**Title: An RShiny powered eLearning platform to teach calcium and phosphate homeostasis**

**Type:** poster/oral-presentation

**Topic:** TO CHECK (web-app)

**Key Words:** Virtual laboratory, Simulation-based teaching, Technology-enhanced learning, R shiny applications

**Authors :** David Granjon1,2, Olivier Bonny2,3, François Verrey1,2, Vartan Kurtcuoglu1,2,4 and Diane de Zélicourt1,2

**Affiliations :**

1 The Interface Group, Institute of Physiology, University of Zurich, Zurich, Switzerland

2 National Center of Competence in Research, Kidney.CH, Zurich, Switzerland

3 Département de Pharmacologie et Toxicologie, Université de Lausanne, Lausanne, Switzerland

4 Zurich Center for Integrative Human Physiology, University of Zurich, Zurich, Switzerland

**Abstract:** (1200 characters max)

Disturbance of calcium‐phosphate (Ca-Pi) homeostasis negatively affects the structure and function of the bones, kidneys, intestine and blood vessels, and may lead to severe morbidities. While it is crucial that medical students understand the corresponding regulatory mechanisms and their interactions, conveying these in a frontal lecture with hard time constraints is rather challenging.

We present two web applications for the teaching and exploration of Ca-Pi homeostasis, building upon on a previously published mathematical model. To ensure efficient computations, the model was first translated to C. In parallel, we developed novel user-interfaces with the web-framework R-Shiny, embedding the compiled model outputs in highly coupled modules. The first application explores the fundamentals of Ca-Pi homeostasis, while the second provides interactive case studies for in-depth exploration of the topic, thereby seeking to foster student engagement and an integrative understanding of Ca-Pi regulation. These applications are hosted on RStudio Connect at http://physiol-seafile.uzh.ch.

In conclusion, we showed that R, C and Shiny can be coupled to emulate a real-life environment, thereby providing a promising starting point for future innovative teaching approaches. This project was a unique opportunity to extend the RShiny framework with shinydashboardPlus and bs4Dash.