:

Section 2 to an Very Section

Check #M135382 in the amount of \$9,350.00 and check #M135383 in the amount of \$371.00 made payable to amount the amount of \$371.00 made payable to amount the second secon

(ease return ______ signed copy(ies) of this receipt a

TO ______ FORM NO. 36-66

26 October 1953

MEMORANDUM FORI CHISP, FIRANCE DIVISION TSS/Bulant Officer Invoice No. 1, Subproject 17, Project HallARA SURTEC

Invoice No. 1 for Subproject 17 of Project MXILTEA is attached. It is requested that payment be made by two cashier's checks in the amounts of \$9,350.00 and \$374.00 made out to **State State State**. The _ checks abould be sent to Chief, CD/T33 through TS3/Julget Officer not later than 30 October 1953.

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5,00 m . 12

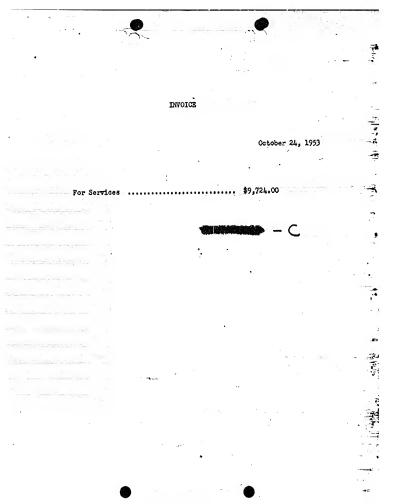
SIDNEY GOTTLIEB Chief Chemical Division, TS3

Attachments: Invoice Certifications

Distributions Addressee • Orig. & 1 Comptroller • 1 T35/Budget • 1 C35/Sagistry • 1 Exce. Sec'y., Ses. Bi. • 1 T35/C9 • 2



CERTIFICATION. (1) "It is hereby cartified that this is Invoice No. 1 applying to subproject 17 of Project MAULTPA, that technical performance by the is estisiactory, that the work is being accomplished in Eccordance with the mutual agreement reached with chapter that this bill is just and correct and that payment thereof has not yet been made. STORY CONTRES Chief, CD/TSS" (2) "It is hereby certified that this invoice applies to subproject 17 under Project MALITRA which was duly approved and that the project is being carried out in accordance with the DD/? memoranium to DCI dated 3 April 1953, the DCI memorandum to DD/A dated 13 April 1953, and the DCI memorandum to the DD/A dated 19 June 1953. Inter Remarch Director (3) "It is hereby certified that the scope of the program of subproject 17 of Project MOLTRA has been approved. Date: Exec. Sec'y., Res. Bl.



22 Ostober 1953

| HENORARDUM FOR | CONTROLLER . | | | | | | |
|----------------|--------------------------------|--|--|--|--|--|--|
| ATTZNTION: | Finance Division | | | | | | |
| SUBJECT: | Project HAULTRA, Subproject 17 | | | | | | |

Under the authority granted in the memoranius dated 13 April 1953 from the DCI to the DD/A, and the further authority granted in the memoranius dated 17 April 1953 from the DD/A to the Comptroller on the subject, 'DD/P-M35 Project HKUETRA', and the memoranium dated 19 June 1953, from the DCI to the DD/A extending the authority to cover Fiscal Year 1954, Subproject 17 has been approved, and #29,172.00 of the over-ell Project HKUETRA funds have been obligated to cover the subproject's expenses.

> SIDERY COTTLIES Chief Chemical Division, 753

PROGRAM APPROVED AND RECOMMENDED: APPROVED FOR OBLIGATION OF FUNDS:

Sesearch Director

Dates

ACT 2 S FN

Regardon Chairman Ditet Distributions Addresson = Oriz. & 2 Ezeo. Sec'y., Ros. Dd. - 1 TS3/Bulget - 1 (4-2502-10), T30/Registry -1 733/00 + 2

MEMORANDUM FOR THE RECORD

SUBJECT: Project MKULTRA, Subproject 17

1. The scope of this research program is intended to cover work to be done with LSD and related compounds by the project will be banked through the period ending 31 October 1954. The project will be banked through the period ending 31 October 1954. The project will be banked to the period ending to the

