

Exhibit K

Chemical Compounds Used in Human Testing at EDGEWOOD ARSENAL (1955 to 1975) *APPROVED DRUGS/CHEMICALS

- I. Anticholinesterase
- Diisopropyl fluorophosphate (DFP)
 - Hexa fluorenium (Mylaxen)
 - Physo stigmine salicylate (Eserine)
 - Prostigmine (Neostigmine)
- II. Anticholinergic
- Atropine sulfate
 - Atropine methylnitrate
 - Benztropine mesylate (Cogentin)
 - Homatropine
 - Methscopolamine bromide (Pamine)
 - Scopolamine hydrobromide
 - Trihexyphenidyl HCl (Artane)
 - Benactyzine HCl
- III. C.N.S. Active Drugs
- Caffeine
 - Chlorpromazine (Thorazine)
 - Diazepam (Valium)
 - Ethyl alcohol
 - Fluphenazine (Prolixin)
 - Ipremazid (Marsilid)
 - Meprobamate
 - Methylphenidate (Ritalin)
 - Prochlorperazine (Compazine)
 - Reserpine
- IV. Adrenergic Agonist/Antagonist
- Dextroamphetamine (Dexedrine)
 - Epinephrine (Adrenalin)
 - Isoproterenol HCl (Isuprel)
 - Methoxamine hydrochloride (Vasoxyl)
 - Phenoxybenzamine HCl (Dibenzyline)
 - Propranolol HCl (Inderal)
- V. Cholinomimetic
- Bethanechol Chloride (Urecholine)
 - Methacholine chloride (Mecholyl Chloride)
- VI. Antihistamine
- Diphenhydramine (Benadryl)
 - Tripelennamine (Pyribenzamine)
- VII. Oxime
- Pralidoxime Chloride (Protopam)
- VIII. Barbiturates
- Amobarbital (Amytal)
 - Pentobarbital (Nembutal)
 - Phenobarbital
 - Secobarbital (Seconal)
- IX. Vasodilater
- Amyl Nitrite
 - Sodium Nitrite
- X. Miscellaneous (Others)
- Adrenocorticotropic Hormone (ACTH)
 - Ammonium chloride
 - Curare (Tubocurarine)
 - Dapsone (U.S.P.)
 - Digoxin (Lanoxin)
 - Heparin
 - Lidocaine
 - Nitrogen Mustard (Mustard)
 - Phenytoin Sodium (Dilantin)
 - Propylene glycol
 - Sodium Bicarbonate
 - Thiamine (U.S.P.)

*Information retrieved from Biomedical Laboratory records - February 1977

Chemical Compounds Used in Human Testing at EDGEWOOD ARSENAL (1955 to 1975) *EXPERIMENTAL COMPOUNDSI. Anticholinesterase

EA 3148
 Diisopropyl phosphorofluoridate (DFP)
 GF
 G-V
 Malathion
 Sarin (BG)
 Soman (GD)
 Tabun (GA)
 Tetrahydrominoacridine (THA)
 VX

II. Anticholinergic

EA 2277 CS4030 (BZ)
 EA 3167
 EA 3443
 EA 3580
 EA 3834
 R 4929
 27349
 226086
 301060
 302196
 302282
 302368
 302537
 302668
 Benactyzine Toxogonin Atropine (TAB) (BTA)
 Ditrane

III. LSD Analogs

EA 1729, EA 1653, EA 3528 (LSD)
 Acetyl lysergic acid diethylamide (ALD)
 Brom-lysergic acid diethylamide (BOL)

IV. Oximes

Pralidoxime methane sulfonate (P2S)
 Toxogonin
 TMB4

V. Irritants

EA 1778
 EA 1779
 EA 2097
 EA 2542
 EA 3547
 EA 4923
 CA
 CN
 CS
 T792
 T792DM
 Other Irritants

VI. Miscellaneous (Incaps)

EA 1476
 EA 2233
 218437
 219362
 220548
 302034
 302089
 302582
 Phenylcyclohexyl Piperidene
 Monohydrobromide (Sernyl)

VII. Simulants

DEP
 DMHP

VIII. Miscellaneous (Others)

5-hydroxy tryptamine (5HTP)
 N-Octylamine
 Nitrogen dioxide
 Para-amino benzoic acid (PABA)

