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B. Computerization Reports from Gill Associates, Inc
C. Ten Sample Unit Records
D. Print-Out of Sample Thesaurus
CHEMICAL AGENT RETRIEVAL SYSTEM

A Comparative Analysis of Minicomputers and Large Scale Computers

Report to:
U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
DEPARTMENT OF THE ARMY

Prepared for:
ASSOCIATE CONSULTANTS, INC.

GILL ASSOCIATES, INC.
MANAGEMENT CONSULTANTS
April, 1981
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I. INTRODUCTION

This report satisfies a special request made by USAMRDC personnel for a discussion paper on the advantages and disadvantages of minicomputers versus large-scale machines. The request was made, and subsequent analysis performed, in order to help determine the best computer architecture and philosophy to be used in Phase I and Phase II implementation of the chemical agent information retrieval system.

The document addresses some of the essential differences between large machines and minicomputers as they relate to the characteristics of the applications to which they are to be applied. With this information, USAMRDC personnel (responsible for establishing information systems and computer policy) will have both justification for the use of minis in particular situations and a framework for selecting the proper data processing environment, large machine or mini, for implementing the chemical data base.

The trend toward centralization of computing was set in motion in the early 1970's when analysts found that a few large computers could do the work of several small or medium ones for less money. A perennial lack of qualified computer specialists reinforced this significant cost benefit, and the emergence of data base technology that enabled report integration on its operation further fueled the flames of centralization.

More recently, however, evidence suggests that this path is not necessarily a good one. Service levels seem to be deteriorating; users complain that data centers are lethargic and nonresponsive, and
centralization of computer facilities all too often runs against the
decentralized operations preferred by many organizations. In addition,
there have been difficult administrative problems in forging formal
coordination and control policy for the centralized computer organiza-
tion. Some of these problems could be viewed as transitional; others
are more fundamental. For example, in order for centralized computing
to be effective, executive management must be willing to endorse and
enforce standardized data processing project development.

As a consequence of these administrative and organizational dif-
ficulties, a burdening question confronts management: Are the measur-
able economic benefits of centralized computing worth the side effects?
Developments in minicomputer technology have dramatically changed the
economic and organizational variables. Today minicomputers are avail-
able for a fraction of the cost of large computers and can be oper-
ated with less specialized support than the large ones require. This
not to imply that minis are going to replace large mainframes in the
near future. The implication is, however, that technology has matured
to the point where the costs of using a mini for certain data proces-
sing jobs compare favorably with using a portion of the capacity of a
large machine.

In order to take advantage of minicomputer technology, management
must first understand its status and its potential, since it is manage-
ment that must provide the initiative, the support, and the guidance
for its implementation. Three areas of concern are addressed in pro-
moting this understanding:

- Examination and assessment of the capabilities of minis as
  opposed to those of more familiar medium and large computers,
- Illustration of a range of options for effective use of the new technology, and
- Assimilation of mini technology into an organization outlining management action guidelines.
II. EXAMINATION AND ASSESSMENT

A minicomputer cost approximately $50,000 for a typical business application and can perform a amount of the work of computers costing $2,000,000. In Table 1, the key architecture and design characteristics of large, medium, and small computers have been outlined along with assessment of the managerial significance of these differences. Data provided in this table are based upon industry averages and a representative group of computers from each category.

Two general observations can be drawn from this exhibit. First, through the minicomputer is not as "powerful" as the large or medium computer, it is surprisingly close, given the substantial price differentials. One reason for this closeness is that it has been possible to utilize new hardware technology considerably earlier in minis than in large machines because there is a smaller investment in hardware and software design for a mini. Consequently, a vendor can produce and integrate a new mini into his line much more rapidly than a large computer.

Since an important characteristic of new technology in the computer area has been rapidly decreasing cost, the price for a given amount of power in minis has been lowered consistently and quite rapidly. For example, in 1965 it cost $25,000 to purchase a machine with 4,096 16-bit words and a 2-microsecond cycle time. Because of advances made in microtechnology, by 1974 it cost only $1,990 to purchase a machine with these capabilities.
The second general observation concerns software. Large machine software is more advanced, and thus applications with substantial multiprogramming or shared multipurpose data bases require a large or medium machine. However, minicomputer manufacturers have recognized that one of their next big markets is the end-user business application, and so over the past two years they have begun to make substantial investments in software developments. As a result, it is now possible to use minicomputers as easily as it is large machines for many business applications.

In fact, it seems that the industry is now moving into an evolutionary stage where what is needed is increased investment in people for application programs and software development—not breakthrough in technology. This will become clear as the services that minis can provide, and the steps management must consider in attempting to assimilate them into the organization, are discussed.
### Table 1. Technical comparison of large, medium and minicomputers

<table>
<thead>
<tr>
<th>Key Computer Architecture Characteristics</th>
<th>Large Computer</th>
<th>Medium Computer</th>
<th>Minicomputers</th>
<th>Effect</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word length</td>
<td>32 bits (a bit is equivalent to a binary digit)</td>
<td>32 bits</td>
<td>16 bits</td>
<td>Size of readily addressable program or data areas is restricted. Instruction repertoire is smaller.</td>
<td>Efficiently implemented higher level languages are hard to provide, thus only a few exist. Large applications execute less efficiently and are harder to program.</td>
</tr>
<tr>
<td>Maximum memory size</td>
<td>8,400,000 bytes (a byte consists of 8 bits which provides enough binary digits to represent one numeric or alphabetic character)</td>
<td>524,000 bytes</td>
<td>262,000 bytes</td>
<td>Multiprogramming (the ability to execute programs simultaneously) is restricted. Substantial manipulation of large arrays of data is restricted.</td>
<td>The multiprogramming limitation is not significant, since minis are relatively inexpensive and can thus be dedicated to one or a few applications.</td>
</tr>
<tr>
<td>Data capacity:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory path (width of the link between the main memory and central processor)</td>
<td>64 bits</td>
<td>16 bits</td>
<td>16 bits</td>
<td>Execution is less efficient.</td>
<td>The data capacity architecture of the large computer makes it more effective for large data processing demands in a multipro-</td>
</tr>
</tbody>
</table>
Table 1. (cont'd)

<table>
<thead>
<tr>
<th>KEY COMPUTER ARCHITECTURE CHARACTERISTICS</th>
<th>LARGE COMPUTER</th>
<th>MEDIUM COMPUTER</th>
<th>MINICOMPUTER</th>
<th>EFFECT</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Capacity (cont)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interleaving (ability to simultaneously access more than one part of main memory)</td>
<td>4-way (as many as 3 input/output (I/O) channels &amp; the central processor can be simultaneously transferring data to and from main memory)</td>
<td>None</td>
<td>None</td>
<td>Overlap of program execution and I/O data transfer is restricted (compared</td>
<td>Minicomputer vs. medium &amp; large computers</td>
</tr>
<tr>
<td>Number of channels (channels operate the I/O devices)</td>
<td>Many</td>
<td>A few</td>
<td>One</td>
<td>Configuration and overlap of activity of I/O devices are restricted</td>
<td></td>
</tr>
<tr>
<td>I/O channel data (the rate that data can be transferred across all channels to main memory)</td>
<td>16,000,000 bytes/second</td>
<td>2,400,000 bytes/second</td>
<td>2,160,000 bytes/second</td>
<td>Simultaneous transfer of data from multiple I/O devices is restricted (compared with the large computer)</td>
<td></td>
</tr>
<tr>
<td>Processor architecture:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central processor unit cycle time (how fast instructions can be carried out)</td>
<td>80 nanoseconds (1 nanosecond = 1 billionth of a second)</td>
<td>275 nanoseconds</td>
<td>300 nanoseconds</td>
<td>Instruction execution is slower compared with large computer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The mini is restricted to applications requiring substantial processing activity; such activity is not</td>
</tr>
</tbody>
</table>
Table 1. (cont'd)

<table>
<thead>
<tr>
<th>KEY COMPUTER ARCHITECTURE CHARACTERISTICS</th>
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<th>MEDIUM COMPUTER</th>
<th>MINICOMPUTERS</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE (cont'd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory cycle (how fast instructions or data can be retrieved from main memory; it should be considered together with the width of the memory path)</td>
<td>480 nanoseconds</td>
<td>800 nanoseconds</td>
<td>850 nanoseconds</td>
<td>Instruction and data transfer to memory is somewhat slower (compared with large computer).</td>
</tr>
<tr>
<td>Number of registers (an indication of more sophisticated programming)</td>
<td>Many</td>
<td>Many</td>
<td>Relatively few</td>
<td>System software development is limited.</td>
</tr>
<tr>
<td>Number of basic instructions</td>
<td>Approximately 150</td>
<td>Approximately 140</td>
<td>Approximately 80</td>
<td>Execution is less efficient.</td>
</tr>
<tr>
<td>SOFTWARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating systems:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batch (applications programs are submitted to computer in self-contained units with no strict timing requirements)</td>
<td>Multiprogramming (batch applications are run simultaneously)</td>
<td>Multiprogramming</td>
<td>Multiprogramming (2 programs only)</td>
<td>System software for the large and medium computer is complex and designed for multiple tasks in order to share expensive resources; this is not</td>
</tr>
</tbody>
</table>


Table 1. (cont'd)

<table>
<thead>
<tr>
<th>KEY COMPUTER ARCHITECTURE CHARACTERISTICS</th>
<th>LARGE COMPUTER</th>
<th>MEDIUM COMPUTER</th>
<th>MINICOMPUTERS</th>
<th>EFFECT</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFTWARE (cont'd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real time (application programs are called into operation in response to request from I/O devices)</td>
<td>Separate telecommunication system added to other operating system</td>
<td>Same as for large computers</td>
<td>Telecommunications system is integrated with main operating system</td>
<td>Real time on a mini is usually dedicated to one application.</td>
<td>necessary for the mini since it is relatively inexpensive.</td>
</tr>
<tr>
<td>Time sharing</td>
<td>Supported simultaneously with other systems by addition of separate facilities</td>
<td>Same as for large computers</td>
<td>Computer must be dedicated to time sharing</td>
<td>Time sharing on a mini is usually dedicated to support of on-line terminals.</td>
<td></td>
</tr>
<tr>
<td>Data base and file management systems</td>
<td>Many sophisticated systems are</td>
<td>Many systems are available</td>
<td>A few limited systems are available</td>
<td>Data-base systems must be largely developed in-house</td>
<td></td>
</tr>
<tr>
<td>Programming languages</td>
<td>All 8 major languages</td>
<td>All 8 major languages</td>
<td>Four major languages</td>
<td>COBOL is only gradually becoming available for some minis, which is a significant limitation for companies using COBOL as a standard language.</td>
<td>Language for some applications may not be perfectly appropriate, but this distinction is not critical since there are enough languages available for minis.</td>
</tr>
<tr>
<td>KEY COMPUTER ARCHITECTURE CHARACTERISTICS</td>
<td>LARGE COMPUTER</td>
<td>MEDIUM COMPUTER</td>
<td>MINICOMPUTERS</td>
<td>EFFECT</td>
<td>SIGNIFICANCE</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>---------------</td>
<td>--------</td>
<td>--------------</td>
</tr>
<tr>
<td>SOFTWARE (cont'd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program development aids (e.g., debugging aids, checkout compilers)</td>
<td>Many</td>
<td>Many</td>
<td>Limited</td>
<td>Programming efficiency is inhibited.</td>
<td>More highly skilled applications programmers are required.</td>
</tr>
<tr>
<td>Application packages (e.g., payroll, bill of materials, models)</td>
<td>Thousands</td>
<td>Thousands</td>
<td>Hundreds</td>
<td>Users must program more applications in-house.</td>
<td>More cost is involved in programming, if packages available for large or medium machines.</td>
</tr>
<tr>
<td>ADDITIONAL CONSIDERATIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>High</td>
<td>High</td>
<td>Very high; time to fix is brief because of relative simplicity</td>
<td>The mini is likely to be more reliable, but the distinction is unlikely to be important for most applications.</td>
<td>Reliability and vendor support must be considered together.</td>
</tr>
<tr>
<td>Vendor support</td>
<td>Outstanding</td>
<td>Outstanding</td>
<td>Good</td>
<td>Caveat emptor applies to mini somewhat.</td>
<td></td>
</tr>
</tbody>
</table>
Table 1. (cont'd)

<table>
<thead>
<tr>
<th>KEY COMPUTER ARCHITECTURE CHARACTERISTICS</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ADDITIONAL CONSIDERATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase cost</td>
<td>Millions of dollars</td>
<td>Hundreds of thousands of dollars</td>
<td>Tens of thousands of dollars</td>
<td>Minis are substantially cheaper</td>
<td>Purchase and operational cost are the most significant advantages minis have over large and medium computers</td>
</tr>
<tr>
<td>Operating requirements</td>
<td>Considerable amount of specially prepared space and air conditioning, operators and well-trained systems programmers required</td>
<td>Same as for large computers</td>
<td>One operator per shift, no special site preparation, good systems programmers required</td>
<td>Operational costs are much lower.</td>
<td></td>
</tr>
</tbody>
</table>

Source: EDP Solutions (Datapro Research Corporation)
III. RANGE OF OPTIONS

Options for using a mini range from enhancing the service level of the data center to replacing the center entirely. Thus the options can first be thought of as being arrayed along the links between the actual user and the central computer. Second, since minis are most often devoted to just one application and are typically located near the user, this same arraying of options can also be thought of as ranging from centralized to decentralized control of the organization's EDP resources.

The relationship between these two concepts is shown in Figure 1. For discussion purposes, four basic options, ranging from using no minis to using only minis have been listed. Of course, an organization can use minis in more than one way, since these options are not mutually exclusive.

Figure 1. Computer configurations and relative degree of decentralized computing

Source: EDP Solutions (Datapro Corporation)
Option 1 represents companies that do not use minis at all. An important issue to be raised is operational effectiveness of using one large computer for all applications. In making the decision, a company should place considerable weight on the value of separate operations for on-line and batch applications—particularly in a system that does not already have on-line applications.

Option 2 covers not only companies that use minis as front-ends, that is, minis that handle communications between terminals and central computers, but those using other combinations of minis and large machines in computing networks as well. The idea is to use mini as the front-end of the central computer, where it can handle communications with terminals and do additional processing otherwise done on the central computer. The minicomputer could thus lower the computing load on the main machine, thereby making it available for more complex processing for which it is better suited.

Option 3 applies to those organization in which minis handle independent applications and require no active link to the central computer. In this case, however, the mini and large machines may interchange data on a periodic basis, for instance, nightly. A distinct advantage of this option is that the performance level of mainframe suffers no deterioration as new and independent applications are added to the system. These applications can be readily absorbed by the minis.

Option 4 represents companies using only minis. It includes those with departmental minicomputers that are tied together in networks with telephone lines to permit sharing of data and programs. This lends itself to organizations fostering a decentralized operating philosophy. The desirability of user control is promoted with this arrangement. Where applicable, some central coordination of computing may result in a degree of standardization of computer operation or software and may contribute to organizational effectiveness.
IV. ASSIMILATION OF MINICOMPUTER TECHNOLOGY

The use of minis is not necessarily an either/or proposition. Instead, management needs to determine how minis can most effectively be integrated into the overall data processing system of an organization. This determination is best made by first carrying out a high-level design for the application. Table 1 provides such a design framework to use in examining the characteristics of a mini that limit its power with respect to a large or medium machine. In particular, the primary limitations occur when the application requires either a substantial amount of processing or the establishment of a complex data base common to multiple applications.

After this analysis is completed and has shown a minicomputer to be feasible, the decision to use a mini, medium, or large computer requires a qualitative weighing of three factors:

A. Economics
B. User Control
C. Operation Effectiveness

A. Economics

Cost is perhaps the most compelling justification for using or not using a mini. There are three components of cost: software development, hardware, and operations. Software development costs for large machines and minis will generally be comparable, but the numerous commercial software packages available for large computers will often justify using a large computer for an application. In analyzing the hardware and operating costs for the large machine, the command must decide whether full costing would charge the application for all resources that it uses directly plus a proportionate share of all other resources in the system that are shared,
such as people and space. Direct costing charges the new application only for the required incremental resources, such as direct use of the central processing unit and peripheral equipment. If existing computer facilities are idle because of underutilization of large machine, arguments can be made for incremental costing of a new application.

Although it may be desirable to use direct costing in some situations, it is important to recognize that there will be pressure from full-cost users to relegate direct-cost users to lower-priority computer time and to suspend them during periods of high load on the large machine. In addition, as the computer needs of a command grow, it may require a larger machine. The direct-cost user will have contributed to making the load heavy enough to justify a new machine and may then have to be charged full instead of direct costs. Thus using direct costing has some pitfalls and must be viewed cautiously.

B. USER CONTROL

The mini allows the user to be independent of other programs on the main computer. In addition, the user of the mini is free from concern about the computer center's need to keep its machine operational and upgrade its capabilities to meet increasing loads. These issues may arise when some users of the large machine have a heavy, high priority load that interferes with the needs of other users. This situation is particularly frustrating when one division is particularly frustrating when one division controls the central computer. (This same problem occurs for small or medium-sized organizations that utilize a service bureau.) The user with his own mini will not suffer from interruptions of this type. Independence is also particularly useful for a user when there are response time constraints, since response will be fully under the user's control.
C. OPERATIONAL EFFECTIVENESS

For substantially decentralized operations, today's economical mini may be more practical and far less disruptive than larger machines for in-house data processing. The mini can help relieve the complexity of the operational load on the central computer. With this simpler environment (particularly with on-line systems), the data processing center will require less systems programming talent, which may be shifted to serve users' needs directly.
V. GUIDELINES

Minicomputer technology has now matured to the stage where management can harness its economic and organization potential. Management's responsibility is to develop an understanding of the appropriate way to integrate minicomputers into the organization. Each should carefully assess its data processing system in terms of where it is going and how, and it should inspect the opportunities for taking advantage of minicomputers.

The data processing staff should build a good understanding of the use and programming of minis. Over a three-year horizon this understanding should evolve so that all computer designers and programmers are equally comfortable using large or small machines. Thus for the long run it is inappropriate to separate the computer staff into minicomputer and large machine programmers. However, in order to get this learning started, it will be necessary to build an understanding of minis in the computer staff, and such a separation may initially be necessary.

To provide leadership to engender an appropriate environment and policy superstructure for incorporating minicomputer technology, top management should take the following actions:

- Direct the EDP manager to acquire and build minicomputer technology capability by integrating technical systems and applications expertise into the current staff.
- Establish a policy to include minicomputer options among alternatives for all new major applications.
- Look for an opportunity to use a mini for the computing needs of a small, independent division, for instance, one that refuses to participate in the central computer utility.
This could also be an opportunity for the entire command to gain valuable experience.

- Establish a central function to study and promulgate mini-computer standards for hardware, software, applications development, and data bases. This is a very important function to keep under control when computer systems are being decentralized.
VI. SUMMARY

Although the cost of mini computers itself is low, the total computing facility is not only the CPU. The peripheral devices for the mini computers are still costly. Also, the cost of software supplied by the manufacturer and that to be developed by the user has to be considered. Hence, when the cost comparison between a minicomputer and mainframe alternative is to be done, the comparison must include the total cost. The comparison should include not only the dollar figure, but non-tangibles such as dependability and "after-sales" customer service from the supplier as well. In general, customer service has been better from manufacturers of mainframes.

In conclusion, the decision to use minicomputers, or mainframes or a combination of these will depend on the particular application under consideration. Certain applications will be definitely suited for minicomputers; while for others, mainframes will be the certain solution.

In light of the chemical information retrieval system the volume of data anticipated for Phase II implementation essentially dictates the use of a large machine because of the current storage limitations of peripherals (specially disk units) associated with minicomputers. In addition, large machines would better allow for system expandibility. In the more likely event that new or related applications are desired, these machines could accommodate future enhancements with less regard to technical questions of space and specific programmer talent. There will be many problems or applications where whether to use mini, mainframe, or a combination of these may not be so obvious. In such situations, a thorough study of present requirements and future...
requirements along with what is available and what is going to be available should be made before making the final choice.
### Chemical Agent Retrieval System

**Procedures for Completing the Unit Record Coding Form**

<table>
<thead>
<tr>
<th>FIELD NAME</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action Code</strong></td>
<td>Circle the code designating the status of the form to be processed as follows:</td>
</tr>
<tr>
<td></td>
<td>To add a new record to the database:</td>
</tr>
<tr>
<td></td>
<td>1. Circle Action Code 1</td>
</tr>
<tr>
<td></td>
<td>2. Enter Accession Number</td>
</tr>
<tr>
<td></td>
<td>3. Fill in all applicable data fields</td>
</tr>
<tr>
<td></td>
<td>To change/update a record in the database:</td>
</tr>
<tr>
<td></td>
<td>1. Circle Action Code 2</td>
</tr>
<tr>
<td></td>
<td>2. Enter Accession Number</td>
</tr>
<tr>
<td></td>
<td>3. Complete only the field to be changed</td>
</tr>
<tr>
<td></td>
<td>To delete a record from the database:</td>
</tr>
<tr>
<td></td>
<td>1. Circle Action Code 3</td>
</tr>
<tr>
<td></td>
<td>2. Enter Accession Number</td>
</tr>
<tr>
<td><strong>Accession Number</strong></td>
<td>Enter the unique identifying number assigned to each unit record.</td>
</tr>
<tr>
<td><strong>Distribution Status</strong></td>
<td>Enter the code designation for the distribution of the report.</td>
</tr>
<tr>
<td></td>
<td>L - Limited</td>
</tr>
<tr>
<td></td>
<td>UL - Unlimited</td>
</tr>
<tr>
<td></td>
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LISTING OF COUNTRY CODES - Page 2

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NOTE: Code consists of first three letters of the name of the language of the article being abstracted.
Appendix C
Ten Sample Unit Records
ITEM 109

