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# Pharmacology Collection Overview

Engage students with hands-on experiments and lessons



## Lt is an online learning platform that includes ready-to-use content and hardware kits and systems for pharmacology courses.

Lt's Pharmacology Collection comes complete with professionally designed lessons and labs that explore ligand-receptor binding and dose-response relationships using a variety of different tissue preparations. During labs, learners use our hardware for practical work that helps them connect core pharmacology principles with a true-to-life lab experience

### Professionally developed lessons

Lt's latest Pharmacology Collection comprises of 13 modules. Each module explores pharmacological phenomena including agonists, antagonists, and dose-response relationships using a variety of different tissue preparations. Use Lt's pre-prepared data to minimize animal use.

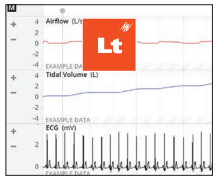
Selected modules also include Pre-Lab Prep material. This lets students walk into the lab with an understanding of key principles, maximizing their engagement and freeing them up to focus on linking scientific theory with practice.

- Improved efficiency
- Increased student engagement
- Improved results in theory and clinical practice
- Increased student pass rates*

**Results of using Lt at the School of Nursing, Otago Polytechnic | Te Pūkenga, 2017*

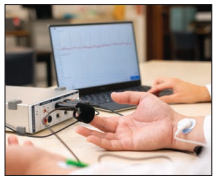
> *"Our students really love Lt and it has improved student engagement"*
>
> **Prof. Dee Silverthorn,**
> Physiology, Dell Medical School, The University of Texas at Austin, USA

