Key Physiology Concepts through Animations Used by about 600 CUHK Students

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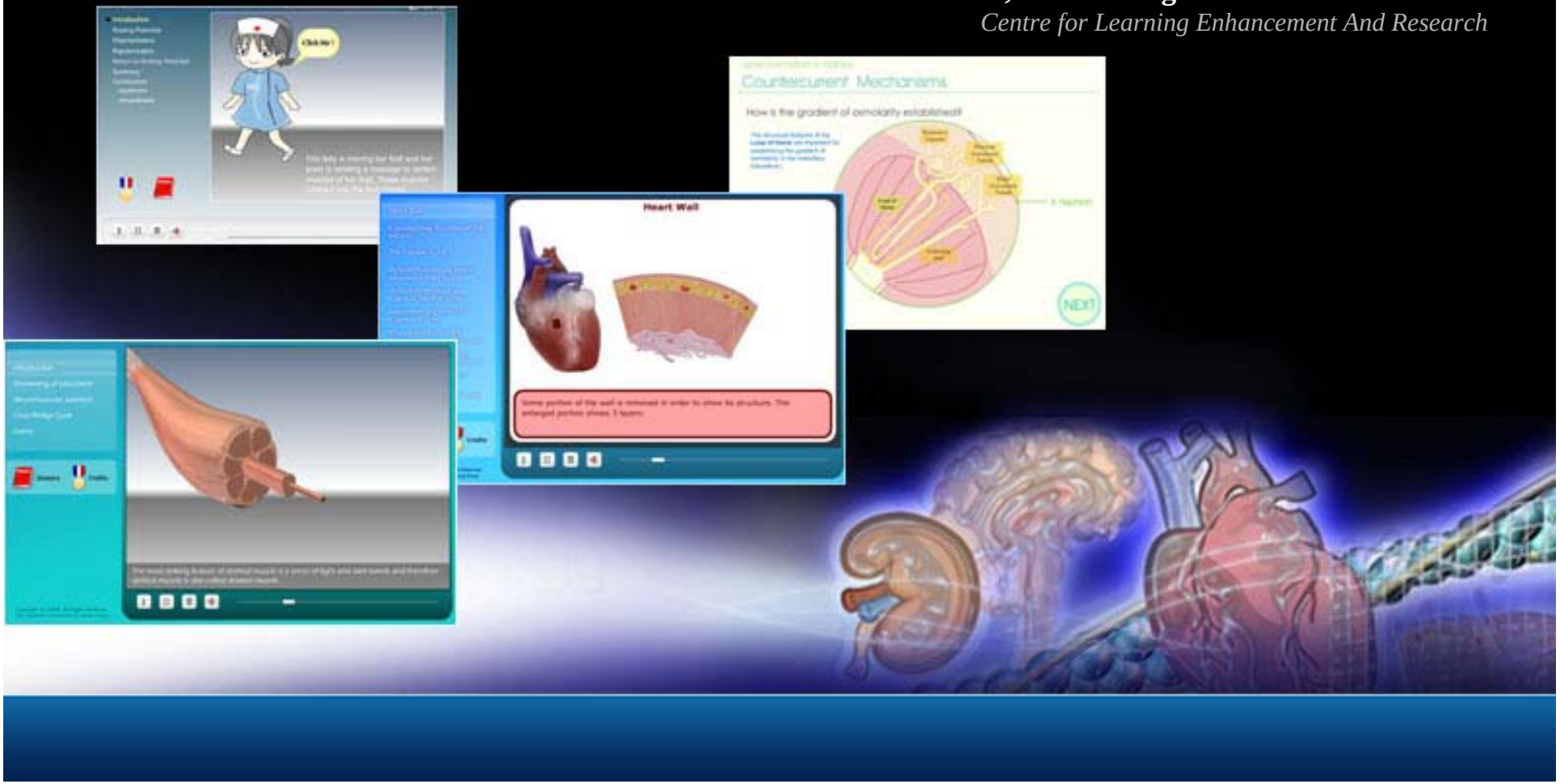