ACCESSION NUMBER: 00000229
DISTRIBUTION STATUS: UL
SECURITY CLASS: U
COUNTRY CODE: US
NO. OF FICHE: 0
LANGUAGE CODE: ENG
DOCUMENT TYPE: J
NO. OF PAGES: 7
PUBLICATION YEAR: 1966
VOLUME NUMBER: 8
NO. OF GRAPHICS: 4
FICHE LOCATOR: 0
PAGE RANGE: 533-539
NO. OF REFERENCES: 9
AUTHORS:
LOOMIS TED A
JOHNSON DENNIS D
CAS REGISTRY NUMBERS:
96-64-0
67-68-5
76-03-9
50-06-6
55-48-1
51-84-3
INDEX TERMS:
AGING
SOMAN
NEUROMUSCULAR FUNCTION
OXIMES
DIMETHYL SULFOXIDE
PHOSPHONYLATION
ACETYLCHOLINESTERASE
RATS (SPRAGUE-DAWLEY)
PENTOBARBITAL
ANTERIOR TIBIAL MUSCLE
SCIATIC NERVE
ISOTONIC CONTRACTIONS
STIMULATION
ATROPINE SULFATE
NUCLEOPHILIC OXIMES
REACTIVATION
SOMAN-INHIBITED ACHE
TMB-4
TCIA
PI50
ENZYMES
TEMPERATURE
DMSO
POTENTIATED TWITCH RESPONSE
TETANIC RESPONSE BLOCKADE
ACETYLCHOLINE
TWITCH RESPONSE
TETANIC RESPONSE
CHOLINESTERASE
N-METHYLPYRIDINE 2-ALDOXIME TRICHLOROACETATE
AFFILIATION:
DEPARTMENT OF PHARMACOLOGY, SCHOOL OF MEDICINE, UNIVERSITY OF WASHINGTON, SEATTLE, WASHINGTON 98105
SOURCE TITLE: TOXICOLOGY AND APPLIED PHARMACOLOGY
PERFORMING ORGANIZATION:
DEPARTMENT OF PHARMACOLOGY, SCHOOL OF MEDICINE, UNIVERSITY OF WASHINGTON, SEATTLE, WASHINGTON 98105
SPONSORING ORGANIZATION:
DEPARTMENT OF PHARMACOLOGY, SCHOOL OF MEDICINE, UNIVERSITY OF WASHINGTON, SEATTLE, WASHINGTON 98105
TITLE (DOCUMENT):
AGING AND REVERSAL OF SOMAN-INDUCED EFFECTS ON NEUROMUSCULAR FUNCTION WITH OXIMES IN THE PRESENCE OF DIMETHYL SULFOXIDE
ABSTRACT/DIGEST:
THE CURRENT SERIES OF EXPERIMENTS STUDIED THE ROLE OF THE AGING PROCESS IN THE FAILURE OF OXIMES TO INDUCE RECOVERY OF SOMAN-INHIBITED NEUROMUSCULAR FUNCTION, AND TO REACTIVATE THE SOMAN-INDUCED PHOSPHONYLATED ACETYLCHOLINESTERASE. STUDIES WERE CONDUCTED ON 300-500 G SPRAGUE-DAWLEY RATS ANESTHETIZED WITH 30 MG/KG PENTOBARBITAL, I.P. THE ANTERIOR TIBIAL BRANCH OF THE LEFT SCIATIC NERVE WAS ARRANGED FOR STIMULATION AND FOR RECORDING OF ISOTONIC CONTRACTIONS OF THE CORRESPONDING ANTERIOR TIBIAL MUSCLE AS OBTAINED FROM A LINEAR TRANSFORMER. STIMULUS VOLTAGE WAS ALWAYS SUPRAMAXIMAL (0.6 V, 4-MSEC DURATION). EACH ANIMAL WAS PRETREATED WITH 1 MG/KG ATROPINE SULFATE I.V. TWO NUCLEOPHILIC OXIMES WERE USED FOR REACTIVATION OF SOMAN-INHIBITED ACHE: 1,1'-TRIMETHYLENEBIS (4-FORMYL PYRIDINIUM) DIOXIME DICHLORIDE (TMB-4) AND N-METHYLPYRIDINE 2-ALDOXIME TRICHLOROACETATE (TCLA). THE SOMAN PREPARATION HAD A PI50 OF 10.2, AND WHEN ADDED TO THE ENZYME IN THE PRESENCE OF THE BUFFER AND ALLOWED TO STAND AT ROOM TEMPERATURE FOR 1, 5, 10, AND 15 MIN, APPROXIMATELY 50% INHIBITION OF THE ENZYME OCCURRED. HOWEVER, WHEN TCLA WAS ADDED IN FINAL CONCENTRATION OF 1.7 X 10(EXP-5) M AT 2, 5, OR 10 MIN AFTER INCUBATION OF THE SOMAN-ENZYME MIXTURE AT ROOM TEMPERATURE, APPROXIMATELY 50% OF THE SOMAN-INHIBITED ENZYME WAS REACTIVATED.
IF THE TCLA WAS ADDED IMMEDIATELY OR WITHIN 2 MIN AFTER ADDITION
OF THE SOMAN INHIBITION. THE DOSE OF SOMAN, WHICH PRODUCED 90%
(2.7 x 10⁹ M), DID NOT REACTIVATE ENZYME. TWELVE ANIMALS
EACH RECEIVED 0.09 MG/KG SOMAN, I.V., AND GROUPS OF THREE WERE
GIVEN 10 MG/KG TMB-4 PLUS 0.5 ML/KG DMSO I.V., AT EACH OF FOUR
DIFFERENT TIME INTERVALS (1.5, 5, 10, OR 15 MIN) FOLLOWING SOMAN.
WHEN TMB-4-DMSO WAS ADMINISTERED AT 1.5-5 MIN AFTER SOMAN,
COMPLETE RECOVERY OF NEUROMUSCULAR FUNCTION OCCURRED. ADMINISTRA-
TION 10 MIN AFTER SOMAN RESULTED IN PARTIAL RECOVERY, 15 MIN
FOLLOWING SOMAN THE MIXTURE PRODUCED BLOCKADE OF THE POTENTIATED
TWITCH RESPONSE, BUT NO RECOVERY OF TETANIC RESPONSE. DMSO ALONE
HAD ONLY MINOR NEUROMUSCULAR EFFECTS. CONTROL DOSES OF ACETYL-
CHOLINE (ACH), 0.1 UG/KG, I.V., PRODUCED NO EFFECT ON THE TWITCH
RESPONSE, WHEN A 0.06-0.09 MG/KG, I.V. DOSE OF SOMAN WAS ADMINISTERED,
BLOCKADE OF TETANIC RESPONSE WAS EVIDENT, BUT 10 MG/KG I.V. TMB-4
PLUS 0.5 ML/KG DMSO INDUCED RECOVERY. THE CONTROL DOSE OF ACH
WAS WITHOUT EFFECT, INDICATING REACTIVATION OF A CHOLINESTERASE
MECHANISM. AFTER 60 MIN, INJECTION OF ACH RESULTED IN A PROLONGED
EFFECT MANIFESTED AS IMPAIRMENT OF THE TWITCH. THE REACTIVATION
OF ACHE BY TMB-4-DMSO IS TEMPORARY AND MAY INVOLVE ENHANCEMENT
OF TRANSFER OF THE OXIME BY DMSO TO THE SITE OF THE SOMAN-INHIBITED
ENZYME.

BASIS KEY : 109
RECORD SECURITY : 0
CEREBRAL CORTEX
CEREBELLAR CORTEX
REACTIVITY
AGING
MINA
DOZER/THROCYTE ACHE
DEALKYLATION
ACETYL-BETA-METHYLCHOLINE
DOG BRAIN HOMOGENATES
ACETYLCHOLINE
SODIUM PHOSPHATE
ACETYLCHOLINE IODIDE
INHIBITION
RADIOPHOSPHORUS
BRAIN HOMOGENATES
ALIQUOTS
TRICHLOROACETIC ACID
BOVINE ALBUMIN
METHYL 32-P PHOSPHONATE
PINACOLYL METHYL 32-P PHOSPHONATE
PHOSPHONYLATED
AFFILIATION
DEPARTMENT OF THE ARMY, EDGEWOOD ARSENAL, BIOMEDICAL LABORATORY,
EDGEWOOD ARSENAL, MD 21010
PERFORMING ORGANIZATION:
DEPARTMENT OF THE ARMY, EDGEWOOD ARSENAL, BIOMEDICAL LABORATORY,
EDGEWOOD ARSENAL, MD 21010
SPONSORING ORGANIZATION:
DEPARTMENT OF THE ARMY, EDGEWOOD ARSENAL, BIOMEDICAL LABORATORY,
EDGEWOOD ARSENAL, MD 21010
TITLE (DOCUMENT):
UTILIZATION OF [(EXP32)P] SOMAN FOR MEASUREMENT OF ACETYLCHOLINESTERASE IN BRAIN TISSUES
COMMENT: SEE ALSO ACC # 0342
ABSTRACT/DIGEST:
DTIC VERIFIED FACSIMILE TP: THOMAS, N. C., FLEISHER, J. H., AND HARRIS, L. W., UTILIZATION OF [(EXP32)P] SOMAN FOR MEASUREMENT OF ACETYLCHOLINESTERASE IN BRAIN TISSUES. BIOCHEM BIOPHYS.
BASIS KEY: 28
RECORD SECURITY: 0
ITEM 66

ACCESSION NUMBER : 00000062
DISTRIBUTION STATUS : UL
SECURITY CLASS : U
COUNTRY CODE : NL
NO. OF FICHE : 0
LANGUAGE CODE : ENG
DOCUMENT TYPE : J
NO. OF PAGES : 11
PUBLICATION YEAR : 1957
VOLUME NUMBER : 26
NO. OF GRAPHICS : 10
FICHE LOCATOR : 0
PAGE RANGE : 29-39
NO. OF REFERENCES : 20
AUTHORS :
COHEN J A
WARRINGA M G P J
CAS REGISTRY NUMBERS :
77-81-6
107-44-6
96-64-0
55-91-4
7439-96-5
INDEX TERMS :
TABUN
SARIN
SOMAN
DFP
HOG
KIDNEY
DFP-ASE
ETHYLMETHANEFLUOROPHOSPHONATE
PROPYL-1-2-ETHANEFLUOROPHOSPHONATE
(2-2-DIMETHYL PROPYL)-1-METHANEFLUOROPHOSPHONATE
NERVE GAS
ANTICHOLINESTERASE POISONING
RATS
MANGANESE
PROTEINS
METAL IONS
COFACTORS
FLUOROPHOSPHORIC ACIDS
CYCLOHEXYL METHANEFLUOROPHOSPHONATE
PURIFICATION AND PROPERTIES OF DIALKYLFLUOROPHOSPHATASE

ABSTRACT/DIGEST

INTEREST IN NERVE GASES (TABUN, SARIN AND SOMAN) AND RELATED COMPOUNDS LIKE DIISOPROPYLPHOSPHOROFLUORIDATE (DFP), TOGETHER WITH GROWING THERAPEUTIC, DIAGNOSTIC, AND AGRICULTURAL USES OF SIMILAR CHEMICALS AS INSECTICIDES, HAS FOCUSED ATTENTION ON METABOLISM IN MAN. BASED UPON FRACTIONATION OF HOG KIDNEY EXTRACTS WITH ALCOHOL, A DFP-ASE ENZYME PREPARATION B(SUB1) WAS FOUND TO BE 100-150 TIMES MORE PURE THAN THE ORIGINAL KIDNEY EXTRACT AND 5 TIMES MORE PURE THAN FRACTION A. FLUOROPHOSPHATASE (DFP-ASE) ACTIVITY WAS ASSESSED BY THE WARBURG METHOD. ACTIVATION OF DFP-ASE. MANGANESE CHLORIDE PRODUCED MARKED ACTIVATION. INHIBITION OF DFP-ASE. P-CHLOROMERUCibenzoic acid (PCP) IN A CONCENTRATION OF 1.66 x 10(EXP-5) PRODUCED 50% INHIBITION ON INCUBATION AT 37 DEGREES C FOR 15 MIN. INHIBITION WAS REVERSED BY INCUBATING THE ENZYME WITH 10(EXP-3)M CYSTEINE.

SPECIFICITY OF DFP-ASE WAS INVESTIGATED FOR A LARGE NUMBER OF COMPOUNDS: (1) ETHYMETHANEFLUOROPHOSPHONATE, (2) PROPYL-1-METHANEFLUOROPHOSPHONATE, (3) SARIN, (4) (2-2-DIMETHYLPROPYL)-1-METHANEFLUOROPHOSPHONATE, (5) SOMAN, (6) CYCLOHEXYL METHANEFLUOROPHOSPHONATE, (7) PROPYL-2-ETHANEFLUOROPHOSPHONATE, (8) PROPYL-2-ISOPROPANE FLUOROPHOSPHONATE, AND (10) TABUN. HYDROLYSIS WAS STRONGLY ACTIVATED BY TABUN AND DFP, BUT NOT BY COMPOUNDS 1-9 EXCEPT COMPOUND 2. FOR ALL OTHER COMPOUNDS, MANGANESE CAUSED INHIBITION OF HYDROLYSIS. ACTIVATION WAS OBSERVED IN ALL COMPOUNDS EXCEPT SOMAN COMPOUNDS 6 AND 9 WHEN MANGANESE AND FRACTION G (AN
ELECTROPHORETIC PRODUCT WITH DFP-ASE ACTIVITY) WERE ADDED.
CHOLINE ESTERS IN HIGH CONCENTRATION CAUSED INHIBITION OF DFP
HYDROLYSIS BY DFP-ASE. HOMOGENEITY OF DFP-ASE IN B PREPARATIONS.
IN B PREPARATIONS, ONE AND THE SAME ENZYME IS PROBABLY RESPONSIBLE
FOR THE HYDROLYSIS OF THE ESTERS OF FLUOROPHOSPHONIC AND FLUORO-
PHOSPHORIC ACIDS. IT IS UNCERTAIN WHETHER THE SAME ENZYME IS
RESPONSIBLE FOR TABUN HYDROLYSIS. EXPERIMENTAL TREATMENT OF
ANTI-CHE POISONING CONDITIONS ONLY ALLOWS CONCLUSIONS PERTAINING
TO PROPYLAXIS AND NOT THERAPY. ONLY A PREPARATIONS HAVE BEEN
USED. FEMALE RATS (110-160(SUBG)) RECEIVED 1 ML, I.V., DFP-ASE
FOLLOWED 1-3 MIN BY LETHAL S.C. DOSE OF 4 MG/KG DFP OR 400-500
UG/KG SARIN. OF 23 TREATED ANIMALS, 18 SURVIVED. ALL 16 UNTREATED
CONTROLS DIED. TREATMENT SAVED 16 OF 38 SARIN-POISONED RATS,
AND KILLED 17 OUT OF 18 CONTROLS. MANGANESE HAD NO EFFECT ON
SURVIVAL. IT WAS CONCLUDED THAT THE ACTIVITY CRUDE HOMOGENATES
OF DFP-ASE CANNOT BE PROPERLY ASSESSED BECAUSE OF THE MULTIPLE
ENZYMES OF RELATED SPECIFICITY, OTHER PROTEINS, METAL IONS,
COFACTORS, AND INHIBITORS.
BASIS KEY :66
RECORD SECURITY :0
ITEM 120

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NO. OF FICHE : 0
LANGUAGE CODE : ENG
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NO. OF PAGES : 4
PUBLICATION YEAR : 1966
VOLUME NUMBER : 2
NO. OF GRAPHICS : 2
FICHE LOCATOR : 0
PAGE RANGE : 989-992
NO. OF REFERENCES : 9
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MEEKS MARIA M
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64-47-1
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ANTICHOLINESTERASE
ACETYLCOLINE
ATROPINE
RAT BRAIN
CORTICAL SLICES
SOMAN
KREBS SOLUTION
OXYGEN
CARBON DIOXIDE
DORSAL LEECH MUSCLE
INCUBATION
ATROPINE SULFATE
POTASSIUM CHLORIDE
ESERINE SULFATE
AFFILIATION :
MEDICAL BIOLOGICAL LABORATORY OF THE NATIONAL DEFENSE RESEARCH
ORGANIZATION TNO, LANGE KLEIWEI 139, RIJSWIJK (Z.H.), THE NETHERLANDS
THE INFLUENCE OF ATROPINE ON THE RELEASE AND UPTAKE OF ACETYLCHOLINE BY THE ISOLATED CEREBRAL CORTEX OF THE RAT

ABSTRACT/DIGEST

BRAIN TISSUE BROUGHT IN CONTACT WITH ANTICHOLINESTERASE AGENTS RELEASES ACETYLCHOLINE (ACH) INTO ITS SURROUNDINGS. THE PRESENT STUDY INVESTIGATED THE INFLUENCE OF ATROPINE ON THE IN VITRO RELEASE AND UPTAKE OF ACH BY RAT BRAIN. RAT CORTICAL SLICES (150 MG, 0.4 MM THICK) WERE PRETREATED WITH 0.005 MM SOMAN. INCUBATED FOR 1 HR AT 37°C IN 2.5 ML OF MODIFIED KREBS SOLUTION (TO CORRECT FOR SUBSTANCES OTHER THAN ACH, WHICH MIGHT INFLUENCE SENSITIVITY OF THE ASSAY PREPARATION); THE MEDIUM WAS SATURATED WITH 95% O₂ AND 5% CO₂. (1.) ACH ACTIVITY OF SLICES AND INCUBATING MEDIA WAS ESTIMATED BY BIOASSAY ON THE ESERINIZED DORSAL LEECH MUSCLE. ACH WAS SET FREE INTO THE MEDIA DURING INCUBATION. FIVE TIMES AS MUCH ACH WAS RELEASED WHEN THE MEDIUM CONTAINED 25 MM KCL AS IN A 4.7 MM KCL MEDIUM. THE ACH CONTENT OF THE TISSUE DID NOT CHANGE DURING INCUBATION IN EITHER MEDIUM. ADDITION OF 1 UG/ML ATROPINE SULFATE TO THE 25 MM KCL MEDIUM RESULTED IN A THREEFOLD ENHANCEMENT OF ACH RELEASE PLUS A RISE OF THE ACH CONTENT OF THE TISSUE. ATROPINE SULFATE (0.05 UG/ML) INCREASED THE ACH OUTPUT: 10 UG/ML PRODUCED THE SAME EFFECT AS 1 UG/ML. NO SIGNIFICANT ATROPINE EFFECT WAS OBSERVED IN A MEDIUM CONTAINING 4.7 MM KCL. (2.) UPTAKE OF ADDED ACH WAS STUDIED BY TREATING CORTICAL SLICES WITH SOMAN AND INCUBATING TISSUE IN A MEDIUM CONTAINING 4.7 MM KCL, 25 MM KCL, OR 25 MM KCL PLUS 1 UG/ML ATROPINE. ACH (4 UG/ML) WAS ADDED AT START OF INCUBATION. THERE WAS SIGNIFICANT TISSUE UPTAKE OF ACH AGAINST A CONCENTRATION GRADIENT. ATROPINE DID NOT SIGNIFICANTLY INHIBIT THIS UPTAKE IN A CONCENTRATION AT WHICH IT MOST ENHANCED THE OUTPUT OF ENDOGENOUS ACH. IN THE EXPERIMENTS USING NORMAL KREBS SOLUTION WHERE ENDOGENOUS ACH PRODUCTION WAS SMALL, ACH CONCENTRATION OF THE MEDIA DECREASED. A SMALLER DECREASE OF ACH IN THE MEDIUM WAS OBSERVED WITH THE 25 MM KCL SOLUTION. SMALLEST REDUCTION OF ACH WAS NOTED IN THE 25 MM KCL MEDIUM WITH ATROPINE, WHICH ALSO PRODUCED LARGE AMOUNTS OF ENDOGENOUS ACH. THE ADDED ACH WAS DISTRIBUTED SIMILARLY BETWEEN TISSUE AND MEDIUM IN ALL THREE MEDIA; DIFFERENCES IN RESULTS WERE CAUSED BY CHANGES IN THE CONCENTRATION OF ENDOGENOUS ACH IN TISSUES AND MEDIA PRODUCED BY ADDITION OF KCL AND ATROPINE.
TO THE MEDIUM. (3.) THE EFFECT OF ATROPINE SULFATE ON UPTAKE OF ACH WAS STUDIED. KEEPING THE CONCENTRATION OF ADDED ACH CONSTANT DURING INCUBATION OF 75 MG SLICES IN 5 ML OF MEDIUM WITH 25 MM KCL FOR 30 MIN. ATROPINE (10 UG/ML) INHIBITED ACH UPTAKE BY 25% AND 100 UG/ML ATROPINE INHIBITED UPTAKE BY 70%. (4.) EFFECTS OF KCL AND ATROPINE ON ACH OUTPUT WAS INVESTIGATED USING A MEDIUM CONTAINING ESERINE SULFATE (0.4 MM) AS THE CHE INHIBITOR. ACH UPTAKE WAS EXTREMELY SMALL AND ACH CONCENTRATION IN THE TISSUE FELL TO APPROXIMATELY 4 UG/ML IN TESTS WHERE THE MEDIUM CONTAINED ESERINE SULFATE PLUS 25 MM KCL WITH OR WITHOUT ATROPINE. THE AUTHORS CONCLUDED THAT ESERINE SULFATE (0.4 MM) STRONGLY INHIBITS UPTAKE OF ACH, SIMILAR TO RESULTS OBTAINED WITH SOMAN.

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RECORD SECURITY :0
ITEM 121

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AUTHORS :
PRESTON E
HEATH C
CAS REGISTRY NUMBERS :
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96-64-0
INDEX TERMS :
RESPIRATORY FAILURE
INTOXICATION
ORGANOPHOSPHATE CHOLINESTERASE INHIBITORS
HYPOXIA
CARDIOVASCULAR SYSTEM
BLOOD PRESSURE
HYPOTENSION
BRADYCARDIA
PERIPHERAL VASCULAR RESISTANCE
CARDIOVASCULAR COLLAPSE
ATROPINE
SARIN
CARDIOVASCULAR HOMEOSTASIS
RATS
DFP
OXIME THERAPY
SOMAN
RABBIT (WHITE)
AUTOPERFUSION
VASCAL VASOMOTOR TONE
VASOMOTOR PATHWAY
MYOCARDIAL TOXICITY
AFFILIATION: DEFENCE RESEARCH ESTABLISHMENT, SUFFIELD, ALBERTA, CANADA, AND THE DEPARTMENT OF PHARMACOLOGY, UNIVERSITY OF ALBERTA, EDMONTON, ALBERTA, CANADA

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PERFORMING ORGANIZATION: DEFENCE RESEARCH ESTABLISHMENT, SUFFIELD, ALBERTA, CANADA, AND THE DEPARTMENT OF PHARMACOLOGY, UNIVERSITY OF ALBERTA, EDMONTON, ALBERTA, CANADA

SPONSORING ORGANIZATION: DEFENCE RESEARCH ESTABLISHMENT, SUFFIELD, ALBERTA, CANADA, AND THE DEPARTMENT OF PHARMACOLOGY, UNIVERSITY OF ALBERTA, EDMONTON, ALBERTA, CANADA

TITLE (DOCUMENT): ATROPINE-INSENSITIVE VASODILATATION AND HYPOTENSION IN THE ORGANOPHOSPHATE-POISONED RABBIT

ABSTRACT/DIGEST:
RESPIRATORY FAILURE IS THE PRIMARY CAUSE OF DEATH FROM INTOXICATION WITH THE ORGANOPHOSPHATE CHOLINESTERASE INHIBITORS. APART FROM THE EFFECT OF HYPOXIA, THESE COMPOUNDS DIRECTLY IMPAIR THE CARDIO-VASCULAR SYSTEM, WHICH MAY CONTRIBUTE TO A RAPIDLY FATAL OUTCOME. THE BLOOD PRESSURE RESPONSE IN UNTREATED LETHAL POISONING IS USUALLY HYPOTENSION, THE SEVERITY OF WHICH IS GOVERNED BY INTERACTION OF A DECREASE IN CARDIAC OUTPUT DUE TO BRADYCARDIA AND AN INCREASE IN PERIPHERAL VASCULAR RESISTANCE. LOWERED CARDIAC OUTPUT CAUSES STAGNANT HYPOXIA, WHICH ALSO PROMOTES CARDIOVASCULAR COLLAPSE. ARTIFICIALLY VENTILATED AND ATROPINIZED ANIMALS MAINTAIN A NORMAL BLOOD PRESSURE THOUGH POISONED WITH VERY LARGE DOSES OF SARIN. THIS IMPLIES THAT ATROPINE AND ARTIFICIAL VENTILATION WILL ENSURE CARDIOVASCULAR HOMEOSTASIS DESPITE SEVERE INTOXICATION. IT HAS BEEN SHOWN, HOWEVER, THAT RATS DIE OF CARDIAC FAILURE FOLLOWING A LARGE DOSE OF DIISOPROPYL PHOSPHONOFLUORIDATE (DFP) DESPITE ATROPINE, ARTIFICIAL VENTILATION, AND OXIME THERAPY. IN THE PRESENT STUDIES, LARGE DOSES OF SOMAN, SARIN, OR DFP ADMINISTERED INTRAVENOUSLY CAUSED SEVERE AND RAPID HYPOTENSION IN THE ANESTHETIZED WHITE RABBIT DESPITE BOTH ARTIFICIAL VENTILATION AND ATROPINE TREATMENT SUFFICIENT TO PREVENT BRADYCARDIA. HYPOTENSION RESULTS FROM AN ATROPINE-INSENSITIVE VASODILATATION, DEMONSTRATED IN THE AUTOPERFUSED FORELIMB. SOMAN INDUCES DEPRESSION OF BASAL VASCULAR TONE: HOWEVER, THIS IS ANTAGONIZED BY ATROPINE WHILE SYSTEMIC HYPOTENSION REMAINS PROFOUNO. IT IS SUGGESTED THAT HYPOTENSION STEMS FROM ORGANOPHOSPHATE EFFECTS WITHIN THE NEURONAL PORTION OF THE VASOMOTOR PATHWAY. THERE IS NO INDICATION THAT SOMAN HAS A MYOCARDIAL TOXIC PROPERTY.

