

Alzheimer's Educator Guide

A resource for using QUEST video, audio, blogs and maps in the classroom

QUEST SUBJECTS

Life Science **Biology Health Environment**

Earth Science **Geology Weather Astronomy**

Physical Science **Physics Chemistry Engineering**

CA SCIENCE STANDARDS

Grade 7

Cell Biology (Focus on Life Sciences)

1. All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope. (a, f)

Genetics (Focus on Life Sciences)

2. A typical cell of any organism contains genetic instructions that specify its traits. These traits may be modified by environmental influences. (c)

Grade 8

Chemistry of Living Systems (Life Sciences)

6. Principles of chemistry underlie the functioning of biological systems. (b, c)

Grades 9-12

Physiology

9. As a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the outside environment. (b, e)

QUEST MEDIA FOR TEACHING ABOUT ALZHEIMER'S

Read and comment on the blogs for these stories by clicking on the story link and clicking on the blog post link below the video/audio.

Watch **Alzheimer's: Is the Cure in the Genes?**

<http://www.kqed.org/quest/television/alzheimers-is-the-cure-in-the-genes>

- An estimated 15 million Americans will suffer from Alzheimer's by 2050. **QUEST** visits with researchers at San Francisco's Gladstone Institutes who have found that a gene may hold the key to a cure for this debilitating affliction.

Listen to **Beyond Alzheimer's** <http://www.kqed.org/quest/radio/beyond-alzheimers>

- There are many other degenerative brain diseases that are even harder to diagnose and treat than Alzheimer's. Amy Standen reports on frontotemporal dementia, a brain disease that commonly affects people in their 40s and 50s and is often misdiagnosed as a psychiatric problem.

Read **Producer's Notes - Alzheimer's: Is the Cure in the Genes?**

<http://www.kqed.org/quest/blog/2008/04/08/producers-notes-alzheimers-is-the-cure-in-the-genes/>

- Producer Gabriela Quirós shares other sources on Alzheimer's research and treatment.

TOPIC BACKGROUND

The brain is the central command station for the human body. It regulates the functions of many organ systems and controls our thoughts, memories, speech and movements. In a normal, healthy brain, this work is done quickly and automatically. Roughly one in five Americans suffer from neurological disorders, including brain tumors, cerebral palsy and other developmental disorders, and degenerative diseases, such as Alzheimer's, frontotemporal dementia and Parkinson's disease.

Alzheimer's disease is the leading cause of dementia in people over the age of 60. It was named for Dr. Alois Alzheimer, a German doctor who in 1906 found abnormal clumps and tangled fibrous bundles in the brain of a woman who had died of an unusual mental illness. Today, we now know these clumps (amyloid plaques) and bundles (neurofibrillary tangles) as two of the three hallmarks of Alzheimer's. The third characteristic of the disease is a slow loss of connections between the neurons in the brain. Recent research has found that certain proteins found in a person's cerebrospinal fluid may actually be able to identify who is most likely to develop Alzheimer's disease. While early detection may help develop Alzheimer's treatments in the future, as of now there's no cure.

Additional Resources:

Inside the Brain: Unraveling the Mystery of Alzheimer's disease
<http://www.nia.nih.gov/Alzheimers/ADVideo/>

Discovering Psychology: The Human Brain
<http://www.learner.org/discoveringpsychology/brain/index.html>

Alzheimer's Disease http://www.alz.org/alzheimers_disease_alzheimers_disease.asp

VOCABULARY

Dementia

significant loss of such intellectual abilities as memory capacity severe enough to interfere with social or occupational functioning

Enzyme

any of several complex proteins that are produced by cells and act as catalysts in specific biochemical reactions

Gene

the basic biological unit of heredity

Mitochondria

spherical or rod-shaped organelles found within the cytoplasm of eukaryotic cells

Mutation

a permanent change or structural alteration in DNA or RNA

Neuron

a nerve cell that sends and receives electrical signals over long distances in the body

Synapse

the junction between two nerve cells

Symptom

a characteristic sign or subjective evidence of disease or physical disturbance

INTRO QUESTIONS

- What do you know about Alzheimer's?
- Do you know of any other brain diseases?
- What do you think would be the hardest thing about losing your memory?

FOCUS QUESTIONS

- What are the symptoms of Alzheimer's?
- How does a brain with Alzheimer's disease differ from a healthy brain?
- Describe the work being done at the Gladstone Institutes. Why are researchers there so interested in the Apo E gene?
- What are some steps a person can take to reduce the risk of Alzheimer's?
- Compare Alzheimer's and frontotemporal dementia. How are the diseases alike? How are they different?