Source of funding

1. **Courseware development grant (2007-2008)**

   General Physiology

2. **Courseware development grant (2008-2009)**

   Cardiovascular Physiology

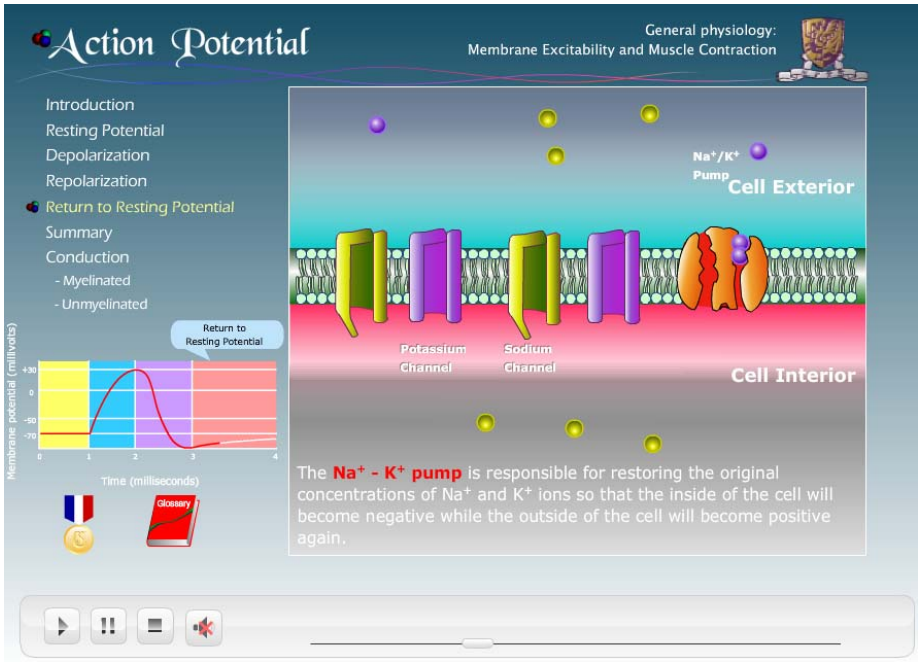
3. **Courseware development grant (2009-2010)**

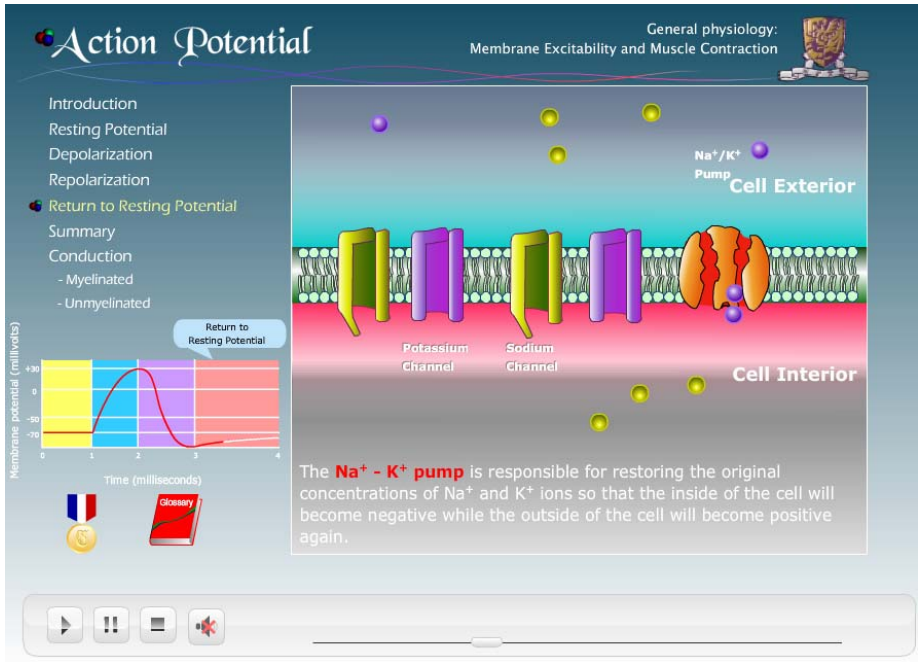
   Renal Physiology (ongoing)