BASIS KEY: 122
RECORD SECURITY: 0
ITEM 95

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COUNTRY CODE :CA
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LANGUAGE CODE :ENG
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NO. OF PAGES :6
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VOLUME NUMBER :34
NO. OF GRAPHICS :2
FICHE LOCATOR :0
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AUTHORS
JOHNSON DENNIS D
WILCOX WILLIAM C
CAS REGISTRY NUMBERS
439-14-5
96-64-0
51-84-3
50-06-6
55-48-1
INDEX TERMS
DIAZEPAM
ANTICHOLINESTERASE
SOMAN
ACETYLCHOLINE
BRADYCARDIA
RABBITS
VALIUM
RESPIRATION
PENTOBARBITAL
ATROPINE SULFATE
TACHYCARDIA
HEART RATE
HERING-BREUER REFLEX
RESPIRATORY DEPRESSION
BLOOD PRESSURE
HYPOTENSION
AFFILIATION
DEPARTMENT OF PHARMACOLOGY, COLLEGE OF MEDICINE, UNIVERSITY OF
SASKATCHEWAN, SASKATOON, CANADA S7N OWO
SOURCE TITLE :EUROPEAN JOURNAL OF PHARMACOLOGY
STUDIES ON THE MECHANISM OF THE PROTECTIVE AND ANTIDOTAL ACTIONS OF DIAZEPAM IN ORGANOPHOSPHATE POISONING

ABSTRACT/DIGEST

PREVIOUS STUDIES SUGGEST THAT DIAZEPAM PROVIDES ANTIDOTAL ACTIVITY AGAINST ANTICHOLINESTERASE AGENTS SUCH AS SOMAN BY PREVENTING SOME OF THE CENTRAL EFFECTS OF EXCESS ACETYLCOLINE. TO MEASURE DIAZEPAM'S EFFECT ON SOMAN-INDUCED BRADYCARDIA, SIX UNANESTHETIZED RABBITS WERE ADMINISTERED 10 UG/KG I.V. SALINE-DILUTED SOMAN, SIX WERE GIVEN 1 MG/KG DIAZEPAM (VALIUM), WHILE SIX WERE GIVEN THE ABOVE DOSES OF DIAZEPAM FOLLOWED BY SOMAN. TO MEASURE DIAZEPAM'S EFFECT ON RESPIRATORY DEPRESSION, ARTIFICIALLY VENTILATED RABBITS, ANESTHETIZED WITH 35 MG/KG PENTOBARBITAL AND PRE-TREATED WITH 1.2 MG/KG ATROPINE SULFATE WERE TESTED IN THE SAME WAY: SIX WERE GIVEN DIAZEPAM, SIX SOMAN, SIX SOMAN FOLLOWED BY ATROPINE, AND TEN SOMAN FOLLOWED BY ATROPINE AND DIAZEPAM. UNANESTHETIZED RABBITS GIVEN SOMAN SHOWED SEVERE BRADYCARDIA (83% OF CONTROL) AND THOSE GIVEN DIAZEPAM SHOWED TEMPORARY TACHYCARDIA (REVERSED WITHIN 30 MIN). DIAZEPAM PRETREATMENT PREVENTED ABNORMAL HEART RATES, (103 +/- 8.5% OF CONTROL). IN ANESTHETIZED ANIMALS (RESULTS NOT PRESENTED STATISTICALLY), DIAZEPAM (1 MG/KG) PRODUCED SLIGHT DEPRESSION OF THE RESPIRATORY RATE, SOMAN (10 UG/KG) REDUCED THE DEPTH OF RESPIRATION AND/OR INHIBITED THE HERING-BREUER REFLEX DURING EXPIRATION, WITHOUT RECOVERY WITHIN 30 MIN. SIMILAR DOSAGES IN COMBINATION (DIAZEPAM AFTER SOMAN) FAILED TO REVERSE RESPIRATORY DEPRESSION AND PRODUCED FURTHER RESPIRATORY IMPAIRMENTS. PRETREATMENT WITH 1.2 MG/KG ATROPINE BLOCKED SOMAN-INDUCED BRADYCARDIA, AND REDUCED BLOOD PRESSURE MODESTLY. DIAZEPAM FOLLOWING SOMAN REDUCED BLOOD PRESSURE FURTHER, AN EFFECT WHICH ATROPINE APPEARED TO BLOCK. BOTH SOMAN-INDUCED HYPOTENSION AND ITS REVERSAL WITH SUBSEQUENT ATROPINE (1.2 MG/KG) COINCIDED WITH CHANGES IN RESPIRATORY FUNCTION. PRE-TREATMENT WITH ATROPINE ALONE DID NOT PREVENT RESPIRATORY DEPRESSION, THOUGH A SECOND DOSE AFTER SOMAN REVERSED IT, INDICATING A DOSE-RESPONSE RELATIONSHIP. IN SUMMARY, ADMINISTRATION OF DIAZEPAM FOLLOWING SOMAN-INDUCED RESPIRATORY DEPRESSION EXACERBATED THE DEPRESSION AND RENDERED RABBITS LESS SUSCEPTIBLE TO ATROPINE. THE ANTIDOTAL EFFECTS OF DIAZEPAM ARE THUS NOT ASCRIBED TO REVERSAL OF RESPIRATORY DEPRESSION. IN CONCLUSION, THE PROTECTIVE EFFECTS OF DIAZEPAM ARE ASCRIBED TO BOTH A NON-SPECIFIC ANTI-CONVULSANT EFFECT THAT REDUCES IMPAIRMENT TO RESPIRATORY CENTERS AND TO THE PREVENTION OF BRADYCARDIA.

BASIS KEY : 95

RECORD SECURITY : 0
THE INACTIVATION BY OXIMES OF SARIN AND SOMAN IN PLASMA FROM VARIOUS SPECIES I. THE INFLUENCE OF DIACETYLMONOXIME ON THE HYDROLYSIS OF SARIN

ABSTRACT/DIGEST

A method is given for measuring hydrolysis of low concentrations of 32-P sarin based upon measurement of the non-volatile hydrolysis product. Demonstration with 32-P sarin permitted a study of the influence of diacetyl monoxime (DAM) on the hydrolysis of: (1) heparinized plasma obtained from the heart or carotid arteries of female albino rats, white guinea pigs, or inbred female mice; and (2) human plasma from volunteers. Samples were intoxicated with 0.1 mm sarin and centrifuged for 20 min. In all samples, hydrolysis was aided by sarinase and by direct interaction of DAM with sarin. In the mouse and rats, DAM greatly enhanced the destruction of sarin; at 1 mm DAM, SARIN IN THE RAT WAS COMPLETELY HYDROLYZED IN 2 MIN. RESULTS CONFIRMED EARLIER FINDINGS THAT DAM UNTIL SARIN IS HYDROLYZED. A SUBSEQUENT PAPER FROM THIS STUDY DEALS WITH SOMAN.
ITEM 7

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AUTHORS:
BERRY W K
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BIOCHEMICAL MECHANISMS
ANTICHOLINESTERASE POISONING
CHOLINESTERASE
SARIN
TOXICITY
DOPA
3, 4-DIHYDROXYPHENYLALANINE
O-DIHYDROXYBENZENE DERIVATIVES
TABUN
SOMAN
DFP
DOPA-SARIN REACTION
INHIBITION
ENZYMES
DOPA OXIDATION
AFFILIATION:
ARMY CHEMICAL DEFENCE ESTABLISHMENT PORTON DOWN, ENGLAND, AND
MINISTRY OF SUPPLY, ENGLAND
SOURCE TITLE:
SECTION OF EXPERIMENTAL MEDICINE AND
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PERFORMING ORGANIZATION: ARMY CHEMICAL DEFENCE ESTABLISHMENT PORTON DOWN, ENGLAND, AND MINISTRY OF SUPPLY, ENGLAND
SPONSORING ORGANIZATION: ARMY CHEMICAL DEFENCE ESTABLISHMENT PORTON DOWN, ENGLAND, AND MINISTRY OF SUPPLY, ENGLAND

TITLE (DOCUMENT): BIOCHEMICAL MECHANISMS INVOLVED IN POISONING BY ANTICHOLINESTERASES

ABSTRACT/DIGEST

EXPERIMENTATION WAS DONE SEEKING A CHEMICAL RESEMBLING THE ACTIVE CENTER OF CHOLINESTERASE (CHE), WHICH WOULD BE NONTOXIC AND YET BE ABLE TO COMBINE WITH SARIN FAST ENOUGH TO PROTECT AN ORGANISM AGAINST SARIN'S TOXIC SIDE-EFFECTS. THE CHEMICAL, 3,4-DIHYDROXY-PHENYLALANINE (DOPA), AND OTHER 0-DIHYDROXYBENZENE DERIVATIVES WERE ABLE TO PROTECT TRUE AND PSEUDO-CHES AGAINST SARIN, TABUN, AND SOMAN AND, TO A LESSER EXTENT, DFP. A DIRECT DOPA-SARIN REACTION APPEARED TO BE INVOLVED, BUT TENTATIVE CONCLUSIONS ARE THAT THE ACTIVE CENTER OF CHE WAS NOT PHENOLIC. DOPA DID NOT REVERSE INHIBITION BY SARIN. ITS PROTECTIVE EFFECT DISAPPEARED ON DILUTION TO A DEGREE THAT WAS THERAPEUTICALLY IMPRACTICABLE. A FURTHER CONCLUSION WAS THAT DOPA MIGHT BE THE PRECURSOR OF A MORE ACTIVE SUBSTANCE. STUDY OF THE PRODUCTS OF ENZYMIC AND NON-ENZYMIC OXIDATION OF DOPA FAILED TO SHOW SUCH A SUBSTANCE.

BASIS KEY: 7
RECORD SECURITY: 0
ITEM 8

ACCESSION NUMBER : 00000026
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NO. OF REFERENCES : 10
AUTHORS :
BERRY W K

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107-49-3
51-15-0
96-64-0
51-84-3
154-97-2
56-97-3
51-55-8

INDEX TERMS :
DIAPHRAGM
ACETYLCHOLINESTERASE
TETRAETHYL PYROPHOSPHATE
PRALIDOXIME
GUINEA PIGS
RATS
RAT DIAPHRAGM
GUINEA PIG DIAPHRAGM
TEPP
LD50
SOMAN
HYDROLYSIS
ACETYLCHOLINE
OXIMES
P2S
TMB-4
ATROPINE
REACTIVATION

AFFILIATION :
CHEMICAL DEFENCE ESTABLISHMENT, PORTON DOWN, WILTS., ENGLAND
SOME SPECIES DIFFERENCES IN THE RATES OF REACTION OF DIAPHRAGM PARTICULATE ACETYLCHOLINESTERASES WITH TETRAETHYL PYROPHOSPHATE AND PRALIDOXIME

ABSTRACT/DIGEST

THE DEMONSTRATED EXISTENCE OF TWO FORMS OF ACHE IN THE GUINEA PIG AND RAT DIAPHRAGM -- SOLUBLE AND PARTICULATE FRACTIONS -- HAS BEEN PROPOSED TO EXPLAIN THE FAILURE OF TETRAETHYL PYROPHOSPHATE (TEPP) PRETREATMENT TO RAISE THE LD50 OF SOMAN FOR RATS BY THE SAME DEGREE APPLICABLE TO OTHER SPECIES. THE PRESENT STUDY EXPLORED THE KINETIC PROPERTIES OF GUINEA PIG AND RAT PARTICULATE ACHE TO EXPLAIN THIS PHENOMENON. THE VELOCITY OF HYDROLYSIS OF 5.5 MM ACETYLCOLINE (ACH) WAS MEASURED FOLLOWED BY ADDITION OF 1 MM TEPP. RESULTS SHOWED THAT TEPP INHIBITION WAS PSEUDO-REVERSIBLE, BEING STABLE PRIOR TO ADDITION OF OXIME. TEPP INHIBITION OF GUINEA PIG DIAPHRAGMS SHOWED 15-20% INHIBITION WITHIN 40-50 MIN, WHILE SUBSEQUENT ADDITION OF 2-HYDROXYIMINOMETHYL-N-METHYL PYRIDINIUM METHANESULPHONATE (P2S) EQUIVALENT TO THE DIAPHRAGM PORTION 30-60 MIN AFTER 30 MG/KG I.M. PRODUCED REACTIVATION TO 20-30% OF NORMAL AFTER 45-50 MIN. AN EQUIVALENT DOSE OF TMB-4 (1,3-DI (4-HYDROXYIMINO METHYLPYRIDINIUM) PROPANE DIHALIDE) PRODUCED REACTIVATION TOO RAPID TO PLOT. THE SAME CONCENTRATION OF TEPP INHIBITED RAT PREPARATIONS TOO RAPIDLY TO DEVELOP RATE CONSTANTS, REACHING THE LEVELS SEEN IN GUINEA PIGS. SUBSEQUENT P2S CAUSED RAPID REACTIVATION TO 25% OF NORMAL. THE AUTHOR CONCLUDES THAT THE MAJOR FACTOR IN TEPP PROTECTION IS THE SPEED OF INHIBITION AND REACTIVATION. IF GIVEN TO GUINEA PIGS 1 MIN BEFORE SOMAN, PROTECTION WAS EQUIVALENT TO THAT OF ATROPINE AND P2S ALONE, WHILE MAXIMAL PROTECTION RESULTED FROM PRETREATMENT AT 0.5-5 HR PRIOR TO SOMAN. P2S IS EFFECTIVE IN THE GUINEA PIG BECAUSE REACTIVATION LAGS BEHIND SOMAN CLEARANCE FROM THE DIAPHRAGM, WHEREAS RAPID REACTIVATION OCCURS IN THE RAT IN THE PRESENCE OF FREE SOMAN. TMB-4 IS INEFFECTIVE IN THE GUINEA PIG BECAUSE OF THE SAME PHENOMENON OF TOO-RAPID REACTIVATION.

BASIS KEY :8

RECORD SECURITY :0
ITEM 9

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PAGE RANGE : 1259-1266
NO. OF REFERENCES : 11
AUTHORS :
BEPRY W K
DAVIES D R
RUTLAND J P
CAS REGISTRY NUMBERS :
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51-55-8
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INDEX TERMS
SOMAN
SARIN
3-METHYLBUTYL-2-METHYLPHOSPHONOFLUORIDATE
MBPF
DIAPHRAGM ACETYLCHOLINESTERASE
RATS
TUB-4
ATROPINE
OXIMES
ORGANOPHOSPHATES
AFFILIATION :
ARMY DEPT., CHEMICAL DEFENCE EXPERIMENTAL ESTABLISHMENT, PORTON DOWN,
SALISBURY, WILTS.
SOURCE TITLE : BIOCHEMICAL PHARMACOLOGY
PERFORMING ORGANIZATION :
ARMY DEPT., CHEMICAL DEFENCE EXPERIMENTAL ESTABLISHMENT, PORTON DOWN,
SALISBURY, WILTS.
SPONSORING ORGANIZATION :
ARMY DEPT., CHEMICAL DEFENCE EXPERIMENTAL ESTABLISHMENT, PORTON DOWN,
SALISBURY, WILTS.
TITLE (DOCUMENT) :
PROBLEMS IN THE TREATMENT WITH OXIMES AND ATROPINE OF RATS POISONED
BY ORGANOPHOSPHATES
ABSTRACT/DIGEST

SINCE SOMAN-INACTIVATED ACETYLCHOLINESTERASE (ACHE) CANNOT BE REACTIVATED UNDER PHYSIOLOGICAL CONDITIONS, AN ATTEMPT HAS BEEN MADE TO ASSESS THE SIGNIFICANCE OF AGING IN VIVO USING THE SOMAN HOMOLOGUE 3-METHYLBUTYL-2-METHYLPHOSPHONOFUORIDATE (MBPF). SOMAN ITSELF WAS NOT PART OF THE EXPERIMENT, BUT PREVIOUS STUDIES USING SOMAN WERE CITED. SARIN WAS USED FOR COMPARISON WITH MBPF. THIS EXPERIMENT ATTEMPTS TO REACTIVATE DIAPHRAGM ACHE OF THE RAT IN VITRO WITH IMB-4 AND ATROPINE.

BASIS KEY : 9
RECORD SECURITY : 0
Appendix D
Print-Out of Sample Thesaurus
Introductory Notes

A desirable objective in an information system is the consistent representation of subject matter in both indexing and searching operations. To this end a controlled standardized vocabulary is frequently used so that both indexing and searching can be conducted using a common language.

The thesaurus serves as an authority list for use in both information indexing and retrieval. It represents an organized, comprehensive, and structured vocabulary listing the terms that have been accepted and approved as a standard by participating members of a specialized user group, in a defined area of information. It specifies those terms that are allowed as authorized "descriptors". The thesaurus identifies the scope of each term so that all terms are clear and discrete. Ideally, the terms in the thesaurus are sufficiently comprehensive for the identification and communication of information in the defined area covered by the information system.

One of the more important functions of the thesaurus is to display the relationships among terms in the vocabulary, thus aiding the indexer and searcher to select the most appropriate terms when indexing documents, or formulating search requests.

The thesaurus shows synonymous, hierarchical and other relationships. Such a controlled vocabulary promotes maximum consistency in the description of concepts. It serves further as a store of intellectual decisions that have been made as a result of previous indexing and searching operations.

The present thesaurus was designed for post-coordinate indexing. In such a system many terms are combined at the search stage. It was prepared to serve as a base for an open-ended microthesaurus to be used for a specialized data base, and was derived from the following sources:

(1) Actual documents in the data base
(2) MeSH (Medical Subject Headings, National Library of Medicine)
(3) Chemical Abstracts Index Guide (American Chemical Society)
(4) Merck Index
(5) Various biomedical and scientific dictionaries and encyclopedias

As new documents are added to the data base, the thesaurus will be expanded accordingly.
Cross references employed in the thesaurus are:
USE; USED FOR; RELATED TERM; BROADER TERM; and NARROWER TERM.
Scope notes are included where necessary.

(1) USE
The USE reference is intended to lead thesaurus users from a term
that is not an authorized term to one that is authorized for in-
dexing and searching.
The USE reference leads to the preferred term.

(2) USED FOR
The USED FOR (UF) reference is the reciprocal of the USE reference,
and accompanies the term to which the USE reference refers. It
is the reverse of a USE reference, and indicates the access points
in the thesaurus referring to the term to be used.

(3) BROADER TERM
The BROADER TERM (BT) reference is employed to refer from a term
representing a member of a class of concepts to the term naming
that class, for example:

Mammals       BT Vertebrates

For each BROADER TERM reference there must also be provided a
Corresponding NARROWER TERM. The broader term may be one which
is higher in a hierarchical relationship than the one under which it appears.

(4) NARROWER TERM
The NARROWER TERM (NT) reference is the reciprocal of the BROADER
TERM (BT). The NT is employed to identify the term as a member of
the class represented by the entry, for example:

Vertebrates     NT Mammals

For each NARROWER TERM reference there must be provided a corre-
sponding BROADER TERM reference. The narrower term, which is the
opposite of the broader term, may be used to indicate terms lower
in a hierarchical relationship than the one under which it appears.

The whole-part relationship may in some cases be used with the
NT/BT designation.

(5) RELATED TERM
The RELATED TERM (RT) reference is employed as a guide from a
given term to other terms that are closely related in ways other
than the genus-species (BT/NT) relationship. In general, any two
terms bear the cross-reference RT to each other if it is believed
that the user, when examining one of them, would want to be re-
mined of the existence of the other. The RT advises the indexer
or searcher to consider also the terms designated as related.
(6) **SCOPE NOTES**

The scope note which accompanies the term, but is not a part of it, is used to designate the scope of the term. It may be used to exclude a possible meaning from the term, and indicate the acceptable term to use for that meaning, or explicitly to include an uncommon meaning under a term. It is used to indicate any intended restrictions in the use of the term. In case of possible misunderstanding, it is used to define a term.

(7) **PARENTHETICAL QUALIFIERS**

Used sparingly, the parenthetical qualifier may be appended to a term to distinguish among homographs, for example.

- Mercury (metal)
- Mercury (planet)

The parenthetical qualifier is considered as a part of the term, in contrast to the definition given in a scope note.

