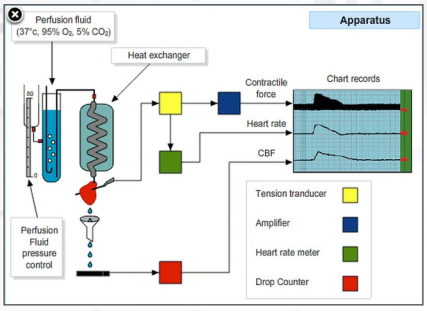
Cat.# SB-16 - **LANGENDORFF HEART** *Windows*



This program is highly interactive and simulates experiments, which may be performed on the isolated perfused mammalian heart (Langendorff preparation).

Introduction and Methods sections cover the removal of the heart , setting it up to record ventricular contractile force, heart rate and coronary blood flow and the administration of drugs.

In the Experiments section simulated data, derived from actual data, is presented on a screen display which emulates a chart recorder. Students 'design' experiments by choosing, from a menu, a range of pharmacological agents which may be administered either alone, or in combination with an antagonist or potentiator. Each trace represents several minutes of recording and thus allows students to access a large amount of data in a short period of time. A facility to compare traces of 'drug X alone' with drug X + antagonist Y or drug X + potentiator Z is available. This allows easy visual comparison of qualitative effects and of course more accurate measurements can be taken from the screen.

The program covers:

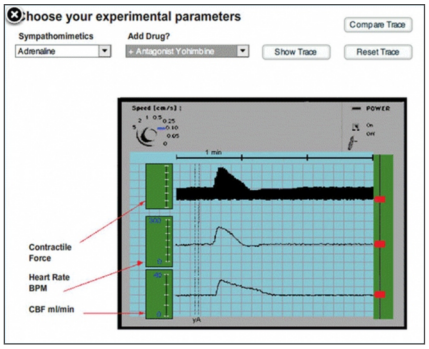
1. Effects of drugs: sympathomimetics (adrenaline, noradrenaline, salbutamol, clonidine, phenyl-ephrine, dobutamine) antagonists (propranolol, yohimbine atenolol, prazosin, butoxamide, phentolamine) potentiators (cocaine); parasympathomimetics (acetylcholine, carbachol, methacholine, nicotine) antagonists (atropine, amitryptyline, hexamethonium) potentiator (neostigmine); cardiac glycosides (digoxin, ouabain); coronary vasodilators (nitrogly-cerine, adenosine (antagonists: theophylline, dipyridamole), histamine (antagonists: cimetidine, mepyramine), verapamil;

2. Effect of ions: (high and low concentrations of calcium, potassium and sodium);

3. Effect of increasing pre-load on contractile (ventricular) force (Starlings Law).

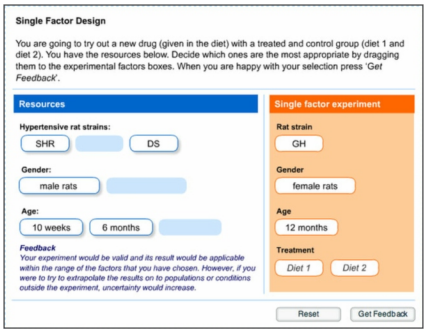
The simulated responses (heart rate, ventricular force and coronary blood flow) are derived from actual experimental data and presented in high resolution colour graphics in a form comparable to that of a chart recorder.

The program contains textual information describing the preparation and experimental method and an editable on screen help facility allows teachers to tailor the information-content of the program to specific groups of students. The package also includes suggested student assignments. It is envisaged that the program could be used in a number of ways: to better prepare students who will the perform the practical at a later date; to debrief students after they have performed the practical; as a ‘fallback’ to provide data for students whose experiments were unsuccessful; as an alternative to the practical, though it should be remembered that different learning objectives may be achieved.



Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This program is available as a Multi-User Educational Licence. See page 38 for prices



'*Experimental Design*' aims to help researchers, particularly those working with animals, to design more effective experiments which will deliver more information, produce more conclusive results, improve interpretation and reduce the number of experimental animals required. It combines real life scenarios, working examples and background theory and throughout the student learns by exploration and engages in interactive practical exercises that give hands on exposure to the key concepts in experimental design. The program has been designed with the close collaboration of research scientists in industry and academia. In addition, members of the scientific community ranging from post-graduates to project leaders have evaluated the software to ensure the appropriateness of its content.

