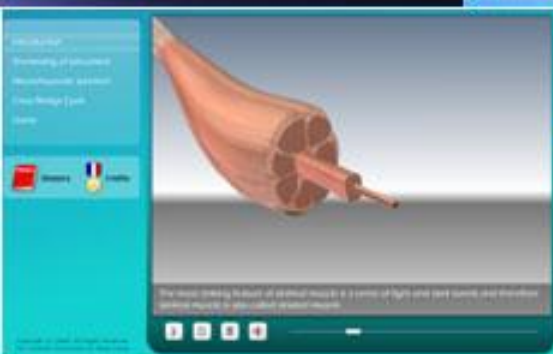
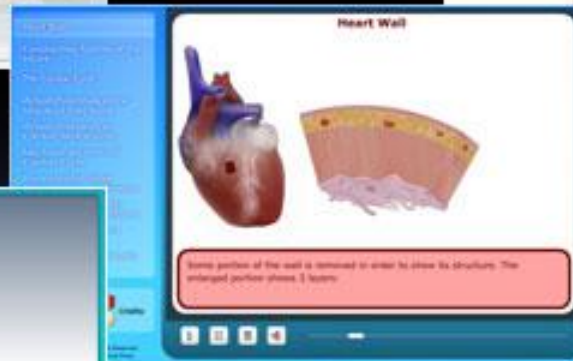


E-Learning tools for Nursing Students

By Dr Isabel Hwang
School of Biomedical Sciences



Source of funding



1. Courseware development grant (2007-2008)

General Physiology

2. Courseware development grant (2008-2009)

Cardiovascular Physiology

3. Courseware development grant (2009-2010)

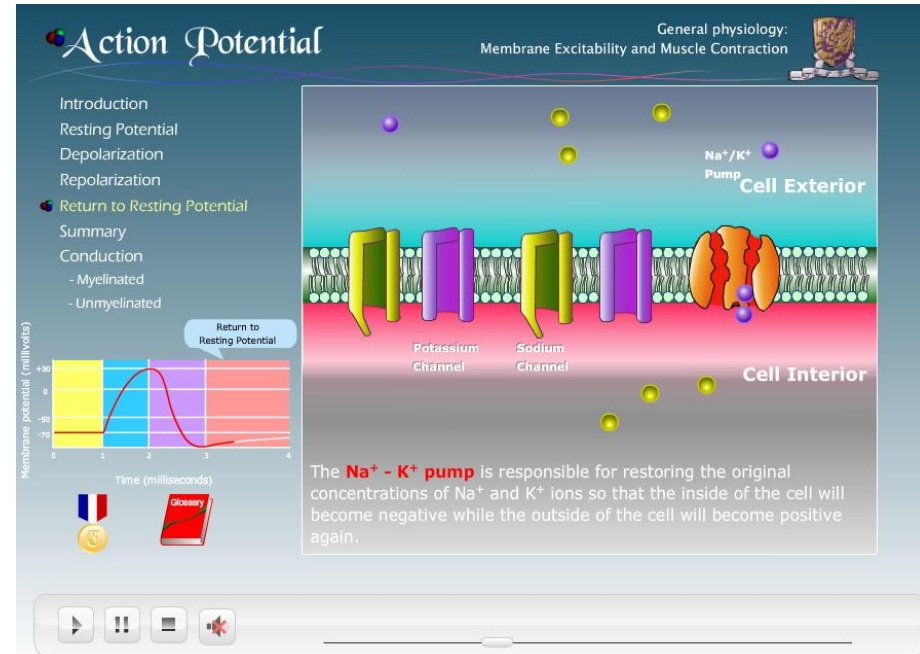
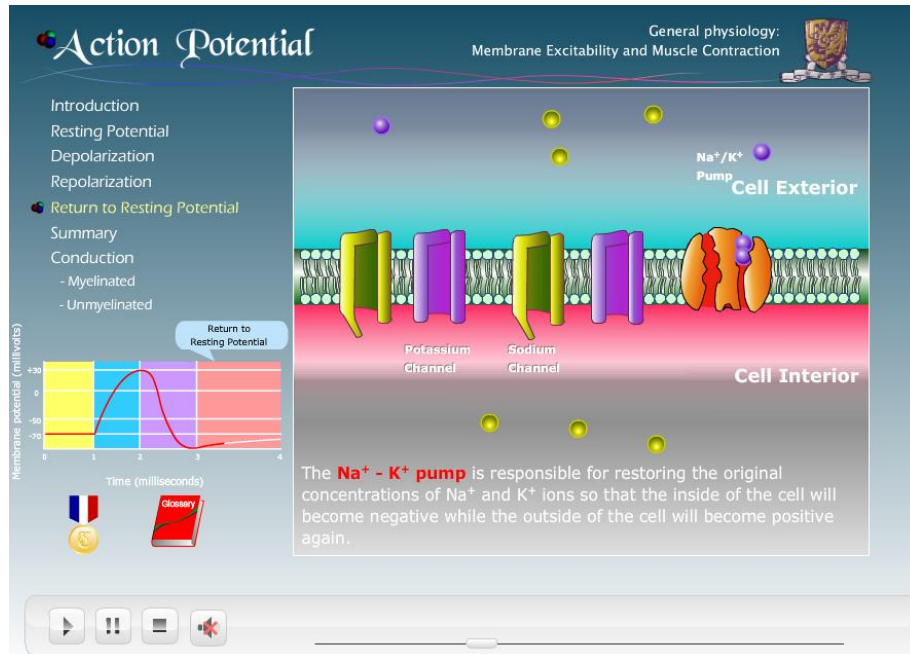
Renal Physiology

