LIVE INTERACTIVE LEARNING @ YOUR DESKTOP

NOVA SEMINARS

NOVA 3.0 Explore/Educate/Engage

Presented by: Thea Sahr, Jen Larese, and Howard Lurie

Tuesday, May 25, 2010
Today’s Presenters

Thea Sahr
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Jen Larese
Outreach Coordinator, NOVA

Howard Lurie
Associate Director, Educational Programming
• NOVA 3.0 Overview
• New Web Site
• New Teachers Page
• New Relationship with Teachers’ Domain
• New Classroom-based Interactives
• New Web-only Series: Secret Lives of Scientists and Engineers
Tonight on NOVA

Mystery of the Megavolcano
Researchers unearth clues to the greatest volcanic eruption of the last 100,000 years.

The Next Big One
What could we expect if a supereruption were to occur today?

Why Toba Matters
NASA's Drew Shindell reflects in this interview on the lessons we can learn.

A Supersized Volcano
As this interactive shows, Toba's upheaval dwarfs all eruptions of recorded history.

Blasts from the Past
Explore a map of supereruptions around the world.

Watch a Preview
Researchers from Indonesia to Greenland unearth clues to the greatest volcanic eruption of the last 100,000 years.

TV Program Description
Links & Books
Teacher's Guide
E-mail Newsletter
Don't miss upcoming NOVA broadcasts and companion Web sites—subscribe to our e-mail newsletter.
Do you use NOVA resources in your classroom?

A. Not at all
B. A little bit
C. Regularly
New Web Site
New Web Site
New Search Features
Mirror Neurons
Teacher's Resource | Posted 12.14.09 | NOVA

This video segment, adapted from NOVA scienceNOW, describes the recent discovery and implications of mirror neurons, a specific kind of brain cell that fires both when performing an action and when observing someone else perform the same action. It turns out that mirror neurons, which are normally associated with physical activities, might also be responsible for signaling the human brain's emotional system, which in turn allows us to empathize with other people. Their failure to work normally might explain why some people, including autistic people, do not interact well with others.

Related Topic Resources
- TEXT (10)
  - Interview with Ben Livernose
  - In this interactive, learn more about the evolution of gilding and flight and database schemas
- MULTIMEDIA (7)
  - Stone Age tools
  - In this interactive, learn more about the evolution of gilding and flight and database schemas
- AUDIO (20)
  - Eco-impact
  - In this interactive, learn more about the evolution of gilding and flight and database schemas
- VIDEO (34)
  - Flying is not just for birds
  - In this interactive, learn more about the evolution of gilding and flight and database schemas
New Resources Page

The media asset was adapted from NOVA scienceNOW's "Fastest Glacier!"

Media Type: Video
Running Time: 04:35
Size: 12.2 MB
Level: Grades 6-12

To download, share, rate, and save to a folder, view this resource on Teachers' Domain (log-in required).

- Background Essay
- Questions for Discussion
- Transcript

- Standards for Grades: K-12
  Change grade range

  Massachusetts
  Strand: Life Science (Biology)
  Systems in Living Things
  6. General functions of the major systems of the human body, and the interactions of these systems.
  Anatomy and Physiology
  4.4 The nervous system mediates communication.

  About Standards | Report a Problem

COMING UP ON PBS

The Human Spark
airs 2.25.09 at 9pm on PBS
Are you familiar with Teachers’ Domain?

A. Yes, I’m a registered user
B. I’ve visited once or twice
C. What’s Teachers’ Domain?
The new NOVA site coming to a computer near you in August 2010

pbs.org/nova
Regulating Genes

Find out what Darwin never knew. He understood that species adapt and change, but he didn’t understand the actual processes that made this happen. New discoveries in the emerging science of “evo devo” are helping to solve these mysteries. In this feature, you’ll see for yourself how genetic mutations influence the development of an individual creature. Study how the mutations in different regions of the DNA impact the expression of genes. Predict how the mutations impact the development of the creature’s traits. And finally, observe the developed creature and explain how the mutation gave rise to any changes.

LAUNCH INTERACTIVE

Observe and manipulate an interactive model that illustrates the mechanisms that govern gene regulation during an organism’s development.

Related Evolution Resources

- **TEXT (27)**
  - Timing is Everything
  - Developing embryos reveal secrets about both genetics and the odyssey of life on Earth.

- **VIDEO (11)**
  - Little People of Flores
  - The remains of three-foot-tall humans are discovered on a remote Indonesian island.

- **MULTIMEDIA (16)**
  - Evolution in Action
  - In this game, change the environment of “living” things and see how random mutations help them survive.

- **AUDIO (2)**
  - Sexual Cannibalism
  - Biologist Maydianne Andrade says that the gruesome mating behavior of some spiders is a lesson in evolution.