Aims: to enable the research scientist to:

- estimate the number of animals needed to attain the scientific objectives economically and effectively.
- select a suitable animal model
- avoid bias and deal with variability
- use appropriate statistical methods or more effectively consult professional statisticians

Sections exploring the key issues in experimental design are accessed from a menu.

Introduction & Aims - primes the user as to why experimental design is so critical. Engages the user with data from a simple experiment to highlight design flaws.

Choice of Animal Model - explores the use different strains (inbred and outbred stock) and covers the various types of animal model (predictive, explanatory, exploratory).

The Experimental Unit - uses interactive examples to explain the critical nature of the experimental unit and it's importance.

Eliminating Bias - covers techniques you can employ to remove systematic differences between treatment groups and ensure your experiments are not biased. Again interactive examples are used

Applying Valid Statistics - covers the application of valid statistical tests to your data, explores the definition of hypotheses, choices of statistical tests, and interpretation of P.

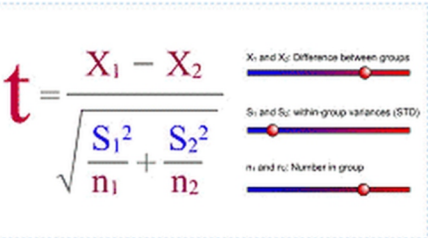
Improving Precision - making experiments more precise so that we can detect treatment differences. Ways of achieving this - ensuring uniformity, use of blocking, using power analysis and the resource equation method.

Increasing the Range of Applicability - using your resources effectively to enable you to interpret your findings over a wider range e.g. different treatments, different strains, sexes, sizes. Use of multi-factorial design.

Planning and Organising - key issues in designing and analysing effective (simple) experiments.

Self-Assessment Activity - series of case studies and true/false questions with feedback to self-assess your understanding.

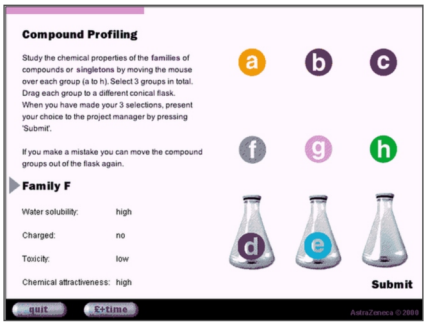
Software Tools & References - where to get further information.



Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This program is available as a Multi-User Educational Licence. See page 38 for prices

An interactive computer-based tutorial to introduce the principles of the drug discovery process



This highly interactive program combines a tutorial and a self-assessment exercise in the form of a 'game'.

Tutorial – this is divided into several sections, each of which may be accessed in any order:

The Pharmaceutical Industry - setting the scene: an introduction to the industry, some historical aspects of drug discovery, different functions of medicines;

Selecting a Disease Area: describes the sort of issues which the industry will consider in deciding what sort of drug they wish to develop;

Selecting the target: introduces potential drug targets (enzymes, receptors and ion channels) and uses examples of common diseases to illustrate how different drugs act;

Initial Screening: describes techniques (high throughput screening) and principles of using an assay to test large libraries of potential compounds;

The Screening Cascade: covers the methods (enzyme assay, cell assay, mode of action test, selectivity test and optimization) used to identify a small number of potential compounds with which to proceed into development;

Safety Testing and Clinical Trials: describes methods of toxicity testing, and phase I, II and III of clinical trials;

Self-assessment section: contains a number of largely multiple-choice questions covering each of the sections

High quality colour graphics are used extensively throughout the program, and features such as animation, a glossary and hotword facility are used to enhance student learning. The program is highly interactive and uses several features to promote this. For example, the main sections all have associated student tasks/self-assessment questions, e.g., true/false questions with feedback, drag-and-drop exercises, data interpretation exercises, calculations, case histories, role-play decision-making group activities. These are designed to consolidate knowledge and to allow students to self-assess their understanding of the section they have completed. They are also used to present additional information and explanations through the feedback. Glossary (definitions of terms) and hotword/hypertext links (fuller explanations of terms and concepts) are used throughout. The section of multiple-choice questions allows students to self-assess their knowledge.

The learning package is intended to be used either: to support existing teaching of modules containing pharmacology, or for independent study. Brief trials with high school students have indicated that it would occupy students for one to two hours of study and that it works best when students study in pairs.