**Thesaurus Displays**

A thesaurus may be complete with only an alphabetic display of terms with cross references. In the present thesaurus it is recommended that a numerical and alphabetical display indicating Chemical Abstracts registry numbers be included. At a later period it may be decided that other displays would be useful, for example, a tree-structure display, and a permuted display of terms in which each word of multi-word terms may be accessed alphabetically.
AATP
  U Parathion
Abate
  BT Insecticides, organothiophosphate
Abdomen
Abnormalities
  NT Deformities
Absorption, skin
  U Skin absorption
Acetic acid phenyl ester
  U Phenyl acetate
Acetone  67-64-1
Acetonitrile  75-05-8
  UF Cyanomethane
  UF Methyl cyanide
3-Acetoxyindole
  U Indoxyl acetate
7-Acetoxy-1-methylquinolinium iodide
  U 7-Ac-Q
8-Acetoxy-1-methylquinolinium iodide
  U 8-Ac-Q
2-Acetoxy-naphthalene
  U Beta-Naphthyl acetate
Acetylation
Acetylcarnitine  14992-62-2
  UF Carnitine Acetyl Ester
Acetylcarnitine chloride
  U Acetylcarnitine hydrochloride
Acetylcarnitine hydrochloride  33661-41-5  4326-58-3  5080-50-2
  UF Acetylcarnitine chloride
Acetylcholine 51-84-3
  UF Ethanaminium, 2-(acetyloxy)-N,N,N-trimethyl-
Acetylcholine bromide  66-23-9
Acetylcholine chloride  60-31-1
Acetylcholine hydrolase
Acetylcholine iodide
Acetylcholine receptor
Acetylcholine release
Acetylcholinesterase
   U AChE
Acetylcholinesterase inhibition
Acetylcholinesterase inhibitors
Acetylcholine uptake
Acetylcholine chloride  60-31-1
Acetylcholine perchlorate
Acetyl-beta-methylcholine
   U Methacholine
Acetyl-beta-methylcholine bromide
   U Methacholine bromide
Acetyl-beta-methylcholine chloride
   U Methacholine chloride
O-Acetyl-beta-naphthol
   U Beta-Naphthyl acetate
Acetyl phenol
   U Phenyl acetate
Acetylthiocholine  4468-05-7
   BT Choline
Acetylthiocholine iodide
Acetyltransferase, choline  9012-78-6
   UF Choline acetylase
   UF Choline acetyltransferase
Acetyltransferases
Acetyltirosine ethyl ester
   U N-Acetyl-L-tyrosine ethyl ester
Acetyl-L-tyrosine ethyl ester
   U N-Acetyl-L-tyrosine ethyl ester
N-Acetyl-L-tyrosine ethyl ester  840-97-1
   UF Acetyltirosine ethyl ester
   UF Acetyl-L-tyrosine ethyl ester
   UF Acetyl-L-tyrosyl ethyl ester
   UF ATEE
   UF Ethyl N-acetyl-L-tyrosinate
   UF Ethyl acetyltirosinate
Acetyl-L-tyrosyl ethyl ester
U Acetyl-L-tyrosine ethyl ester
AChE
BT Cholinesterases
UF Acetylcholinesterase
Acid-base equilibrium
NT Buffers
Acidity
RT pH
Acids
RT Bases
Acocantherin
U Ouabain
7-Ac-Q
U 7-Acetoxy-1-methylquinolinium iodide
8-Ac-Q
UF 8-Acetoxy-1-methylquinolinium iodide
9-Acidinamine, 1,2,3,4-tetrahydro-
U Tacrine
Actinomycin D 50-76-0
UF Cosmegen
UF Dactinomycin
UF Meractinomycin
Acyl groups
U Radicals, acyl
Adaptation, biological
Adenosine 58-61-7
BT Nucleosides
Adenosine 3',5'-cyclic monophosphate 60-92-4
UF cAMP
UF cyclic AMP
Adenosine, N-(1-oxobutyl)-, cyclic 3',5'-(hydrogen phosphate) 2'-butanoate
U Dibutyryl cyclic AMP
Adenosine 5'-phosphorimidazolide 20816-58-4
Adenosine triphosphatase
BT Phosphatases
UF ATPase
Adenosine triphosphate 56-65-5
UF ATP
Adenylate cyclase 9012-42-4
UF Adenyl cyclase
UF Adenylyl cyclase
UF Cyclase, adenylyl
Adenyl cyclase
U Adenylate cyclase
Adenyl cyclase
  U Adenylate cyclase
Adephenine hydrochloride
  U Trasentine hydrochloride
Adiphenine 64-95-9
  UF Benzeneacetic acid, alpha-phen/1-, 2(diethylamino)ethyl ester
Adrenal Cortex
  BT Adrenal glands
Adrenal glands
  BT Endocrine glands
  NT Adrenal Cortex
  NT Adrenal Medulla
  NT Interrenal gland
Adrenaline
  U Epinephrine
Adrenal Medulla
  BT Adrenal glands
Aging
Aging rate
Air sacs
  RT Lung
Albumins
Alcohol, ethyl
  U Ethanol
Alcohol, methyl
  U Methanol
Alcohols
Aldicarb 116-06-3
  BT Insecticides, carbamate
Aliesterase
  U Esterase, carboxyl
Alitinal
  U Amobarbital sodium
Alkaloids
Alkoxy
  U Radicals, alkoxy
Alkylation
Alkyl radicals
  U Radicals, alkyl
Allergens
  RT Hypersensitivity
Allergy
  RT Hypersensitivity
Allosteric regulation
AM-1 71006-78-5
  UF O-Ethyl, S-diethylaminoethyl ethylphosphonothiolate
  UF 1H-Imidazole-1-ethanol, alpha-(methoxymethyl)-2-methyl-4-nitro-
Ambenonium chloride  115-79-7
BT Cholinesterase inhibitors
UF Ambestigminum
Ambestigminum
    U  Ambenonium chloride
Amechcl
    U  Methacholine bromide
Amines
    RT  Amino compounds
gamma-Aminobutyric acid
    U  GABA
Amino compounds
    RT  Amines
    RT  Nitrogen
beta-Aminoethylglyoxaline
    U  Histamine
Aminoethylphosphonic acid
    BT  Organophosphorus compounds
2-Amino-3-hydroxypropionic acid
    U  Serine
alpha-Aminoisocaproic acid
    U  Leucine
2-Amino-4-methylvaleric acid
    U  Leucine
Aminoxyacetic acid hemihydrate 2921-14-4
Aminophylline  317-34-0
4-Amino-1-beta-D-ribofuranosyl-2-(1H)-pyrimidinone
    U  Cytidine
9-Amino-1,2,3,4-tetrahydroacridine
    U  Tacrine
Aminotransferase, aspartate
    U  Glutamic oxalacetic transaminase
Amiton  78-53-5  3734-97-2
BT Cholinesterase inhibitors
BT Insecticides
    UF  O,O-Diethyl S-2-diethylaminoethyl phosphorothioate
    UF  DSDP
    UF  Inferno
    UF  Metramac
    UF  Phosphorothioic acid, esters, S-2[(diethylamino)ethyl] O,O-diethyl ester
    UF  Tetrain
Ammonium fluoride  12125-01-8
Amobarbital sodium  35942-73-5  64-43-7
UF Alitinai
UF Amylobarbitone sodium
UF Amytal sodium
UF Sodium amobarbital
Amobarbital sodium

Amobarbital sodium (cont’d)
UF Sodium amytal
Amygdala
U Amygdaloid body
Amygdaloid body
UF Amygdala
Amylacetate ester
U Isoamyl acetate
Amylobarbitone sodium
U Amobarbital sodium
Amytal sodium
U Amobarbital sodium
Anaerobiosis
BT Metabolism
Analgesia
RT Pain
Anaphylaxis
RT Hypersensitivity
Anesthesia
Anesthesia adjuvants
Anesthesia, conduction
UF Anesthesia regional
Anesthesia, general
Anesthesia, inhalation
Anesthesia, intravenous
Anesthesia, local
Anesthesia, regional
U Anesthesia, conduction
Anesthesia, spinal
Anesthetics
Anesthetics, local
Animals
NT Laboratory animals
Animals, laboratory
U Laboratory animals
Animal testing
RT Laboratory animals
Anions
Anoxia
UF Hypoxia
UF Oxygen deficiency
Antagonism
Antagonists
Anthracene carboxylic acid
UF Anthroic acid
Anthroic acid
U Anthracene carboxylic acid
Anti-arrhythmia agents
UF Antifibrillatory agents
UF Cardiac depressants
UF Myocardial depressants
Antibody diversity
Antibody diversity

Antibody diversity (cont’d)
BT Immunity
Antibody formation
BT Immunity
Antibody specificity
BT Immunity
Anticholinergic agents
U Parasympatholytics

Anticholinesterase activity
U Cholinesterase inhibitors
Anticholinesterase agents
U Cholinesterase inhibitors
Anticonvulsants
Antidotes
RT Poisoning
Antifibrillatory agents
U Anti-arrhythmia agents
Antigen-antibody reactions
BT Immunity
Antimuscarinic agents
U Parasympatholytics
Antirex
U Edrophonium chloride
Apnea
RT Respiration
Apocrine glands
BT Sweat glands
Arm
NT Forearm
Armin 546-71-4
BT Organophosphorus compounds
UF Armine
UF Ethoxy-4-nitrophenyloxy-ethylphosphonoxide
UF Ethyl p-nitrophenyl ethylphosphonate
UF Phosphonic acid, ethyl-, ethyl 4-nitrophenyl ester
Armine
U Armin
Arpenal 3098-65-5
UF Benzenacetic acid, alpha-phenyl, 3
(diethylamino)propyl ester, hydrochloride
UF N-[(3-Diethylaminopropyl)-2-2] diphenylacetamide
UF Diophenylacetic acid diethylaminopropylamide
UF 1-Propanol, 3-(diethylamino)–, diphenylacetate,
hydrochloride
Arterenol
U Norepinephrine
Arterial blood pressure
U Blood pressure
Arteries
Where indicated use names of specific arteries
BT Blood vessels
Artificial respiration
  U Respiration, artificial
Artificial ventilation
  U Respiration, artificial
Aspiration
  BT Respiration
ATEE
  U N-Acetyl-L-tyrosine ethyl ester
Atmosphere
  U Adenosine triphosphate
ATPase
  U Adenosine triphosphatase
Atrioventricular block
  U Heart block
Atrioventricular node
Atropine 51-55-8
  BT Parasympathomimetics
  UF Hyoscyamine
Atropine methyl bromide
  U Methylatropine bromide
Atropine sulfate 55-48-1
Autonomic fibers
  BT Neurons
Autonomic nervous system
  BT Nervous system
Autoradiography
  UF Radioautography
Axons
  BT Nerve fibers
  BT Neurons
Axoplasm
Azinphosmethyl 86-50-0
  BT Insecticides, organothiophosphate
Azinphos-methyl
  U Guthion
  8-Azoniabicyc [3.2.1] octane, 3-(3-hydroxy-1-oxo-2-phenylpropoxy)-8,8-
  dimethyl-, endo-, nitrate
  U Methylatropine nitrate
  8-Azoniabicyc [3.2.1] octane, 3-(3-hydroxy-1-oxo-2-phenylpropoxy)-8,8-
  dimethyl-; bromide, endo-
  U Methylatropine bromide
B4FPBOCl₂
  UF 1,3-bis(4-formylpyridinium-propane)bis-oxime dichloride
Back
Barbital 57-44-3
  BT Barbiturates
  UF Barbitone
  UF 2, 4, 6 (1H, 3H, 5H)-pyrimidinetrione, 5, 5-diethyl-
  UF Vero nal
Barbital phosphates
Barbitone
   U Barbital
Barbiturates
   BT Hypnotics and Sedatives
   NT Barbital
Bases
   RT Acids
Beak (chicken)
Benactyzine 302-40-9
   BT Benzilates
   BT Parasympatholytics
   UF Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 2-(diethylamino)ethyl ether
   UF 2-Diethylaminoethylbenzylate hydrochloride
Bensyllyt
   U Dibenzyline
Benzalin
   U Nitrazepam
Benzenaminium, 3-[(diethoxy-phosphinyl)-oxy]-N,N,N-trimethyl-, methyl sulfate
   U Ro-3-0340
Benzenaminium, 3-[((dimethylamino) carbonyl]oxy]-N,N,N-trimethyl-
   U Neostigmine
Benzenaminium, N-ethyl-3-hydroxy-N,N-dimethyl-, chloride
   U Tensilon
Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 1-azabicyclo[2.2.2]oct-3-yl ester
   U Ro-2-3308
Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 2-(diethylamino)ethyl ether
   U Benactyzine
Benzeneacetic acid, alpha-hydroxy-alpha-phenyl esters, 1-methyl-3-piperidinyl ester
   U JB-336
Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 1-methyl-4-piperidinyl ester, hydrochloride
   U JB-336/4
Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 1-methyl-3-piperidinyl ester, hydrochloride
   U JB 336/3
Benzeneacetic acid, alpha-phenyl-2-(diethylamino)ethyl ester
  U Adiphenine
Benzeneacetic acid, alpha-phenyl-2-(diethylamino)ethyl ester
  U Trasentine
Benzeneacetic acid, alpha-phenyl, 3(diethylamino)propyl ester, hydrochloride
  U Arpenal
Benzenaminium, N-ethyl-3-hydroxy-N,N-dimethyl-
  U Edrophonium
Benzenemethanamine, N-(2-chloroethyl)-N-(1-methyl-2-phenoxyethyl)-
  U Dibenzyline
Benzene, methyl-
  U Toluene
Benzenesulfonyl fluoride
Benzilates
  NT Benactyzine
Benzin 8030-03-06
  NT Naphtha
  NT Petroleum ether
Benzodiazepines
  2H-1,4-Benzodiazepin-2-one, 7-chloro-1,3-dihydro-1-methyl-5-phenyl-
    U Diazepam
  2H-1,4-Benzodiazepin-2-one, 7-chloro-1,3-dihydro-1-methyl-5-phenyl-
    U Valium
  2H-1,4-Benzodiazepin-2-one, 1,3-dihydro-7-nitro-5-phenyl-
    U Nitrazepam
Benzoic acid, 4-amino, 2-(diethylamino)ethyl ester
  U Procaine
Benzoic acid, 3-chloro-2,5,6-trimethyl-
  UF U-23223
Benzoic acid, esters
Benzoic acid, 4-(2-methylpropoxy)-3-(diethylamino)1,2-dimethylpropyl ester hydrochloride
  U Gangleron
Benzoylcholine 2208-04-0 2964-09-2
  BT Choline
Benzoylcholine (cont’d)
UF Choline benzoate
UF Choline, benzoyl
UF Ethanaminium, 2-(benzoyloxy)-N,N,N-trimethyl-
Benzoylcholinesterase
UF Cholinesterase
Benzylty
UF Dibenzyline
Bicyclo [2.2.1]heptan-2-amin, N,2,3,3-tetramethyl-
UF Mecamylamine
Binding, competitive
UF Competitive binding
Binding sites
Bladder
BT Urinary tract
Blockage
Blood
Blood brain barrier
RT Cerebrospinal fluid
Blood cell count
BT Cell count
Blood cells
BT Cells
NT Blood platelets
NT Erythrocytes
NT Hemocytes
NT Leukocytes
Blood circulation
RT Ischemia
UF Circulation
Blood coagulation
Blood flow velocity
Blood glucose
RT Hyperglycemia
Blood levels
Blood plasma
UF Plasma
Blood platelets
BT Blood cells
Blood pressure
RT Pressure
UF Arterial blood pressure
Blood pressure determination
Blood pressure, high
UF Hypertension
Blood pressure, low
UF Hypotension
Blood pressure, venous
UF Venous pressure
Blood transfusion

Blood transfusion
  UF Transfusion
Blood vessels
  NT Arteries
  NT Veins
Body temperature
  RT Fever
  RT Temperature
  RT Thermography
  RT Thermometers
Body temperature changes
Body temperature regulation
  UF Heat loss
  UF Heat production
  UF Thermoregulation
Body weight
  RT Weight gain
  RT Weight loss

Bone and Bones
  Names of specific bones are used where indicated
Bone marrow
  UF Marrow
Bone marrow cells
  BT Cells
Borates
Botulin
  UF Botulinum toxins
Botulinum toxins
  RT Botulism
  UF Botulin
Botulism
  RT Botulinum toxins
Bovine serum albumin
  UF Serum albumin, bovine
Brachial plexus
Bradycardia
Brain
  UF Cerebrum
Brain stem
Breast
Breathing
  NT Inhalation
Bromine cyanide
  UF Cyanogen bromide
Bromophos
  BT Insecticides, organothiophosphate
Bronchi
  BT Lung
Bronchial arteries
Bronchial spasm
  UF Bronchospasm
Bronchodilation
Bronchodilator agents
Buffers
  BT Acid-base equilibrium
Bursine
  U Choline
Butanedioic acid [(dimethoxyphosphinothioyl) thio]-, diethyl ester
  U Malathion
2,3-Butanedione, monooxime 57-71-6
  UF DAM
  UF Diacetyl monoxime
Butanoic acid, 4-amino
  U GABA
Butanoic acid, anhydrides, anhydride
  U Butyric anhydride
2-Butanol, 3,3-dimethyl-
  U Pinacolyl alcohol
2-Butenoic acid, 3-[(dimethoxy-phosphinyl)oxy]-methyl ester
  U Phosdrin
Buttocks
Butyl dihydrogen phosphate 1623-15-0
  UF Monobutylphosphoric acid
Butyl ether 142-96-1
Butyric anhydride 106-31-0
  UF Butanoic acid, anhydrides, anhydride
Butyrocholine iodide  U Butyrylcholine iodide
Butyrylcholine 3922-86-9
Butyrylcholine bromide 18956-84-8
Butyrylcholine chloride 2963-78-2
Butyrylcholine iodide 2494-56-6
  UF Butyrocholine iodide
Butyrylcholinesterase
  U Cholinesterase
Butyrylthiocholine
  BT Choline
Butyrylthiocholine iodide 1866-16-6
  UF (2-Mercaptoethyl)trimethylammonium iodide butyrate

Caffeine 58-08-2
Calciunm 7440-70-2
Callithricidae
  UF Marmosets
cAMP
  U Adenosine 3'5'-cyclic monophosphate
Cannula
Cannulation
  U Catheterization
Capillaries
Caramiphene 77-22-5
  UF Cyclopentanecarboxylic acid, 1-phenyl-2(diethylamino) ethyl ester
Caramiphen 77-22-5

Caramiphen 77-22-5 (cont’d)
UF Parpanil
UF Pentaphen
Caramiphene hydrochloride
UF Caramiphen hydrochloride
Caramiphen hydrochloride 125-85-9
BT Parasympatholotics
UF 2-Diethylaminoethyl-L-phenyl cyclopentane carboxylate hydrochloride
UF Caramiphene hydrochloride
UF Caramiphenium chloride
UF G 2747
UF Parpanit
UF Pentaphene hydrochloride
Caramiphenium chloride
UF Caramiphen hydrochloride
Carbachol 51-83-2
BT Parasympatholytics

UF Carbacholine chloride
UF Carbaminoylcholine chloride
UF Carbamylcholine
UF Choline carbamate chloride
Carbacholine chloride
UF Carbachol
Carbamates
Carbamic acid, esters
Carbamic acid, esters, ethyl ester 51-79-6

UF Ethyl carbamate
UF Urethan
UF Urethane
Carbamide
UF Urea
Carbaminocholine
UF Carbamoylcholine
Carbaminoylcholine
UF Carbamoylcholine
Carbaminoylcholine chloride
UF Carbachol
Carbamoylcholine 462-58-8
UF Carbaminocholine
UF Carbaminoylcholine
Carbamylcholine
UF Carbachol
Carbaryl
UF N-Methyl carbamate
Carbohydrate metabolism
Carbon 7440-44-0
Carbon dioxide 124-38-9
Carbonic acid, monosodium salt
Carbonic acid, monosodium salt (cont’d)
   U Sodium bicarbonate
Carbonic dichloride
   U Phosgene
Carbon tetrachloride poisoning  56-23-5
Carbonyl chloride
   U Phosgene
Carbonyl compounds
Carbonyldiamide
   U Urea
Carboxylic acids, esters
3-Carboxypyridine N-oxide
   U Oxyniacic acid
Cardiac arrest
   U Heart arrest
Cardiac depressants
   U Anti-arrhythmia agents
Cardiac output
Cardiovascular agents
Cardiovascular diseases
Cardiovascular homeostasis
Cardiovascular system
Cardiovascular system physiology
Carnitine  541-15-1
Carnitine Acetyl Ester
   U Acetylcarnitine
Carotid arteries
Carotid body
Catalysis
Catheterization
   UF Cannulation
Cathode ray oscilloscope
   U Oscilloscope
Cations
Cats
   BT Laboratory animals
   BT Mammals
Caudate nucleus
CDP-Choline
   U Cytidine 5’-diphosphate choline
CEES
   U 2-Chloroethyl ethyl sulfide
Cell count
   BT Cells
      NT Blood cell count
      NT Cell wall

Cell division
Cell membrane
<table>
<thead>
<tr>
<th>Cell membrane</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell membrane (cont'd)</td>
<td></td>
</tr>
<tr>
<td>RT Membrane potentials</td>
<td></td>
</tr>
<tr>
<td>RT Membranes</td>
<td></td>
</tr>
<tr>
<td>UF Plasma membrane</td>
<td></td>
</tr>
<tr>
<td>Cell membrane permeability</td>
<td></td>
</tr>
<tr>
<td>UF Permeability, cell membrane</td>
<td></td>
</tr>
<tr>
<td>Cell nucleus</td>
<td></td>
</tr>
<tr>
<td>BT Cells</td>
<td></td>
</tr>
<tr>
<td>Cells</td>
<td>Names of specific cells are used where indicated.</td>
</tr>
<tr>
<td>NT Blood cells</td>
<td></td>
</tr>
<tr>
<td>NT Bone marrow cells</td>
<td></td>
</tr>
<tr>
<td>NT Cell count</td>
<td></td>
</tr>
<tr>
<td>NT Cell nucleus</td>
<td></td>
</tr>
<tr>
<td>NT Cytoplasm</td>
<td></td>
</tr>
<tr>
<td>NT Epithelial cells</td>
<td></td>
</tr>
<tr>
<td>Cells, cultured</td>
<td></td>
</tr>
<tr>
<td>Cell wall</td>
<td></td>
</tr>
<tr>
<td>BT Cell count</td>
<td></td>
</tr>
<tr>
<td>Central nervous system</td>
<td></td>
</tr>
<tr>
<td>BT Nervous system</td>
<td></td>
</tr>
<tr>
<td>Centrum medianum</td>
<td></td>
</tr>
<tr>
<td>Cerebellar cortex</td>
<td></td>
</tr>
<tr>
<td>Cerebellum</td>
<td></td>
</tr>
<tr>
<td>Cerebral blood flow</td>
<td></td>
</tr>
<tr>
<td>Cerebral cortex</td>
<td></td>
</tr>
<tr>
<td>Cerebral hemorrhage</td>
<td></td>
</tr>
<tr>
<td>UF Hemorrhage, cerebral</td>
<td></td>
</tr>
<tr>
<td>Cerebrospinal fluid</td>
<td></td>
</tr>
<tr>
<td>RT Blood brain barrier</td>
<td></td>
</tr>
<tr>
<td>Cerebrum</td>
<td></td>
</tr>
<tr>
<td>U Brain</td>
<td></td>
</tr>
<tr>
<td>Cevadine 62-59-0</td>
<td></td>
</tr>
<tr>
<td>UF Cevane-3,4,12,14,16,17,20-heptol,4,9-epoxy-,3- (2-methyl-2-butenoate)</td>
<td></td>
</tr>
<tr>
<td>UF Veratrine</td>
<td></td>
</tr>
<tr>
<td>Cevane-3,4,12,14,16,17,20-heptol,4,9-epoxy-,3- (2-methyl-2-butenoate)</td>
<td></td>
</tr>
<tr>
<td>U Cevadine</td>
<td></td>
</tr>
<tr>
<td>cGMP</td>
<td></td>
</tr>
<tr>
<td>U Guanosine 3',5'-cyclic monophosphate</td>
<td></td>
</tr>
<tr>
<td>Chemoreceptors</td>
<td></td>
</tr>
<tr>
<td>Chickens</td>
<td></td>
</tr>
<tr>
<td>Chloralose 15879-93-3 693-07-2</td>
<td></td>
</tr>
<tr>
<td>Chlorfenvinphos</td>
<td></td>
</tr>
<tr>
<td>BT Insecticides, organophosphate</td>
<td></td>
</tr>
<tr>
<td>Chlorine cyanide</td>
<td></td>
</tr>
<tr>
<td>U Cyanogen chloride</td>
<td></td>
</tr>
<tr>
<td>N-Chloroacetyl-L-tyrosine ethyl ester</td>
<td></td>
</tr>
<tr>
<td>U Acetyl-L-tyrosine ethyl ester</td>
<td></td>
</tr>
<tr>
<td>2-Chloroethyl ethyl sulfide 693-07-2</td>
<td></td>
</tr>
<tr>
<td>UF CEES</td>
<td></td>
</tr>
</tbody>
</table>
2-Chloroethyl ethyl sulfide 693-07-2 (cont’d)