Features of animation materials used

- **Simple interface for easy access**
- **Presence of sliding bar or buttons to pause, to rewind or to skip pages/ sections**
- **Some animations were structured according to topics/ with glossaries/ with narrations**

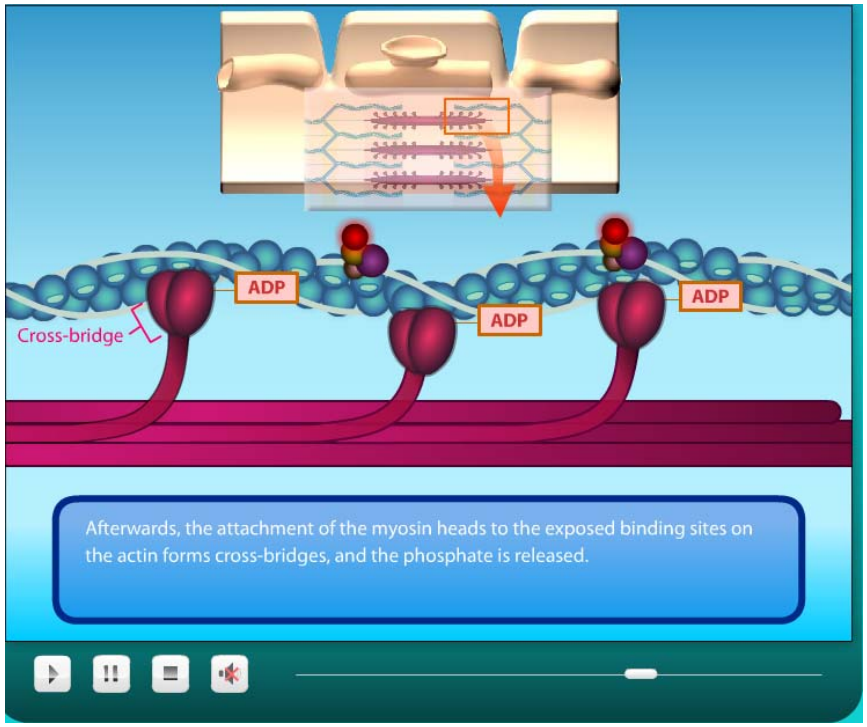
Snapshots of the animations

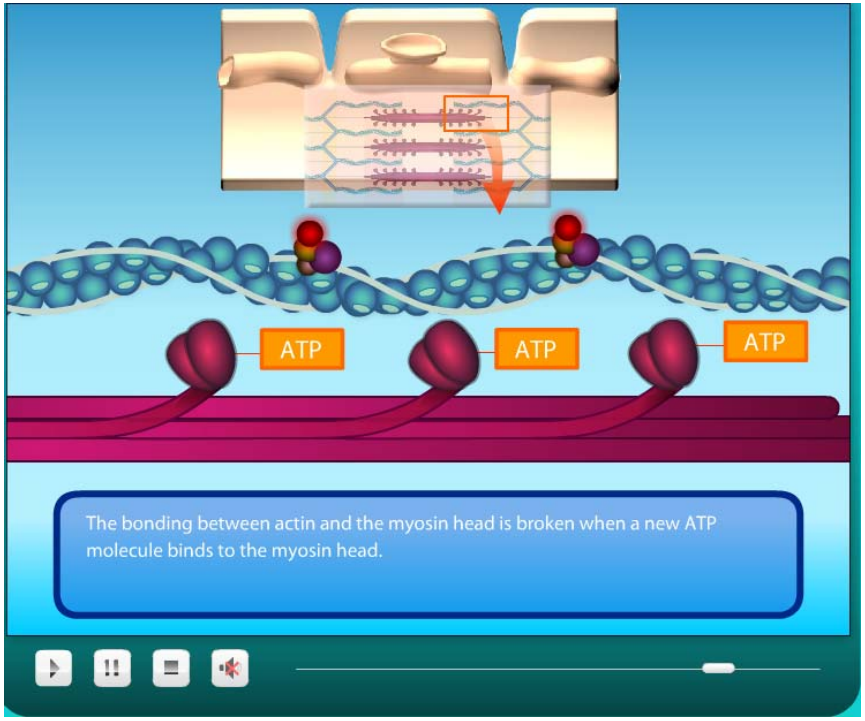




(Generation of electrical signal in human nerve cell)