Student Exercise - takes the form of a 'game' and is designed to complement the interactive tutorial. Students are placed in the shoes of a project team working for a fictitious pharmaceutical company 'Lion Pharmaceuticals'. They have a brief to identify three potential new medicines to treat prostate cancer (the selected disease area) starting with Lion's library of compounds and an identified target (a key enzyme).

The team have to make crucial decisions at each step of the process. Poor decisions trigger the intervention of a Project Manager whose job is to keep the team within budget and on schedule. He advises the team when he intervenes but also penalizes them with the loss of a 'life'. The team have to complete the task with the loss of fewer than five 'lives'.

The game is divided into four sections which follow closely mirror the approach of the tutorial program.

High Throughput Screening – students must decide the number of compounds from the library to test and, using a simulated spread-sheet to help them, decide on the optimum use of resources (human and machine) to complete the task.

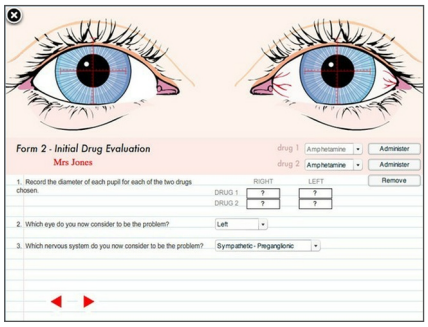
The Screening Cascade (enzyme assay, cell assay, mode of action test) - students have to decide on the best way of conducting this series of tests – either to develop and carry out the tests in series or in parallel.

Compound Profiling - here students study the properties (water solubility, toxicity, ionic charge and chemical 'attractiveness') of the small number of families of compounds and singletons and select three to take into the final stage.

Animal (in vivo) testing - at this stage there are ten possible compounds remaining. Students have to reduce this number to three by eliminating 'candidates' from results of five 'in vivo' studies in animals. They are presented with results of the compounds on: plasma concentration (after oral dosing in mice); target enzyme activity in rats; prostate gland weight in rabbits in which prostate cancer has been induced; tumour cell growth rate; and preliminary safety and toxicity testing. The emphasis is on reinforcing their learning and highlighting important principles of the discovery process e.g. efficient use of resources, use relatively inexpensive in vitro testing for preliminary screening, in vivo (animal) studies are expensive, the discovery process is long (several years) and very costly.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

Cat.# SB-32 - **AUTONOMIC PHARMACOLOGY** *Windows*



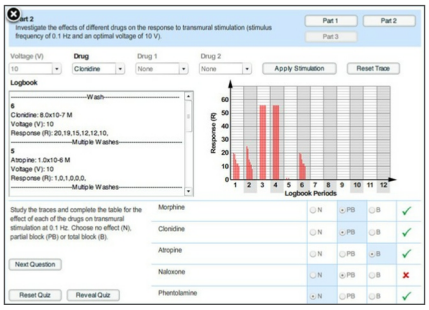
The 'Tutorial' section describes, using text and animated schematic graphics, the sympathetic and parasympathetic control of pupil diameter and how pupil diameter changes in response to a change in ambient light intensity.

The 'Student Exercise' section provides information on how to work through the investigation on a virtual patient using a 'normal' patient as an illustration. Thus students have the opportunity to investigate how the normal pupil will respond to a change in ambient light intensity, investigate the blink reflex and text the action of a number of pharmacological agents. They are encouraged to measure the pupil diameter (using an on-screen cross-hair cursor) at a range of light intensities and to observe, for each eye, the speed with which the pupil diameter changes. They can also investigate the action of a number of pharmacological agents applied topically to the eye (single dose, enough for a large, but not maximal, response in eyes that are responsive) and record their observations on an on-screen chart. The agents available (atropine, pilocarpine, physostigmine, phenylephrine, cocaine, and amphetamine) all affect neurotransmission at the postganglionic sympathetic and parasympathetic synapses and have little effect on ganglionic transmission. There is also a 'washout' facility which instantly removes the applied drugs whereas in the real situation several hours might be required for some of the drug effects to be reversed.