UF Ethyl 2-chloroethyl sulfide
Bis(2-chloroethyl) sulfide
UF 2,2’-Dichloroethyl sulfide
Bis(beta-chloroethyl) sulfide
UF 2,2’-Dichloroethyl sulfide

Chloroform 67-66-3
Chloromercuribenzoates
2-Chloropromazine
UF Chlorpromazine
Chlorpromazine 50-53-3
UF 2-Chloropromazine
UF CPZ
UF Promazil
UF Thorazine
Choline 62-49-7
NT Acetylthiocholine
NT Benzoylcholine
NT Butyrylthiocholine

NT Phosphorylcholine
NT Thiocholine
NT Triethylcholine
UF Bursine
UF Ethanaminium, 2-hydroxy-N,N,N-trimethyl-
UF Vidine

#H-Choline
Choline acetylase
UF Acetyltransferase, choline
Choline acetyltransferase
UF Acetyltransferase, choline
Choline benzoate
UF Benzoylcholine
Choline, benzoyl
UF Benzoylcholine
Choline bromide 306-41-2
Choline carbamate chloride
UF Cartachol
Choline chloride 67-48-1
Choline Cytidine 5’-pyrophosphate
UF Cytidine 5’-diphosphate choline

Choline phosphate chloride
UF Phosphorylcholine
Choline phosphoglycerides
UF Phosphatidylcholines
Cholinergic agents
UF Parasympathomimetics
Cholinergic blocking agents
UF Parasympatholytics
Cholinergic receptors
Cholinergic receptors (cont’d)
Receptors, cholinergic
Cholinesterase
Esterases
Benzoylcholinesterase
Butryrylcholinesterase
Esterase, choline
Propionylcholinesterase
Pseudocholinesterase
Cholinesterase activity
Cholinesterase inhibitors
Ambenonium chloride
Amiton
Cholinesterase inhibitors, irreversible
Cholinesterase inhibitors, reversible
Insecticides
Anticholinesterase activity
Anticholinesterase agents
Cholinesterase inhibitors, irreversible
Cholinesterase inhibitors
Cholinesterase Reactivators
Cholinesterases

NT AChE
Cholinoceptive sites
Receptors, cholinergic
Cholinceptors
Receptors, cholinergic
Cholinolytics
Parasympatholytics
Cholinomimetics
Parasympathomimetics
Chondrosamine
Galactosamine
Chondrosamine hydrochloride
Galactosamine hydrochloride
Choroid plexus
Chromatography
Column and liquid chromatography
Gas chromatography
Gel chromatography
Paper chromatography
Thin-layer chromatography
Chymar
Alpha-Chymotrypsin
Alpha-Chymotrypsin 8049-46-5 9004-07-3 9025-29-0
Alpha-Chymotrypsin 8049-46-5 9004-07-3 9025-29-0
(cont’d)
BT Peptide hydrolases
UF Chymar
UF Chymotrypsin-A
Chymotrypsin-A
U Alpha-Chymotrypsin
Cinchocain
U Dibucaine
Cinchocaine
U Dibucaine
Cinchocaine hydrochloride 61-12-1
Circadian rhythm
RT Periodicity
Circulation
U Blood circulation
Citicholine
U Cytidine 5’-diphosphate choline

Clonazepam 1622-61-3
Cloning
Cocaine 50-36-2
Cold
RT Hypothermia
Color
Colorimetry
Competitive binding
U Binding, competitive
Constriction
Contracture
Convulsions
Cordycepin 73-03-0
Cosmegen
U Actinomycin D
Coumaphos
BT Insecticides, organothiophosphate
CPZ
U Chlorpromazine
Creatinine 60-27-5
CRO
U Oscilloscope
Crufomate
BT Insecticides, organophosphate
Crustacea
CTP
U Cytidine 5’-triphosphate
Culture media
Curare 8063-06-7
Cyanides
Inorganic cyanides are indexed at Cyanides; organic cyanides, at Nitriles.
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<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
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<td>Cyanogen bromide</td>
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<td>Cyclonal</td>
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<td>Hexobarbital</td>
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<td>Hexobarbital sodium</td>
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<td>Caramiphen</td>
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<td>Cymography</td>
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<td>Cytidine</td>
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<td>Cytidine choline diphosphate</td>
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<td>Cytidine 5'-diphosphate choline</td>
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Cytidine diphosphate (cont'd)

Cytidine diphosphate choline

- U Cytidine 5'-diphosphate choline 987-78-0
- UF CDP-Choline
- UF Choline Cytidine 5'-pyrophosphate
- UF Citicholine
- UF Cytidine choline diphosphate
- UF Cytidine diphosphate choline

Cytidine 5'-diphosphate choline, monosodium salt 33818-15-4

Cytidine monophosphate

- BT Cytosine nucleotides

Cytidine triphosphate

- BT Cytosine nucleotides

Cytidine 5'-triphosphate 6547-4
- UF CTP

Cytidine phosphates

- U Cytosine nucleotides

Cytoplasm

- BT Cells

Cytosine nucleotides

- NT Cytidine cyclic monophosphate
- NT Cytidine diphosphate
- NT Cytidine monophosphate
- NT Cytidine triphosphate
- UF Cytidine phosphates

Cytosine riboside

- U Cytidine

Dactinomycin

- U Actinomycin D

DAM

- U 2,3-Butanedione, monooxime

DDVP 6273-7

- UF 2,2-Dichlorovinyl dimethyl phosphate
- UF Dichlorvos
- UF Dimethyl-alpha,2-dichlorovinyl phosphate
- UF 0,0-Dimethyl-O-(2,2-dichlorovinyl) phosphate
- UF Phosphoric acid, esters, 2,2-dichloroethenyl dimethyl ester

Dealkylation

Death

Death rate

- U Mortality

Decamethonium 15674-1

Defoliants, chemical

- U Herbicides
Deformities
  BT Abnormalities
Delacurarine
  U d-Tubocurarine chloride
Demeton  8065-48-3
Dendrites
  BT Neurons
Denervation
  (1-(2-deoxy-beta-D-erythropentofuranosyl)-5-methyl-2, 4(1H, 3H)-pyrimidinedione)
  U Thymidine
1-(2-Deoxy-beta-D-ribofuranosyl)-5-methyluracil
  U Thymidine
Deoxyribonucleic acid
  UF DNA
Dephosphorylation
Depolarization
Depression
Dermal absorption
  U Skin absorption
Detoxification
Dextrose
  U Glucose
DFF
  UF DFP (Pesticide)
DFP (Pesticide)  55-91-4
  UF DFF
    UF Difluorophate
    UF Diisopropoxyphosphoryl fluoride
    UF Diisopropyl fluorophosphate
    UF Dyflos
    UF Fluorodiisopropyl phosphate
    UF Isofluorophate
    UF Phosphorofluoridic acid, bis (1-methylethyl) ester
Diacetyl monoxide
  U 2,3-Butanedione, monooxime
Diamethazole hydrochloride  17140-69-1
Diamethazole dihydrochloride  136-96-9
Diaphragm
Diathermy
  RT Microwaves
Diazepam  439-14-5
  UF Valium
    UF 2H-1, 4-Benzodiazepin-2-one, 7-chloro-1, 3-dihydro-1-methyl-5-phenyl-
Diazinon  333-41-5
  BT Insecticides, organothiophosphate
    UF Phosphorothioic acid, O,O-diethyl O-(2-isopropyl-6-methyl-4-
pyrimidinyl) ester
Dibenyline

Dibenzyl line 59-96-1

UF Benzyl

UF Benzenemethanamine, N-(2-chloroethyl)-N-(1-methyl
2-phenoxyethyl)-

UF Benzyl

UF Dibenzyl

UF Phenoxybenzamine

Dibenzyl line hydrochloride 63-92-3

UF Dibenzyl line chloride

UF Phenoxybenzamine chloride

UF Phenoxybenzamine hydrochloride

Dibucaine 85-79-0

UF Cinchocaine

UF Cinchocain

Dibucaine hydrochloride 61-12-1

Dibutyl 2,2-dichloroethenyl phosphate

U 2,2-Dichlorovinyl dibutylphosphate

Dibutyl 2,2-dichloroethenyl phosphate

U 2,2-Dichlorovinyl dibutylphosphate

Dibutyryl adenosine-3',5'-monophosphate

U Dibutyryl cyclic AMP

Dibutyryl cyclic adenosine monophosphate

U Dibutyryl cyclic AMP

Dibutyryl cyclic AMP 362-74-3

UF Adenosine, N-(1-oxobutyl)–, cyclic 3',5'
(hydrogen phosphate) 2'-butanoate

UF Cyclic AMP-N6,2'-O-dibutyrate

UF Dibutyryl 3',5'-cyclic AMP

UF Dibutyryl adenosine-3',5'-monophosphate

UF Dibutyryl cyclic adenosine monophosphate

Dibutyryl 3',5'-cyclic AMP

U Dibutyryl cyclic AMP

2,2-Dichloroethenyl diethyl phosphate

U 2,2-Dichlorovinyl diethyl phosphate

2,2-Dichloroethenyl dipropyl phosphate

U 2,2-Dichlorovinyl dipropyl phosphate

Di-2-chloroethyl sulfide

U 2,2'-Dichloroethyl sulfide

2,2'-Dichloroethyl sulfide 505-60-2

UF Mustard gas

UF Bis(2-chloroethyl) sulfide

UF Bis(beta-chloroethyl) sulfide

UF Di-2-chloroethyl sulfide

2,4-Dichlorophenyl methyl methyl phosphonate

2,2-Dichlorovinyl dibutylphosphate 18795-58-9

UF Dibutyl 2,2-dichloroethenyl phosphate

UF Dibutyl 2,2-dichlorovinyl phosphate

2,2-dichlorovinyl diethyl phosphate 72-00-4

UF 2,2-Dichloroethenyl diethyl phosphate

UF Ethyl DDVF
2,2-Dichlorovinyl diethyl phosphate 72-00-4 (cont'd)
UF SD 1652
2,2-Dichlorovinyl dimethyl phosphate
U DDVP
2,2-Dichlorovinyl Di-N-pentyl phosphate 20202-93-1
2,2-Dichlorovinyl diphenyl phosphate
UF 2,2-Dichloroethenyl dipropyl phosphate
2,2-Dichlorovinyl methyl penty1 phosphate 34622-69-0
Dichlorvos
U DDVP
Diethylaminoacetyl-N-phenothiazine hydrochloride
U Difazin
2-Diethylaminoethylbenzylate hydrochloride
U Benactyzine
2-Diethylaminoethyl diphenyl acetate hydrochloride
U Trazentine
2-Diethylaminoethyl-L-phenyl cyclopentane carboxylate hydrochloride
U Caramiphen hydrochloride
N-(3-Diethylaminopropyl)-2-2-diphenylacetamide
U Arpenal
3-Diethylaminopropyl oximinoacetate 25057-76-6
UQAB
1,4-Diethylene dioxide
U Dioxane
Diethyl-p-nitrophenyl phosphate
U Paraoxon
Diethyl p-nitrophenyl phosphorothionate
U Parathion
Diethyl p-nitrophenylthionophosphate
U Parathion
Diethyl p-nitrophenylthiophosphate
U Parathion
Diethylphosphorylfluoride
Diethyl-S-2-diethylaminoethyl phosphorothioate
O, O-Diethyl S-2-diethylaminoethyl phosphorothioate
  U Amiton
Difacil hydrochloride
  U Trasentine hydrochloride
Difazin  641-33-8
  U 10H-Phenothiazine, 10 [(diethylamino)acetyl]
  U Diethylaminoacetyl-N-phenothiazine hydrochloride
Difluorophate
  U DFP (Pesticide)
Difonate
  BT Insecticides, organothiophosphate
Digestive system
1, 3-Dihydro-7-nitro-5-phenyl-2H-1, 4-benzodiazepin-2-one
  U Nitrazepam
7', 2'-Dihydroxy-6, 6'-dimethoxy-2, 2', 2'-trimethyltubocuraranium chloride
  U d-Tubocurarine chloride
Dihydroxyphenylalanine
  U DOPA
Diisopropoxyphosphoryl fluoride
  U DFP (Pesticide)
Diisopropyl fluorophosphate
  U DFP (Pesticide)
N, N'-Diisopropylphosphorodiamic anhydride
  U DPDA
N, N'-Diisopropylphosphorodiamic fluoride
  U Mipaflox
Diisopropylphosphorofluoridase
  U Tabunase
Diisopropyl phosphorofluoridate
  U Isofluorophate
Dibenzyline chloride
  U Dibenzyline hydrochloride
Dimefox  115-26-4
  U Phosphoramidate fluoride, tetramethyl-1, 1-Dimethyl-4-phenylpiperazinium iodide
  U DMPP
Dimethoate  60-51-5
  U Phosphamide
  U Phosphorodithionic acid, esters, O, O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
  U Dimethoxy p-nitrophenoxysphosphine oxide
Dimethoxy p-nitrophenoxophosphine oxide

Dimethoxy p-nitrophenoxophosphine oxide (cont'd)
  U DMPA
3,4-Dimethoxy-L-phenylalanine
  U DMPA
Dimethylamidoethoxyphosphoryl cyanide
  U Tabun
Dimethylamine 124-40-3
  UF Methanamine, N-methyl-
  3-(2-Dimethylaminoethyl) phenyl-N-methylcarbamate
2,3-Dimethyl-2-butanol 594-60-5
  UF Isopropylidimethylcarbinol
3,3-Dimethyl-2-butyl-methyl-phosphonofluoridate
  U Soman
Dimethyl carbamate 39589-98-5
1,5-Dimethyl-5-(1-cyclohexenyl) barbituric acid
  U Hexobarbital

0,0-Dimethyl-0-(2,2-dichlorovinyl) phosphate
  U DDVP

Dimethyl-alpha,2-dichlorovinyl phosphate
  U DDVP
1,2-Dimethyl-3-diethylaminopropyl p-isobutoxybenzoate
  U Gangleron
N,N-Dimethylformamide 68-12-2
  UF DMF
  UF DMFA
  UF Formamide, N,N-dimethyl-
1,1-Dimethyl-2-phenylaziridinium
  UF DPA
Dimethylphenylpiperazinium
  U DMPP
N-Dimethylphosphoramidocyanidate
  U Tabun
Dimethylphosphoramidocyanidic acid, ethyl ester
  U Tabun
Dimethylphosphorylfluoride
Dimethyl sulfoxide 67-68-5
  UF DMSO
Dimethyltubocurarine
  U Dimethyl-D-tubocurarine
Dimethyl-D-tubocurarine 35-67-6
  UF Dimethyltubocurarine
Dimethyl-D-tubocurarine chloride 518-25-2
  UF Dimethylturocurarine chloride
Dimethyl tubocurarine iodide 518-26-3 7601-55-0
  UF Metocurine iodide
Dimethylturocurarine chloride
  U Dimethyl-D-tubocurarine chloride
Dimetilan 644-64-4
Dimetilan 644-64-4 (cont'd)

UF Dimetilan

Dimetilan

U Dimetilan

Dimethylphenylpiperazinium iodide

U DMPP

Dina 4185-47-1

UF Ethanol, 2, 2'- (nitroimino)bis-, dinitrate (ester)

Dinitrogen monoxide

U Nitrous oxide

2, 4-Dinitrophenol

51-28-5

Diisopropylphosphoric acid

Diophenylacetic acid diethylaminopropylamide

U Arpenal

Dioxane

123-91-1

UF 1, 4-Diethylene dioxide

Dioximes

UF Oximes, di-

Diphosphoramidate, octamethyl-

U Octamethyl pyrophosphoramide

Diphosphoric acid tetraethyl ester

U Tetraethyl pyrophosphate

Dipterex

U Trichlorfon

Disodium thiosulfate

U Sodium thiosulfate

Disulfoton

BT Insecticides, organothiophosphate

Dithionates

DMF

U N,N-Dimethylformamide

DMFA

U N,N-Dimethylformamide

DMPA 32161-30-1

UF Dimethoxy p-nitrophenoxycarbonyl oxide

UF 3, 4-Dimethoxy-L-phenylalanine

DMPA (herbicide) 299-85-4

UF Phosphoramidothioic acid, (1-methylethyl)-0-(2, 4 dichlorophenyl)-0-methyl ester

UF Zytron

DMPP 54-77-3

BT Piperazines

UF 1, 1-Dimethyl-4-phenylpiperazinium iodide

UF Dimethylphenylpiperazinium

UF Dimethylphenylpiperazinium iodide

UF Piperonazinium, 1, 1-dimethyl-4-phenyl-, iodide

DMSO

U Dimethyl sulfoxide

DNA

U Deoxyribonucleic acid
Dogs

Dogs

- Laboratory animals
- Mammals

DOPA 59-92-7
  - Dihydroxyphenylalanine
Dorsal muscles
Dosage forms
Dose-response relationship
  - Immunity
Doxapram 309-29-5

DPA
  - U 1,1-Dimethyl-2-phenylaziridinium
DFNA 513-00-8
  - U N,N'-Diisopropylphosphorodiamidic anhydride
  - UF tetraisopropyl pyrophosphoramide

Drug therapy
DSDP
  - U Amiton
Dyes
Dyflos
  - UF DFP (Pesticide)
Dyspnea
E-600
  - U Paraoxon
Ear
  - Sense organs
  - Sweat glands

Echothiopate iodide 513-10-0
  - UF Echothiopate iodide
  - UF Phospholine iodide
Echothiopate 6736-03-4
  - UF Echothiopate
  - UF MI-217
  - UF Phospholine
Echothiopate
  - UF Echothiopate
Echothiopate iodide
  - UF Echothiopate iodide
Edem
  - UF O-Ethyl-S-(2-diethylaminoethyl)methyl thiophosphonate

Edetic acid
  - UF EDTA
Edrophone bromide
  - UF Edrophonium bromide
Edrophonium 312-48-1
  - UF Benzenaminium, N-ethyl-3-hydroxy-N,N-dimethyl-
  - UF Edrophonium bromide 302-83-0
Edrophonium bromide 302-83-0 (cont’d)

UF Edrophonium bromide
UF Ethyl(m-hydroxyphenyl)dimethylammonium bromide
UF N-Ethyl-3-hydroxy-N,N-dimethylbenzenaminium bromide
UF Tensilon bromide
Edrophonium chloride 116-38-1
UF Antirex
UF Tensilon chloride
EDTA 60-00-4 64-02-8
UF Edetic acid
UF Ethylenediaminetetraacetic acid

Eel
Electric stimulation
UF Stimulation, electric
Electrodes
Electrodes, implanted
Electrophoresis
Embryo
Enantiomerism and Enantiomers
UF Isomerism and Isomers, optical
Endocid
UF Endothion
Endocide
UF Endothion
Endocrine glands
NT Adrenal glands
NT Islands of Langerhans
NT Parathyroid glands
NT Pineal body
NT Pituitary gland
NT Pituitary-adrenal system
NT Thyroid gland

Endocrine system
Endothion 2778-04-3
UF Endocid
UF Endocide
Endplate
Enzymatic phosphorylation
Enzyme activation
Enzyme inhibitors
Enzyme reactivators
Enzyme repression
Enzymes
Epinephrine 51-43-4
UF Adrenaline
Epithelial cells
BT Cells
Epithelium
EPN 2104-64-5
BT Insecticides, organothiophosphate
UF Phosphonothiolic acid, phenyl-O-ethyl O-(4-nitrophenyl)ester

Equilibrium
Ergamine

Ergamine
U Histamine
Ergoline-8-carboxamide, 9,10-didehydro-N,N-diethyl-6-methyl-,(8B)-
U LSD
Ergotidine
U Histamine
Erythroblasts
BT Erythrocytes
Erythrocytes
BT Blood cells
NT Erythroblasts
RT Reticulocytes
UF Red blood cells
Erythrocyte volume, packed
U Hematocrit
Erythropoiesis
Erythropoietin 11076-26-7
BT Glycoproteins
Eserine
U Physostigmine
Esterase, carboxyl 9016-18-6
BT Esterases
UF Aliesterase

Esterase, choline
U Cholinesterase

Esterases
BT Hydrolases
NT Cholinesterase
NT Esterase, carboxyl

Esters
Ethanaminium, 2-(acetyloxy)-N,N,N-trimethyl-
U Acetylcholine
Ethanaminium, 2-(benzoyloxy)-N,N,N-trimethyl-
U Benzoylcholine
Ethanaminium, 2-hydroxy-N,N,N-trimethyl-
U Choline
Ethanaminium 2-(benzoyloxy)-N,N,N-trimethyl-
U Benzoylcholine
Ethanaminium, 2-mercapto-N,N,N-trimethyl-
U Thiocholine
Ethanol 64-17-5
UF Alcohol, ethyl
Ethanol, 2,2'-(nitroimino)bis-,dinitrate (ester)
U Dina
Ethon
BT Insecticides, organothiophosphate
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<td>(2-((Ethoxymethylphosphiny1)thi0)ethyl)ethylmethyl sulfurimonium methyl sulfate</td>
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<td>U Ethylbenztropine</td>
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<td>UF Ponalid</td>
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<td>U Carbamic acid, esters, ethyl estor</td>
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<td>Ethyl 2-chloroethyl sulfide</td>
<td>U 2-Chloroethyl ethyl sulfide</td>
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<td>Ethyl dimethylamidocyanophosphate</td>
<td>U Tabun</td>
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<td>Ethyl N,N-dimethyl phosphoramidocyanidate</td>
<td>U Tabun</td>
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<td>Ethyl N,N-dimethyl phosphoramido cyanidate</td>
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<td>Ethylenediaminetetraacetic acid</td>
<td>U EDTA</td>
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<td>N-Ethyl-3-hydroxy-N,N-dimethylbenzenaminium bromide</td>
<td>U Edrophonium bromide</td>
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<td>Ethyl methylphosphonothiothiolic acid</td>
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<td>Ethyl (a-hydroxyphenyl)dimethylammonium bromide</td>
<td>U Edrophonium bromide</td>
</tr>
<tr>
<td>Ethyl p-nitrophenyl ethylphosphonate</td>
<td>U Armin</td>
</tr>
<tr>
<td>Ethyl 4-nitrophenyl methylphosphonate</td>
<td>3735-98-6</td>
</tr>
</tbody>
</table>
N-Ethylnorthropane

N-Ethylnorthropane benzhydrole ether hydrochloride
U Ethylbenztrione
Ethyl paraoxon
U Paraoxon
Ethyl parathion
U Parathion
Ethyl phosphoric acid
U Phosphoric acid, esters, ethyl ester
N-Ethyl-2-pyrrolidylmethyl phenylcyclopentylglycolate hydrochloride
U PMCG
O-Ethyl S-diethylaminoethyl ethylphosphonothiolate
21738-25-0
O-Ethyl, S-diethylaminoethyl-ethylphosphonothiolate
U AM-1
O-Ethyl-S-(2-diethylaminoethyl)methyl thiophosphonate
U Edem
O-Ethyl S-(2-diisopropylaminoethyl methylphosphonothioate
50762-69-9
UF O-Ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate
O-Ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate
U 0-Ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate
Ethyl-S-(2-diisopropylaminoethyl) methylthiophosphonate
U VX
O-Ethyl S-(beta-ethylthioethyl) methylphosphonothioate
U GD-7

Exocrine glands
U Research design
U Exposure, chambers, inhalation
U Inhalation chambers
U Eye
U BT Sense organs
U Eyelids
U RT Nictitating membrane
Face

Fasciculation
  Involuntary contractions, or twitchings, of groups of muscle fibers

Fasciculus

Fatty acids

Fatty acids, unsaturated

Femoral artery

Femoral nerve

Femoral vein

Femur

Fensulfothion
  BT Insecticides, organothiophosphate

Ferric chloride  7705-08-0

Ferrohemoglobin
  U Hemoglobins

Fever
  RT Body temperature
  UF Hyperthermia

Fibrillation

Flexor

Flowmeters

Fluorescence

Fluorides
  Term used for fluorides as a class. Specific terms are used to index subclasses.

