

Genetics, Genomics, Genethics

How will our growing knowledge of the genome affect our health, our societies, and the natural world? How do heredity and the environment interact? This course explores a scientific frontier: how scientists are investigating and applying the information contained in genetic codes. Examine the tools and techniques used in a molecular biology lab, learn about the Human Genome Project, and discuss the ethical issues involved in emerging fields like genetic enhancement, genetically modified foods, and cloning.



Key Science Concepts:

- **Gregor Mendel's** groundbreaking work on pea plants provided a foundation for modern genetics and molecular biology.
- While our genome has all the genetic information necessary for us to be humans, both **nature and nurture** are important in determining who we are.
- **People are genetically similar** to other people and to other organisms. For example, 45% of the genes found in a fruit fly are also found in humans, and we share approximately 96% of our genome with chimpanzees.
- The **Human Genome Project**, which made history by mapping the human genome, is likely to revolutionize basic medical and pharmaceutical research and its clinical application.
- **Genetically Modified Organisms (GMOs)** can be created to resist certain diseases, pests or chemicals. Many commercial crops are GMOs. You have probably eaten GMO food without knowing it.
- **New technologies** such as microarrays and polymerase chain reaction (PCR), give scientists advanced ways to study living things.
- Geneticists study **model organisms** (such as mice, fruit flies, worms and bacteria) to understand how genes function. Many genes in these model organisms are also found in humans and can be used to study genetic disorders.
- Increased knowledge about genetics will confront individuals and society with **ethical decisions**. Sound decisions require an accurate understanding of the science involved, a careful consideration of all the stakeholders' views and a strong ethical framework.

Authoring Scientists:

Dr. Rob DeSalle is curator in the Museum's Division of Invertebrate Zoology and co-director of its molecular laboratories. Working at the Museum gives Rob the opportunity to help design exhibition spaces, such as "The Genomic Revolution" and "Epidemic!".



Dr. Claudia Englbrecht, a postdoctoral fellow at the American Museum of Natural History from 2000-2001, was born in Munich, Germany. Claudia enrolled at the University of Munich, she decided to study biology, with a major in zoology and minors in biochemistry, human genetics, and ecology.

