

AV & Software Reviews

MOLECULAR BIOLOGY

Inside Cancer. 2006. Created and developed by Dolan DNA Learning Center, Cold Spring Harbor Laboratory, funded by a National Institutes of Health Science Education Partnerships Award (SEPA). <http://www.insidecancer.org>. Accessed on July 30, 2006.

System Requirements:

Adobe Flash Player

Inside Cancer displays complex biology concepts related to cancer with exhilarating integrated media. Interview videos of 18 prominent scientists with transcribed text and conceptual animations are simultaneously displayed to provide an effective and exciting presentation that helps students learn complex concepts. Flash MX technology by Macromedia was critical to the production for media integration. Also, this multimedia guide is understandable to various high school and college biology students because the concepts are strategically presented in small segments and constructed with layers

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of information from simple to complex. Because the authoritative content is exciting and has carefully crafted presentations, students are more likely to revisit the site to review the concepts.

The explanations are presented in four modules. Each module is summarized below with a brief description and list of the topics of the slides. Most of the slides include interview videos with transcribed text and animations that provide many hours of guided instruction. ***Bold-faced italicized text*** indicates that at least 50% of the slides in the subsection contain more complex and abstract explanations that exceed basic chemistry and genetics concepts.

Hallmarks of Cancer explores the common features or “hallmarks” of cancer cells. During interviews Robert Weinberg, Ph.D., of the Massachusetts Institute of Technology and Douglas Hanahan, Ph.D., of University of California, San Francisco, explain the capabilities required by a cell to become cancerous tumors. This section includes the following:

- Overview
- Growing Uncontrollably Evading Death Processing Nutrients
- Becoming Immortal
- Invading Tissues
- Avoiding Detection
- Promoting Mutations

Causes and Prevention uses cancer epidemiology to explore behaviors and environmental factors in relationship to cancer risks. It also analyzes the molecular mechanisms that are associated with cancer development. It includes the following:

- Overview
- Smoking
- Inheritance
- Diet
- Mold
- Viruses
- Sunlight

Diagnosis and Treatment explores new molecular and cellular techniques used to diagnose and customize treatment of tumors in relationship to the genetic changes they undergo during their development.

- Pathology
- ***Pharmacogenetics***
- Targeted therapies

Pathways to Cancer uses dramatic 3-D animations with narrations and sound effects to take the students to the nucleus to see how the cell’s normal signaling systems are malfunctioning.

- Overview
- ***At the Cell Surface***
- ***Beneath the Membrane***
- ***A Bevy of Interactions***
- ***To the Nucleus***
- ***Inside the Nucleus***
- ***Making the Protein***
- ***Releasing the Protein***

Molecular Menu is a quick-reference index/glossary of the specific genes and proteins involved in the oncogenesis explanations.

The material is simplified in the overviews to give only the fundamental and simplest concepts, and then each section proceeds by layering the more complex and detailed concepts. For example, the *Hallmarks of Cancer* module builds the concepts step-by-step with Dr. Weinberg’s explanations and then each subsection is summarized by

Dr. Hannahan. I was impressed with the efficiency of presentation and the quality and quantity of information in this module with a limited number of complex terms. This presentation technique increases the possibility of successful learning of the concepts and acquisition of higher levels of knowledge, and prevents frustration from premature introduction of concepts. It is an excellent example of master teaching techniques.

There are choices for viewing methods: video with narration, video with sound effects only, slides with audio only which is recommended for dial-up connections. Since transcripts are provided with the interviews, audio is not necessary and the animations are highly effective. Most of *The Pathways of Cancer* module lacks transcripts and requires audio for the explanations. The variety of viewing options accommodates various student learning styles and limitations in available technology.

The students meet the scientists and the scientists explain their current investigation projects and how they learn science concepts with their research. As they share their research, they teach the students science concepts in a fashion similar to the way they discover concepts. They are careful to build from the simple to the complex and to manage the terminology by including definitions. Analogies are frequently used to help the students relate the complex concepts to common knowledge. For example, Angelo De Marzo, M.D., Ph.D., a surgical pathologist at the Sidney Kimmel Comprehensive Cancer Center, used the following analogy to compare normal and cancerous tissue morphology.

A group of normal cells are similar to a normal class of students that dress properly, sit orderly and take directions from the teacher, but a group of cancer cells do not sit orderly, and do not dress properly. They may even sit on top of one another, they do not appear to take directions, and are out of control.

Images of microscope slide preparations are displayed as the analogy is presented. Then the students are given the opportunity to examine prepared microscopic images of cervical, lymph node, and prostate gland cells from

different patients to practice making diagnoses. Answers with explanations are provided. This section, Pathology, of the *Causes and Prevention* module, is excellent for students to learn about pathology as a career option, since the daily tasks of pathologists are vividly considered by Dr. De Marzo.

Inside Cancer manages the presentation of many concepts that require prior knowledge of a broad range of applied chemistry and genetics topics by organizing the presentations from simple to complex so students can build their knowledge and achieve many inquiry and content standards. My list of sections, as previously described, identifies those that require more advanced knowledge with bold italicized text.

Dolan DNA Learning Center staff has plans to continue to develop the site with current cancer research and to include diverse teaching resources. This incredible resource has an abundance of possible applications that will help the education community better utilize its diverse potential.

Inside Cancer is a progressive and authoritative Web site that presents concepts that relate to everyone's daily life. Students will want to revisit this site many times throughout their lives.

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INTERNET TOOLS FOR OBJECTIVE ANALYSIS OF SCIENCE ISSUES

PersuadeStar. 2006. Created and developed by The Advanced Learning Technologies in Education Consortia (ALTEC) at the University of Kansas Center for Research on Learning. <http://persuadestar.4teachers.org>. Accessed on September 4, 2006.

