



Learn foundational topics in medicine
with Harvard Medical School.
Designed to take full advantage
of the online medium, HMX
integrates fundamental
and clinical applications.
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Get Ahead



“The visuals were wonderful!
The step-by-step illustrations were
very clear, easy to understand,
and helpful in digesting the lesson.”

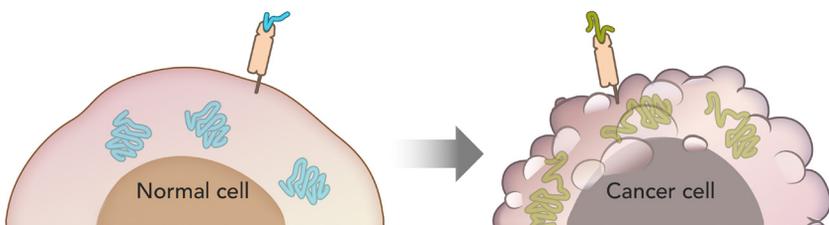
—
HMX Student

and Stay
Ahead.

Learn foundational topics in medicine with Harvard Medical School.

Designed to take full advantage of the online medium, HMX integrates fundamental principles and clinical applications.

Harvard Medical School offers HMX to our incoming students over the summer as an opportunity to prepare for a demanding curriculum and to our current students as part of the flipped classroom model.



Courses benefit individuals interested in a career in health care.

Lessons introduce concepts in ways that combine best practices from learning sciences and biomedical visualization.

Real patient interactions demonstrate the clinical relevance of the material and how doctors use fundamental principles in practice.

Rich analytics capture students' interactions and learning gains, points of confusion, and completion statistics.

Courses are crafted by leading HMS faculty members working with a skilled team of educators and creative production experts.

HMX Fundamentals courses feature:

True-to-life Scenarios that give students a contextual framework for exploring concepts, providing relevance and integration of key principles through storytelling.

Dynamic Animations that combine illustrative visuals with narration to guide learners through complex processes in a step-by-step, self-paced way.

Concept Videos that take advantage of faculty's expertise to explain key concepts in digestible segments, using writing, drawing, and animations along with conversational tone.

Clinical Application Videos that take learners inside the hospital or other clinical setting with outstanding HMS clinicians or inside the research labs of world-class scientists. Designed to demonstrate the clinical relevance and significance of the

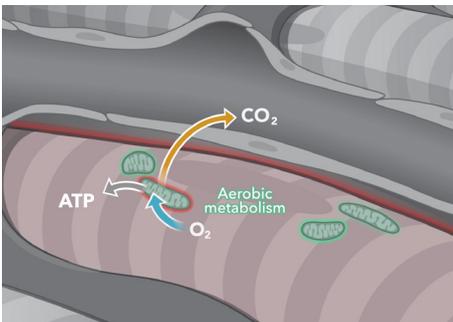
foundational topics learners are studying, these videos provide applications of knowledge and a glimpse into students' potential futures.

Interactives that guide learners through a topic by encouraging active engagement and experimentation with simulations and other uniquely responsive visuals.

Notetaking Guides that are visually crafted to support and encourage reflective synthesis and review of key topics.

Question and Answer Forums that foster exploration of questions and peer-to-peer interaction and learning.

Interleaved Assessments that provide feedback, enhance learning, and allow students to self-evaluate and measure their progress.



Dynamic visualizations that reveal



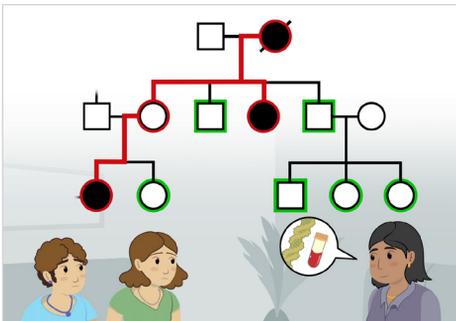
Scenarios that bring principles to life

HMX Fundamentals Courses

Courses in the HMX Fundamentals series focus on key foundational concepts in Physiology, Immunology, Genetics, and Biochemistry, taking traditionally difficult-to-learn concepts and applying the latest educational research and digital technologies to enhance the student experience. Topics include:

