

<http://www.nature.com/scitable>



The image shows a screenshot of a web browser displaying the Scitable website. The browser's address bar shows the URL <http://www.nature.com/scitable>. The website header features the Scitable logo, the tagline "A Collaborative Learning Space for Science", and navigation links for "ABOUT", "FACULTY", and "STUDENTS". A secondary navigation bar includes "HOME", "TOPICS", "PEOPLE", "GROUPS", and "BLOGS", along with "Sign In" and "Register" options. The main content area is titled "What Is Scitable?" and includes a photograph of a bee on a yellow flower. The text describes Scitable as a free science library and personal learning tool, highlighting its focus on genetics and cell biology. A sidebar titled "Inside Scitable" lists four key features: "Browse + Search Science", "Get Help or Connect", "Build an Online Class", and "Contribute + Share Your Knowledge". The Windows taskbar at the bottom shows the date as 08/09/2013 and the time as 10:17.

Scitable
by nature EDUCATION

A Collaborative Learning Space for Science
▶ ABOUT ▶ FACULTY ▶ STUDENTS

HOME | TOPICS | PEOPLE | GROUPS | BLOGS | Sign In | Register

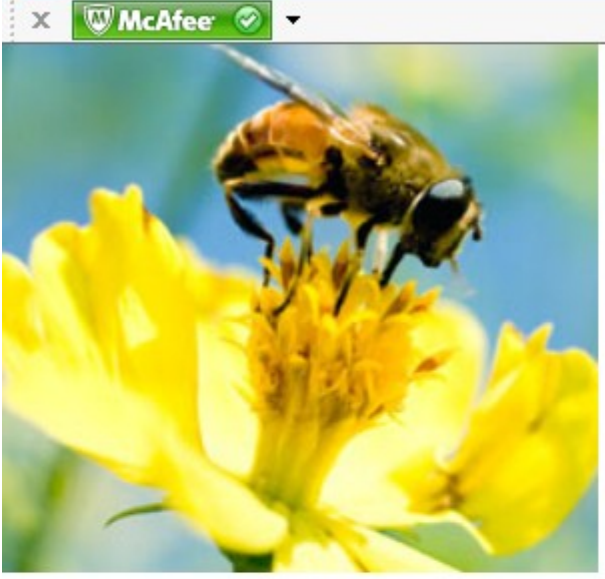
What Is Scitable?

Scitable is a free science library and personal learning tool brought to you by Nature Publishing Group, the world's leading publisher of science.

Scitable currently concentrates on **genetics** and **cell biology**, which include the topics of evolution, gene expression, and the rich complexity of cellular processes shared by living organisms. Scitable also offers resources for the budding scientist, with advice about **effective science communication** and **career paths**.

Inside Scitable

-  Browse + Search Science
Free in-depth overview
-  Get Help or Connect
Ask experts, join discussions
-  Build an Online Class
Engage students through interactive content
-  Contribute + Share Your Knowledge
Communicate with the community







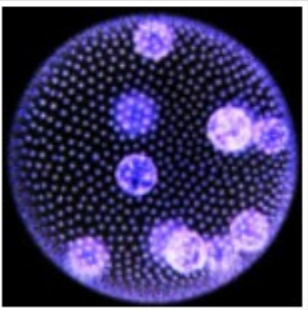
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Engage students through interactive content
-  Contribute + Share Your Knowledge
Communicate with the community



Cell Biology

Editor: Ilona Miko

Cell biology is the study of cell structure and function focusing on the cell as the fundamental unit of life.



Ecology

Editor: Sara Tenney

The field of ecology studies the interactions of organisms with each other and their environment.



Explore This Topic

CELL ORIGINS AND METABOLISM



This Topic Room focuses on how cells became individual units, separate from the external environment and capable of producing energy to sustain themselves.

Discussion of cell origin is inevitably linked with issues of cell energy, and how a cell evolved to acquire and process its own energy via metabolic processes.

[Read More](#)

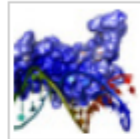
CELL COMMUNICATION



This Topic Room focuses on how a cell gives and receives messages with its environment and with itself. Cell survival depends on the ability to receive and

process information from the outside environment. Cells can communicate directly with one another via a variety of chemical and mechanical signals, and these signals are crucial to the growth, health, and maintenance of organisms.

