Evolution: Darwin to DNA

This course provides an overview of concepts of biological evolution, from pre-Darwinian attempts to describe life through modern genetic theory. It will emphasize the history of evolutionary thought and science, review the basic principles of evolutionary theory, and discuss their implications for modern life as well as state-of-the art technologies, such as genomics. Topics covered include the structure of DNA, reproduction and the transfer of genetic traits, natural selection, speciation, and evolution over the long term via introductory systematics.

Dr. Martin Mendez is the Assistant Director of the Latin America and Caribbean Program at the Wildlife Conservation Society, a Visiting Researcher at the Sackler Institute for Comparative Genomics at the American Museum of Natural History, a Resource External Affiliate Faculty at E3B, and an Adjunct Assistant Professor at SCPS, New York University. After his doctoral studies on cetacean conservation and molecular ecology at Columbia University and his postdoctoral research at the American Museum of Natural History, Dr. Mendez is now devoting his time to broader terrestrial and marine conservation initiatives in Latin America and the Caribbean. He is generally interested in the application of molecular tools for species conservation.

Syllabus

Week 1: History of Evolution and evolutionary thinking

Readings:

- Kardong Chapter 1: Evolution of evolution

- Kardong Chapter 2: Time

- Futuyma Chapter 1: Evolutionary biology

Week 2: Heredity mechanisms

Readings:

- Kardong Chapter 3: Heredity

    - Miko, I. (2008) Mitosis, meiosis, and inheritance. Nature Education 1(1)

http://www.nature.com/scitable/topicpage/mitosis-meiosis-and-inheritance-476

- Miko, I. (2008) Gregor Mendel and the principles of inheritance. Nature Education 1(1)

http://www.nature.com/scitable/topicpage/gregor-mendel-and-the-principles-of-inheritance-593

Week 3: Evolutionary mechanisms

Readings:

- Kardong Chapter 7: Selection

- Futuyma Chapter 11: Natural Selection and adaptation

Week 4: Applications of Evolution to real life 1 – systematics and conservation.

Readings:

-TBD articles from scientific journals or popular science.

Week 5:Applications of Evolution to real life 2 – pandemics / student presentations

Readings:

- TBD articles from scientific journals or popular science.