Career Tracks in the Biological Sciences

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Anthropocentrism
Overconsumption of Natural Resources
Human Induced Global Warming
Anthropocentric View of Importance of Biological Diversity
Homo sapiens is just one of the 2 million species of organisms on Planet Earth.
Science of Biology

• Biology is a natural science concerned with the study of life (living organisms).
• Majority of undergraduate biology majors are interested in human health careers (medicine, pharmacy, dentistry, nursing).
• Biology encompasses so much more than this.
• Aim of this presentation is to give you an appreciation of the breadth of biology.
Biology (Sub-disciplinary areas)

- Anatomy
- Biochemistry
- Bioinformatics
- Biomechanics
- Biotechnology
- Cell biology
- Developmental Biology
- Ecology
- Evolution
- Genetics
- Histology
- Immunology
- Limnology
- Marine biology
- Microbiology
- Molecular biology
- Natural History
- Neurobiology
- Organismal biology
- Paleontology
- Parasitology
- Physiology
- Systematics
- Taxonomy
- Virology
Biology (Sub-disciplinary areas)

- Anatomy
- Biochemistry
- **Bioinformatics**
- Biomechanics
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- Cell biology
- Developmental Biology
- **Ecology**
- Evolution
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- Parasitology
- Physiology
- **Systematics**
- Taxonomy
- Virology
Organismal Biology

Major groups of living organisms

• **Viruses**: DNA viruses — RNA viruses — retroviruses

• **Single-cell organisms**:  
  – prokaryotes: microbe — bacteria — archaea  
  – eukaryotes: fungi — algae — protozoa — protista

• **Multicellular organisms**:  
  – Plantae — plants — bryophytes — pteridophytes — seed plants  
  – Animalia — animals — metazoa — insects — mollusks — vertebrates  
  – Fungi — lichens — mycorrhizae
Biology (Taxonomic areas)

- Arachnology – spiders and mites
- Botany – plants
- Entomology - insects
- Herpetology – amphibians and reptiles
- Ichthyology – fishes
- Malacology - mollusks
- Mammalology - mammals
- Mycology - fungi
- Myrmecology - ants
- Ornithology - birds
- Phycology – algae
- Zoology - animals
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Ecology

• Study of how organisms interact among themselves and with their environment.

• Encompasses ecosystem science, population biology, conservation biology.

• Careers –
  – Higher education
  – Governmental natural resource agencies (Agriculture, Forest Service, Park Service, Fish and Wildlife Service, NOAA fisheries)
  – Non-governmental conservation organizations (Nature Conservancy, Sierra Club, WWF, Conservation International, etc.).
Evolutionary Biology

• Study of changes in the characteristics of organisms over time.
• Encompasses species formation, taxonomy, interrelationships of species and higher groups (phylogenetics).
• Careers -
  – Higher education
  – Natural history museums
Biodiversity Informatics

• Application of information technology to facilitate the study of biodiversity.
• Interdisciplinary (biology and computer science).
• Encompasses digitization of biodiversity information and development of software tools for using biodiversity data in research.
• Careers in higher education and natural history museums (biodiversity research centers).
Advice for Career Planning

• Find and pursue your passion.
• Explore some of these subfields of biology at your institutions (faculty-mentored research experiences, independent study).
• Seek career advice from established professionals and trainees (your mentors and their students, us).
• Consider graduate school after graduation.
THANKS AGAIN FOR YOUR ATTENTION!

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