PROTEINS AND GENE EXPRESSION



This Topic Room covers a range of subjects, from how the sequence of amino acids in a protein determines its structure to how the structure of proteins impacts

essential cell function, such as gene expression. A particular emphasis is placed on the modulation of gene expression by proteins.

[Read More](#)

CELL CYCLE AND CELL DIVISION

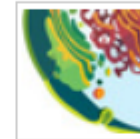


This Topic Room focuses on mechanisms that regulate the timing and frequency of DNA duplication and cell division. The study of the cell cycle has vast relevance to

the health, well-being, and biology of all organisms, from the growth and development of these organisms, to cancer and aging humans, to the potential for disease and injury repair via stem cell therapies.

[Read More](#)

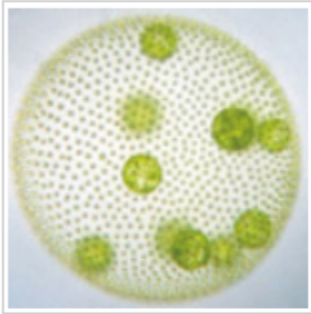
SUBCELLULAR COMPART



This Topic Room focuses on how subcellular compartments create divided labor within the cell. The structure of organelles of cells into discrete compartments

enables the cell to create specialized organelles, specific structures that perform specific functions. These compartments can be local, defined by the concentration of molecules, or they can be global, defined by physical characteristics and properties.

[Read More](#)



Cell Origins and Metabolism

Editor(s): [Gary Coté](#), [Mario De Tullio](#) | [Subscribe](#)

The study of cell origins primarily involves the question of how cells became individual units, separate from the external environment and capable of producing energy to sustain themselves. Cellular metabolism is the set of biochemical processes by which energy is either created or used in the cell, and energy resources in eukaryotic cells are regulated by two well-studied organelles: the mitochondrion and the chloroplast. Due to the widely held contention that these organelles once existed as separate organisms, the study of cell energy is inherently linked to the study of cell origins.

How do scientists study the origin of cells, a process that obviously occurred long before the origin of humans? Genomic comparisons between Archaea, Bacteria, and Eukarya, the three main categories of organisms, yield clues. In fact, a prevailing hypothesis emerging from genomic and other comparisons is that the first eukaryote actually evolved from **collaboration between an archaeon and a bacterium**. Scientists study the structure and function of mitochondria and chloroplasts as well as their fascinating separate genomes to see what evidence might be left of the entities they once were. The focus on the origin of the cell is not restricted to the study of energy-generating organelles. Indeed, scientists spend much time and debate on the fundamental question of how **gradients of protons** separated by cell membranes enabled energy creation in primordial conditions. In addition, studies of cell origin focus on the **evolution of multicellularity**, the state of cells cooperating to form a single organism, a large step toward the creation of the vertebrates and invertebrates we know today. Comparative genomics has helped map out these paths to multicellularity and diagram evolutionary divergence as well as convergence.

- Bio 2.0: What I've Lately
- Earthbound: The Earth. Sciences.
- The Beyond: An View of Solar
- Pop: Voyager 1: To
- Saltwater Science: And Sex Change

pic (27)

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Mario De Tullio: Lead Editor

Mario De Tullio is a member of the Cell Biology Editorial Board and Lead Editor of the Origins and Metabolism Topic Room.

Aa

Mario C. De Tullio is Assistant Professor of Plant Biology at the University of Bari, Italy. He received his M.A. in Biology and his Ph.D in Plant Physiology from the University of Bari, and followed that with postdoctoral positions at the University of Kassel (Germany), the Vrije Universiteit Amsterdam (The Netherlands) and the University of London, Royal Holloway College (Egham, UK). In 2007 he was a Fulbright Visiting Scholar at the University of California–Berkeley, where he worked on the role of ascorbic acid (vitamin C) in the redox regulation of **development**.

Currently, Mario teaches classes in Plant Biology, Plant Morphology and Physiology, Plant **Biotechnology**, Phycology, Plant Developmental Biology, Techniques in Plant Biology, and Science Teaching. His interest in science communication is a consequence of the continuing debate on the necessity of developing new teaching tools. Mario believes that the use of new media and a more appealing approach to science will possibly help in solving the problem of "scientific illiteracy" in our society.