Background Essay

For Teachers

Student Resources

COMING UP ON PBS
REGULATING GENES

This is a close-up of two DNA segments in the nucleus of a fertilized egg. Each segment contains a gene — one controlling spots, the other appendages.

Each segment is made up of three sections (from left to right):
- DNA not associated with the gene
- Enhancers in the non-coding regulatory region of the gene
- The protein-coding region of the gene (spot or appendage)

Click “Develop” to watch the fertilized egg begin to develop into an organism.

After your first run, click “View Mutation” to view a random mutation that was inherited by the fertilized egg.
Which genes were activated in which cell?

What traits do you expect will develop in each section of the creature?
Classroom-based Interactives

What effect did the proteins in each cell have on the creature’s traits?
What effect did the proteins in each cell have on the creature's traits?
Classroom-based Interactives

What effect (if any) did mutations have on the creature’s traits?

genes. Predict how the mutations impact the development of the creature’s traits. And finally, observe the developed creature and explain how the mutation gave rise to any changes.
Bones of Contention

By Inquirium | Posted 01.08.10 | NOVA

Explore the challenges scientists face when classifying hominin fossils by using this database to classify your own collection of 10 mystery fossils. Identify your fossils by comparing their features to known hominin fossils, and defend your classifications with peers. By using known facts about fossils to define hominin species, take part in the ongoing scientific process of discovering human origins.

LAUNCH INTERACTIVE

Do the work of scientists, using this interactive database to classify actual fossil records of human ancestors.

- Background Essay
- For Teachers
- Student Resources
- Sources
In this video segment adapted from NOVA, see how paleoanthropologists—including Don Johanson, with his famous discovery of the *Australopithecus afarensis* “Lucy”—have used the fossil record to identify a large number of fairly similar bipedal species that encompass ancestors of humans and related species. These species, which walked upright like humans, but resembled apes in small brain size and in facial structure, flourished as a group for millions of years. Scientists still debate which of these species was our direct ancestor. The video features a comparison of Lucy's fossilized pelvis bone with that of an ape, and shows how strikingly similar Lucy's is to a human one.
### Bones of Contention

#### Filters
- Select a field
- Additional options

#### Records
- Show all mystery fossils
- Edit Columns
- Double-click to view detailed information

<table>
<thead>
<tr>
<th>Description</th>
<th>ID</th>
<th>Date</th>
<th>Bone Type</th>
<th>Cranial Capacity (cc)</th>
<th>Cresting</th>
<th>Dentition</th>
<th>Foramen Magnum Orientation</th>
<th>Femur Orientation</th>
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<tbody>
<tr>
<td>Mystery 1</td>
<td>?</td>
<td>6,000,000-7,000,000</td>
<td>Cranial</td>
<td>320-180</td>
<td>Large</td>
<td>Small Molars</td>
<td>Back of Skull</td>
<td>n/a</td>
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<td>Mystery 2</td>
<td>?</td>
<td>2,900,000-3,300,000</td>
<td>Partial</td>
<td>0</td>
<td>Small</td>
<td>Large Molars</td>
<td>Middle of Skull</td>
<td>n/a</td>
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<td>Mystery 3</td>
<td>?</td>
<td>1,000,000</td>
<td>Cranial</td>
<td>500</td>
<td>None</td>
<td>Megadontia</td>
<td>Middle of Skull</td>
<td>n/a</td>
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<td>?</td>
<td>2,500,000</td>
<td>Cranium</td>
<td>475</td>
<td>None</td>
<td>Small Molars</td>
<td>Middle of Skull</td>
<td>Angled</td>
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<td>1,800,000</td>
<td>Cranial</td>
<td>510-150</td>
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<td>Middle of Skull</td>
<td>n/a</td>
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<td>1,700,000</td>
<td>Cranial</td>
<td>500</td>
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<td>Small Molars</td>
<td>Middle of Skull</td>
<td>n/a</td>
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<td>1,510,000-1,560,000</td>
<td>Partial</td>
<td>900</td>
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<td>Megadontia</td>
<td>Middle of Skull</td>
<td>n/a</td>
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<td>220,000-580,000</td>
<td>Partial</td>
<td>1,000</td>
<td>None</td>
<td>Small Molars</td>
<td>Middle of Skull</td>
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<td>Cranial</td>
<td>1,200</td>
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<td>Middle of Skull</td>
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<td>Cranial</td>
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</table>
Do you think you’ll be using Secret Lives videos in your classroom?

A. No
B. Maybe
C. Yes
QUESTIONS?

For more information about NOVA
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Thank you to the sponsor of tonight's Web Seminar:
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