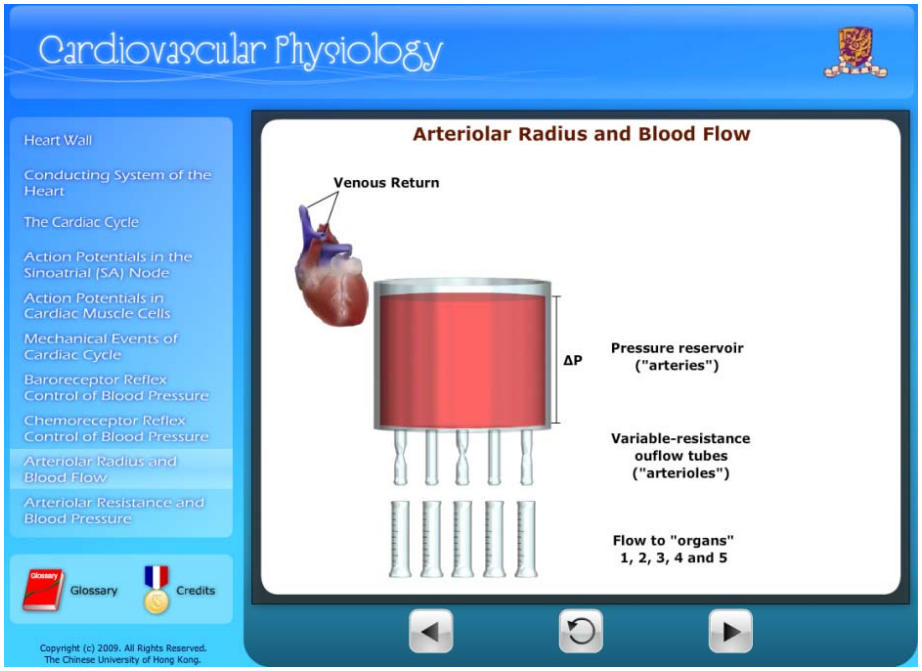
Snapshots of the animations

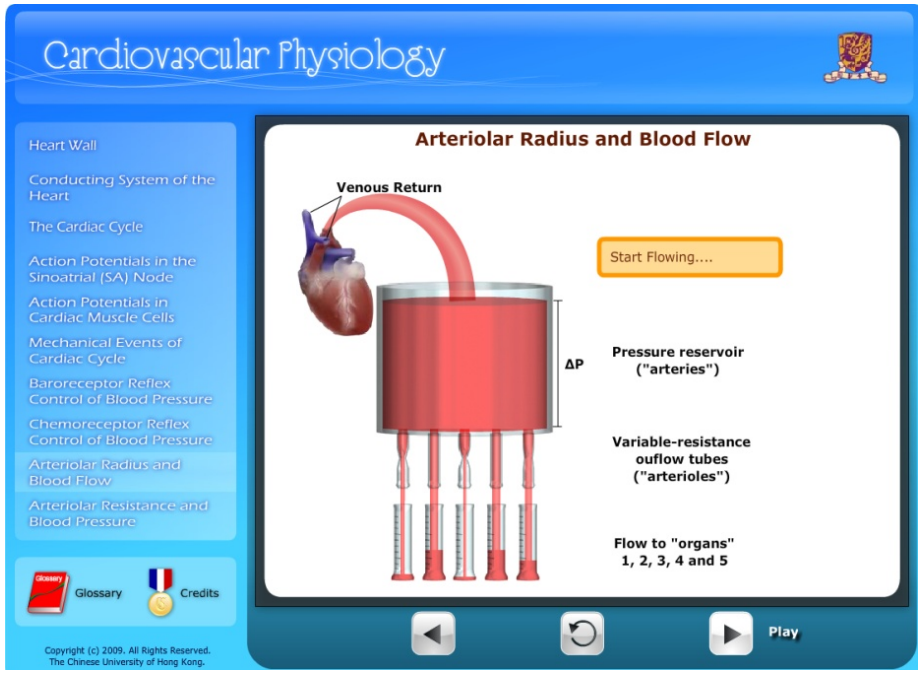




(Contraction and relaxation of human skeletal muscle)