For all media see:

- Segment Summary Student Sheet
http://www.kqed.org/quest/downloads/QUEST_SegSum_StudentSheet.pdf
- Personal Response Student Sheet
http://www.kqed.org/quest/downloads/QUEST_PersResp_StudentSheet.pdf

LESSON PLANS and RESOURCES from PBS, TEACHERS' DOMAIN and NPR

NOTE: Resources from the Teachers' Domain collection require a fast and free registration.

Alzheimer's Disease Teachers' Domain

<http://www.teachersdomain.org/resource/tdc02.sci.life.gen.alzheimers/>

This video segment adapted from the **Secret of Life** school video "Genetic Medicine: Tinkering with Our Genes" examines the dilemmas associated with genetic testing for diseases and the potential of gene therapy to one day cure Alzheimer's.

Finding Disease Genes Teachers' Domain

<http://www.teachersdomain.org/resource/tdc02.sci.life.gen.findingdisease/>

This video segment adapted from **NOVA: Cracking the Code of Life** looks at how researchers find and isolate the genes that cause disease.

An Alzheimer's Vaccine? PBS

http://www.pbs.org/newshour/bb/health/july-dec99/alzheimers_7-8.html

In this video from **Online NewsHour** (July 8, 1999), Margaret Warner talks with Dr. Steven DeKosky from the Alzheimer's Disease Research Center at the University of Pittsburgh about a vaccine that could be used to treat and possibly even prevent Alzheimer's.

The Forgetting: Short Films About Alzheimer's PBS

<http://www.pbs.org/theforgetting/watch/pocket.html>

These four film shorts highlight the basic facts known about Alzheimer's and information about the latest research into possible cures. They offer a message of hope for newly diagnosed patients and their families.

Second Opinion: Alzheimer's Disease PBS

<http://www.pbs.org/secondopinion/episodes/alzheimersdisease/>

This episode of **Second Opinion** discusses the three known types of Alzheimer's and shares information on how the disease is diagnosed.

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The Bay Institute
www.bay.org

California Academy of Sciences
www.calacademy.org

Chabot Space and Science Center
www.chabotspace.org

East Bay Regional Park District
www.ebparks.org

Exploratorium
www.exploratorium.edu

Girl Scouts of Northern California
www.girlscoutsnorcal.org

Golden Gate National Parks Conservancy
www.parksconservancy.org

The J. David Gladstone Institutes
www.gladstone.ucsf.edu

Lawrence Berkeley National Laboratory
www.lbl.gov

Lawrence Hall of Science
www.lawrencehallofscience.org

Monterey Bay Aquarium
www.mbayaq.org

Monterey Bay Aquarium Research Institute
www.mbari.org

Oakland Zoo
www.oaklandzoo.org

The Tech Museum of Innovation
www.thetech.org

UC Berkeley Natural History Museums
<http://bnhm.berkeley.edu/>

U.S. Geological Survey
www.usgs.gov

MORE EDUCATIONAL RESOURCES FOR USING QUEST MULTIMEDIA TO ENHANCE 21ST CENTURY SKILLS IN TEACHING AND LEARNING

Why Use Multimedia in Science Education?

<http://www.kqed.org/quest/downloads/QUESTWhyMedia.pdf>

- Read about the importance of using multimedia in the 21st century science classroom.

How to Use Science Media for Teaching and Learning

<http://www.kqed.org/quest/downloads/QUESTMediaTips.pdf>

- A collection of tips, activities and handouts to actively engage students with multimedia.

Science Multimedia Analysis

<http://www.kqed.org/quest/downloads/QUESTMediaAnalysis.pdf>

- Give your students the tools to recognize the purposes and messages of science multimedia.

Create Online Science Hikes with Google Maps

http://www.kqed.org/quest/files/download/52/QUEST_ExplorationCreation.pdf

- Do you like the science hike Explorations on the QUEST site? Use this place-based educational guide to create similar science-based maps with youth.

OTHER WAYS TO PARTICIPATE IN QUEST



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KQED 88.5 FM San Francisco &
89.3 FM Sacramento
Mondays at 6:30am and 8:30am



WATCH

KQED Channel 9
Tuesdays at 7:30pm

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SHAFER: It actually makes me have more faith in human nature. That people really are good, kind, loving, compassionate, pro-social, as long as their right temporal lobe is working. I actually think innate human nature is probably pretty darn good. With QUEST, I'm Amy Standen, KQED Radio News.