The 'Simulation' section contains four virtual patients each suffering from a medical condition which results in an abnormal pupillary reflex in one eye: Normal but with reddening of the eye and physiological anischoria, Horner's Syndrome (pre-ganglionic), Horner's syndrome (postganglionic), and Partial parasympathectomy. Students first take measurements of the response to a change in light intensity which should give a clue to the underlying problem. They can then investigate this further by choosing two of the drugs from the list and observing their effects - that is sufficient to test the best hypothesis for each patient. To confirm their diagnosis students can then choose to administer one more agent after which they will be expected to select a diagnosis from the list.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

Cat.# SB-34 - **GUINEA PIG ILEUM** *Windows*



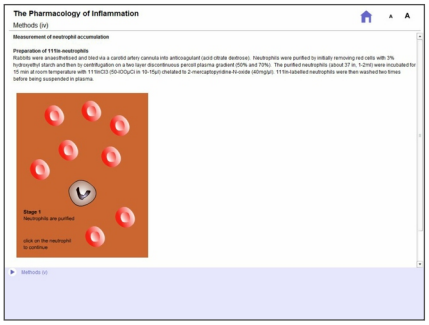
This program simulates an isolated preparation of the guinea pig ileum, a smooth muscle preparation exhibiting little spontaneous contractile activity, which is extensively used for pharmacological studies. Its aim is to enable the exploration of the effects of drugs and electrical stimulation on the release of, and response to, neurotransmitters in the enteric nervous system. Simulated responses are derived from a model which presents the contractile response of the ileum both to added drugs and to transmural electrical stimulation. Learning is through exploration and the program places at the disposal of the user a range of DRUGS (acetylcholine, histamine, clonidine, morphine, naloxone, phentolamine, atropine, mepyramine) which may be added alone or in combination to the organ bath in a range of DOSES, and an electrical STIMULATOR. A 'magic' WASH facility instantly removes all traces of added drugs and greatly speeds up the process of data collection compared to the real experiment. Simulated contractions of the gut are presented on a scrolling display comparable to that of a chart recorder. Students may take measurements directly from the monitor.

The program has four sections: *Introduction* uses text, high quality graphics and quizzes to enable students to learn the appropriate structures in the small intestine and the pharmacological basis of how motility is controlled. *Methods* describes the apparatus and the experimental protocols. A *Pretest* section tests the students understanding of the information presented in the introduction and methods sections. *Experiments* is the main section and allows students to simulate performing several experiments:

- action of drugs (acetylcholine, histamine, atropine and mepyramine);
- dose response curve for acetylcholine and determination of ED50;
- dose response curve for acetylcholine in the presence of atropine and determination of ED50;
- effects of low frequency transmural electrical stimulation (10V, 0.1 Hz) and the action of drugs (atropine, phentolamine, naloxone, clonidine, morphine)
- effects of high-frequency transmural electrical stimulation (10V, 10Hz) and the action of naloxone and phentolamine.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

Cat.# SB-13 - INFLAMMATION PHARMACOLOGY *Windows*



This program simulates a range of experiments designed to demonstrate the action of inflammatory mediators and pharmacological agents on the in vivo inflammatory response in the anaesthetised rabbit. The program uses data obtained from actual experiments and is aimed at undergraduate students on courses in which pharmacology is a major component. It may be particularly useful for teaching students either to support laboratory practicals or, in those departments where lack of equipment and/or technical expertise precludes this, as a student-centred alternative.

Introduction and Methods sections combine text and high- quality colour graphics to describe the animal preparation, the methods employed to measure oedema formation (extravascular accumulation of 125I - albumin) and neutrophil accumulation, and to provide the student with the essential background information required to understand the how the inflammatory response is triggered, and the mechanisms involved.

The **Experiments** section allows the student to select, from a menu, to study the effects of the following agents on oedema formation (and where appropriate on neutrophil numbers) in normal rabbits:

1. A range of direct mediators of increased microvascular permeability [histamine, bradykinin, platelet activating factor (PAF), Substance P, leukotriene D4], either alone (dose-response relationships), in the presence of a vasodilator (PGE2) or with receptor antagonists;

2. A range of agents which cause inflammation principally via neutrophil accumulation [complement Factor C5a, cytokines interleukins IL-1 and IL-8, the bacterial peptide f-methyl-leucyl-phenylalanine (FMLP), leukotriene B4, Tumour Necrosis Factor (TNFalpha)], either alone (dose-response relationships) and in the presence of a vasodilator (PGE2). The effects of neutrophil depletion and the importance of adhesion molecules are also covered;

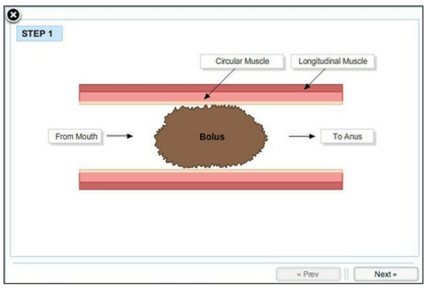
3. Non-steroidal (local and systemic effects) and steroidal anti-inflammatory agents.