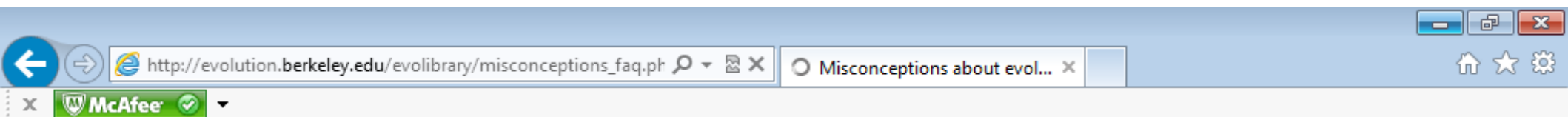
Nothing in Biology Makes Sense Except in the Light of Evolution

THEODOSIUS DOBZHANSKY



One of the world's leading geneticists, Theodosius Dobzhansky is professor emeritus, Rockefeller University, and adjunct professor of genetics, University of California, Davis 95616. Born in Russia, in 1900, he is a graduate of the University of Kiev and taught (with J. Philipchenko) at the University of Leningrad before coming to the U.S., in 1927; thereafter he taught at Columbia University and the California Institute of Technology before joining the Rockefeller faculty, in 1962. He has been president of the Genetics Society of America, the American Society of Naturalists, the Society for the Study of Evolution, the American Society of Zoologists, and the American Teilhard de Chardin Association. Among his many honors are the National Medal of Science (1964) and the Gold Medal Award for Distinguished Achievement in Science (1969). He holds 18 honorary doctorates from universities in this country and abroad. Among his well-known books are *The Biological Basis of Human Freedom* (1956) and *Mankind Evolving* (1963). The present paper was presented at the 1972 NABT convention.

http://www.evolution.berkeley.edu



Misconceptions about evolution

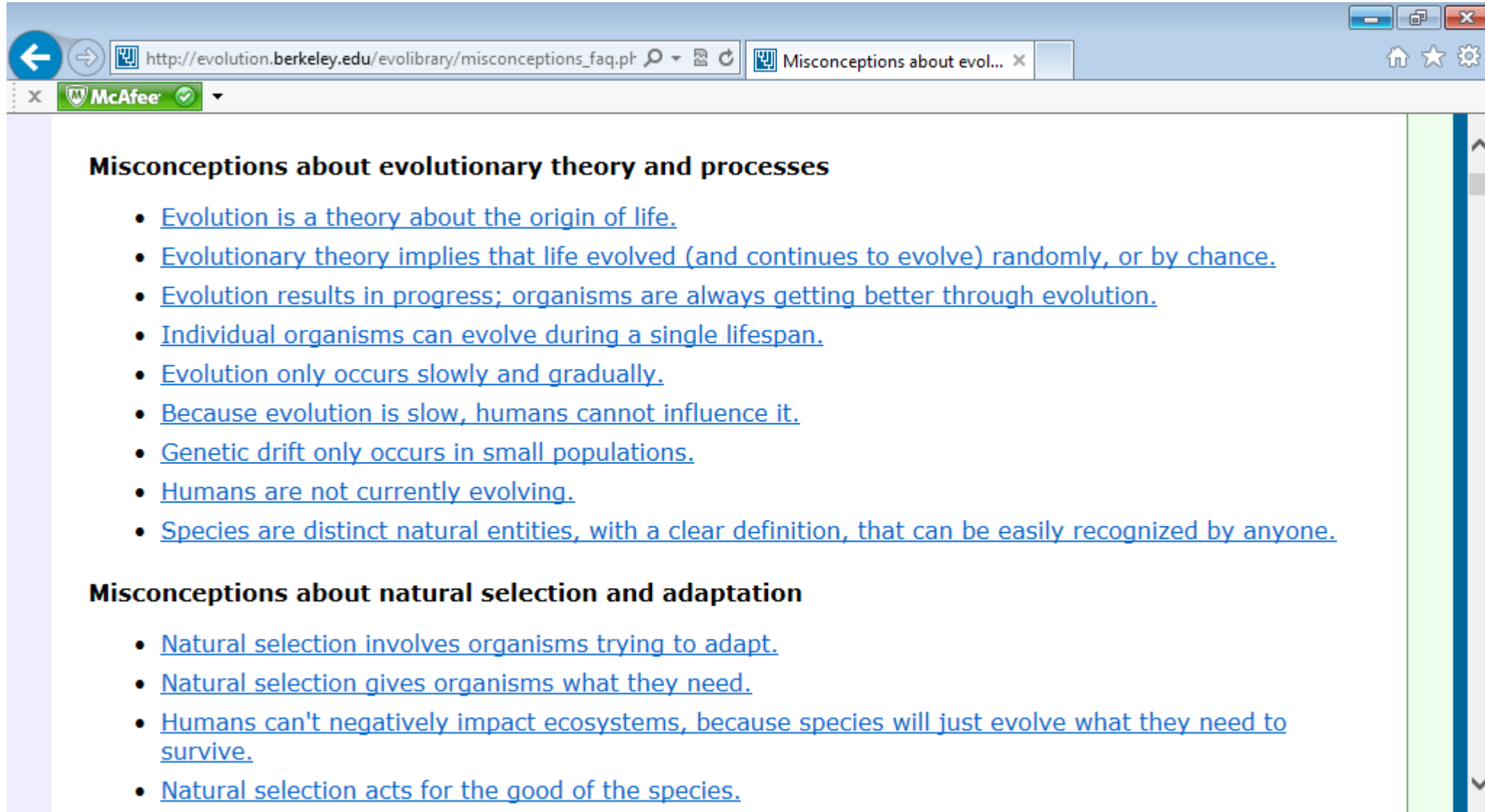
Unfortunately, many people have persistent misconceptions about evolution. Some are simple misunderstandings—ideas that develop in the course of learning about evolution, possibly from school experiences and/or the media. Other misconceptions may stem from purposeful attempts to misrepresent evolution and undermine the public's understanding of this topic.