### Creating a custom education system is easy:




Active learning software

+



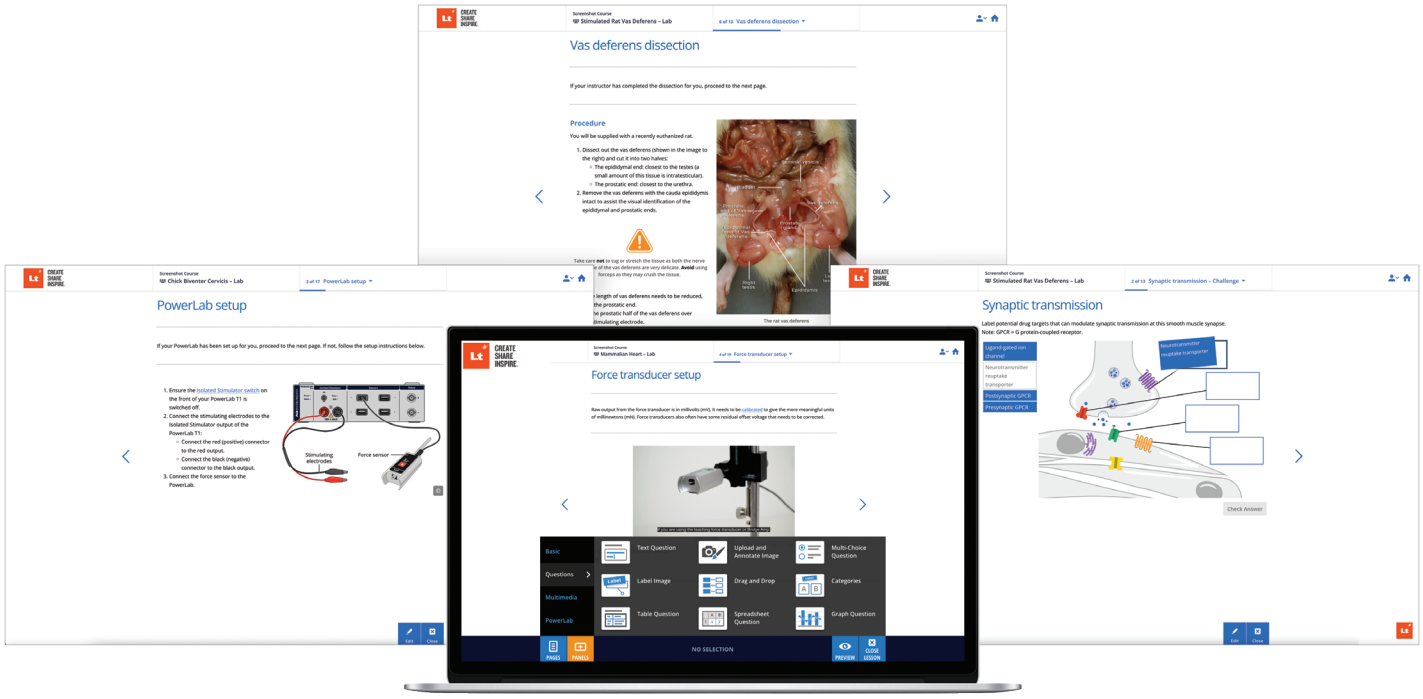
Content Collections

+



PowerLab Sensors
(Bundles, kits, or individual sensors)

ADINSTRUMENTS




# Pharmacology Collection

## 13 MODULE COLLECTION

**Modules include: Pre-Lab Prep, Lab**

### Airways Resistance

Measure the effects of histamine and acetylcholine on airway contraction, using guinea pig trachea dissection to stimulate asthma.

### Chick Biventer Cervicis

Use the isolated biventer cervicis muscle from a chick to investigate how the curare poison affects muscle contraction, and which drugs may work as an antidote to curare.

### Mammalian Atria

Examine how isoprenaline, propranolol, acetylcholine, atropine, and physostigmine affect the frequency and strength of myocardial contraction, using guinea pig atria.

### Mammalian Diaphragm

Measure changes in neuromuscular transmission in an isolated phrenic-innervated diaphragm under the effects of suxamethonium, tubocurarine, and edrophonium.

### Mammalian Heart

Use an isolated rabbit heart to investigate the effects of epinephrine, norepinephrine, isoproterenol, isoprenaline, acetylcholine, lidocaine, ouaban and a low potassium solution on heart rate and the force of contraction.

### Mammalian Jejunum

Apply repetitive electrical stimulation to the sympathetic nerves of the isolated rabbit jejunum, inhibiting its rhythmic output from the enteric nerve plexuses and thus, reducing gastrointestinal motility.

### Mammalian Uterus

Examine the effects of a variety of drugs (oxytocin, epinephrine, high potassium solution, salbutamol, and propanolol) on a stimulated mammalian uterus preparation.

### Stimulated Ileum

Investigate how codeine, naloxone, naltrexone, norepinephrine, and acetylcholine affect gastrointestinal motility, using guinea pig ileum preparation.

### Stimulated Rat Vas Deferens

Test the effects of presynaptic drugs, like noradrenaline on synaptic transmission. Students can also investigate the effects of a range of adrenoceptor agonists and antagonists.

### Toad Rectus Abdominis

Use an isolated toad rectus abdominis muscle to investigate the effects of tubocurarine and suxamethonium on muscle contraction stimulated by acetylcholine application.

### Unstimulated Ileum

Examine the effects of a variety of drugs on the unstimulated guinea pig ileum preparation and explore the effects of two mystery drugs to determine their mechanism of action.

### Unstimulated Rat Vas Deferens

Use an isolated rat vas deferens to investigate the effects of alpha adrenergic receptor agonists and antagonists, and drugs that affect the amount of norepinephrine in the synaptic cleft.

### Vascular Smooth Muscle

Use arterial rings from a pig coronary artery to explore some drug effects. Arterial rings can be used to demonstrate classical responses to autonomic drugs on vascular smooth muscle. Arterial rings can also be used to show the recently-discovered role of the endothelium in modulating vascular responses.





**PTK62**

## Pharmacology Kit II

The PTK62 Pharmacology Kit II is ideal for student laboratories conducting isolated tissue and pharmacological experiments.

The kit includes the 25 mL ML514 ADI Teaching Organ Bath (Single Chamber) and a SEN2101 Force Sensor (50 g). A compatible heated water recirculator is required (purchased separately), such as the MLA212-V.