A section describing the results of selected experiments using sensitised rabbits is also included and covers the IgG (Reverse Passive Arthus response) and IgE response. The results are presented in graphical form either as bar-charts or line graphs. The program contains numerous self-assessment exercises which demand interpretation of experimental data presented to them, and an understanding of the underlying inflammatory mechanisms. These student-centred activities make the program useful for self-directed learning or, in the ideal situation, it would be incorporated into a structured teaching programme and used with a teacher-designed workbook.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This program is available as a Multi-User Educational Licence. See page 38 for prices

Cat.# SB-33 - INTESTINAL MOTILITY *Windows*



This program is designed to simulate experiments which may be performed on an isolated preparation of rat colon to study intestinal motility. Peristalsis in the rat colon differs in detail, but not in principle, from that in human colon, or indeed from small intestinal peristalsis.

The **Tutorial** section program explains, using animations and high quality graphics the mechanism of peristalsis and the excitatory and inhibitory nervous pathways which influence it. **Methods and Materials** describes with the aid of diagrams the apparatus, the method of administering control and test agents and how the peristaltic reflex test is performed. The effects of these procedures on longitudinal muscle tension (g) and fluid propulsion from a drop counter (number of drops over time) are also explained.

Experiments allows the user to see the effects of physiological stimuli (activation of the peristaltic reflex by distension of the colon with saline) and of the following automotive pharmacological agents either administered alone or in combination: saline (control), atropine , neostigmine , acetylcholine , carbachol , epinephrine.

Self-assessment: each experiment is accompanied by a series of true/false questions designed to assess students interpretation of the displayed results and their understanding of the underlying pharmacological mechanisms.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

An interactive, menu driven and easy to use program which simulates experiments performed on the sciatic nerve-anterior tibialis muscle preparation of the cat (in vivo) to illustrate the important differences in the pharmacological action of depolarizing and non-depolarizing blocking agents.

An on-screen student handbook covers:

- an outline, using text and graphics of the process of neuromuscular transmission
- the preparation of the anaesthetised cat,
- the protocol for sciatic nerve stimulation and isometric recording of evoked contractions of the anterior tibialis muscle.
- a summary of the actions of the different types of blocking agents
- the clinical relevance of the different blocking agents.

The **Experiments Section** presents high-resolution graphic simulations of experimental results (muscle contractions), in accelerated time, on a scrolling display to simulate a chart recorder.

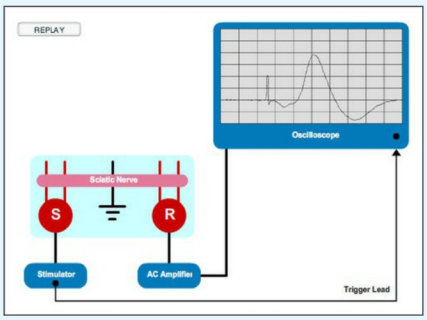
Phase I Experiments - each experiment compares the action of the two types of neuromuscular blocking agent using d-tubocurarine as an example of a non-depolarizing blocker and decamethonium as an example of a depolarizing blocker.

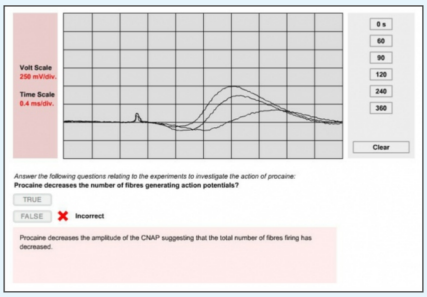
- administered i.v.
- administered close arterially
- in conjunction with an anticholinesterase
- in conjunction with a different competitive (non-depolarizing) blocker
- in conjunction with a different depolarizing blocker
- in response to tetanic stimulation
- in response to acetylcholine administered by close arterial injection.