Browse the lists below to learn about common misconceptions regarding evolution, as well as clarifications of these misconceptions. You can also [download a pdf of this section](#).

Misconceptions about evolutionary theory and processes

- [Evolution is a theory about the origin of life.](#)
- [Evolutionary theory implies that life evolved \(and continues to evolve\) randomly, or by chance.](#)
- [Evolution results in progress; organisms are always getting better through evolution.](#)

Risposte alle principali misconcezioni sull'evoluzione



The image is a screenshot of a web browser window. The address bar shows the URL http://evolution.berkeley.edu/evolibrary/misconceptions_faq.ph. The page title is "Misconceptions about evol...". The browser has a McAfee security icon in the top left. The main content of the page is as follows:

Misconceptions about evolutionary theory and processes

- [Evolution is a theory about the origin of life.](#)
- [Evolutionary theory implies that life evolved \(and continues to evolve\) randomly, or by chance.](#)
- [Evolution results in progress; organisms are always getting better through evolution.](#)
- [Individual organisms can evolve during a single lifespan.](#)
- [Evolution only occurs slowly and gradually.](#)
- [Because evolution is slow, humans cannot influence it.](#)
- [Genetic drift only occurs in small populations.](#)
- [Humans are not currently evolving.](#)
- [Species are distinct natural entities, with a clear definition, that can be easily recognized by anyone.](#)

Misconceptions about natural selection and adaptation

- [Natural selection involves organisms trying to adapt.](#)
- [Natural selection gives organisms what they need.](#)
- [Humans can't negatively impact ecosystems, because species will just evolve what they need to survive.](#)
- [Natural selection acts for the good of the species.](#)

Browser window showing the URL: http://evolution.berkeley.edu/evolibrary/misconceptions_faq.ph. The page title is "Misconceptions about evol...". The McAfee security bar is visible below the address bar.

Misconceptions about evolutionary theory and processes

- **MISCONCEPTION: Evolution is a theory about the origin of life.**

CORRECTION: Evolutionary theory *does* encompass ideas and evidence regarding life's origins (e.g., whether or not it happened near a deep-sea vent, which organic molecules came first, etc.), but this is not the central focus of evolutionary [theory](#). Most of evolutionary biology deals with how life changed *after* its origin. Regardless of how life started, afterwards it branched and diversified, and most studies of evolution are focused on those processes.

- **MISCONCEPTION: Evolutionary theory implies that life evolved (and continues to evolve) randomly, or by chance.**

CORRECTION: Chance and [randomness](#) *do* factor into evolution and the history of life in many different ways; however, some important mechanisms of evolution are non-random and these make the overall process non-random. For example, consider the process of [natural selection](#), which results in [adaptations](#) — features of organisms that appear to suit the environment in which the organisms live (e.g., the fit between a flower and its pollinator, the coordinated response of the immune system to pathogens, and the ability of bats to echolocate). Such amazing adaptations clearly did not come about "by chance." They evolved via a combination of random and non-random processes. The process of [mutation](#), which generates [genetic variation](#), is random, but selection is non-random. Selection favored variants that were better able to survive and reproduce (e.g., to be pollinated, to fend off pathogens, or to navigate in the dark). Over many generations of random mutation and non-random selection, complex adaptations evolved. To say that evolution happens "by chance" ignores half of the picture. To [learn more about the process of natural selection](#), visit our article on this topic. To [learn more about random mutation](#), visit our article on DNA and mutations.

