

# EVOLUTIONARY BIOLOGY



## EVOLUTIONARY BIOLOGY'S CONTRIBUTIONS TO SOCIETY

### Human Health and Medicine

- Genetic Diseases
- Infectious Diseases
- Mental Disease
- Normal Physiological Functions

### Agriculture and Natural Resources

- Plant and Animal Breeding
- Using Biodiversity
- Pest Management
- Genetic Engineering
- Forestry and Fisheries

### Finding Useful Natural Products

- Fossil Fuels
- Microorganisms

### Environment and Conservation

- Conservation Biology
- Effects on an Ecosystem with the Introduction of New Organisms

### Understanding Humanity

- Human History
- Variations with and among Populations
- Human Nature
- Models of Cultural Change
- Comparison to Non-human Primates and other Species

## GOALS OF EVOLUTIONARY BIOLOGY

### DISCOVER THE HISTORY OF LIFE ON EARTH

- Determine ancestor-descendant relationship among all species that have ever lived (phylogeny)
- Determine times of species' origin and extinction
- Determine the rate, course of change, and origin of each lineage's characteristics
- Determine the timing of major genomic rearrangements and the origin of new genetic information

### UNDERSTAND THE CAUSAL PROCESSES OF EVOLUTION

- How hereditary variations originate
- How various processes act to affect the fate of hereditary variations
- How natural selection, mutation, genetic drift, gene flow, diverse molecular, anatomical, behavioral and other co-acting processes cause evolution
- How populations of one species become different species