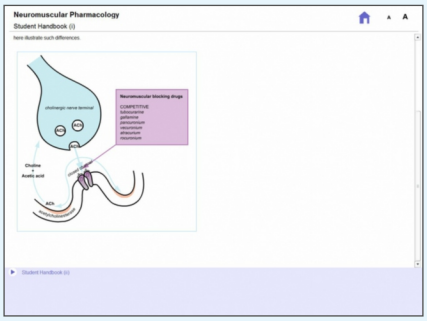
Phase II Experiments - the effects of four successive doses of decamethonium followed by the effects of tetanic stimulation and an anticholinesterase

Student Activities - Each experiment has an associated student activity designed to assess understanding of the experimental results. These might be a series of true/false statements or a table to complete. There are also some suggested questions which would form the basis of a report of the experiment.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.







This program is available as a Multi-User Educational Licence. See page 38 for prices

This highly interactive CBL program is designed to teach the essential physiology and pharmacology of the neuromuscular junction. It is intended for first or second year undergraduate students of medicine, physiology, pharmacology and biological sciences. Some sections may also be appropriate for health-related courses. It is suitable for primary learning, revision or as a resource to support other types of teaching. It should occupy students for 3-4 hours of study.

Learning Objectives: after working through this program students should be able to:

- Describe the functional anatomy of the skeletal neuromuscular junction;
- Explain the process of neurotransmission;
- Describe the characteristics of nicotinic acetylcholine receptors and the actions of acetylcholine at these receptors;
- Explain the differences in mode of action of depolarising and non-depolarising neuromuscular blocking agents and the characteristics of the blocks they produce;
- Describe the clinical use of anticholinesterases;
- Discuss the clinical implications of using neuromuscular blocking agents.

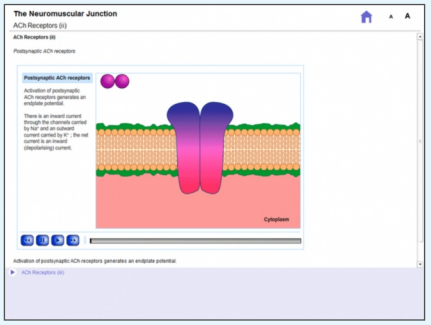
Content: the program is divided into several sections:

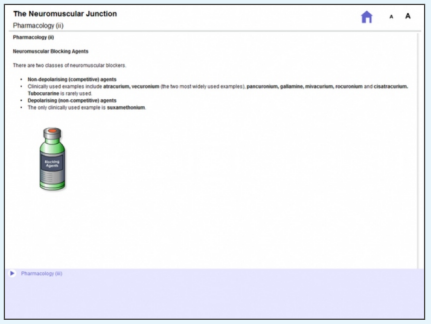
- Introduction: gives an overview of content and approach of the program;
- Neuromuscular Transmission: uses animated stepwise sequences to describe synthesis of acetylcholine, transmitter release mechanisms, action of acetylcholine at receptors and transmitter inactivation;
- Acetylcholine Receptors:describes the function of and action of acetylcholine at both pre- and post-synaptic nicotinic receptors;
- Pharmacology: gives examples of, and describes the characteristics and mechanism of action of depolarising and non-depolarising neuromuscular blocking agents and anticholinesterases;
- Clinical Aspects: covers the clinical use of neuromuscular blocking agents and anticholinesterases (particularly for treatment of myaesthenia gravis). This section describes how depth of blockade may be monitored, and the pharmacokinetics, characteristics, side-effects and drug interactions of clinically used drugs.

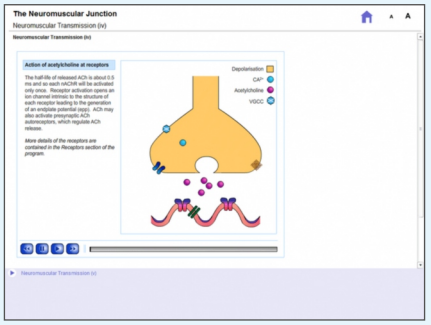
The approach is to combine succinct textual/factual descriptions with graphics and to use features such as animation and hotwords where appropriate. Hotwords function either to define terms which may be unfamiliar to the student or to provide additional, sometimes more detailed or advanced information. Some experimental data, which illustrates the different actions of neuromuscular blocking agents in animal models, is also used.