Windows taskbar showing icons for Internet Explorer, File Explorer, Windows Media Center, Mail, and Adobe Reader. The system tray on the right shows the time as 20:04 and the date as 07/09/2013, along with network, volume, and power icons.

E-MoVe: Evoluzione del Mondo Vegetale

(Museologia scientifica per la didattica dell'evoluzione)

- (A) Allestimento di spazi espositivi presso il Museo Orto Botanico;
- (B) Formazione di insegnanti ed operatori museali.



Phylowall: il giardino verticale



Lo studiodi Darwin e le "sue" piante

Realizzazione di giochi interattivi



Livello base:

La macchina del tempo

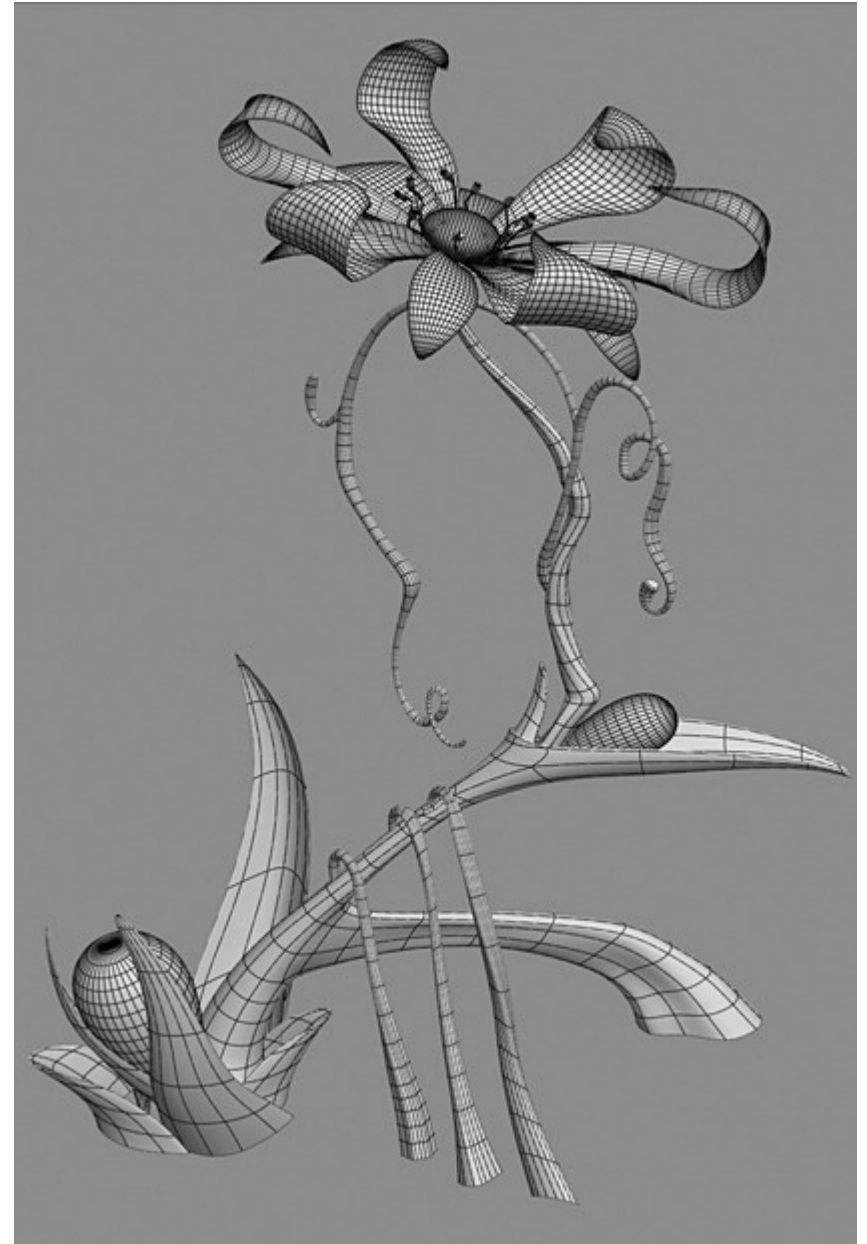


Si allestiscono rappresentazioni di ambienti in diverse epoche del passato e del futuro. Il giocatore parte dal tempo attuale, ed “imposta le coordinate” di un'epoca precedente con una “manopola”. Giunti nell'ambiente prescelto, il giocatore deve rispondere ad una domanda sulle caratteristiche o sui nomi di alcune piante caratterizzanti di quell'era per passare al quadro successivo. Per ogni livello una “scheda di attualizzazione” spiega se quella pianta è ancora esistente e dove si può trovare. Tabella finale del punteggio conseguito.

Livello intermedio:

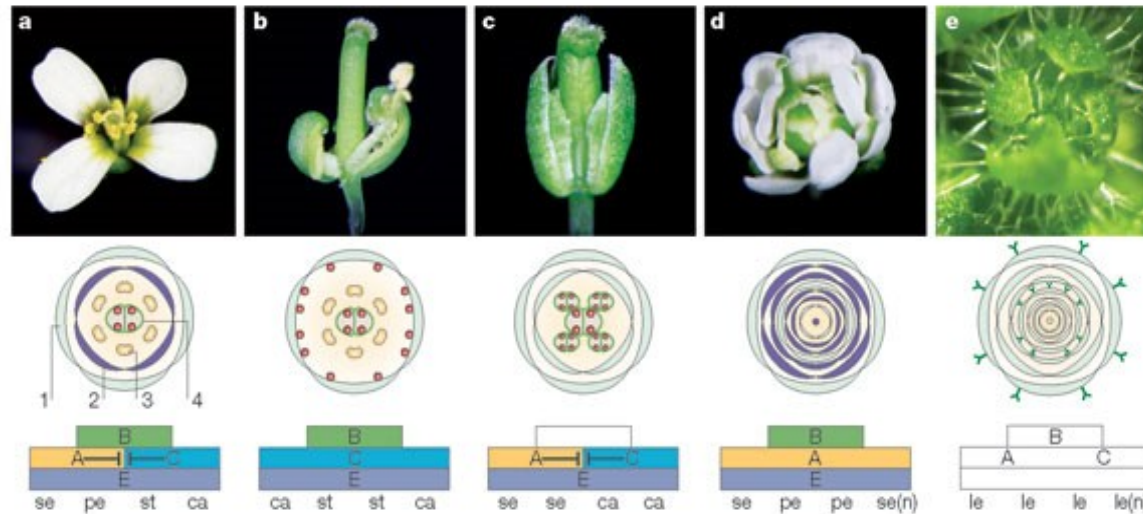
Morphing

Morphing con velocità controllabile dall'operatore in cui alcune strutture si modificano diventando più efficienti (es. vasi) o cambiando forma (es. foglie-fiori) nel corso dell'evoluzione.



