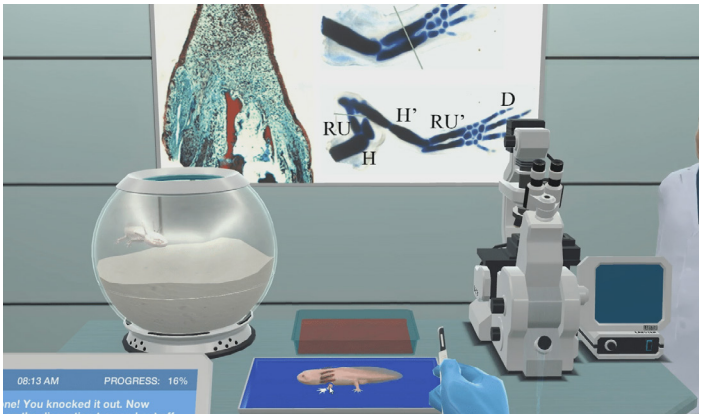
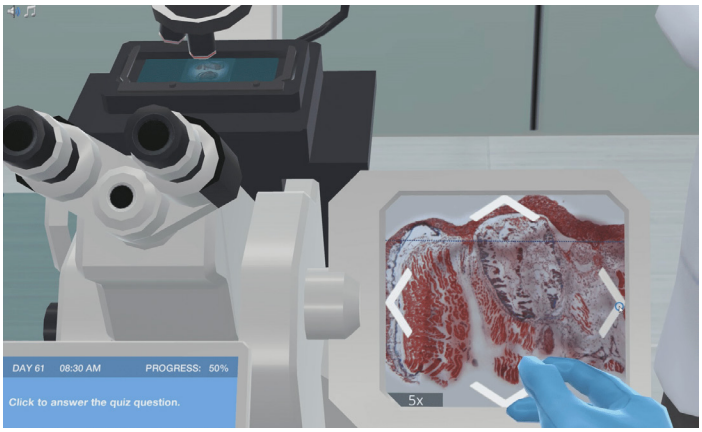
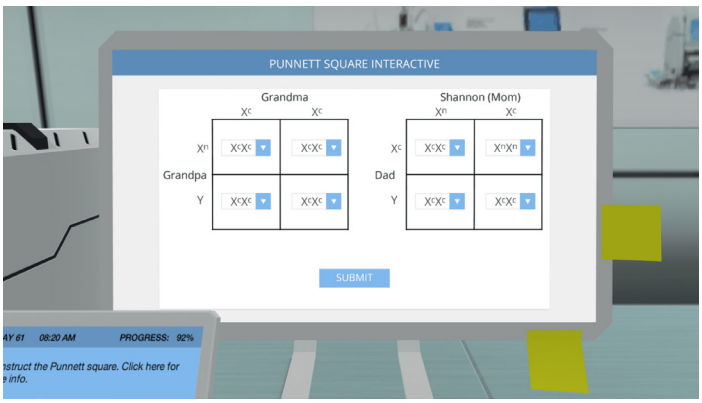
Labster Virtual Lab Simulations for Anatomy & Physiology







Labster is a world-leading provider of virtual lab simulations for higher education and high schools.

The simulations are designed to let students learn by doing in a virtual laboratory, solving real-case problems. Quiz questions test the students' knowledge, supporting an inquiry-based and deep-learning approach. The students will train real lab skills in a safe virtual environment where they can safely make mistakes, and learn at their own pace.

The most basic simulations are ideal as a self-study activity since the students will review essential concepts. The more advanced simulations are designed to support the course syllabus, reinforcing concepts and giving the students an innovative tool to deepen their learning.

Labster

University Anatomy & Physiology Simulations

Includes 17 simulations:

- Action Potential [Q2 '19]
- Cardio-respiratory physiology [Q2 '19]
- Cardiovascular exercise [Q2 '19]
- Diabetes
- Embryology
- Endocrinology: control of reproduction [Q2 '19]
- Exercise Physiology
- Hematology
- Intestinal transport [Q2 '19]
- Invertebrate Model System
- Osmoregulation/renal function [Q2 '19]
- Parkinson's Disease
- Regeneration Biology
- Sensory physiology [Q2 '19]
- Signal Transduction
- Skeletal muscle function [Q2 '19]
- Smooth muscle regulation lab

Ready to learn more?