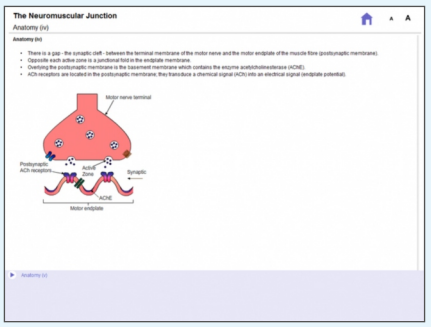
The program contains numerous self-assessment questions e.g. multiple choice and true/false questions with feedback, drag and drop exercises (to test e.g. knowledge of stepwise sequences), and clinically-related scenarios. These are designed primarily to promote and reinforce learning rather than to test students. Learning by this method is non-intimidating, is independent of time and place, may be self-paced and may take place either individually or in small groups.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.









This highly interactive program uses pulmonary function data obtained from guinea pig to teach the fundamental pharmacology of the airways.

1. AIMS, INTRODUCTION and METHODS sections of the program use a combination of text and high-resolution colour graphics to describe:

- The aims and objectives of the program
- The structure of the airways, the physiological control of bronchial smooth muscle tone pharmacology, airway smooth muscle receptor pharmacology, pathophysiology (asthma and COPD) and it's treatment.
- The guinea pig preparation and the apparatus used to monitor airway function.

2. EXPERIMENTS is the main section and allows the student to select, from a menu, to study the effects of various mediators and inhibitory agents in the normal and allergen-sensitized animals.

Normal Guinea Pig:

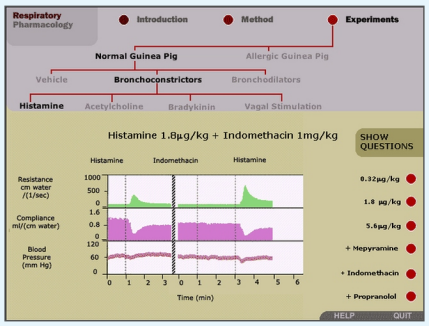
- Vehicle (0.9ml saline);
- Bronchoconstrictors (Histamine: 3 single doses and + mepyramine, + indomethacin + propranolol;
- Acetylcholine (3 single doses and + atropine, + indomethacin, + propranolol;
- Bradykinin (3 single doses and + indomethacin;)
- Vagal Stimulation: (low frequency stimulation, LF + atropine, high frequency stimulation, HF + atropine);
- Bronchodilators (bombesin treated: single dose, + epinephrine, + mepyramine)

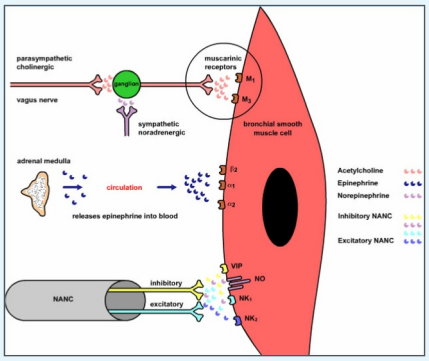
Allergen-sensitized Guinea Pig:

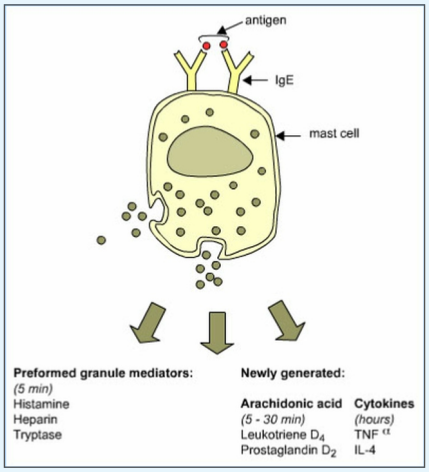
- Histamine, + mepyramine;
- LTC4 + mepyramine, + montelucast;
- Antigen (i.v.) + mepyramine; + mepyramine and montelucast.

For each experiment the display shows simultaneous traces of resistance, dynamic compliance and blood pressure which are presented in a form similar to that in the Mumed recording system. Each set of data is accompanied by self-assessment questions which demand interpretation of experimental data presented to them, and an understanding of the underlying control mechanisms. These student-centred activities make the program useful for self-directed learning or, in the ideal situation, it would be incorporated into a structured teaching programme and used with a teacher-designed workbook.