Fluorine 7782-41-4
  BT Halogens

Fluorine cyanide
  U Cyanogen fluoride

Fluorodiisopropyl phosphate
  U DFP (Pesticide)

Fluoromethyl sulfone
  U Methanesulfonic fluoride

Fluoromethyl(1,2,2-trimethylpropoxy)phosphine oxide
  U Soman

Flurometry

Foot

Forearm
  BT Arm

Forelimb

Formaldehyde  50-00-0

Formamide, N,N-dimethyl-
  U N,N-Dimethylformamide

Formothion
  BT Insecticides, organothiophosphate

1,3-bis(4-formylpyridinium-propane)bis-oxime dichloride
  U B4FPBOCl2

Frogs

G 2747
  U Caramiphen hydrochloride

GABA  56-12-2
  UF Butanoic acid, 4-amino
GABA (cont'd)
  UF gamma-aminobutyric acid
GABA-T
  UF GABA transamininase
GABA transamininase
  U GABA-T
GAD
  UF Glutamic acid decarboxylase
Galactosamine 1948-54-5
  UF Chondrosamine
  UF Galactose, 2-amino-2-deoxy-
Galactosamine hydrochloride
  UF Chondrosamine hydrochloride
Galactose, 2-amino-2-deoxy-
  U Galactosamine
Gangleron 1510-29-8
  UF 1,2-Dimethyl-3-diethylaminopropyl p-isobutoxybenzoate
  UF Benzoic acid, 4-(2-methylpropoxy)-3 (diethyl:ino)-1,2-dimethylpropyl ester hydrochloride
  U Ganglerone
Ganglerone
  U Gangleron
Ganglia
  Ganglia, parasympathetic
    UF Parasympathetic ganglia
Ganglia, spinal
    BT Spinal nerve roots
Ganglia, sympathetic
    UF Sympathetic ganglia
Ganglionic blockaders
  UF Ganglionic blocking agents
  UF Ganglioplegic agents
Ganglionic blocking agents
  U Ganglionic blockaders
Ganglionic stimulants
  UF Nicotinic agents
Ganglioplegic agents
  U Ganglionic blockaders
Gas chromatography
  UF Chromatography, gas
Gastric emptying
Gastric probe
Gastrocnemius muscle
  BT Muscles
Gastrointestinal hemorrhage
  UF Hemorrhage, gastrointestinal
Gastrointestinal system
    NT Intestines
    NT Stomach
GD-42    2562-54-1
UF    (2[(Ethoxymethylphosphiny]thio)ethyl]ethyl)methyl sulphonium methyl
sulfate
UF    Ethoxy-2-ethylthioethyl-thiomethyl-phosphine oxide methylsulfomethylate
UF    Phosphonothioic acid, methyl-, O-ethyl ester
UF    Sulfonium, 2-[(ethoxymethylphosphiny]thio]ethyl)methyl-, methyl sulfate
GD-7    556-75-2
UF    Ethoxy-2-ethylthioethyl-thiomethyl-phosphine oxide
UF    O-Ethyl S-(beta-ethylthioethyl)methylphosphonothioate
UF    Phosphonothioic acid, methyl-, O-ethyl S-[2(ethylthio)ethyl] ester

Geiger Counter
RT    Radiometry
UF    Geiger-Mueller Counter
Geiger-Mueller Counter
U     Geiger Counter
Gel chromatography
U     Chromatography, gel
Germ cells
Gills
Globus pallidus
Glucose    50-99-7
UF    Dextrose
UF    D-Glucose
D-Glucose
U     Glucose
Glutamic acid    6899-05-4
DL-Glutamic acid    617-65-2
L-Glutamic acid    56-86-0
Glutamic acid decarboxylase
U     GAD
Glutamic oxalacetic transaminase    9000-97-9
UF    Aminotransferase, aspartate
UF    GOT
Glycemia
Glycoproteins
NT    Erythropoietin
GMP
U     Guanosine monophosphate
3,5-GMP
U     Guanosine 3',5'-cyclic monophosphate
GOT
U     Glutamic oxalacetic transaminase
Growth
Growth inhibitors
G-Strophanthin
U     Ouabain
Guanosine 3',5'-cyclic monophosphate 7665-99-8
UF 3',5'-GMP
UF cGMP
UF Cyclic GMP
Guanosine monophosphate
UF GMP
Guinea pigs
BT Laboratory animals
BT Mammals
Guthion M
UF Guthion
Guthion 86-50-0
UF Azinphos-methyl
UF Gusathion M

Gyrus, frontalis superior
Gyrus, post centralis
Gyrus, precentralis
Hair
Half-life
Halogens
NT Fluorine
Hamsters
BT Mammals
Hand
Hazards
Hb
UF Hemoglobin
HC-3 312-45-8
UF Morpholinium, 2,2'-(1,1-biphenyl)-4,4'-diylbis [2-hydroxy-4,4-dimethyl-, dibromide-
Head
Heart
Heart arrest
UF Cardiac arrest
Heart block
UF Atrioventricular block
Heart failure, congestive
Heart function tests
Heart rate
Heart ventricle
Heat
Heating
Heat loss
UF Body temperature regulation
Heat production
UF Body temperature regulation
Hematoctrit
UF Erythrocyte volume, packed
Hemicholinium 16478-59-4
UF Morpholinium, 2,2'-(1,1'-biphenyl) 4,4'-diylbis [2-hydroxy-4,4-dimethyl-
Hemicholinium-3  312-45-8
  UF Morpholinium, 2,2' [1,1'-biphenyl]4,4'-diylbis[2-hydroxy-4,4-dimethyl-, dibromide
Hemocytes
  UF Blood cells
Hemoglobins
  UF Ferrohemoglobin
  UF Hb
Hemolysins
  UF Hemotoxins
Hemolysis
Hemorrhage
Hemorrhage, cerebral
  UF Cerebral hemorrhage
Hemorrhage, gastrointestinal
  UF Gastrointestinal hemorrhage
Hemotoxins
  UF Hemolysins
Hens
Heparin  9005-49-6
  UF Heparinic acid
Heparinic acid
  UF Heparin
Herbicides
  UF Defoliants, chemical
Hering-Breuer Reflex
Hexamethonium  60-26-4
  UF 1,6-Hexanediaminium, N,N,N,N',N',N'-hexamethyl-
Hexamethonium bromide  55-97-0
Hexamethonium chloride  60-25-3
Hexamethonium iodide  870-62-2
  UF 1,6-Hexanediaminium, N,N,N,N',N',N'-hexamethyl-, diiodide
Hexamethylene  110-82-7
  UF Cyclohexane
1,6-Hexanediaminium, N,N,N,N',N'-hexamethyl-
  UF Hexamethonium
1,6-Hexanediaminium, N,N,N,N',N'-hexamethyl-, diiodide
  UF Hexamethonium iodide
Hexobarbital  56-29-1  630-97-7
  UF 1,5-Dimethyl-5-(1-cyclohexenyl) barbituric acid
   UF 5-Cyclohexenyl-1,5-dimethylbarbituric acid
   UF Cyclonal
   UF Hexobarbital
Hexobarbital sodium  50-09-9
  UF Cyclonal sodium
  UF Hexobarbital soluble
  UF Hexobarbitone sodium
  UF Sodium hexobarbital
  UF Sodium hexobarbitone
Hexobarbital soluble

Hexobarbital soluble
   U Hexobarbital sodium
Hexobarbinite
   U Hexobarbital
Hexobarbinate sodium
   U Hexobarbital sodium
Hexokinase
HI-6 34433-31-3

Hip
Hippocampus

Histamine 51-45-6
   UF 1H-Imidazole-4-etharamine
   UF 2-(4-Imidazolyl)ethylamine
   UF 4-Imidazoleethylamine
   UF beta-Aminoethylglyoxaline
   UF Ergamine
   UF Ergotidine
   UF Theramine

Histology
   NT Histopathology
Histopathology
   BT Histology
   BT Pathology

HNB-3
   U Quinuclidinyl benzilate hydrochloride

Homeostasis
Homogenates

Hormones
   For studies of hormones as a class. For specific
   hormones, use specific terms.

Horse serum
HS-3 25487-36-9
   UF Pyridinium, 2-[[hydroxyimino]methyl]-1-[[[4-
   [(hydroxyimino) methyl] pyridinio] methoxy]methyl]
   , dichloride
HS-6 22625-23-6
   UF N,N'-Oxydimethylene-bis (pyridinium-2-aldoxime-3
   carboxamido)
   UF Pyridinium, 1-[[[3-(aminocarboxyl)pyridinio]methoxy]methyl] -2-[(hydroxyimino)
   methyl] -, dichloride

Hydrazone, phenyl
   U Phenylhydrazone
Hydrofluoric acid 7664-37-3
   UF Hydrogen fluoride
Hydrogen 1333-74-0
Hydrogen-3
U Tritium
Hydrogen fluoride
U Hydrofluoric acid
Hydrogen, isotopes of
NT Tritium
Hydrolases
NT Esterases
NT Peptide hydrolases
NT Phosphatases
Hydrolysis
Hydroxyimino compounds
U Eximes
Hydroxyimino group
2-Hydroxyiminomethyl-1-methylpyridinium 154-97-2 51729-73-8 methanesulfonate
U P2S bis(4-hydroxyiminomethyl-pyridinium- 1-methyl)- ether dichloride
U Toxicogonin
Beta-Hydroxylalanine
U Serine
Hydroxyl group
alpha-(Hydroxymethyl)benzenacetic acid
U Tropic acid
Tris (hydroxymethyl) methanamine
U Tris buffer
7-Hydroxyquinoline 580-20-1
Hydroxyquinolines
Hyoscine
U Scopolamine
Hyoscyamine 101-31-5
U Atropine
Hyperglycemia
RT Blood glucose
Hypersensitivity
RT Allergens
RT Allergy
RT Anaphylaxis
RT Immunity
RT Immunology
RT Sensitization
Hypertension
UF Blood pressure, high
Hyperthermia
U Fever
Hypnotics and Sedatives
NT Barbiturates
Hypnotics and Sedatives (cont'd)

- NT Sedatives, Nonbarbiturate
- RT Tranquilizing agents
- UF Sedatives

- Hypo
  - U Sodium thiosulfate
- Hypotension
  - UF Blood pressure, low
- Hypothalamus
- Hypothermia
  - RT Cold
- Hypoxia
  - U Anoxia

- Ileum

- Imidazole 288-32-4
  - 1H-Imidazole-4-ethanamine
    - U Histamine
  - 1H-Imidazole-1-ethanol, alpha-(methoxymethyl)-2-methyl 4-nitro-
    - U AM-1

- 4-Imidazoleethylamine
  - U Histamine

- Imidazoline 28299-33-4
  - 2-(4-Imidazolyl)ethylamine
    - U Histamine

- Immobilization
- Immunity
  - NT Antibody diversity
  - NT Antibody formation
  - NT Antibody specificity
  - NT Antigen-antibody reactions
  - NT Immunity, natural
  - NT Immunity, passive
  - RT Dose-response relationship
  - RT Hypersensitivity
  - RT Receptors, immunologic

- Immunity, natural
  - BT Immunity
- Immunity, passive
  - BT Immunity

- Immunization
- Immunology
  - RT Hypersensitivity

- Incubation

- 1H-Indol-3-ol
  - U Indoxyl

- Indophenol acetate
  - U Indophenyl acetate
- Indophenyl acetate 7761-80-0
  - UF Indophenol acetate
- Indoxyl 480-93-3
  - UF 1H-Indol-3-ol
Indoxyl acetate 608-08-2

UF 3-Acetoxyindole

Induction

Inferno

U Amiton

Inflammation

Infrared spectra

Infrared spectrometry

Inhalation

BT Breathing

Inhalation chambers

UF Exposure, chambers, inhalation

Inhalation tests

Inhalation toxicity

Inhibition

Inhibition, neural

U Neural inhibition

Inhibitor

Injuries

Insecticides

NT Amiton

NT Insecticides, organophosphate

NT Insecticides, organothiophosphate

NT Malathion

RT Cholinesterase inhibitors

Insecticides, carbamate

NT Aldicarb

Insecticides, organophosphate

BT Insecticides

NT Chlorfenvinphos

NT Cruvomate

NT Mevinphos

NT Monocrotophos

NT Naled

NT Phosphamidon

Insecticides, Organophosphate

RT Organophosphorus compounds

Insecticides, organothiophosphate

BT Insecticides

BT Organothiophosphorus compounds

NT Abate

NT Azinphosmethyl

NT Bromophos

NT Coumaphos

NT Diazinon

NT Difonate

NT Disulfoton
Insecticides, organothiophosphate (cont'd)

- NT EPN
- NT Ethion
- NT Fensulfothion
- NT Formothion
- NT Methyl mercaptophos
- NT Phorate
- NT Phosmet
- NT Phosvel
- NT Thiometon

Interneurons
  - BT Neurons

Interrenal gland
  - BT Adrenal glands

Intestines
  - BT Gastrointestinal system

Intoxication

Intracranial pressure
  - RT Skull

Iodine 7553-56-2

Iodine monocyanoideide
  - U Cyanogen iodide

Ionization

Ions

Irradiation

Irritation
  - RT Primary irritancy

Ischemia
  - RT Blood circulation

Islands of Langerhans
  - BT Endocrine glands
    - UF Pancreas, endocrine

Isoamyl acetate 123-92-2
  - UF Amylactic ester

Isofluorophosphate
  - U DFP (Pesticide)

Isolan 119-38-0

Isomerism and Isomers, optical
  - UF Enantiomerism and Enantiomers

Isomerism and Isomers
  - UF Stereoisomerism and Stereoisomers

Isonitrosoacetone
  - U MINA

Isonitrosocompounds
  - U Oximes
Iso-OMPA 513-00-8
Isopropanol
Isopropyl alcohol
Isoproterenol
Isoxsuprine

Isopropyl methyl fluorophosphonate
U Sarin
Isopropyl methyl phosphonofluoridate
U Sarin
Isoproterenol 7683-59-2
UF Isoprenaline
Isosystox 126-75-0
JB-358 3321-80-0

UF Benzeneacetic acid, alpha-hydroxy-alpha-phenyl esters, 1-methyl-3-piperidinyl ester
UF N-Methyl-3-hydroxypiperidine benzilate
UF N-Methyl-3-piperidinyl benzilate
JB-336/3 3689-80-3

UF Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 1-methyl-3-piperidinyl esters, hydrochloride
UF N-Methylpiperidyl benzilate, hydrochloride
JB-336/4 29568-43-0

UF Benzeneacetic acid, alpha-hydroxy-alpha-phenyl-, esters, 1-methyl-4-piperidinyl ester, hydrochloride
UF N-Methyl-4-piperidyl benzilate hydrochloride
UF N-Methyl-4-piperidyl diphenylglycolate hydrochloride

Joints
Jugular veins
Ketamine 6740-88-1
UF Cyclohexanone, 2-(2-chlorophenyl)-2-(methylamino)
Kidney
BT Urinary tract
Kinetics
Knee
Kymography
UF Cymography
LA-1

U Nitrazepam

Laboratory animals
BT Animals
NT Cats
NT Dogs
NT Guinea pigs
NT Mice
NT Monkeys
NT Rabbits
NT Rats
RT Animal testing
UF Animals, laboratory

Lacunae
Lanthanum 7439-91-0
LD50
NT Lethal dose
UF Lethal dose 50

Lecithins
General term. Use name of specific lecithins where indicated.
UF Lecithol
UF Phosphatidylcholines

Lecithol
UF Lecithins

Leeches

Leg

Lethal dose
BT LD50
Lethal dose 50
UF LD50

Leucine 7005-03-0
UF 2-Amino-4-methylvaleric acid
UF alpha-Aminoisccaproic acid
DL-Leucine 328-39-2
L-Leucine 61-90-5

Lektocytes
BT Blood cells
UF White blood cells

Lidocaine 137-58-6
UF Lignocaine
UF Xylocaine

Ligaments
Ligands
Lignocaine
UF Lidocaine

Ligroin 8032-32-4
UF Petroleum ether
Limbic system
Limbs
Lip
Lipids
   NT Membrane lipids
Liver
LSD 50-37-3
   UF Ergoline-8-carboxamide, 9,10-didehydro-N,N-diethyl-6-methyl-, (BB)-
   UF Lysergic acid diethylamide
   UF Lysergide
LuH-6
   U Toxogonin
Lung
   NT Bronchi
   NT Pulmonary alveoli
   RT Air sacs
   RT Respiration
Lymph
Lymphatic system
Lymph nodes
Lysergic acid diethylamide
   U LSD
Lysergide
   U LSD
Lysocythins
   U Lysolecithins
Lysolecithins
   For lysolecithins as a class. Prefer specific lysolecithins.
   UF Lysocythins
   UF Lysophosphatidylcholines
Lysophosphatidylcholines
   U Lysolecithins
Macaca Mulatta
   U Monkey, Rhesus
Magnesium 7439-95-4
Magnesium chloride 7786-30-3
Magnesium sulfate 7487-88-9
Malaoxon
   U Malathion
Malathion 121-75-5
   BT Insecticides
   UF Butanedioic acid . [Dimethoxyphosphinothiol]thio]-, diethyl ester
   UF Malaoxon

Mammals
   BT Vertebrates
   NT Cats
   NT Dogs
Mammals (cont'd)
NT Guinea pigs
NT Hamsters
NT Mice
NT Primates
NT Rabbits
NT Rats

Manganese 7439-96-5
Manometry
RT Pressure
Marmosets
U Callithricidae
Marrow
U Bone marrow
Mass spectra
Mass spectrometers and spectrographs
Mass spectrometry
U Mass spectroscopy
Mass spectroscopy
UF Mass spectrometry
Maximal voluntary ventilation
BT Respiratory air flow
Mecamine
U Mecamylamine
Mecamylamine 60-40-2
UF Mecamine
UF Bicyclo [2.2.1] heptan-2-amine, N,2,3,3,tetramethyl-
UF N,2,3,3-Tetramethylbicyclo 2.2.1 heptan-2-amine
UF Versamine
Mecholin
U Methacholine bromide
Mecholyl bromide
U Methacholine bromide
Medemo 51366-09-7
UF Ethoxy-2-dimethylamino-ethylthiomethyl-phosphine oxide
UF Phosphonothioic acid, methyl-, S-[ 2-[(dimethylamino)-thio] ethyl] O-ethyl ester
Medulla oblongata
Methylnorepinephrine
U Norepinephrine
Membrane lipids
BT Lipids
Membrane potentials
RT Cell membrane
RT Membranes
Membranes
RT Cell membrane
RT Membrane lipids
RT Membrane potentials
Mepenzolate 25990-43-6
Mepenzolate bromide  76-90-43
UF  N-Methyl-3-piperidyl benzilate methyl bromide
Meractinomycin
U  Actinomycin D
2-Mercaptoethyl sulfide
U  TDT
(2-Mercaptoethyl)trimethylammonium iodide butyrate
U  Butyrylthiocholine iodide
Mestinon  101-26-8
UF  Mestinon bromide
UF  Pyridostigmine bromide
Mestinon bromide
U  Mestinon
Mesyl fluoride
U  Methanesulfonic fluoride
Metabolic detoxication, drug
Metabolic inhibitors
Metabolism
NT  Anaerobiosis
Metabolites
Methacholine  55-92-5
UF  1-Propanaminium, 2-(acetyloxy)-N,N,N-trimethyl- 
UF  Acetyl-beta-methylcholine
Methacholine bromide  333-31-3
UF  1-Propanaminium, 2-acetyloxy)-N,N,N-trimethyl-, bromide 
UF  Acetyl-beta-methylcholine bromide 
UF  Amechol 
UF  Mecholin 
UF  Mecholyl bromide 
Methacholine chloride  62-51-1 
UF  1-Propanaminium, 2 (acetyloxy)-N,N,N-trimethyl chloride 
UF  Acetyl-beta-methylcholine chloride 
Methacholine iodide  625-19-4 
Methanamine, N-methyl-
U  Dimethylamine 
Methanesulfonic fluoride  558-25-8 
UF  Fluoromethyl sulfone 
UF  Mesyl fluoride 
UF  MSF 
UF  Methylsulfonyl fluoride 
Methanol  67-56-1 
UF  Alcohol, methyl 
Methionine  7005-18-7 
DL-Methionine  59-51-8 
L-Methionine  63-68-3 
l-Methyl-2-aldoximinopyridinium chloride 
U  2-PAM chloride 
Methyaltrpine  287-07-15 
Methyaltrpine bromide  2870-71-5
Methylatropine bromide 2870-71-5

Methylatropine bromide 2870-71-5 (cont’d)
   UF Atropine methyl bromide
   UF 8-Azoniabicyclo [3.2.1] octane, 3-(3-hydroxy-1
   oxo-2-phenylpropoxy)-8,8-dimethyl-, bromide, endo-
Methylatropine nitrate 52-88-0
   UF 8-Azoniabicyclo [3.2.1] octane, 3-(3-hydroxy-1
   oxo-2-phenylpropoxy)-8,8-dimethyl-, endo-, nitrate
N-Methyl carbamate 63-25-2
   UF 1-Naphthalenol, methylcarbamate
   UF Carbaryl
   UF Sevin
Methyl cyanide
   U Acetonitrile

N,N’-bis (1-methylethyl)phosphorodiamidic fluoride
   U Mipafox
Methyl glycol
   U alpha-Propylene glycol
Methyl group

N-Methyl-3-hydroxypiperidine benzilate
   U JB-336
Methyl isoproxy phosphoryl fluoride
   U Sarin
Methyl mercaptophos
   BT Insecticides, organothiophosphate
Methyl parathion 298-00-0
Tris (o-methylphenyl) phosphate
   U Tri-o-tolyl phosphate
Methyl phosphonate
   U Phosphonic acid, dimethyl ester
Methylphosphonic acid
   U Phosphonic acid, methyl-
Methylphosphonofluoridates
Methylphosphonofluoridic acid, 1-methylethyl ester
   U Sarin
Methylphosphonofluoridic acid 1,2,2-trimethylpropyl
   ester
   U Soman
Methylphosphonofluoridic acid 1,2,2-trimethyl propyl
   ester
   U Soman
Methyl pinacolyloxy phosphoryl fluoride
   U Soman
Methyl pinacolyl phosphonofluoridate
   U Soman
N-Methyl-3-piperidinyl benzilate
   U JB-336
N-Methylpiperidylbenzilate, hydrochloride
   U JB-336/3
N-Methyl-4-piperidyl benzilate hydrochloride