DRAFT

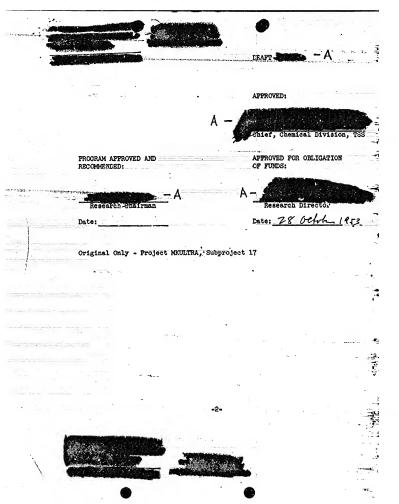
2. The general object of this project is aimed at elucidation of the site and mech them of action of LSD by the use of isotopically tagged molecules. I least three major advantages will accrue from such knowledge. First, such data should greatly facilitate the development of a suitable antichote for LSD; in addition, they should make it possible to design new compounds having like but even more bizarre activities; and finally; fundamental knowledge of the psychotherapeutic action of drugs will be made available for future development

3. constant group of scientists of international reputstion encompassing the fields of physical and organic chemistry in addition to those of medicine and psychology. He plans to use these people as informal consultants in the vork.

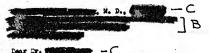
4. The funds for this project include \$7,000.00 for the synthetic work on tagged LSD, \$18,500.00 for the metabolic studies on such compounds, \$2,550.00 for the 10% University overhead charge, and \$1,122.00 for a 45 service charge by **metabolic studies** — C. Therefore, the total cost of this investigation will not exceed \$29,172.00 for the period ending 31 October 1954.

5. This project will be completely unclassified after it leaves .





September 30, 1953



Exclosed pieces find an outline of a proposed study of the metabolism of d-lysergic Acid Disbyland. This outline is somebod in general terms bocause all of us feel that as we open the investigation we would like to have our objectives in general terms rather than in specific cases. If it is important to you, present one artise out a detailed statement of the first steps that be is going to take with the aid of Dr. Genera and I can drow you a detailed $\ll -0$ description of first experiment we would like to do in the metabolic program.

Or: .exportant question is the source of lycengic sold and derivatives. Do you have any suggestions as to people we might write to or commanies that would be interested in collaborating with ds, at least to the system of providing economical

Another problem has to do with the report system. Our first preference would be to achests an annual report. It scenes to us that such a study so we are proposing about not be undertaken for a period of less then three years. Is it yestble that you or scenese from your office sould wist us so that we would have a better ties of how we are arguested to furnish information.

"The overland cost of sponsored research at the University Commission -B is consider each year for both the Collage of Arts and Science (organic chemistry) and the Maital School (phermacology). On cost-rointuresensis contracts, the overherd is expressed as a percentage of solaries and woges and the roises for the collection Proper 1953 are done in the Arts College and Woges and the roise for the collection grants-in-sid from foundations, mational societies and organizations, it is the policy of the University to accest the established overhead policy of the granting approx. Whos such policy provides less than the University's overhead octs a direct charge is made to the grant for the University's overhead oct a expressed as a percentage of solaries and wages for the colordor year 1953 the expressed as a percentage of solaries and wages for the colordor year 1953 the

Sentember 30, 1953 Since the study of the metabolism of LSD implies to me opening the possibility of developing a chemo-there watte agent for montal disease, I can assure you that the problem seems to no to have a first-rank importance. I can secure you that it is with kose anticipation that this program will be undertaken by our group. There may be a number of aspects about this proposal that need to be discussed. I errect to be in Kashington briefly I have I have the opportunity of talking with you if you no desire. Yours wary truly. Inclosure

wsh 312.31 PROPOSED BUDGETS \$7.000 Synthetic Program Salary for Dr. 4,500 1,500 Graduate student 1,000 Expenses \$18,500 Metabolism Program Salaries \$5,500 (director of program) Dr. 3,000 (part-time) Dr. (biophysical parts Dr 4 500 of investigation) 5,000 Apparatus 2,000 Excenses 500 Travel Contingency 2,000 \$25,500 plus allowance for university overhead

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9 December 1953

VENORANDUM FOR: LASO DD/P/TSS

SUBJICT:

Request for Services of

3. Other possible means of initiating clearance of **contracts** and discarded mainly because they would jecpardize the security of "cut-outs" and cover stories used in the past - with this subject.

4. It is requested that action be taken in this matter as soon as possible and that the completed form be returned to CD/TSS.

Chamical Civision, TSS

APPROVED:

Chief, Chemical Civision, TSS

Listribution: Addressee - Orig. 2-1 CD - 1 V CD Chrono





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