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CANDIDATE COMPOUNDS AND STANDARD AGENTS TESTED IN MAN
(IRRITANT PROGRAM)

CONTRACTOR COMPOUNDS

1. 118055-1
2. 118539-2
3. 118609-2
4. 119135-4
5. 119400-2
6. 123175-8
7. 126312-12
8. 301021-2
9. 302049-2
10. 7498-99A-9

CS COMPOUNDS (COMMERCIAL SOURCE)

- | | | |
|-----------------|-----------------|-----------------|
| 1. CS 1086-2 | 33. CS 39241 -2 | 64. CS 42740 -2 |
| 2. CS 2127-2 | 34. CS 39242 -2 | 65. CS 42818 -2 |
| 3. CS 4659-0 | 35. CS 39666 -2 | 66. CS 42822 -2 |
| 4. CS 5146-2 | 36. CS 39715 -2 | 67. CS 42824 -2 |
| 5. CS 5616-2 | 37. CS 40320 -1 | 68. CS 42984 -2 |
| 6. CS 5635-4 | 38. CS 40325 -2 | 69. CS 42985 -2 |
| 7. CS 14632-2 | 39. CS 40331 -2 | 70. CS 43000 -2 |
| 8. CS 15442-2 | 40. CS 40332 -2 | 71. CS 43001 -2 |
| 9. CS 18692-2 | 41. CS 40679 -2 | 72. CS 43010 -2 |
| 10. CS 20409-2 | 42. CS 40683 -2 | 73. CS 43013 -2 |
| 11. CS 23653-2 | 43. CS 40686 -2 | 74. CS 43014 -2 |
| 12. CS 24302-2 | 44. CS 40781 -2 | 75. CS 43109 -2 |
| 13. CS 27474-0 | 45. CS 40785 -2 | 76. CS 43166 -2 |
| 14. CS 29780-2 | 46. CS 40804 -2 | 77. CS 43168 -2 |
| 15. CS 30747-0 | 47. CS 40805 -2 | 78. CS 43169 -2 |
| 16. CS 30748-2 | 48. CS 40806 -2 | 79. CS 43320 -2 |
| 17. CS 30749 -2 | 49. CS 40841 -2 | 80. CS 43331 -2 |
| 18. CS 30785 -2 | 50. CS 40849 -2 | 81. CS 43945 -2 |
| 19. CS 30799 -2 | 51. CS 40850 -2 | 82. CS 43974 -2 |
| 20. CS 30800 -2 | 52. CS 41377 -1 | 83. CS 43981 -2 |
| 21. CS 31979 -2 | 53. CS 41458 -2 | 84. CS 43988 -2 |
| 22. CS 36273 -2 | 54. CS 41462 -2 | 85. CS 43989 -2 |
| 23. CS 36579 -3 | 55. CS 41468 -2 | 86. CS 44354 -1 |
| 24. CS 36650 -2 | 56. CS 41592 -2 | 87. CS 45514 -2 |
| 25. CS 36667 -2 | 57. CS 41623 -2 | 88. CS 45659 -2 |
| 26. CS 36722 -2 | 58. CS 41722 -2 | 89. CS 46345 -2 |
| 27. CS 37149 -2 | 59. CS 41725 -2 | 90. CS 46398 -2 |
| 28. CS 37200 -2 | 60. CS 42055 -2 | 91. CS 47137 -2 |
| 29. CS 37270 -2 | 61. CS 42057 -1 | 92. CS 47148 -2 |
| 30. CS 38355 -2 | 62. CS 42213 -2 | 93. CS 47563 -2 |
| 31. CS 38731 -2 | 63. CS 42216 -2 | 94. CS 48418 -2 |
| 32. CS 38756 -2 | | |

Continued on pg 2.