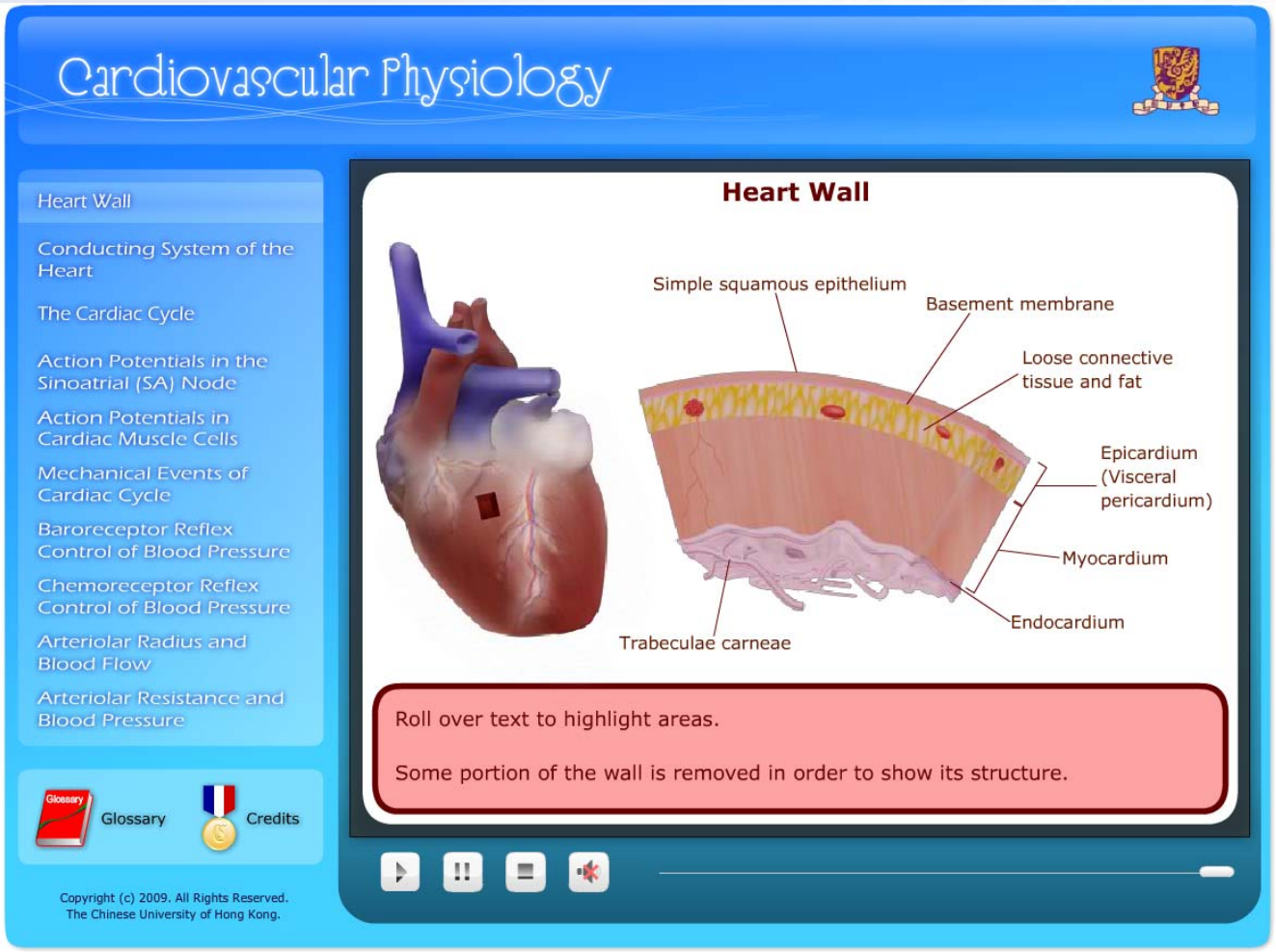
Snapshots of the animations





(Regulation of blood flow)