It is envisaged that the program could be used in a number of ways: to better prepare students who will perform the practical at a later date; to debrief students after they have performed the practical; as a 'fallback' to provide data for students whose experiments were unsuccessful; as an alternative to the practical, though it should be remembered that different learning objectives may be achieved.



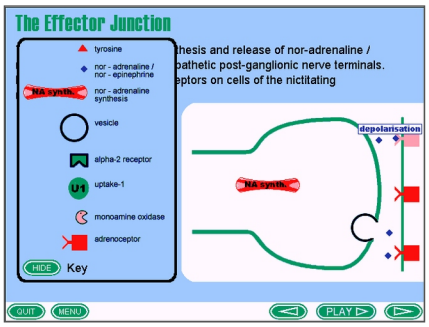




Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This program is available as a Multi-User Educational Licence. See page 38 for prices

Cat.# SB-4 - CAT NICTITATING MEMBRANE *Windows*



An interactive, menu driven program which simulates experiments on the superior cervical ganglion-nictitating membrane preparation of the cat (in vivo) to teach the pharmacology of ganglionic transmission and sympathetically innervated smooth muscle.

Introduction: provides information about the program and it's curricula context;

Tutorial: presents diagrammatic representations of the effector junction and the superior cervical ganglion. This section of the program uses animated sequences to demonstrate the stages of transmission at both the synapse and neuro-effector junction and highlights possible sites of action of drugs;

Methods: describes the preparation, protocols for nerve stimulation and administration of drugs to the superior cervical ganglion and the nictitating membrane, and the method of recording contractions of the nictitating membrane.

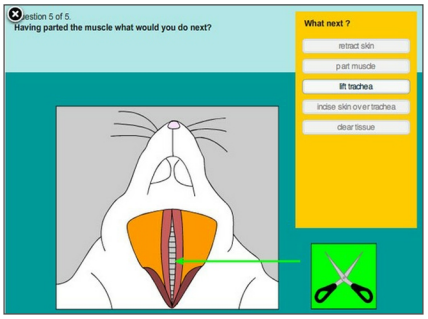
Experiments: allows students to perform simulated experiments on the preparation and provides recordings of the force of contraction of both ipsilateral and contralateral nictitating membranes which are displayed on a screen designed to emulate a chart recorder. A sub-menu gives students some control over experimental parameters (they can choose:

1. to administer an agent from a list: saline (vehicle control), acetylcholine, noradrenaline, atropine, phentolamine, propranolol, isoprenaline, hexamethonium, physostigmine, nicotine (low and high dose), tyramine, an unknown (which is randomly selected from the list above when the program is run);
2. the site of administration;
3. whether to electrically stimulate preganglionic nerves (half-maximal stimulation).

Although it is envisaged that the tutor will develop a set of tasks for students to address when using the simulation which will meet their own teaching objectives, this section does also includes some suggested tasks to aid independent use of the program.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

Cat.# SB-31 - RAT BLOOD PRESSURE *Windows*



This highly interactive program simulates a range of experiments to demonstrate the effects of a variety of pharmacological agents/procedures on blood pressure and heart rate of the anaesthetized rat (in vivo). It is aimed at undergraduates studying pharmacology modules on a range of medical and science courses. Each section combines text, high quality colour graphics, and animation with interactive questions designed to reinforce learning.

The main menu allows students to access sections covering different aspects of the laboratory class;

- Introduction: Home Office Licence requirements,
- Preparation: anaesthesia/anaesthetization, cannulation of trachea, jugular vein and carotid artery,
- Apparatus: equipment used to maintain body temperature, record blood pressure and heart rate,
- Measurements: describes how to take measurements from the simulated chart recorder and how to calculate mean BP and pulse pressure,
- Experiments: provides typical data for 16 different experiments selected to teach the essential pharmacology: catecholamines; pressor agents; acetylcholine; ganglion stimulants; uptake1-blockers; alpha-blockers; beta-blockers; adrenaline reversal; guanethidine; sympathetic nerve stimulation; depressor drugs; ganglion blockade; quantitative effects of alpha-blockade; quantitative effects of beta-blockade; reserpine; pithing

Students are expected to record and tabulate data from the screen display and to then complete student assignments e.g. a series of MCQ questions, with feedback, to assess accuracy of data collection and data interpretation; a student task (typical of a traditional lab-class report) to be completed in their own time. In addition there is a section containing a selection of MCQ's with feedback covering cardiovascular pharmacology which students can use for revision.

Recommended System Requirements: Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.