CS COMPOUNDS (COMMERCIAL SOURCE) Continued:

- 95. CS 48861 - 2
- 96. CS 61804 - 2
- 97. CS 815799 - 25

EA COMPOUNDS (EDGEWOOD ARSENAL SOURCE)

- 1. CS (EA 1779) - 1
- 2. FOGOILCS (EA 1779)
- 3. EA 2097 - 32
- 4. EA 2129 - 4
- 5. EA 2214 - 4
- 6. EA 2542 - 15
- 7. EA 2284 - 2
- 8. EA 2302 - 2
- 9. EA 2305 - 0
- 10. EA 2329 - 2
- 11. EA 2366 - 0
- 12. EA 2413 - 1
- 13. EA 2433 - 2
- 14. EA 3176 - 2
- 15. EA 3437 - 2
- 16. EA 3365 - 17
- 17. EA 3547 - 79
- 18. EA 4922 - 6
- 19. EA 4923 - 17

EA 1779 - 30

Chemical Compounds used in Human Testing at EDGWOOD ARSENAL (1955 to 1975) *
 (Number in parenthesis shows number of human subjects who received drug/chemical)

<u>Used Drugs/Chemicals</u>	<u>Investigative Drugs/Chemicals</u>
I. <u>ANTICHOLINERGIC</u> (519) Scopolamine (519)	I. <u>ANTICHOLINERGIC</u> (850) 3167 (2) 302196 (52) 3443 (101) 302282 (8) 3580 (132) 302368 (5) 3834 (164) 302668 (29) 218437 (8) BZ(2277, 4030) (276) 226086 (23) Ditran (10) 301060 (29) 219362 (11)
II. <u>BARBITURATES</u> (145) Amytal (41) <i>p 52</i> Nembutal (25) Phenobarbital (21) <i>p 53</i> Seconal (58)	IV. <u>ANTICHOLINESTERASE AGENTS</u> (1042) 3148 (32) GD (78) Malathion(10) GA (25) GF (21) VX (418) GB (111) G-V (347)
III. <u>DIAGNOSTIC</u> (120) Antipyrine (16) <i>p 21</i> BSP (Sulfobromophthaleim) (14) <i>p 24</i> ICG (Indocadio green) (34) PAH (Sodium Aminohippurate) (56) <i>p 57</i>	V. <u>ANTIDOTES</u> (77) BOL (5) Metatropine (15) THA (15) BTA (24) 4929 (18)
IV. <u>ANTICHOLINESTERASE AGENTS</u> (161) DFP (12) Physostigmine (Eserine) (125) Prostigmine (24)	VI. <u>OXIMES</u> (139) P2S (53) TMB4 (50) Toxogonin (56)
V. <u>ANTIDOTES</u> (409) Atropine (319) Benactyzine (16) Homatropine (4) Sodium Nitrite (6) Vasoxyl (3) Methscopolamine (61)	VII. <u>IRRITANTS</u> (1648) T792 (26) 5547 (53) DMHP (55) 1778 (28) 4923 (9) DEP (4) 1779 (2) CA (6) T792DM (29) 2097 (8) CN (17) 2542 (15) CS (893) Other Irritants (503)
VI. <u>OXIMES</u> (245) Protopam Chloride (245)	VIII. <u>MISCELLANEOUS (INCAPS)</u> (873) 1729,1653,3528(LSD) (399) 1476 (35) 302089 (33) 2233 (all isomers) (213) 27349 (50) 302537 (18) 218437 (8) 302582 (18) 219362 (11) Nitrogen Dioxide (3) 220548 (32) Sernyl (6) 302034 (44) ALD (LSD-inactive analog) (3)
IX. <u>MISCELLANEOUS (OTHER)</u> (912) Adrenalin (5) Lanoxin (6) Alcohol (125) Lidocaine (16) Amyl Nitrite (20) Maisilid (2) Artane (2) Mecholyl Chloride (8) Ammonium Chloride (5) Meprobamate (36) Benadryl (5) Mylaxin (9) Caffeine (52) PABA (2) Compazine (2) Propylene glycol (38) Cogentin (7) Prolixin (22) Curare (7) Pyribenzamine (1) Dapsone (2) Reserpine (2) Dexedrine (64) Ritalin (99) Dilantin (4) Sodium Bicarbonate (5) Dibenzylamine (2) Thiamine (86) Heparin (68) Thorazine Inderal (4) (chlorpromazine) (82) Isuprel (3) Urecholine (11) Valium (111) ACTH (1)	IX. <u>MISCELLANEOUS (Others)</u> (178) 5HTP (21) Mustard (119) N-Octylamine (38)

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2-1

TABLE OF CONTENTS
(confidential compounds)

	<u>Page No.</u>
EA 3167 3148 3167	1
EA 3443	2
EA 3580 3534	3
301,060	4
302,196	5
302,215	5a
220,584	
226,086	