Flash animation



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Recent Development

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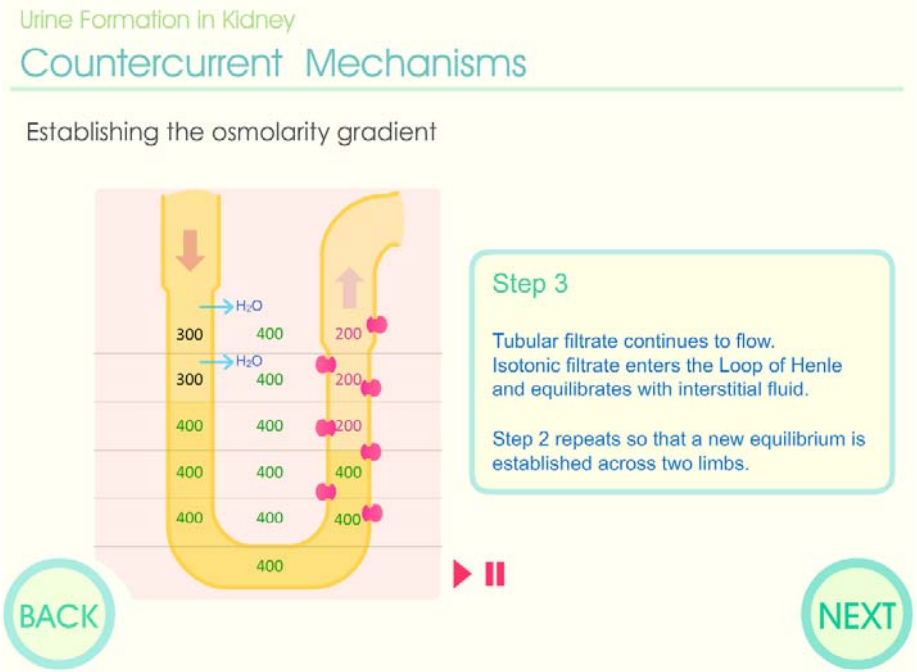
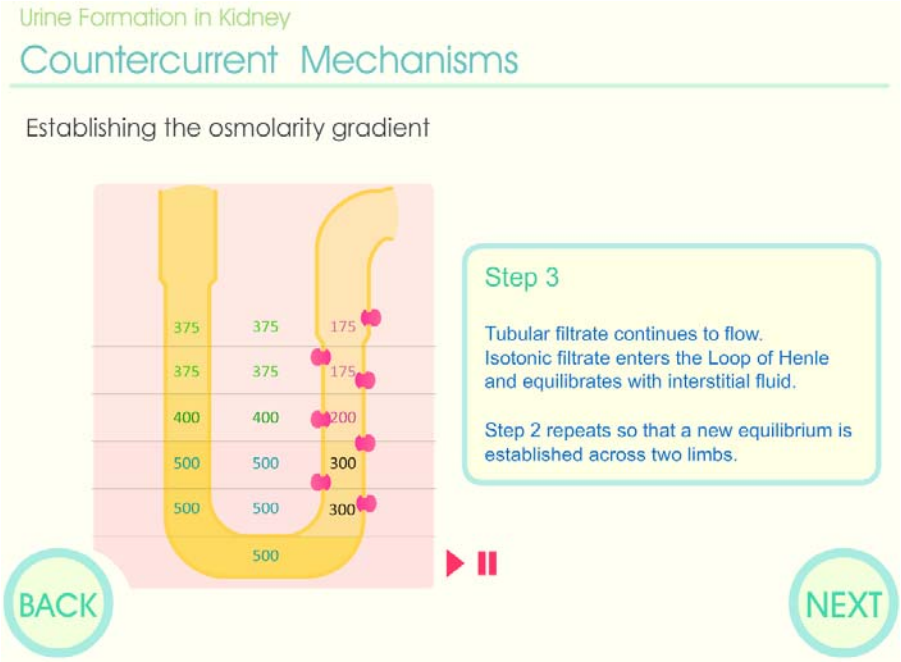
Snapshots of the animations