Livello avanzato:

Evoluzione degli organi floreali nelle Angiosperme



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La duplicazione dei geni responsabili della fioritura ha portato alla diversificazione delle Angiosperme (Darwin ed il “mistero abominevole”). L'operatore, regolando l'espressione dei geni, determina delle modificazioni nella formazione dei fiori che portano all'origine di nuove specie.

Se desiderate partecipare alla sperimentazione e validazione dei giochi interattivi, inviate una mail a

mario.detullio@uniba.it

Supporto di importanti istituzioni



American Society
of Plant Biologists

Cultivating a better future through plant biology research

Dear Dr. De Tullio,
I look forward to collaborating with you on
the plant evolution educational project you
are developing.

Mary E. Williams
American Society of Plant Biologists



Dear Mario:

This is to confirm that we will collaborate on the
development of teaching tools on plant evolution,
within the educational project E-MoVe! (Evolution
of the Plant World).

Douglas Soltis
Distinguished Professor

Visita al Museo Orto Botanico



L'orto botanico negli anni '50



Il Museo Orto Botanico oggi



**Banca del Germoplasma
Herbarium
Orto Botanico
Laboratorio didattico
*Xylotomotheca italica***

**Mostra permanente
sull'evoluzione delle piante
(progetto E-MoVe!)**



MUSEO ORTO BOTANICO DI BARI



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