Computer software for physiology education

The computer programs listed below are presented to help physiologists locate appropriate software for use in their curricula. These programs have not been reviewed by Advances in Physiology Education, and inclusion in the listing does not constitute endorsement of the software. If you use or are aware of software that may be useful in teaching physiology, please share this information with us, so that it can be included in future listings. Send pertinent information to Harold Modell, Editor, Advances in Physiology Education, National Resource for Computers in Life Science Education, PO Box 51187, Seattle, WA 98115-1187.

AneSoft Corporation
13051 SE 4th Place
Bellevue, WA 98006
(206) 644-7488

Artwave: the Radial Artery Pressure Waveform. Simulation dealing with factors influencing the shape of the radial arterial pressure waveform. Available for IBM-PC-compatible equipment.


Axon Instruments, Inc.
1101 Chess Drive
Foster City, CA 94404
(415) 571-9400

Aneirox: A simulation program that investigates the mechanisms underlying the action potential by graphically fitting the Hodgkin-Huxley equations for single or multiple channels. Available for IBM-PC-compatible equipment.

Barry, Dr. Peter H.
School of Physiology and Pharmacology
University of New South Wales
P.O. Box 1, Kensington
NSW 2033
Australia
61.2.697

Mempot. A graphical interactive program that simulates the measurement of membrane potentials in a number of excitatory cells and allows the fitting of permeability parameters to the data. Available for IBM-PC-compatible equipment.

Biosource Software
2105 S. Franklin, Suite B
Kirkville, MO 65501
(816) 665-3678

Concepts in Thermography. Tutorial covering basic DC concepts, peripheral vascular physiology, detecting skin temperature, amplifiers, and processing DC signals. Program for Apple II equipment.


Skeletal Muscle Anatomy/Physiology. Tutorial covering three muscle categories, skeletal muscle microstructure, sliding filament theory, motor units, and lever systems. Program for Apple II equipment.

Skills in Electromyography. Tutorial covering skin preparation, reducing EMG artifact, testing a myograph's operation, electrode location, and preventing shock hazards. Program for Apple II equipment.

Branch, Dr. Charles
Department of Physiology and Biophysics
Auburn University
Auburn, AL 36849
(205) 844-5414

Interactive Videodisc Basic Science Laboratories for Health Sciences Education. Interactive videodisc simulation of cardiovascular laboratories. Available for MS-DOS computers with either IBM Infowindows, Sony View II, or the Matrox VGO overlay system.

Decker Electronic Publishing, Inc.
P.O. Box 785
Leviston, NY 14092-0780
(605) 844-5414

Arterial Blood Gas Analysis. A series of exercises designed to sharpen clinical skills in assessing blood gas levels. Available for IBM-PC-compatible and Macintosh equipment.

Dietz, Dr. John R.
Department of Physiology and Biophysics
University of South Florida
College of Medicine, Box 8
Tampa, FL 33612
(813) 974-9723

Endolab. An endocrine physiology computer laboratory designed to provide some experience with the effects of a number of hormones as well as practice in problem-solving in endocrinology. Available for IBM-PC-compatible equipment.


Educe Education Technologies
P.O. Box 199
Whitewood, SD 57793
(605) 269-2612

TECHNOLOGY-BASED RESOURCES

From the Heart Software
211 S. Stadium Drive
Monmouth, OR 97361
(503) 838 1960

Cardiovascular Function Laboratory/Physiology Laboratory Tutor. Programs developed to provide problem-based learning in cardiovascular physiology. Available for IBM-PC-compatible and Macintosh equipment.

Gaar, Dr. Kermit A.
Department of Physiology and Biophysics
School of Medicine in Shreveport
Louisiana State University Medical Center
Shreveport, LA 71130-3932
(318) 674-6010

O2/CO2 Transport Model. Simulation for studying oxygen transport from the lungs to the tissues. Available for Apple II and IBM-PC compatible equipment.

Goerke, Dr. Jon
CVRI
University of California, San Francisco
San Francisco, CA 94145-0130

The Cardiac Cycle. HyperCard stack providing students with three animations for viewing the cardiac cycle: a four-chamber echocardiographic sequence, a Wiggers’ plot of physiological variables, and a pressure-volume diagram of the left ventricle. Available for Macintosh equipment.

The Ventricular Triangle. HyperCard stack that allows students to explore how changes in the direction and magnitude of the cardiac net dipole vector affect voltages in the standard electrocardiographic leads. Available for Macintosh equipment.

Hempling, Dr. Harold G.
Department of Physiology
Medical University of South Carolina
171 Ashley Avenue
Charleston, SC 29425-2258
(803) 792-2005


Self Exam. Questions, answers, and a discussion used for self-study or for student evaluation. Available for Apple II-compatible and Macintosh equipment.


HRM Software
175 Tompkins Avenue
Pleasantville, NY 10570
(914) 769-7496; (800) 431-2050

Biofeedback. Part of 10-program package “Experiments in Human Physiology.” Experiments include biotelemetry, condition-
**TECHNOLOGY-BASED RESOURCES**

**Human Electrocardiogram.** HyperCard stack describes the classic human ECG (response, artifacts, heart sounds, exercise effects, and finger pulse). Available for Macintosh equipment (requires HyperCard 1.2.2).

