ALLEN INSTITUTE *for* CELL SCIENCE

ALLENCELL.ORG TEACHER QUICK-START GUIDE

Get started teaching with resources that are particularly popular with educators. This quick-start guide for teachers provides in-depth tips for new users, detailed information on how to view and interact with data online, and use cases for each resource in classrooms and curricula. This guide is also available as a webpage at allencell.org/link-to-this-page.

All of our resources feature data derived from human cells, and all of the tools featured for educators can be used entirely online, with no software or downloading required.

All Allen Institute for Cell Science resources are based on our fluorescently labeled human induced pluripotent stem cells (hiPS cells), which enable scientists to precisely visualize one or several cell structures while the cell functions normally. For a brief overview of our research goals, process, and cells, see What We Do (allencell.org/what-we-do).

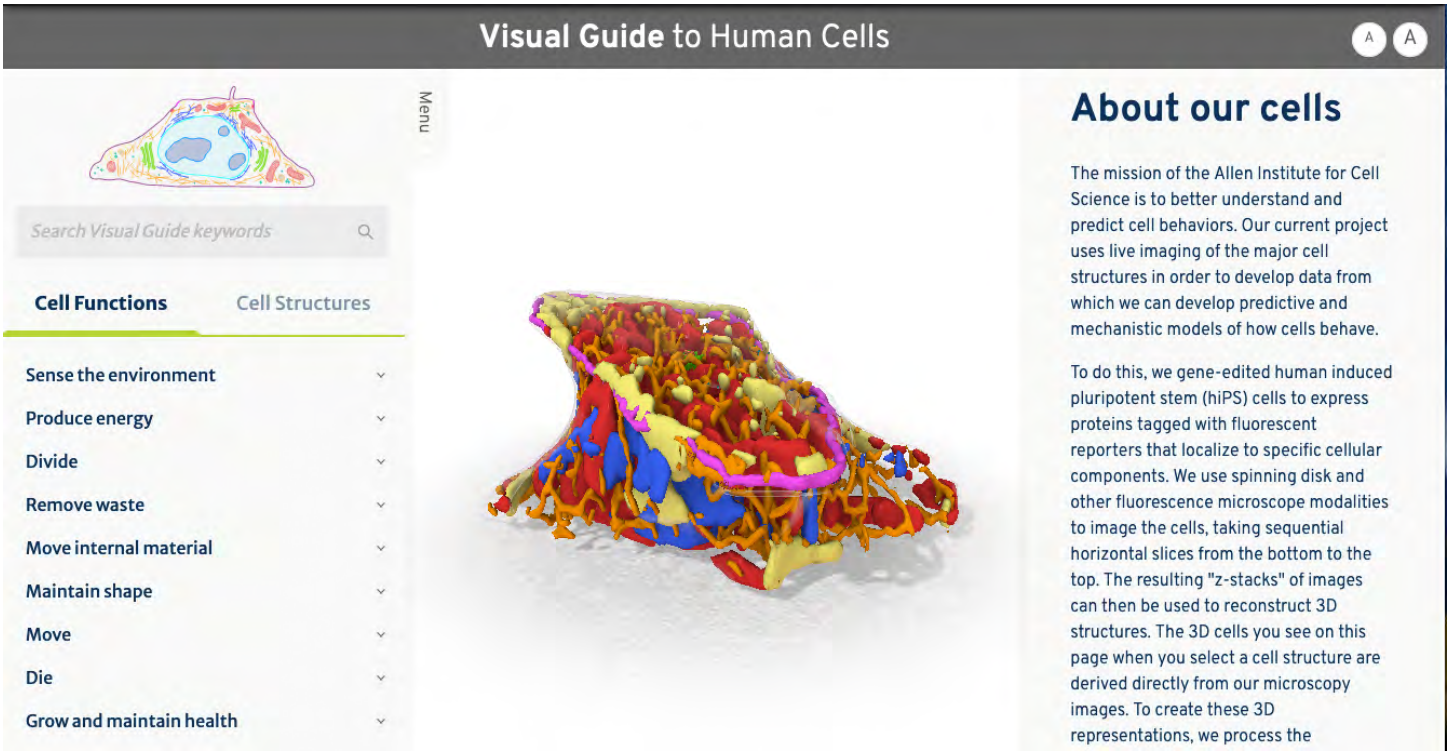
THE VISUAL GUIDE TO HUMAN CELLS

allencell.org/visual-guide-to-human-cells

Overview: This interactive resource displays major cell structures and describes their functions in an annotated model of a real human cell. The cell contains 14 structures that were derived from our microscopy image data via direct segmentation, (three structures), machine-learned models (seven structures), or that were modeled in by a scientific illustrator using 3D animation software (three structures). The annotated cell model is accompanied by microscope images and videos, illustrations and written explanations describing each structure's anatomy and function, as well as an additional 84 3D models that display each structure undergoing each stage of mitosis.

Primary audience level: This resource is written broadly for biologists and students as a self-guided reference. It is well suited for students in high school and college, but can be presented to learners of any level by a teacher possessing an advanced knowledge of cellular and molecular biology.

Classroom applications: This resource may be particularly useful for overviewing cell anatomy and physiology or for guiding more advanced students through the transition from textbooks/ cell diagrams to the types of cell images found in journal publications. It also serves as a reference that can reinforces the relationship between cell structures and structure functions in an interactive format.



THE VISUAL GUIDE, CONTINUED
allencell.org/visual-guide-to-human-cells

Interpretation and use: The explanatory text in this interactive resource describes how the model cell was generated from real human cell data. Students can browse cells structures by their function, or search for specific structures directly. The data used to generate the model comes from our fluorescent cell lines, which each tag a protein associated with a specific cell structure and dyes to label the DNA and cell membrane; the tagged proteins selected to label each structure are named along with the structure. For each cell structure, students can read an explanation written for high school level biology students of what that structure does, watch microscope videos of cells with that structure fluorescently tagged, and step the model through the stages of mitosis.

Citation: Allen Institute for Cell Science (2017). Visual Guide to Human Cells [interactive resource]. Available from allencell.org/visual-guide-to-human-cells.

