

**EasyCellBio** (\$15.99 in the App Store and the Microsoft Store, with site licenses available; created by Loïc Letertre; updated July 22, 2017)

Educational software has made a dramatic frameshift in the past 10 years. Software publishers are no longer producing CD-ROMs that are used in classrooms. Instead they are releasing their software online and designing it specifically for use on either a computer or a portable device, such as a phone or tablet. Such is the case with this excellent new biology app.

EasyCellBio is the brainchild of a French medical researcher living in Iceland who wanted to marry his three main passions – biology, teaching, and 3D programming. His app has achieved such a union, providing one of the most realistic and engaging (not to mention inexpensive) pieces of science software. The tagline for the app is “real-time interactive cell biology,” and it does not disappoint. The graphics are very engaging, and quite a bit of useful information is presented as the user moves through.

Upon launching the app, users are presented with a menu that allows them to change the resolution and the input device. The resolution comes preset at the maximum, but the app allows for any number of other configurations, which will be very useful when viewing the app on a smaller screen. There are also instructions on the controls and the notes windows. EasyCellBio has a

neat feature that allows users to copy and paste from the text presented in the app itself, or to paste in additional information from outside sources, for future use. Students will find this feature particularly useful as they look elsewhere for additional content but want to keep all their notes in the same location.

The main screen of EasyCellBio has two main directions the user can go in. The first is the “Library.” Here, the different organelles found in the cell are presented in 3D animation form. When the mouse is moved over a part of an organelle, a label for that part appears. There is also a “General Info” link on each organelle page that provides a lot more detail about the particular organelle, as well as a “Structure” link that brings the user deeper into what makes up the organelle. For example, when the cell membrane is selected, there is a link to a page about its composition, including animations and more information about membrane lipids, cholesterol, membrane proteins, and glycoproteins. Additional linked pages provide information about lipid mobility, distribution, rate, and membrane protein interactions.

The second main section of the app is called “Cell Simulation.” Here the user enters a cell and can freely zoom around, getting up-close and personal with the organelles. This section of the app is still a work in progress. The software designer states that plans for this section include “being able to fly inside, get

information on every element by interacting with it and witness cellular processes in a virtual ‘in situ.’ It will be like walking, or ‘flying’ in a ‘world sized’ living cell.”

EasyCellBio would be a great addition to any general or cell biology class. The information provided is detailed but easy to comprehend. Students in middle school and up will find the app engaging and even fun to use. Its availability as a direct download (from the App Store or the Microsoft Store) may pose a problem for teachers, as each copy will need to be purchased separately. However, site licensing is available. Additionally, updates with new features and bug fixes are planned for release once per year. There will be no additional charge for these, nor should owners have to download anything additional. The updates should occur automatically.

This is a great piece of software that will enhance learning about the cell and its processes. The next update is scheduled to add a cellular metabolism section that will contain content on glycolysis, the Krebs cycle, and electron transport. As cells are very complex structures, the amount of material that could be added is pretty much endless. Hopefully this app will continue to grow as new discoveries are made.

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