Features of animation materials used



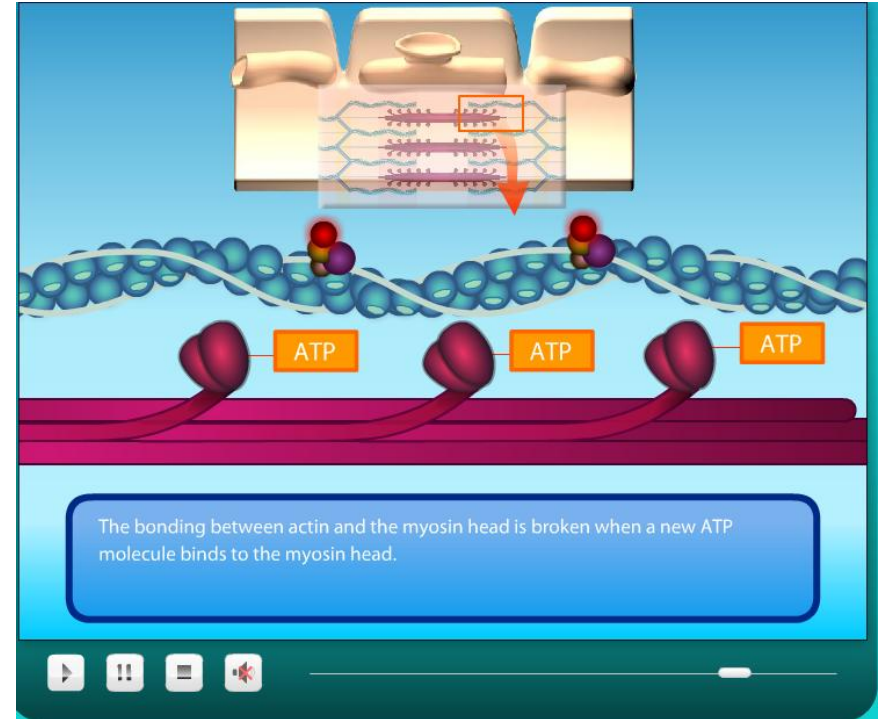
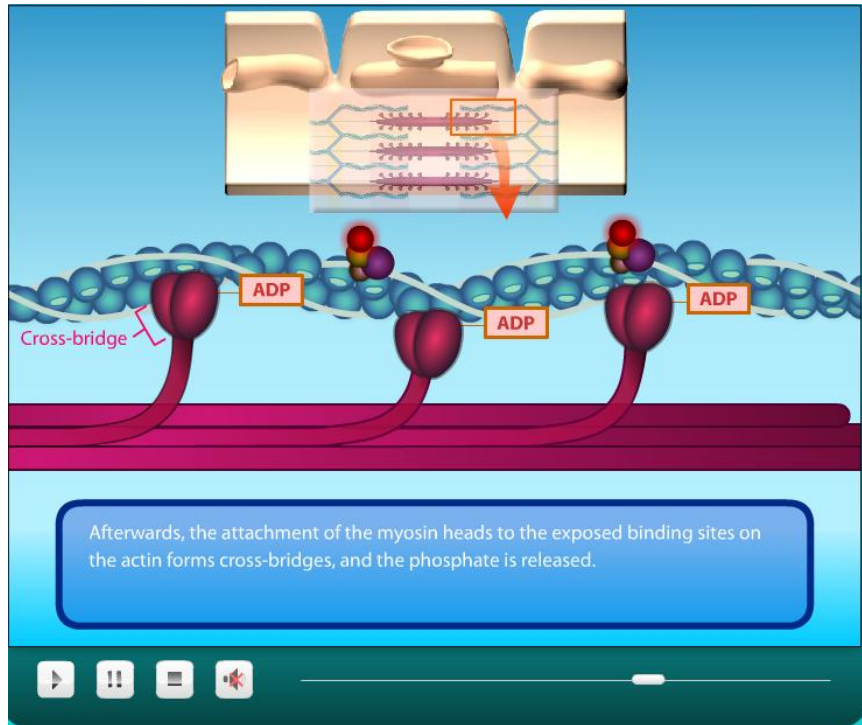
- Simple interface
- With sliding bar or buttons for students to pause, to rewind or to skip pages/ sections
- Some were structured according to topics/ with glossaries/ with narrations

Snapshots of the animations



(Action potential generation)

Snapshots of the animations



(Skeletal muscle contraction)

Snapshots of the animations



Cardiovascular Physiology

Heart Wall
Conducting System of the Heart
The Cardiac Cycle
Action Potentials in the Sinoatrial (SA) Node
Action Potentials in Cardiac Muscle Cells
Mechanical Events of Cardiac Cycle
Baroreceptor Reflex Control of Blood Pressure
Chemoreceptor Reflex Control of Blood Pressure
Arterial Radius and Blood Flow
Arterial Resistance and Blood Pressure

Arterial Radius and Blood Flow

Venous Return

ΔP

Pressure reservoir ("arteries")

Variable-resistance outflow tubes ("arterioles")

Flow to "organs" 1, 2, 3, 4 and 5

Glossary Credits

Copyright (c) 2009, All Rights Reserved.
The Chinese University of Hong Kong.

Cardiovascular Physiology

Heart Wall
Conducting System of the Heart
The Cardiac Cycle
Action Potentials in the Sinoatrial (SA) Node
Action Potentials in Cardiac Muscle Cells
Mechanical Events of Cardiac Cycle
Baroreceptor Reflex Control of Blood Pressure
Chemoreceptor Reflex Control of Blood Pressure
Arterial Radius and Blood Flow
Arterial Resistance and Blood Pressure

Arterial Radius and Blood Flow

Venous Return

Start Flowing....

ΔP

Pressure reservoir ("arteries")

Variable-resistance outflow tubes ("arterioles")

Flow to "organs" 1, 2, 3, 4 and 5

Glossary Credits

Copyright (c) 2009, All Rights Reserved.
The Chinese University of Hong Kong.