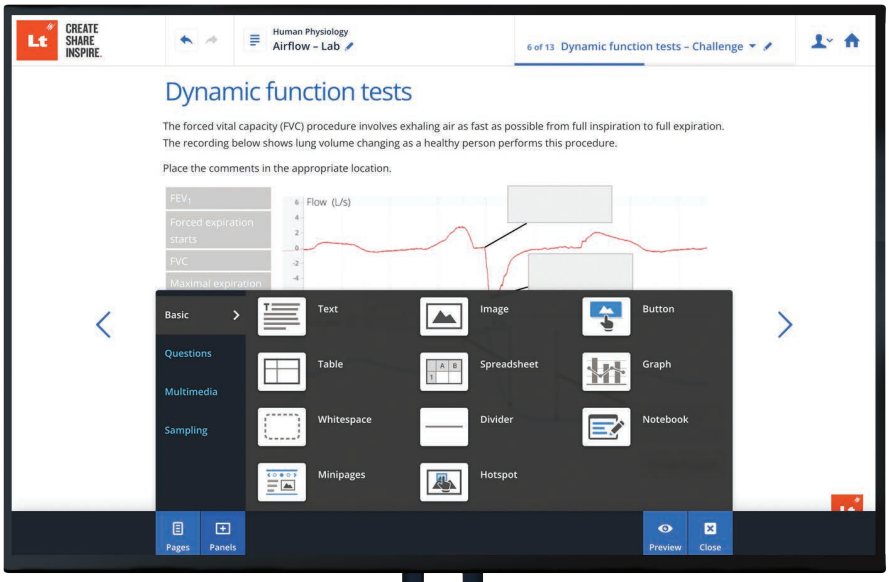
The ML514 apparatus is ideal for use in education. Modular in design, it has a 25 mL glass tissue chamber, 300 mL glass open reservoir, stainless steel base, 24” stainless steel support rod, manipulator, glass tissue hook and vessel supports. Both the tissue chamber and reservoir have their own teflon needle valve, which allows gassing control of its buffer. A MLA212-V Heated Water Recirculator (purchased separately) can be used to provide heated water to its water jacketed glassware to maintain a constant temperature (can supply heated water to up to four of these apparatuses in series, but with no more than 2 m distance from each other).

**Recommended:**
Lt or Lt LabStation: Pharmacology,
PowerLab T1

**Kit contains:**
- ML514 25 mL ADI Teaching Organ Bath (Single Chamber)
- SEN2101 Force Sensor (50 g)

*"Lt allows me and my colleagues to collaborate on lesson plans in real-time."*

**Dr James Clark**,
Senior Lecturer,
Human and Applied Physiology,
King's College, London




*Right: Record data effortlessly on macOS® and Windows with PowerLab Sensors*



# How can Lt help?

## Educators

**Authoring and customization**
Easily edit, share, and update our content or create your own in real-time, wherever and whenever you need. Drag-and-drop a range of content types including video, audio, images, quizzes, and text directly into your lessons.

**Collaborative**
Share content and workload with your fellow educators and teaching assistants. Set varying levels of access to allow others to review content, add content, or publish revisions online.

**Flexible grading**
Automatically grade quizzes while keeping the flexibility to add feedback and positive reinforcement, and manually grade written assessments.

**Supporting your Lt journey**
When you sign up to Lt, you become part of our global community of Lt collaborators. We provide you with ongoing support, including a dedicated Customer Success Manager during onboarding and beyond to ensure you're meeting your teaching objectives.

## Administration

**Simple setup**
Lt needs only an internet browser to allow course administration, authoring, and publishing. Our data acquisition app, used for sampling, installs in 30 seconds.

**Analytics**
Our analytics allow you to view class progress in each lesson and section in your course, and provide valuable insights about where and how students are interacting with course material.

**Secure and scalable**
Totally secure, Lt is hosted on Amazon Web Service's encrypted servers with guaranteed 99% uptime and the ability to maintain speed as more students login to Lt.

**Future-proof**
Lt is automatically updated with new features by our team of engineers, developers, and education specialists.

## Students

**Learn anywhere, anytime**
Lt's cloud-based platform means students can learn on almost any device that connects to the internet. Whether they use iOS or Android, tablet, mobile, or laptop, lessons will be resized to suit.

**PowerLab Sensors integration**
In the lab, students can record and view their own physiological signals live on screen with PowerLab or PowerLab Sensors. Sampling panels in Lt can record Pulse, ECG, Respiratory Rate, Blood Pressure, and more.

**Remote learning**
The Human Physiology Collection comes with pre-recorded example data that students can use to achieve the desired learning outcomes, even when they can't make it to the lab.

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