**Frog Heart.** HyperCard stack describing the classic frog heart preparation. Covers heart contraction, temperature effects, adrenaline, and acetylcholine effects, and the refractory period of the ventricle. Available for Macintosh equipment (requires HyperCard 1.2.2).

**Frog Sciatic Nerve.** HyperCard stack describes the classic frog sciatic nerve preparation. Covers nerve conduction, undulation velocity, bidirectionality, effects of temperature, and refractory periods. Available for Macintosh equipment (requires HyperCard 1.2.2).

**Human Lung.** HyperCard stack allowing students to record breathing movements and the corresponding electrocardiogram. The experiments include the effect of gravity on lung capacity and of rebreathing on breathing. Available for Macintosh equipment (requires HyperCard 1.2.2).

**Mouse Thyroid Gland.** HyperCard stack describes the effects of reversal thyroid destruction on growth rate and cold temperature on the metabolic rate. Available for Macintosh equipment (requires HyperCard 1.2.2).

**Think Tank.** Allows experimental differentiation between chemical synapses, electrical synapses, and no synapses. Available for Macintosh equipment (requires HyperCard 1.2.2).

**Water and Ion Movement Across Frog Skin.** HyperCard stack describes the effects of ouabain and antidiuretic hormone on the movement of sodium and water across frog skin. Available for Macintosh equipment (requires HyperCard 1.2.2).

**National Biomedical Simulation Resource**

**Duke University Medical Center**


**Oregon State University**


**New Jersey Medical School**

**Cardiac Muscle Mechanics.** Simulation of heart muscle behavior in response to changes in length, load, and contractility. Available for IBM-PC-compatible equipment.

**Mechanical Properties of Active Muscle.** Set of six programs concerned with skeletal muscle contraction. Available for IBM-PC-compatible equipment.
TECHNOLOGY-BASED RESOURCES

Sheffield BioScience Programs
Dr. David Dewhurst
Department of Applied Science
Leeds Polytechnic
Culverley Street
Leeds LS1 3HE, U.K.

Exercise Physiology. Simulation of some of the important physiological measurements that can be made to assess cardio-respiratory performance or “fitness” in the laboratory. Available for IBM-PC-compatible equipment.

Frog Heart. Simulation of experiments that can be performed on the in situ frog heart. Available for IBM-PC-compatible equipment.

Frog Skin—Membrane Transport. Simulation of experiments that can be performed on the frog skin preparation to teach the principles of the epithelial transport of ions. Available for IBM-PC-compatible equipment.

Guinea Pig Ileum. Simulation of the isolated, transmurally stimulated guinea pig ileum preparation to investigate the effects of drugs on neurotransmitter release in the enteric nervous system. Available for IBM-PC-compatible equipment.

The Langendorff Heart. Simulates experiments that can be performed on the isolated perfused mammalian heart (Langendorff preparation). Available for IBM-PC-compatible equipment.

Muscle Physiology. Simulation of experiments that can be performed on the isolated frog sciatic nerve-gastrocnemius muscle to illustrate some of the physiological properties of skeletal muscle. Available for IBM-PC-compatible and Acorn (BBC) equipment.

Nerve Physiology. Simulation of experiments that can be performed on the isolated frog sciatic nerve to illustrate some of the physiological properties of mixed nerves. Available for IBM-PC-compatible, Macintosh, and Acorn (BBC) equipment.

The Electrocardiogram. Interactive, menu-driven program to teach the fundamentals of the electrocardiogram. Available for IBM-PC-compatible and RBC B/Master equipment.

Siegman, Dr. Marion J.
Department of Physiology
Jefferson Medical College
1020 Locus Street
Philadelphia, PA 19107


Trinity Software
P.O. Box 960
Campton, NH 03223
(603) 726-4641

Mechanical Properties of Active Muscle.
Set of six programs concerned with skeletal muscle contraction. Available for IBM-PC-compatible equipment.

Membrane Potential Problem Solver.
Simulation to help students grasp the complexities of cell membrane potentials. Available for IBM-PC-compatible equipment.

Walker, Dr. J. R.
University of Texas Medical Branch
Galveston, TX 77550
(409) 761-2966

Regulation of the Cardiovascular System.

Wise-Ware
Madison Academic Computing Center
University of Wisconsin-Madison
1210 West Dayton Street
Madison, WI 53706
(608) 543-3201

Acid-Base Simulation Program. Simulation of acid-base disturbances. Values are displayed numerically and in up to five common graphical formats. Designed for use as a lecture aid and for independent study. Available for IBM-PC or PS/2 equipment (requires Windows).

AHB-Abnormal Human Biology Clinical Tutorial. Tutorial on abnormal human biology based on clinical case presentations. The program is organized into 12 separate lessons. Available for IBM-PC or PS/2 equipment.

Physiological Simulation Program. The basic purpose of this program is to provide interactive software that can be used in a variety of physiological simulations applicable for biomedical teaching and research. Available for IBM-PC or PS/2 equipment (requires Windows 2.03).