N-Methyl-4-piperidyl benzilate hydrochloride
U JB-336/4

N-Methyl-4-piperidyl diphenylglycolate hydrochloride
U JB-336/4

1-Methylpyridinium-2-aldoxime methanesulfonate
U P2S

N-Methylpyridinium-2-aldoxime methanesulfonate
U P2S

N-Methyl pyridinium-2-aldoxime trichloroacetate
Methylpyridinium iodide 61734-40-5 930-73-4
UF Pyridine methiodide

Methylscopolamine 13265-10-6
UF Scopolamine methyl bromide

Methylscopolamine bromide 18905-44-7
UF Scopolamine methyl bromide

Methylsulfonyl fluoride, U Methanesulfonic fluoride
Metocurine iodide, U Dimethyl tubocurarine iodide

Matramac, U Amiton

Mevinphos
BT Insecticides, organophosphate
Mevinphos, U Phosdrin
MI-217, U Echothiophate
Mice
BT Laboratory animals
BT Mammals
Microcirculation
Microsomes
Microwaves
RT Diathermy
MINA 306-44-5
UF Isonitrosocetone
UF Monoisotrosoacetone

UF Propanol,2-oxo-1-oxime
UF Propanone 1-oxime
UF Pyruvaldehyde 1-oxime

Mipafox 371-86-8
UF N,N'-bis (1-methylethyl)phosphorodiamidic fluoride
UF N,N'-diisopropylphosphorodiamidic fluoride
UF Phosphorodiamidic fluoride, N,N-bis (1 methylethyl)-

Mitochondria
Mitosis

MMB-4  51026-61-0
    UF Pyridinium, 1,1'-Methylenebis-4
        [hydroxyiminomethyl]-, dichloride
Monkey, Rhesus
    BT Monkeys
    UF Macaca Mulatta
Monkeys
    BT Laboratory animals
NT Monkey, Rhesus
Monobutylphosphoric acid
    U Butyl dihydrogen phosphate
Monocrotophos
    BT Insecticides, organophosphate
Monoisonitrosoacetone
    U MINA
Monopotassium oxalate
    U Potassium acid oxalate
Morphine  57-27-2
Morpholinium, 2,2'[(1,1'-biphenyl) 4,4'-diylbis [2
        hydroxy-4,4-dimethyl-]
        U Hemicholinium
Morpholinium, 2,2'[1,1'-biphenyl]-4,4'-diylbis [2
        hydroxy-4,4-dimethyl-, dibromide-
        U HC-3
Morpholinium, 2,2' [1,1'-biphenyl]4,4'-diylbis [2
        hydroxy-4,4-dimethyl-, dibromide
        U Hemicholinium-3
Morphothion  144-41-2
Mortality
    UF Death rate
Motor activity
Motor endplate
    U Neuromuscular junction
Motor neurons
    BT Neurons
Mouth
MPA
    U Phosphonic acid, methyl-
MSF
    U Methanesulfonic fluoride

Mucus
Muscaranic action
Muscarinic agents
    U Parasympathomimetics
Muscarinic receptors
    U Receptors, muscarinic
Muscle contraction
    RT Muscle relaxation
Muscle denervation
Muscle relaxants, central

Muscle relaxants, central
Muscle relaxation
   RT Muscle contraction

Muscle rigidity
Muscles
   General term. See Table of Muscles for specific names.
   NT Gastrocnemius muscle
   NT Pectoralis muscles
   NT Tibial muscle
Muscle, smooth
Muscle spasticity
   UF Spasticity, muscle
Musculoskeletal system
Mustard
Mustard gas
   U 2,2'-Dichloroethyl sulfide

Mutagens
   RT Mutation
   RT Teratogenic agents
Mutation
   RT Mutagens
Myocardial depressants
   U Anti-arrhythmia agents
Myoclonus
Myoneural junction
   U Neuromuscular junction
Nails
Naled
  BT Insecticides, organophosphate
Naphtha
  BT Benzin
  1-Naphthalenol, methylcarbamate
    U N-Methyl carbamate
Beta-Naphthol acetate
  U Beta-Naphthyl acetate
Naphthols
  2-Naphthyl acetate
    U Beta-Naphthyl acetate
Beta-Naphthyl acetate 1523-11-1
  UF 2-Acetoxy-naphthalene
  UF 2-Naphthyl acetate
  UF Beta-Naphthol acetate
  UF O-Acetyl-beta-naphthol
Neck
Neoserine methyl sulfate
  U Neostigmine methyl sulfate
Neostigmine 59-99-4
  UF Benzenaminium, 3-[(dimethylamino) carbonyl]oxy]-
    N,N,N-trimethyl-
  UF Prostigmin
  UF Prostigmine
Neostigmine bromide 114-80-7
  UF Prostigmin bromide
  UF Prostigmine bromide
Neostigmine methyl sulfate 51-60-5 59954-03-9
  UF Neoserine methyl sulfate
  UF Prostigmine methyl sulfate
Nerve block
Nerve cells
  U Neurons
Nerve degeneration
  UF Neuron degeneration
  UF Retrograde degeneration
Nerve endings
  NT Neuroeffector junction
  NT Prressorreceptors
  NT Receptors, sensory
  NT Thermoreceptors
  RT Neural transmission
Nerve endings, sensory
  U Receptors, sensory
Nerve fibers
  NT Axons
Nerve gases
Nerve-muscle preparation
  U Neuromuscular junction
Nerve net
  U Nervous system
Nerve regeneration
Nerves
  NT Tibial nerve
  NT Vagus nerve
Nerve stimulation
Nerve tissue
Nerve transmission
  U Neural transmission
Nerve transmitter substances
  U Neuroregulators
Nervous system
  NT Autonomic nervous system
  NT Central nervous system
  UF Nerve net
Nervous system diseases
  RT Neurology

Nervous system physiology
Neural conduction
  Conduction along a single nerve, as opposed to neural transmission (between neurons)
  RT Neurons
  UF Nerve conduction
Neuralgia
Neural inhibition
  UF Inhibition, neural
Neural pathways
Neural transmission
  RT Nerve endings
  Transmission between nerves, as opposed to neural conduction (along a single nerve)
  UF Nerve transmission
Neuritis
Neuroblast
Neuroblastoma
Neurochemistry
Neuroeffector junction
  BT Nerve endings

Neurofibrils
  BT Neurons
Neuroglia
  U Neuroregulators
Neuroleptics
  U Tranquilizing agents, major
Neurologic examination
Neurologic manifestations
Neurology
  RT Nervous system diseases
Neuromodulators
  U Neuroregulators
Neuromuscular blocking agents
  Neuromuscular agents
Neuromuscular diseases
Neuromuscular functions

Neuromuscular functions
Neuromuscular junction

UF Motor endplate
UF Myoneural junction
UF Nerve-muscle preparation

Neuromuscular paralysis
Neuromuscular spindles
Neuromuscular transmission
Neuromuscular agents
Neuron degeneration
U Nerve degeneration

Neurons
NT Autonomic fibers
NT Axons
NT Dendrites
NT Interneurons
NT Motor neurons
NT Neurofibrils
NT Neurons, afferent
NT Neurons, efferent
NT Synapses
RT Neural conduction
UF Nerve cells

Neurons, afferent
BT Neurons
UF Neurons, sensory

Neurons, efferent
BT Neurons

Neurons, sensory
U Neurons, afferent

Neuropathy
Neurophysiology
RT Sensation

Neuroreceptors
U Receptors, sensory

Neuroregulators
UF Nerve transmitter substances
UF Neurohumors
UF Neurotransmitters

Neurosecretion
Neurosurgery
Neurotendinous spindles
Neurotoxins
Neurotransmitters
U Neuroregulators

Niacin
U Nicotinic acid
Nicotine  54-11-5
Nicotinic acid  59-67-6
  UF 3-Pyridinecarboxylic acid
  UF Niacin
Nicotinic acid 1-oxide
  U Oximiniac acid
Nicotinic agents
  U Ganglionic stimulants
Nicotinic receptors
  U Receptors, nicotinic
Nicotinohydroxamic acid  5657-61-4
  UF 3-Pyridinecarboxamide, N-hydroxy-
Nictitating membrane
  RT Eyelids
Niter
  U Sodium nitrate
Nitrazepam  146-22-5
  UF 1,3-Di hydro-7-nitro-5-phenyl-2H-1,4- benzodiazepin-2-one
  UF 2H-1,4-Benzodiazepin-2-one, 1,3, dihydro-7-nitro
  5-phenyl-
  UF Benzalin
  UF LA-1
  UF Nitrodiazepam
Nitric acid, sodium salt
  U Sodium nitrate
Nitrodiazepam
  U Nitrazepam
Nitrogen  7727-37-9
  RT Amino compounds
Nitrogen oxide
  U Nitrous oxide
  p-Nitrophenyl ethyl penty lphosphonate  3015-75-6
  1-Nitropropane  108-03-2
Nitrostigmine
  U Parathion
Nitrous oxide  10024-97-2
  UF Dinitrogen monoxide
  UF Nitrogen oxide
NMR
  U Nuclear magnetic resonance
NMR spectra
  U Nuclear magnetic resonance spectra
Noradrenaline
  U Norepinephrine
Norepinephrine  51-41-2
  UF Arterenol
  UF Met_thynorepinephrine
  UF Noradrenaline
Nose
Nuclear magnetic resonance

UF NMR

Nuclear magnetic resonance spectra

UF NMR spectra

Nucleophiles

Specific headings are used for specific nucleophiles.

Nucleosides

NT Adenosine

Nucleotides

Nucleotides, cyclic

UF Cyclic nucleotides

OAB

U 3-Diethylaminoropropyl oximinoacetate

Obidoxime

UF Toxogonin

Obidoxime chloride

U Toxogonin

Obidoxime hydrochloride

U Toxogonin

Occiput

Octamethyldiphosphoramidate

U Octamethyl pyrophosphoramidate

Octamethyl pyrophosphoramidate 152-16-9

UF Diphosphoramidate, octamethy-

UF Octamethyldiphosphoramidate

UF OMPA

UF Sytam

Oligomycin B 11050-94-5

BT Oligomycins

Oligomycins

NT Oligomycin B

Olive oil

OMP A

U Octamethyl pyrophosphoramidate

Optical rotation

Organophosphate poisoning

Organophosphates

U Organophosphorus compounds

Organophosphorus compounds

NT Aminoethylphosphonic acid

NT Armin

NT Phosphonoacetic acid

NT Phosphoric acid, esters

NT Pyrophosphoric acid, esters

NT Sarin

NT Soman

RT Insecticides, Organophosphate

UF Organophosphates

UF Phosphates, organic
Organothiophosphorus compounds
- Insecticides, organothio phosphate

Orthophosphoric acid
- Phosphoric Acid

Oscilometry

Oscilloscope
- Cathode ray oscilloscope
- CRO

Ouabain 630-60-4
- Acocantherin
- G-Strophanthin

Oxalates

Oximes
- Toxogonin
- Hydroxyimino compounds

Oximes, di-
- Dioximes

3-Oximino-2-pentanone 609-29-0

Oxiniac acid 2398-81-4
- 3-Carboxypyridine N-oxide
- Nicotinic acid 1-oxide

Oxotremorine 70-22-4

Oxidation

Oxynymono compounds

Oxyn parathion
- Para oxon

32p
- A beta-emitting radioactive phosphorus isotope
- Phosphorus-32

P2S 154-97-2 51729-73-8
- 1-Methylpyridinium-2-aldoxime methanesulfonate
- 2-Hydroxyiminomethyl-1-methylpyridinium methanesulfonate
- 2-PAM methanesulfonate
- N-Methylpyridinium-2-aldoxime methane sulfonate
- Pralidoxime mesylate
- Pralidoxime methanesulfonate
- Pyridine-2-aldoxime methyl methanesulfonate
- Pyridinium, 2-[(hydroxyimino)methyl]-1-methyl-, methanesulfonate (salt)

Pain
Pain (cont’d)
RT Analgesia
PAM 94-63-3
UF 2-PAM
UF 2-FAM iodide
UF 2-Pyridine aldoxime methyl iodide
UF 2-Pyridinium aldoxime methochloride
UF Pralidoxime iodide
UF Pralidoxime methiodide
UF Pyridinium, 2-[hydroxyimino)methyl]-1-methyl-
                 iodide
2-PAM
UF 2-PAM chloride 51-15-0 27951-78-6
UF 1-Methyl-2-aldoximinopyridinium chloride
UF 2-Pyridinealdoxime methochloride
UF Pralidoxime chloride
2-PAM iodide
UF 2-PAM methanesulfonate
UF P2S
Pancreas
RT Exocrine glands
Pancreas, endocrine
UF Islands of Langerhans
Pancreatic ducts
Paper chromatography
UF Chromatography, paper
Paper electrophoresis
Paralysis
Paraaxon 311-45-5
UF Parathion
UF Diethyl-p-nitrophenyl phosphate
UF E-600
UF Ethyl paraaxon
UF Oxyparathon
UF Phosphacol
UF Phosphoric acid, esters, diethyl-4-nitrophenyl
                 ester
Parasympathetic ganglia
UF Ganglia, parasympathetic
Parasympathetic nervous system
Parasympatholotics
UF Caramiphen hydrochloride
Parasympatholytics
UF Benactyzine
UF Carbachol
UF Anticholinergic agents
UF Antimuscarinic agents
UF Cholinergic blocking agents
UF Cholinolytics
Parasympathomimetics
Parasympathomimetic (cont’d)

NT Atropine

UF Cholinergic agents
UF Cholinomimetics
UF Muscarinic agents

Parathion 56-38-2

UF AATP
UF Diethyl p-nitrophenyl phosphorothionate
UF Diethyl p-nitrophenylthionophosphate
UF Diethyl p-nitrophenylthiophosphate
UF Ethyl parathion
UF Nictostigmine
UF Paraoxon
UF Phosphorothioic acid, esters, 0,0-diethyl 0-(4 nitrophenyl) ester
UF Thiophes

Parathoid glands
BT Endocrine glands

Parpanil
U Caramiphen

Parpanit
U Caramiphen hydrochloride

Pathology
NT Histopathology

Pectoralis muscles
BT Muscles

Pelvis

Pentaphen
U Caramiphen

Pentaphene hydrochloride
U Caramiphen hydrochloride

Pentobarbital 76-74-4 UF Pentobarbitalone

Pentobarbital sodium 57-33-0

UF Pentobarbitalone sodium
UF Sodium 5-ethyl-5-(1-Methylbutyl) barbiturate
UF Sodium pentobarbital
UF Sodium pentobarbitone

Pentobarbitone sodium
U Pentobarbital sodium

Peptide hydrolases
BT Hydrolases
NT Alpha-Chymotrypsin
UF Proteolytic enzymes

Perchloric acid 7601-90-3

Percutaneous absorption
Perfusion
Perfusion, regional
Perineum
Periodicity
BT Circadian rhythm
Peripheral nerves
Permeability

Permeability, cell membrane
  U Cell membrane permeability

Pesticides

Petroleum ether
  BT Benzin
  U Ligroin

pH
  RT Acidity

Phencapton
  U Phencapton

Phenkapton 2275-14-1
  BT Phosphorodithioic acid, esters
  UF Phencapton
  UF Phenkapton

'UF Phosphorodithioic acid, esters, S-[(2,5 dichlorophenyl)thiomethyl]O,0-diethyl ester

Phenkapton
  U Phenkapton

Phenobarbital 50-06-6
10H-Phenothiazine, 10[(diethylamino)-acetyl]
  U Difrazin
10H-Phenothiazine-10-propanamine,N,N-dimethyl-2-(trifluoromethyl)-
  U Triflupromazine

Phenoxybenzamine
  U Dibenzyline

Phenoxybenzamine chloride
  U Dibenzyline hydrochloride

Phenoxybenzamine hydrochloride
  U Dibenzyline hydrochloride

Phenyl acetate 122-79-2
  UF Acetic acid phenyl ester
  UF Acetyl phenol

alpha-Phenylbenzeneacetic acid 2-(diethylamino) ethyl ester
  U Trasentine hydrochloride

Phenylhydrazine 100-63-0
  UF Hydrazine, phenyl
  UF PHZ

Phenyl saligenin phosphate 4081-23-6
  UF Saligenin cyclic phenyl phosphate

Phorate 298-02-2
  BT Insecticides, organothiophosphate
  U Thimet

Phosdrin 7786-34-7
  UF Mevinphos

Phosgene 75-44-5
  UF Carbonic dichloride
  UF Carboxyl chloride
Phosmet
   BT Insecticides, organothiophosphate
Phoscol
   U Paraoxon
Phosphamid
   U Dimethoate
Phosphanid "13171-21-6"
   BT Insecticides, organophosphate
Phosphatases
   BT Hydrolases
   NT Adenosine triphosphatase
Phosphate esters
   U Phosphoric acid, esters
Phosphates
   UF Phosphates, inorganic
Phosphates, inorganic
   U Phosphates
Phosphates, organic
   U Organophosphorus compounds
Phosphatidylcholines
   U Lecithins
   UF Choline phosphoglycerides
Phosphodiesterases
   NT Cyclic nucleotide phosphodiesterases
Phospholine
   U Echothiophate
Phospholine iodide
   U Echothiobate iodide
Phospholipids
Phosphonate
   U Phosphonic acid, ion(2-)
Phosphonates
Phosphonic acid "13598-36-2"
   Phosphonic acid, dimethyl ester "868-85-9"
   U Methyl phosphonate
   Phosphonic acid, ethyl-, ethyl 4-nitrophennyl ester
   U Armin
   Phosphonic acid, ion(2-)
   U Phosphonate
   Phosphonic acid, methyl-
   UF Methylphosphonic acid
   UF MPA
Phosphonoacetic acid
   BT Organophosphorus compounds
Phosphonofluoridic acid "14939-29-8"
Phosphonofluoridic acid, methyl-, 1-methylethyl ester
   U Sarin
Phosphonofluoridic acid, methyl-, 1,2,2-trimethylpropyl ester
   U Soman
Phosphonofluorimidic acid "27682-26-4"
Phosphonothioic acid, methyl-, O-ethyl ester
Phosphonothioic acid, methyl-, O-ethyl ester

Phosphonothioic acid, methyl-, O-ethyl ester (cont’d)
U GI-42
Phosphonothioic acid, methyl-, O-ethyl S-[2-(ethylthio)ethyl] ester
U GD-7
Phosphonothioic acid, methyl-, S-[2
U Medemo
Phosphonothioic acid, phenyl-O-ethyl O-(4-nitrophenoxy)ester Equilibrium
U EPN
Phosphonylation
Phosphoramidothioic acid, (1-methyl ethyl)O-(2,4
dichlorophenyl)-O-methyl ester
U DMPA (herbicide)
Phosphoric acid 7758-38-2
UF Orthophosphoric acid
Phosphoric acid, esters
BT Organophosphorus compounds
UF Phosphate esters
Phosphoric acid, esters, 2,2-dichloroethenyl dimethyl ester
U DDVP
Phosphoric acid, esters, diethyl-4-nitrophenoxy ester
U Paraaxon
Phosphoric acid, esters, ethyl ester
UF Ethyl phosphoric acid
Phosphoroamidocyanidic acid, dimethyl-, ethyl ester
U Tabun
Phosphorodiamide fluoride, tetramethyl-
U Dimefox
Phosphorodiamide fluoride, N,N-bis (1-methyl ethyl) -
U Mipafox
Phosphorodithionic acid, esters
NT Phenkapton
Phosphorothioic acid, esters, S-[[2,5
U Phenkapton

Phosphorodithionic acid, esters, O,O-dimethyl S-[2
(methylamino)-2-oxoethyl] ester
U Dimethoate

Phosphorofluoridic acid, bis (1-methyl ethyl) ester
U DFP (Pesticide)
U Isoflurophate
Phosphorothioic acid, O,O-diethyl O-(2-isopropyl-6
methyl-4-pyrimidinyl) ester
U Diazinon
Phosphorothioic acid, esters, O,O-diethyl O-(4-nitrophenyl) ester
U Parathion
Phosphorothioic acid, esters, S-[2-(diethylamino)ethyl] O,O-diethyl ester
U Amiton
Phosphorus 7723-14-0
Phosphorus-32
U 32p
Phosphorylase phosphatase
Phosphorylation
Phosphorylcholine 107-73-3
BT Choline
UF Choline phosphate chloride
Phosphorylthiocicholines
Phosvel
BT Insecticides, organothiophosphate
Phrenic nerve
Physical stimulation
UF Stimulation, physical
Physostigmine 50975-37-6 57-47-6
UF Eserine
Physostigmine hydrochloride 6091-12-9
Physostigmine salicylate 57-64-7
Physostigmine sulfate 64-47-1
PHZ
U Phenylhydrazine
Pinacoloxymethylphosphoryl fluoride
U Soman
Pinacolyl alcohol 464-07-3
UF 2-Butanol, 3,3-dimethyl-
Pinacolyl hydrogen methylphosphonate
U PMPA
O-Pinacolyl hydrogen methylphosphonate
U PMPA
Pinacolyl methylfluorophosphonate
U Soman
O-Pinacolyl methylphosphonate
U PMPA
Pinacolyl methylphosphonic acid
U PMPA
Pinacolyl methylphosphonofluoridate
U Soman
Pineal body
BT Endocrine glands
Piperazines
NT DMPP
Piperazinium, 1,1-dimethyl-4-phenyl-+, iodide
U DMPP
Pituitary-adrenal system
  BT Endocrine glands
Pituitary gland
  BT Endocrine glands
Plasma
  UF Blood plasma
Plasma membrane
  U Cell membrane
Pleura
PMCG 2001-91-4
  UF N-Ethyl-2-pyrroldidylmethyl-phenyl cyclopentylglycolate hydrochloride
PMFP
  U Soman
PMPA 616-52-4
  UF O-Pinacolyl hydrogen methylphosphonate
  UF O-Pinacolyl methylphosphonate
  UF Pinacolyl hydrogen methylphosphonate
  UF Pinacolyl methylphosphonic acid
32P-PMPA
  UF 32P-Pinacolyl methylphosphonic acid
Poisoning
  RT Antidotes
  RT Poisons
  RT Toxicology
Poisons
  RT Poisoning
  RT Toxicology
Polyethylene glycol octylphenol ether
  U Triton X-100
Ponalid
  U Ethylbenztropine
Pons
Potassium 7440-09-7
Potassium acid oxalate 127-95-7
  UF Monopotassium oxalate
  UF Potassium hydrogen oxalate
  UF Potassium oxalate
Potassium chloride 7447-40-7
Potassium fluoride 7789-23-3
Potassium hydrogen oxalate
  U Potassium acid oxalate
Potassium iodide 7681-11-0
Potassium oxalate
  U Potassium acid oxalate
Potassium persulfate 7727-21-1
Potency
Potentiation
Pralidoxime chloride
Pralidoxime chloride (cont’d)
  U 2-PAM chloride
Pralidoxime iodide
  U PAM
Pralidoxime mesylate
  U P2S
Pralidoxime methanesulfonate
  U P2S
Pralidoxime methiodide
  U PAM
Pressor receptors
  BT Nerve endings
Pressure
  RT Blood pressure
  RT Manometry
  RT Venous pressure
Prilocaine  721-50-6
  UF Propitocaine
Primary irritancy
  RT Irritation
Primates
  BT Mammals
Procaine  59-46-1
  UF Benzoic acid, 4-amino, 2-(diethylamino)ethyl ester
Promazil
  U Chlorpromazine
Promethium  7440-12-2
  Radioactive, metallic chemical element, formerly called florentium and illinium
1-Propanaminium, 2-(acetyloxy)-N,N,N-trimethyl-
  U Methacholine
1-Propanaminium, 2-acetyloxy)-N,N,N-trimethyl-, bromide
  U Methacholine bromide
1-Propanaminium, 2(acetyloxy)-N,N,N-trimethyl-, chloride
  U Methacholine chloride
1,2-Propanediol
  U alpha-Propylene glycol
1,3-Propanediol, 2-amino-2-hydroxymethyl-
  U Tris buffer
Propanil  709-98-8
  UF DPA
2-Propanol  67-63-0
  UF Isopropanol
  UF Isopropyl alcohol
1-Propanol, 3-(diethylamino)-, diphenylacetate, hydrochloride
  U Arpenal
Propanol, 2-oxo-l-oxime
  U MINA
Propanone 1-oxime
U MINA
Propionylcholine 5072-54-8
Propionylcholine chloride 2365-13-1
Propionylcholine iodide 5072-54-8
Propionylcholinesterase
U Cholinesterase
Propitocaine
U Prilocaine
alpha-Propylene glycol 57-55-6
UF 1,2-Propanediol
UF Methyl glycol
beta-Propylene glycol 504-63-2
Prostigmin
U Neostigmine
Prostigmin bromide
U Neostigmine bromide
Prostigmine
U Neostigmine
Prostigmine bromide
U Neostigmine bromide
Prostigmine methyl sulfate
U Neostigmine methyl sulfate
Protective doses
Protective index
Protective ratio
Proteins
General use only. Prefer specific proteins.
Proteolytic enzymes
U Peptide hydrolases