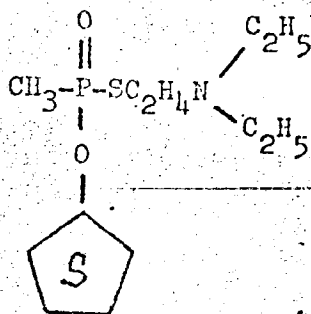
CONFIDENTIAL

CONFIDENTIAL
UNCLASSIFIED

EA 3148

TF 9003

T 2606

 $C_{12}H_{26}NO_2PS$ $PNSO_2C_{12}H_{26}$

(OVER)

Phosphonothioate, methyl-, O-cyclopentyl S-(2-diethylaminoethyl)

Phosphine oxide, cyclopentylthio(2-diethylaminoethyl)-methyl-

M.W.: 279.38

B.P.: 111 - 113° at 50 - 55 u

Refractive Index: n_D^{25} 1.4930-32Prep.: Cyclopentyl methylphosphonothioic
Aid reacted with diethylaminoethyl chloride

(from data sheet - loaned from Tox Screening Br)

CHEMICAL TYPE: ORGANOPHOSPHORUS ESTER

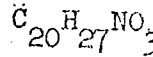
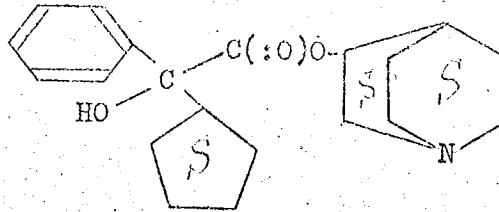
PHARMACOLOGIC TYPE: ANTICHOLINESTERASE

UNCLASSIFIED

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EA 3167

Mandelate, α -cyclopentyl-, 3-quinuclidinyl



EA 3167

TF 9194

3-Quinuclidinol, α -cyclopentylmandelate

Mol. wt. 329.4

CHEMICAL TYPE: GLYCOLATE

PHARMACOLOGIC TYPE: ANTI-CHOLINERGIC

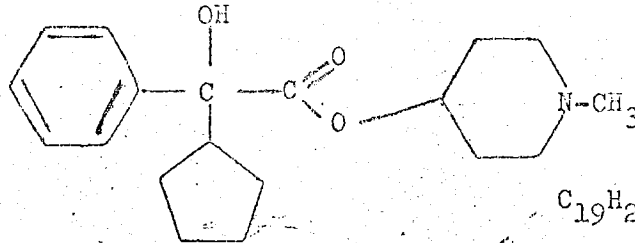
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CONFIDENTIAL

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EA 3443

Mandelate, α -cyclopentyl-, (1-methyl-4-piperidyl),
isomer II (from d-ester and the piperidinol)



TF 11,775

TIC 3632

(1-Methyl-4-piperidyl) cyclopentylphenylglycolate,
isomer II (from d-ester and the piperidinol)

$C_{19}H_{27}NO_3$

$NO_3C_{19}H_{27}$

CHEMICAL TYPE: GLYCOLATE

PHARMACOLOGICAL TYPE: ANTI-CHOLINERGIC

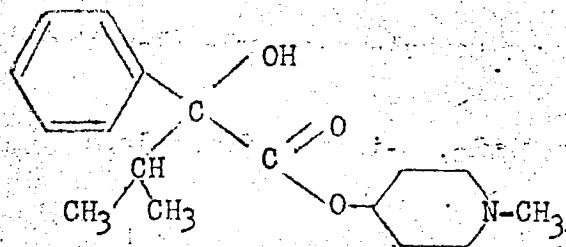
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EA 3834 B

Mandelate, α -isopropyl-, (1-methyl-4-piperidyl)



$C_{17}H_{25}NO_3$

$NO_3C_{17}H_{25}$

TF 10,638

N-Methyl-4-piperidyl isopropylphenyl-
glycolate

TIC 3038

DC 1405

Butyrate,

(OVER)

T 3436

Mol. wt. = 291.391 (over)

Butyrate, α -hydroxy- β -methyl- γ -phenyl- (1-methyl-4-piperidyl)

4-Piperidinol, 1-methyl-, α -isopropylmandelate

Mol. wt. ratio 1/1.25

CHEMICAL TYPE: SUBSTITUTED HYDROXY ACETATE

PHARMACOLOGIC TYPE: ANTI-CHOLINERGIC

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