(Distribution of blood flow)

Snapshots of the animations



Urine Formation in Kidney

Countercurrent Mechanisms

Establishing the osmolarity gradient



Step 3

Tubular filtrate continues to flow.
Isotonic filtrate enters the Loop of Henle and equilibrates with interstitial fluid.

Step 2 repeats so that a new equilibrium is established across two limbs.



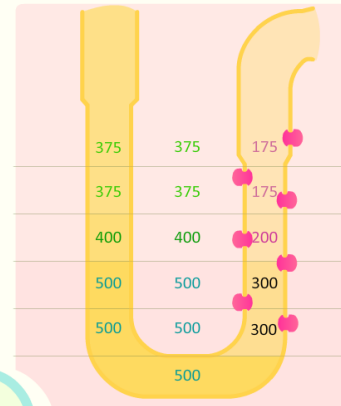
BACK

NEXT

Urine Formation in Kidney

Countercurrent Mechanisms

Establishing the osmolarity gradient



Step 3

Tubular filtrate continues to flow.
Isotonic filtrate enters the Loop of Henle and equilibrates with interstitial fluid.

Step 2 repeats so that a new equilibrium is established across two limbs.



BACK

NEXT

(Countercurrent mechanism)

Student survey – basic information



| | 1st survey | 2nd survey | 3rd survey |
|--------------------------------------|--|---|-----------------------------------|
| Date | September 2008 (2008-2009) | September – October, 2009 (2009-2010) | April 2010 (2009-2010) |
| Student background | Nursing , pharmacy, Chinese Medicine & Medicine | Nursing , pharmacy, Chinese Medicine & Human Biology | Nursing & Chinese Medicine |
| Number of surveys distributed | 269 | 320 | 236 |
| Topic of animation | Action potential & Skeletal muscle contraction | Action potential & Skeletal muscle contraction | Cardiovascular physiology |

Student survey – quantitative data



| Question item | (2008-2009) Action potential (AP) & Skeletal muscle contraction (SMC) | | | (2009-2010) Action potential (AP) & Skeletal muscle contraction (SMC) | | | (2009-2010) Cardiovascular physiology | | |
|---|--|-------------------------|------------------|--|-------------------------|------------------|---|-------------------------|------------------|
| | Mean (5-point Likert scale) | Number of replies | Response rate | Mean (5-point Likert scale) | Number of replies | Response rate | Mean (5-point Likert scale) | Number of replies | Response rate |
| The animation are able to explain the concepts clearly | 3.92 | 245 | 91.1% | 4.07 | 220 | 68.8% | 3.94 | 113 | 47.9% |
| The content on the animations on the whole improved my understanding towards | 3.82 (AP); | 245 | 91.1% | 4.05 (AP); | 219 (AP); | 68.4% (AP); | 3.90 | 113 | 47.9% |
| | 3.79 (SMC) | | | 4.00 (SMC) | 218 (SMC) | 68.1% (SMC) | | | |

Student survey – qualitative data



The animations were interesting/ could stimulate students' interest (survey data: mentioned in 11 replies in 2008-2009 & 8 replies in 2009-2010)



The animations improved understanding (survey data: mentioned in 10 replies in 2008-2009 & 5 replies in 2009-2010)



The animations provided clear illustration on the subject matter (survey data: mentioned in 16 replies in 2008-2009 & 24 replies in 2009-2010)



The animations were difficult to access (survey data: mentioned in 13 replies in 2008-2009 & 10 replies in 2009-2010) and were slow during running (survey data: mentioned in 8 replies in 2008-2009 & 1 reply in 2009-2010)

Main comments



- **The comments could be grouped into 3 categories:**
 1. Affective function (good graphics)
 2. Cognitive function (easy for students to understand)
 3. Their first choices of learning materials (paper-based or animation-based)



**Thank you for your
attention.**