Pseudocholinesterase
U Cholinesterase
Pulmonary alveoli
BT Lung
Pulse
Purification
Pyramat 2532-49-2
Pyridine 110-86-1
UF Pyridine ring
2-Pyridinealdoxime methochloride
U 2-PAM chloride
2-Pyridine aldoxime methyl iodide
U PAM
Pyridine-2-aldoxime methyl methanesulfonate
U P2S
3-Pyridinecarboxamide, N-hydroxy-
U Nicotinohydroxamic acid
3-Pyridinecarboxylic acid
3-Pyridinecarboxylic acid (cont’d)

Pyridine, compounds

Pyridine methiodide

U Methylpyridinium iodide

Pyridine ring

U Pyridine

Pyridines


U. HS-6

Pyridinium, 1-[[4aminocarbonylpyridinio]methoxy]methyl] -2 [(hydroxyimino)methyl]-dichloride

U HI-6

Pyridinium, compounds

Pyridinium, 3-[(dimethylamino)carbonyl]oxy]-1-methyl-

U Pyridostigmine

Pyridinium, 2-(hydroxyimino)methyl]-1- [[4-

[(hydroxyimino) methyl] pyridinio] methoxy] methyl],

dichloride U HS-3

Pyridinium, 2-[(hydroxyimino)methyl]-1-methyl-,

methanesulfonate (salt)

U P2S

Pyridinium, 2-[(hydroxyimino)methyl]-1- methyl-, iodide

U PAM

2-Pyridinium aldoxime methochloride

U PAM

Pyridinium, 1,1’-Methylenebis-4-[(hydroxyimino)methyl] -, dichloride

U MMB-4

Pyridinium, 1,1’ [oxybis(methylene bis)][4

[(hydroxyimino) methyl]-dichloride

U Toxogonin

Pyridinium, 1,1’ [oxybis(methylene)]bis[4-(1,1-

dimethylethyl) -, dichloride

U SAD-128

Pyridinium, 1,1’-(1,3-propanediyl)bis [4

[(hydroxyimino)methyl] -, dibromide

U TMB-4

Pyridostigmine 155-97-5

U F Pyridinium, 3-[(dimethylamino)carbonyl]oxy]-1

methyl-

Pyridostigmine bromide 101-26-8

U Mestinon

2,4,6 (1H,3H,5H)-pyrimidintriones, 5,5-diethyl-

U Barbitol

2,4,6 (1H,3H,5H)-Pyrimidintriones, 5,5-diethyl

U Barbital

Pyroban 87-47-8
Pyrophosphoric acid, esters

Pyrophosphoric acid, esters
BT Organophosphorus compounds
Pyrophosphoric acid tetraethyl ester
U Tetraethyl pyrophosphate
2-pyrrolidinone, 1-[4-(1-pyrrolidinyl)-2-butynyl]-
U Oxotremorine
Pyruvaldehyde 1-oxime
U MINA
Quaternary ammonium compounds
Quinine 130-95-0
Quinolinium compounds
Quinuclidines
NT Quinuclidinyl benzilate
NT Quinuclidinyl benzilate hydrochloride
Quinuclidinyl benzilate
BT Quinuclidines
Quinuclidinyl benzilate hydrochloride 13004-56-3
BT Quinuclidines
UF HNB-3

Rabbits
BT Laboratory animals
BT Mammals
Radicals, acyl
UF Acyl groups
Radicals, alkoxy
UF Alkoxy
Radicals, alkyl
UF Alkyl radical
Radioactivity
Radioautography
U Autoradiography
Radioimmunoassay
Radiometry
RT Geiger Counter
Rare earth metals
Rats
BT Laboratory animals
BT Mammals
Rat tail BT Tail
Reaction time
UF Response time
Reactivation
Reactivity
Receptors
Receptors, cholinergic
UF Cholinergic receptors
UF Cholinoceptive sites
UF Cholinoceptors
Receptors, immunologic
RT Immunity
Receptors, muscarinic
Receptors, muscarinic (cont’d)
  UF Muscarinic receptors
Receptors, nicotinic
  UF Nicotinic receptors
Receptors, sensory
  BT Nerve endings
  UF Nerve endings, sensory
  UF Neuroreceptors
Red blood cells
  U Erythrocytes
Renal artery
Renal damage
Renal veins

Research design
  UF Experimental design
Resistance
Respiration
  NT Aspiration
  RT Apnea
  RT Lung
Respiration, artificial
  UF Artificial respiration
  UF Artificial ventilation
  UF Ventilation, mechanical
Respiration disorders
Respirators
  UF Ventilators, pulmonary
Respiratory air flow
  NT Maximal voluntary ventilation
Respiratory center
Respiratory depression
Respiratory failure
  U Respiratory insufficiency
Respiratory function tests
Respiratory insufficiency

  UF Respiratory failure
Respiratory paralysis
Respiratory system
Response time
  U Reaction time
Reticulocytes
  RT Erythrocytes
Retina
Retrograde degeneration
  U Nerve degeneration
Ribonucleic acids
  U RNA
RNA

RNA, Messenger
RNA, Transfer
Ro-3-0340 5823-10-9
Ro-2-3308 6581-06-2
SAD-128 40225-02-3
UF 1,1'-Oxydimethylene bis-(4-tert)-butylpyridinium chloride
Saligenin cyclic phenyl phosphate
U Phenyl saligenin phosphate
Saline
U Sodium chloride
Sarin 107-44-8
BT Organophosphorus compounds
UF Isopropoxymethylphosphoryl fluoride
UF Isopropyl methyl fluorophosphonate
UF Isopropyl methyl phosphonofluoridate
UF Methyl isopropoxy phosphoryl fluoride
UF Methylphosphonofluoridic acid, 1-methylethyl ester
UF Phosphonofluoridic acid, methyl-, 1-methylethyl ester
32P-Sarin

Sciatic nerve
Scintillation counting
Scopolamine 51-34-3
UF Hyoscine
Scopolamine hydrobromide 114-49-8
Scopolamine methyl bromide
U Methylscopolamine
U Methylscopolamine bromide
SD 1652
U 2,2-dichlorovinyl diethyl phosphate
Seawater, artificial
Sebaceous glands
Secretions
Sedatives
U Hypnotics and Sedatives
Sedatives, Nonbarbiturate
BT Hypnotics and Sedatives
Seizures
Sensation
RT Neurophysiology
Sense organs
NT Ear
NT Eye
Sensitization
Sensitization (cont'd)
  RT Hypersensitivity
Serine  6898-95-9
  UF 2-Amino-3-hydroxypropionic acid
  UF Beta-Hydroxylalanine
L-Serine  56-45-1
Serum
Serum albumin
Serum albumin, bovine
  UF Bovine serum albumin
Sevin
  U N-Methyl carbamate
Sheep
Shoulder
Skin
Skin absorption
  UF Absorption, skin
  UF Dermal absorption
Skin, animal
Skull
  RT Intracranial pressure
Soda niter
  U Sodium nitrate
Sodium  7440-23-5
Sodium amobarbital
  U Amobarbital sodium
Sodium amytal
  U Amobarbital sodium
Sodium azile  26628-22-8
Sodium bicarbonate  144-55-8
  UF Carbonic acid, monosodium salt
Sodium chloride  7647-14-5
  UF Saline
Sodium 5-ethyl-5-(1-Methylbutyl) barbiturate
  U Pentobarbital sodium
Sodium fluoride  7681-49-4
Sodium hexobarbital
  U Hexobarbital sodium
Sodium hexobarbitone
  U Hexobarbital sodium
Sodium hydroxide  1310-73-2
Sodium hyposulfite
  U Sodium thiosulfate
Sodium nitrate  7631-99-4
  UF Niter
  UF Nitric acid, sodium salt
  UF Soda niter
Sodium pentobarbital
  U Pentobarbital sodium
Sodium pentobarbitone
  U Pentobarbital sodium
Sodium pentothal
Sodium pentothal (cont’d)
  U Thiopental sodium
Sodium pentothiobarbital
  U Thiopental sodium
Sodium phosphate (dibasic) 7558-79-4
Sodium phosphate (monobasic) 7558-80-7
Sodium thiopental
  U Thiopental sodium
Sodium thiopentone
  U Thiopental sodium
Sodium thiosulfate 7772-98-7
UF Disodium thiosulfate
UF Hypo
UF Sodium hyposulfite
UF Thiosulfuric acid, disodium salt
Solenoids
Soman 96-64-0
  BT Organophosphorus compounds
  UF 1,1,2-Trimethylpropoxyfluorophosphine oxide
  UF 1,2,2-Trimethylpropyl-methylphosphonofluoridate
  UF 3,3-Dimethyl-2-butyl-methyl-phosphonofluoridate
  UF Fluoromethyl(1,2,2-trimethylpropoxy) phosphine oxide
  UF Methyl pinacolyl phosphonofluoridate
  UF Methyl pinacolyloxy phosphoryl fluoride
  UF Methylphosphonofluoridic acid 1,2,2-trimethyl propyl ester
  UF Methylphosphonofluoridic acid 1,2,2-trimethylpropyl ester
  UF Phosphonofluoridic acid, methyl-, 1,2,2-trimethylpropyl ester
  UF Pinacoloxymethylphosphonyl fluoride
  UF Pinacolyl methylfluorophosphonate
  UF Pinacolyl methylphosphonyl fluoride
  UF PMFP
  UF Zoman
32P-Soman
Soman poisoning
Sonication
Spasticity, muscle
  U Muscle spasticity
Spectra
  NT Ultraviolet and Visible spectra
Spectrometry
  UF Spectrophotometry
Spectrophotometry
  U Spectrometry
Spheroidine
  U Tetrodotoxin
Sphingomyelins
Spinal cord
Spinal nerve roots
   NT  Ganglia, spinal
Spinal nerves
Spine
Spleen
Squid
Stereoisomerism and Stereoisomers
   U  Isomerism and Isomers
Stimulation, chemical
Stimulation, electric
   U  Electric stimulation
Stimulation, physical
   U  Physical stimulation
Stoichiometry
Stomach
   BT  Gastrointestinal system
Stratum corneum
Substrate
Succinate dehydrogenase
   UF  Succinic oxidase
Succinic oxidase
   U  Succinate dehydrogenase
Sulfides
   U  Thioethers
Sulfonium, [2-[(ethoxymethylphosphinyl)thio]ethyl]ethylmethyl-, methyl sulfate
   U  GD-42
Sulfonyl compounds
Sulfur 7704-34-9
Sweat glands
   NT  Apocrine glands
   NT  Eccrine glands
Sympathetic blocking agents
   U  Sympatholytics
Sympathetic ganglia
   U  Ganglia, sympathetic
Sympathetic nervous system
Sympatholytics
   UF  Sympathetic blocking agents
Synapses
   BT  Neurons
Synaptic activity
Synaptic receptors
Synaptic vesicles
Synergism
Sytam
   U  Octamethyl pyrophosphoramide
Tabun    77-81-6
    UF Dimethylamidoethoxyphosphoryl cyanide
    UF Dimethylphosphoramidocyanidic acid, ethyl ester
    UF Ethyl dimethylamidocyanophosphate
    UF Ethyl dimethylphosphoramidocyanidate
    UF Ethyl N,N-dimethyl phosphoramido cyanidate
    UF N-Dimethylphosphoramidocyanidate
    UF Phosphoramidocyanidic acid, dimethyl-, ethyl ester
Tabunase  9032-18-2
    UF Diisopropylphosphorofluoridase
Tachycardia
Tachyphylaxis
Tachypnea
Tacrine    321-64-2
    UF 1, 2, 3, 4-tetrahydro-5-aminoacridine
    UF 1, 2, 3, 4-Tetrahydro-9-acridinamine
    UF 9-Acridinamine, 1, 2, 3, 4-tetrahydro-1
    UF 9-Amino-1, 2, 3, 4-tetrahydroacridine
Tail
Tail response
Tarichatoxin
    UF Tetrodotoxin
TCA
    UF Trichloroacetic acid
TDI 3570-55-6
    UF 2, 2'-thiodiethanethiol
    UF 2-Mercaptoethyl sulfide
Temperature
    RT Body temperature
    RT Thermometers
Tendons
Tensilon 116-38-1
    UF Benzenaminium, N-ethyl-3-hydroxy-N,N-dimethyl-, chloride
Tensilon bromide
    UF Edrophonium bromide
Tensilon chloride
    UF Edrophonium chloride
TEP
    UF Tetraethyl pyrophosphate
TEPP
    UF Tetraethyl pyrophosphate
Teratogenic agents
    RT Mutagens
Tetanic activity
Tetanic blockade
Tetanic contraction
Tetanic response
Tetanic stimulation
Tetanus
Tetraethylphosphate
    UF Tetraethyl pyrophosphate
Tetraethyl pyrophosphate 107-49-3
    UF Diphosphoric acid tetraethyl ester
Tetraethyl pyrophosphate (cont'd)
  UF Pyrophosphoric acid tetraethyl ester
  UF TEP
  UF TEPP
  UF Tetraethylidiphosphate
  UF Tetraestigmine
  UF Tetron-100
1,2,3,4-Tetrahydro-9-acridinamine
  U Tacrine
1,2,3,4-tetrahydro-5-aminoacridine
  U Tacrine
Tetraisopropyl pyrophosphoramide
  U DPDA
Tetram
  U Amiton
N,2,3,3-Tetramethylbichclo [2.2.1] heptan-2-amine
  U Mecamylamine
Tetraestigmine
  U Tetraethyl pyrophosphate
Tetrodotoxin
  U Tetrodotoxin
Tetrodotoxin 4368-28-9
  UF Speridine
  UF Tarichatoxin
  UF Tetrodotoxin
  UF TTX
Tetron-100
  U Tetraethyl pyrophosphate
THA
  U Thalactamine
Thalactamin
  U Thalactamine
Thalactamine 23434-97-1
  UF THA
  UF Thalactamin
Thalamus
Tham
  U Tris buffer
Theramine
  U Histamine
Therapeutic processes
  Therapy
  Thermography
  RT Body temperature
Thermometers
  RT Body temperature
  RT Temperature
Thermoreceptors
  BT Nerve endings
Thermoregulation
  U Body temperature regulation
Thigh
Thimet
  U Phorate
Thin-layer chromatography
  U Chromatography, thin-layer
Thiocholine 625-00-3
  BT Choline
  UF Ethanaminium, 2-mercapto-N,N,N-trimethyl-2,2'-thiodiethanethiol
  U TDT
Thioethers
  U Sulfides
Thiometon
  BT Insecticides, organothiophosphate
Thiopental sodium 71-73-8 7438-31-5
  UF Sodium pentothal
  UF Sodium pento thiobarbital
  UF Sodium thiopental
  UF Sodium thiopentone
  UF Thiopentone sodium
Thiopentone sodium
  U Thiopental sodium
Thiophos
  U Parathion
Thiosulfuric acid, disodium salt
  U Sodium thiosulfate
Thiourea 62-56-6
Thorax
Thorazine
  U Chlorpromazine
Thymidine 50-89-5
  UF 1-(2-Deoxy-beta-D-ribofuranosyl)-5-methyl uracil
  UF Thymine-2-desoxyriboside
Thymidine, esters
Thymine-2-desoxyriboside
  U Thymidine
Thyroid gland
  BT Endocrine glands
Tibia
Tibial muscle
  BT Muscles
Tibial nerve
  BT Nerves
Tissue
TMB-4 56-97-3
  BT Oximes
TMB-4 56-97-3 (cont'd)
  UF Trimedoxime bromide
  UF 1,1'-Trimethylene-bis(4-formylpyridinium bromide)
TOCP
  U Tri-o-tolyl phosphate
Toluene 108-88-3
  UF Benzene, methyl-
TOTP
  U Tri-o-tolyl phosphate
Toxicity
Toxicology
  RT Poisoning
  RT Poisons
Toxins
Toxogonin 114-90-0
  BT Oximes
  UF bis(4-hydroxyiminomethyl-pyridinium-1-methyl)-ether dichloride
  UF LuH-6
  UF Obidoxime chloride
  UF Obidoxime hydrochloride
  UF Toxogonin dichloride
  UF Toxogonine
Toxogonin dichloride
  U Toxogonin
Toxogonine
  U Toxogonin
Toxoids
Trachea
Tracheal cannula
Tranquilizers
  U Tranquilizing agents
Tranquilizing agents
  RT Hypnotics and Sedatives
  UF Tranquilizers
Tranquilizing agents, major
  UF Neuroleptics
Tranquilizing agents, minor
Transfusion
  U Blood transfusion
Trasentine 64-95-9
Trasentine hydrochloride 50-42-0
  UF Adiphenine hydrochloride
  UF 2-Diethylaminoethyl diphenyl acetate hydrochloride
  UF Difacil hydrochloride
Trasentine 71-96-5
Tremor
Trichlorfon 52-68-6
  UF Dipterex
Trichloroacetic acid 76-03-0
  UF TCA
Tri-o-cresyl phosphate
    U Tri-o-tolyl phosphate
Triethylcholine
    BT Choline
Triflupromazine 146-54-3
Trimedoxime bromide
    U TMB-4
1,1'-Trimethylene-bis(4-formylpyridinium bromide)
    U TMB-4
1,1'-Trimethylene-bis(4-formylpyridinium) dioxime dibromide 56-97-2
Trimethylolaminomethane
    U Tris buffer
1,1,2-Trimethylpropoxyfluorophosphine oxide
    U Soman
1,2,2-Trimethylpropyl-methylphosphonofluoridate
    U Soman
Tris buffer 77-86-1
    UF 1,3-Propanediol, 2-amino-2-(hydroxymethyl)-
    UF THAM
    UF Trimethylolaminomethane
    UF Tris(hydroxymethyl) methanamine
Tritium 10028-17-8
    BT Hydrogen, isotopes of
    UF 3H
    UF Hydrogen-3
Tri-o-tolyl phosphate 78-30-8
    UF TOCP
    UF TOTP
    UF Tri-o-cresyl phosphate
    UF Tris (o-methylphenyl) phosphate
Tritons
    Triton X-100 39409-11-5 66057-68-9 66057-69-0 9002-93-1 9010-42-8
    UF Polyethyleneglycol octylphenol ether
Tropaic acid
    U Tropic acid
Tropic acid 529-64-6
    UF alpha-(Hydroxymethyl) benzeneacetic acid
    UF Tropaic acid
Tryspan blue 72-57-1
Trypsin
    UF Tryptar
Tryptar
    U Trypsin
TTX
    U Tetrodotoxin
Tubadil
    U d-Tubocurarine chloride
Tubarine
   U d-Tubocurarine chloride
d-Tubocurarine  57-95-4
d-Tubocurarine chloride  57-94-3
   UF Delacurarine
   UF Tubadil
   UF Tubarine
Twitch
Twitch response
Twitch stimuli
U-23223
   U Benzoic acid, 3-chloro-2,5,6-trimethyl-
UDP
   U Uridine 5'-(trihydrogen diphosphate)
Ultraviolet and Visible spectra
   BT Spectra
   UF Ultraviolet spectra
Ultraviolet rays
Ultraviolet spectra
   U Ultraviolet and Visible spectra
Urea  57-13-6.
   UF Carbamide
   UF Carboxyldiamide
   UF Ureaphil
Ureaphil
   U Urea
Urethan
   U Carbamic acid, esters, ethyl ester
Urethane
   U Carbamic acid, esters, ethyl ester
Urethanes
   For specific urethanes, see specific terms
Uridine 5'-pyrophosphate
   U Uridine 5'-(trihydrogen diphosphate)
Uridine 5'-pyrophosphoric acid
   U Uridine 5'-(trihydrogen diphosphate)
Uridine 5'-(tetrahydrogen triphosphate)
   U Uridine 5'-'triphosphate
Uridine 5'-(trihydrogen diphosphate)  58-98-0
   UF UDP
   UF Uridine 5'-pyrophosphate
   UF Uridine 5'-pyrophosphoric acid
Uridine 5'-triphosphate  63-39-8
   UF Uridine 5'-(tetrahydrogen triphosphate)
   UF UTP
Urinary tract
   NT Bladder
   NT Kidney
Urogenital system
UTP
  U Uridine 5'-triphosphate
Vagus nerve
  BT Nerves
Valium
  U Diazepam
Vascular resistance
Vasoconstriction
Vasoconstriction agents
  UF Vasopressor agents
Vasodilation
Vasodilator agents
Vasomotor system
Vasopressor agents
  U Vasoconstriction agents
Vein
  BT Blood vessels
Venous pressure
  RT Pressure
  UF Blood pressure, venous
Ventilation
  Term is used for environment, not lungs.
Ventilation, artificial
  U Respiration, artificial
Ventilation, mechanical
  U Respiration, artificial
Ventilators, pulmonary
  U Respirators
Veratrine
  U Cevadine
Veronal
  U Barbital
Vertebrates
  NT Mammals
Vidine
  U Choline
Vinblastine 865-21-4
  UF Vincaleukoblastine
  UF VLB
Vinblastine sulfate 145-67-9
  UF Vincaleukoblastine, sulfate
Vincaleukoblastine
  U Vinblastine
  'Vincaleukoblastine, sulfate
  U Vinblastine sulfate
VLB
U Vinblastine

VX 51848-47-6
U Ethyl-S-(2-diisopropylaminoethyl) methylthiophosphonate

VX-3
Warburg technique
Weight gain
  RT Body weight
Weight loss
  RT Body weight
White blood cells
  U Leukocytes

Xylocaine
  U Lidocaine

Yttrium

Zoman
  U Soman

Zytron
  U DMPA (herbicide)