(Physiology of the kidneys-Countercurrent Mechanism)

Flash animation

Urine Formation in Kidney

Countercurrent Mechanisms

NEXT

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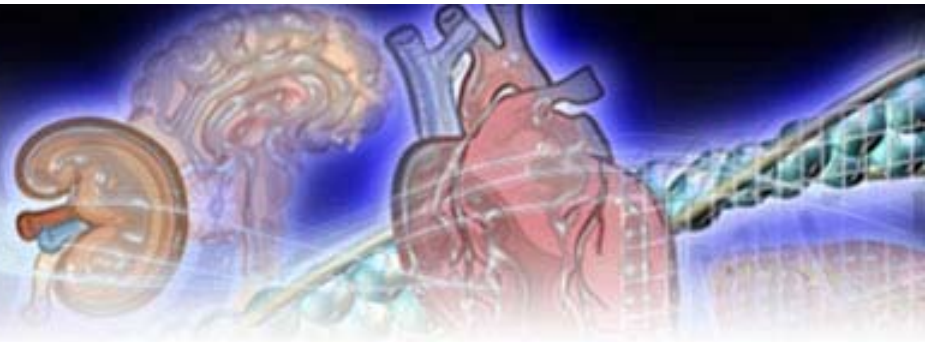
Student survey – basic information



	1st survey	2nd survey	3rd survey
Date of survey/ Calendar year	September 2008 (2008-2009)	September – October, 2009 (2009-2010)	April 2010 (2009-2010)
Student background	Nursing, pharmacy, Chinese Medicine & Human Biology	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
Courseware Development Grant (year of award)	CDG 2007-2008	CDG 2007-2008	CDG 2008-2009

Student survey – quantitative data

Question item	(2008-2009) Action potential (AP) & Skeletal muscle contraction (SMC)			(2009-2010) Action potential (AP) & Skeletal muscle contraction (SMC)		
	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%
The content on the animations on the whole improved my understanding	**3.82 (AP);** **3.79 (SMC)**	245	91.1%	**4.05 (AP);** **4.00 (SMC)**	219 (AP); 218 (SMC)	68.4% (AP); 68.1% (SMC)

Student survey – quantitative data

- The animations were interesting/ could stimulate students' interest
  (survey data: mentioned in 11 replies in 2008-2009 & 6 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 & 12 replies in 2009-2010)

Main comments – student interviews

- **Animations had assisted learning of the content**
  - "I just partially understood the process of osmolarity change (in the topic of kidney) during lesson but fully understood after I had viewed the animation … Although there were figures in textbook that showed the value changes of osmolarity in kidney, such changes were still difficult to perceive. I just noted they were discrete changes but not trends of changes" (a Nursing student)

Main comments – student interviews

- **On what topics that animation would be a applicable as a learning material**
  - “complicated process in human body such as the mechanism of filtering wastes in blood by kidney. That process involved many steps, components (ions coming in and out), and flows of fluid.” (a Chinese Medicine student)
  - “physiology topics involve too many types of hormones and interactions” (a Human Biology student)

Main comments – student interviews

- **Limitations of animations**
  - Going through the animation sequences can be time-consuming and may not worth the effort if they can understand them anyway in traditional method
  - Animations tends to provide less in-depth knowledge of concepts than text

Discussion and Conclusion

- The overall feedback from students was positive
- Certainly, worthiness of the use of animations should be considered if the knowledge can be quickly understood
- Provision of good text is always essential to in-depth learning in addition to animations
- Animations may be a good starting point for students but they are not the end points

Acknowledgement

- **Academic IT Steering Committee**
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  (special thanks to Judy and Ray)
- **Prof. Paul Lam (CLEAR)**
- **Mr. Learn Lam & Miss Shereen Yuen (CLEAR)**

Thank you for your attention.