System Requirements

A JavaScript compliant browser with enabled JavaScript

PersuadeStar is a new and free online application without advertisements on the student pages that is

designed to help students from grades five through higher education write online, persuasive essays. These essays require students to make critical analyses. Students need to view "science and technology thoughtfully, being neither categorically antagonistic nor uncritically positive," which is a benchmark of the American Association for the Advancement of Science's Project 2061. Persuasive writing activities can help students to accomplish this benchmark in association with other benchmarks that concern specific biology concepts. For example, I use a persuasive writing assignment that requires my students to consider the advantages and disadvantages of cloning in association with the basic science concepts of cloning to help them accomplish this benchmark.

I avoid using the term "persuasive essay" when I first introduce **PersuadeStar** to my biology students. I use the term "persuasive analysis activity" to prevent students from becoming overly anxious about the technical writing tasks that are associated with a formal essay for an English class assignment. I quickly reveal that **PersuadeStar** is a tool that helps with the writing tasks, so there can be greater focus on biology concepts and analyses. **PersuadeStar** allows instructors to easily create assignments and monitor student work. Instructors can enable options, such as:

- an essay analysis tool
- an essay planning tool
- an essay writing space
- a spelling feedback tool
- a bibliography tool

Students have the technological and organizational advantages of these **PersuadeStar** tools to write quality persuasive analyses that often contain five paragraphs or sections. The following is a list of the paragraphs and their components:

- Paragraph 1: hook, opinion, and opposing opinion with references
- Paragraph 2: argument fact 1 with references
- Paragraph 3: argument fact 2 with references
- Paragraph 4: argument fact 3 with references
- Paragraph 5: Conclusion

(which summarizes the most important details of the argument and restates what the reader is to believe)

The goal of Paragraphs two through four is to disprove the opposing opinion and to provide referenced evidence to support each of the essay author's arguments. The **PersuadeStar** format can help students learn to write comprehensive and multifaceted arguments.

First, students can analyze customized sample essays prepared or selected by the instructor with the analysis tool. It allows the students to identify the different components of a persuasive essay. Second, students can use the planning tool to organize and compose each section. The planning tool integrates the bibliography tool that encourages students to base each argument on evidence and to cite the associated references with each argument in the proper format. It actually prompts students to give credit to the sources of their arguments, and to comply with copyright laws. Students can gain an understanding that references are as critical to science compositions as they are to English compositions. The essay writing space integrates the results of the planning tool. If the planning tool is not used, then the writing tool can be used independently. If the planning tool is used, then most of the writing is complete and only needs to be transferred to the writing space. Transition sentences can be added to help relate the paragraphs. Spell check is an option that can help students to edit their essays. Also, graphics can also be included with the essay. Instructors and students can review, save and print them. The essays are saved online for one month from the date of the student's last modification.

When students do a **PersuadeStar** writing activity, they learn to develop objective science arguments with the innovative and integrated online tools. **PersuadeStar** provides an organized format to allow for effective writing. However, there is limited information about the characteristics of each component of persuasive essays included in the help sections of **PersuadeStar**. More information would help students to become more familiar with the essay components, which is essential

to writing a persuasive essay. During my recent communications with the ALTEC staff, they indicated their plans to include more support information. Also, it would be helpful to have a feedback tool for instructors to communicate with the students. A feedback tool is available in **NoteStar** (<http://notestar.4teachers.org>), which is reviewed in this issue of *ABT*, and can be used in association with **PersuadeStar** until this feature is added to the tool options. **PersuadeStar** is a new tool and the ALTEC staff has plans to continue its development. The current version is a powerful utility and students will profit from using it in writing persuasive science essays.

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INTERNET TOOLS: BIBLIOGRAPHIES AND MESSAGING MADE EASY

NoteStar. 2006. Created and developed by The Advanced Learning Technologies in Education Consortia (ALTEC) at the University of Kansas Center for Research on Learning. <http://notestar.4teachers.org>. Accessed on September 4, 2006.

System Requirements

A JavaScript compliant browser with enabled JavaScript (ALTEC strongly encourages MAC users to use Internet Explorer because certain operations do not perform properly in Netscape.)

NoteStar is a free utility without advertisements on the student pages that helps students complete assignments requiring citations and communicate with their instructor. Students can focus more of their attention on the research topic because the details of taking notes, keeping track of the corresponding citations, and formatting the citations correctly are managed with **NoteStar**. It encourages students to respect copyright laws and to avoid plagiarism, which is a responsibility of all authors. The following is an inventory of the instructor and student **NoteStar** tools:

- **NoteStar** tools help instructors to:
 - create and assign projects to students
 - check citations for legitimacy
 - help students learn to organize notes
 - track each group's progress with completing a task
 - manage projects easily for multiple classes.
- **NoteStar** tools help students to:
 - create topics and sub-topics for each research topic
 - assign topics and sub-topics to specific group members
 - take notes from Web sites, books, magazines, journals, and newspapers and format references that correspond to the notes
 - add a button to the Internet Explorer links bar to make taking notes easy because Internet citation information (including title and Web address) is automatically captured to assist in creating a citation
 - track information regarding their citations
 - organize their notes and sources to create printable notes and bibliography.
- **NoteStar** tools helps instructors and students to:
 - communicate privately and securely with a special messaging tool. This messaging tool is restricted communication between only the instructor and the student. It alone is a powerful tool for communicating with students online.

NoteStar is a handy utility and an ideal tool to use in association with **PersuadeStar**, if the instructor desires to provide online feedback to students about their essays or to require the students to do more extensive research than allowed by **PersuadeStar**. **PersuadeStar** is also reviewed in this issue of *ABT*. **NoteStar** tools can help students of all grade levels who need to make a bibliography to be more successful with science writing assignments.

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