Genetics

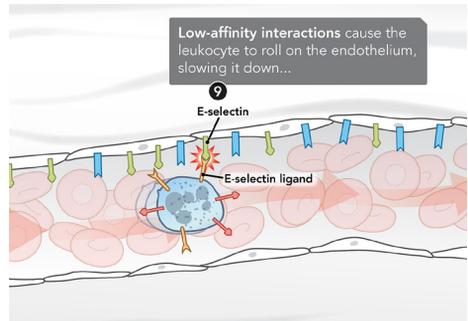
- Introduction to the Human Genome
- Central Dogma and Genetic Variation
- Mendelian Inheritance of Disease
- Identifying Mendelian Disease Genes
- Chromosomal Aberrations
- The Genetics of Cancer
- Other Modes of Inheritance
- Complex Traits
- Human Population Genetics
- Personalized Medicine



Storytelling that teaches

Immunology

- Overview of Immunology and the Immune System
- Innate Immunity and Inflammation
- Microbial Recognition and Responses in Innate Immunity
- Antibodies - Structure and Function
- Lymphocyte Development and Diversity
- T Cell Activation by Antigenes
- T Cell-Dependent B Cell Responses
- Helper T Cells
- Cytotoxic T Cells
- Failures of the Immune System
- Novel Immune Therapies



Visuals that guide

“I truly love the clinical applications in this physiology course because it makes the science feel not just like premedical education, but like the actual practice of medicine that we have long been awaiting... It makes everything so much more real.”

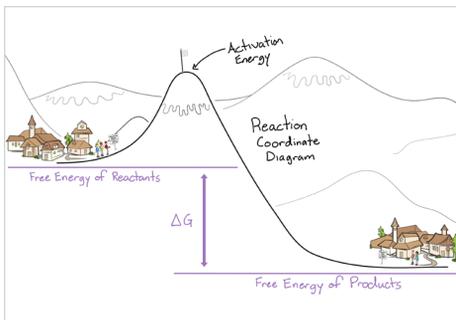
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Biochemistry

- Introduction to Biochemistry
- The Rules of Energy
- How Energy is Harnessed
- How Energy is Transformed
- How Cells Compartmentalize
- How Cells Specialize
- How Cells Communicate
- The Chemistry of Life

Physiology

- Partial Pressure
- Movement of Body Fluids
- Flow Through Tubes
- Compliance
- Supply and Demand
- Transmural Pressure
- Dynamic and Steady State Conditions
- Acid-Base
- Homeostasis
- Exercise - Integration



Metaphors that illustrate



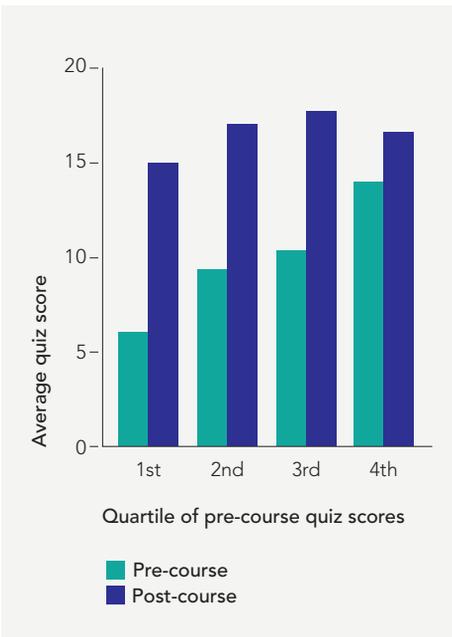
Clinical applications that bring relevance

Demonstrated Learning Gains

Data from pilot courses to-date indicates that students are highly engaged and learning from this unique approach, demonstrating how principles from learning science can be combined with user feedback and course metrics to improve the effectiveness of online educational materials.

Quizzes at the beginning and end of the Immunology course demonstrated large and statistically significant learning gains for students at all levels of background knowledge.

83 percent increase in immunology knowledge



“The assessment questions were well formulated and allowed me to really determine whether I was understanding the concepts correctly.”

—
HMX Student

Brought to you by the Office of Online Learning within HMS External Education, HMX brings to bear the vast medical knowledge, clinical expertise, and academic excellence of Harvard Medical School while taking full advantage of the online medium to teach foundational concepts in medicine in new ways and to reach learners around the world.

World-class HMS faculty bring medical concepts to life by integrating clinical experiences, bedside teaching, and real doctor-patient interactions within the research and clinical facilities of Harvard Medical School. Real-world scenarios bring medical concepts beyond the institution, making them relevant for every learner.

Our online programming is engaging and rigorous, bringing forth all of the educational innovation and excellence you’ve come to expect from Harvard Medical School.

“It is exciting to see these fantastic
new approaches to medical education
being used successfully both here
at HMS and by innovative schools
around the world.”

—
Edward Hundert, MD
Dean for Medical Education
Harvard Medical School

For more information, visit
onlinelearning.hms.harvard.edu/hmx

or contact
onlinelearning@hms.harvard.edu



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