Bring the world of science into the classroom and enable students to bring learning home with Labster's virtual science lab content. No need for additional hardware or lab equipment; access these labs on Chromebooks or any other laptops, and spark creativity in students with this innovative and interactive way to explore science.

It's a million-dollar lab, one click away.

To learn more about how you can incorporate Labster virtual labs in your teaching, visit us at www.labster.com.

Learning objectives covered in Labster's general biology simulations

Action Potential

To be confirmed.

Cardio-respiratory physiology

To be confirmed.

Cardiovascular exercise

To be confirmed.

Diabetes

Learning objectives: At the end of this simulation you will be able to...

- Understand how Type II diabetes is diagnosed
- Understand the risk factors for Type II diabetes
- Understand the function of insulin in the body
- Understand how untreated diabetes affects organ function
- Regulate Type II diabetes
- Know how and when to measure blood sugar levels using a glucose meter
- Understand the effect of insulin and diabetes medication
- Prepare a syringe with insulin and know how to inject insulin
- Understand how a healthy diet and regular exercise help to regulate Type II diabetes

Embryology

Learning objectives: At the end of this simulation you will be able to...

- Understand the advantages and disadvantages of the mouse and chicken models
- Understand the different developmental stages and compare them between organisms
- Understand the molecular pathway responsible for forming forelimbs or hindlimbs

Endocrinology: control of reproduction

To be confirmed.

Exercise Physiology

Learning objectives: At the end of this simulation you will be able to...

- Explain physiological responses to high-intensity sprint interval training (SIT)
- Understand how to perform a Wingate sprint
- Determine the impact of repeated Wingate sprints on health
- Monitor acute and chronic physiological responses during and after a Wingate sprint
- Explain the contribution of different energy systems during supramaximal exercise
- Perform a breath-by-breath gas analysis
- Define the role of lactate in anaerobic glycolysis
- Measure blood lactate levels

Hematology

Learning objectives: At the end of this simulation you will be able to...

- Understand the organisation of a hematology laboratory, equipment selection and lab safety
- Understand the principles, application, and limitations of selected hematological tests in relation to clinical problems
- Select an appropriate test and interpret laboratory data in relation to a clinical problem

Intestinal transport

Learning objectives: At the end of this simulation you will be able to...

To be confirmed.

Invertebrate Model System

Learning objectives: At the end of this simulation you will be able to...

- Explain the importance of C. elegans as an invertebrate model system in medical research
- Perform a forward genetic screen
- Use sequencing data to discover the genes of interest

Osmoregulation/renal function

To be confirmed.

Parkinson's Disease

Learning objectives: At the end of this simulation you will be able to...

- Describe the role of alpha synuclein in Parkinson's disease
- Describe the different parts of a liquid chromatography equipment
- Interpret results from liquid chromatography experiments
- Describe the difference between Ion Exchange Chromatography and Size Exclusion Chromatography
- Evaluate the mode of action of Epigallocatechin gallate on Lewy body formation
- Describe the benefits of using Large Unilamellar vesicles as a cell membrane in vitro model

Regeneration Biology

Learning objectives: At the end of this simulation you will be able to...

- Understand that the ability to regenerate tissues varies throughout vertebrates
- Describe what a blastema is and the cell types that compose this structure
- Understand the concept of positional information in regenerative biology

Sensory Physiology

To be confirmed.

Signal Transduction

Learning objectives: At the end of this simulation you will be able to...

- Explain the principles and importance of intracellular signal transduction
- Explain receptor tyrosine kinase (RTK) cell signaling
- Analyze dysregulated signal transduction in human cancer cells
- Understand the connection between angiogenesis and tumor growth
- Investigate the involvement of vascular endothelial growth factor receptor (VEGFR) signaling in human breast cancer

Skeletal Muscle Function

Learning objectives: At the end of this simulation you will be able to...

- Explain length tension relationships of a skeletal muscle
- Understand how twitch and tetanus, the force-frequency relationship and the response to fatigue differs for two specific muscles
- Measure physiological properties of isolated EDL and soleus muscles
- Quantify the proportion of fibers found in both muscles
- Understand where the above muscles are found

Smooth Muscle Regulation Lab

Learning objectives: At the end of this simulation you will be able to...

- Understand smooth muscle characteristics
- Understand the autonomous nervous system (sympathetic and parasympathetic) control of smooth muscle
- Understand which neurotransmitters and receptors are involved in smooth muscle contraction
- Use the equipment and to interpret the results from the performed experiments