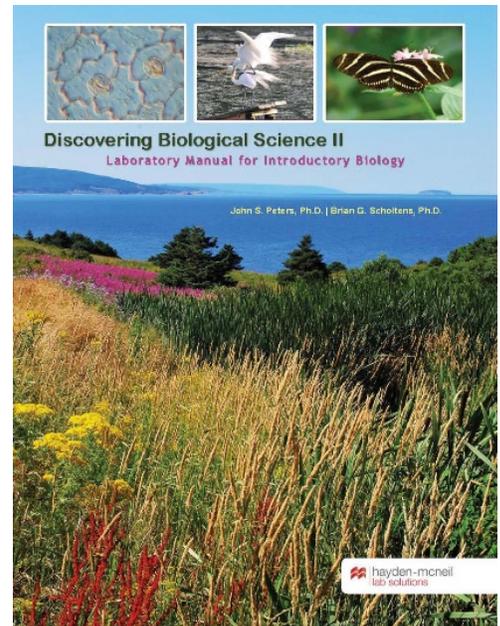


Discovering Biological Science II Experiments

- 1) **Darwinian Snails** – This lab uses the popular [SimBio®](#) Darwinian Snails computer simulation software which challenges, dispels and helps students to reform common misconceptions about how natural selection operates. The student instructions for this lab have been modified in DBS I to make this exploration more inquiry-based. **In-person or online.**
- 2) **Exploring the Evolutionary Genetics of Sickle Cell Alleles** - This uses the popular [SimBio®](#) Sickle Cell Alleles computer simulation software. The lab contextualizes abstract evolutionary genetics concepts to a classic case of how malaria influences the prevalence of sickle-cell anemia in humans. The student instructions for this lab have been modified in DBS I to make this exploration more inquiry-based. **In-person or online.**
- 3) **Adaptations: Thermoregulation in Butterflies** - This lab has students constructing models of butterflies to test alternative hypotheses regarding thermoregulatory adaptations.
- 4) **Exploring Water and Nutrient Transport in Plants** – Students test their own hypothesis about how environmental factors might affect transpiration rate in stem/leaf cuttings.
- 5) **Exploring Animal Circulation I** - This lab had students initially making careful observations of mammalian heart structure. Student then pose hypotheses about heart how the heart pumps blood, which they then test by measuring the heart’s electrical activity (EKG); heart sounds and pressure during the heart cycle.
- 6) **Exploring Animal Circulation II** – This second part of the Animal Circulation lab has students using computer-based dissections to explore circulation in several vertebrate groups.
- 7) **Independent Team Projects Labs** - This lab has teams honing their scientific process skills by conceiving of, developing, and executing an investigation of their own design. Compared to the independent projects lab we developed in DBS I, this lab affords students more flexibility in terms of the topic they are interested in exploring as students can explore questions related to prior lab explorations
- 8) **Exploring Human Overpopulation and Environmental Sustainability** - This lab begins with a case study in which the issue of human overpopulation of the planet is presented as a myth. After initially reflecting on their views students calculate their current and future ecological footprint and discuss its implications for sustainability. **In-person or online.**
- 9) **Exploring the Salt Marsh Ecosystem** - This field-based lab takes students out into a salt marsh ecosystem to explore the biological diversity and physical factors that characterize the marsh ecosystem, and to discover the essential ecosystem services of provided by the marsh ecosystem.
- 10) **SimPredator-Prey: Exploring the Ecology of Invasive Species** - This case study-based lab begins at a public hearing in which several proposals are being put forth by various stakeholders to control the spread of this invasive species of fish. The case then leads students to explore the effect of an invasive species and the implications of using biocontrol agents through a fun, hands-on predator-prey simulation.
- 11) **Exploring Keystone Species** - Adapted from the [SimBio®](#) *Keystone Predator* simulation, the lab begins with a case study exploring the environmental effects of 70 years of efforts to eradicate Grey wolves from North America. Although the lab explores ecological drivers of community structure in a simulated rocky intertidal community, students use the findings from the lab to understand how and why wolf reintroduction impacted the Yellowstone ecosystem. **In-person or online.**



About the Authors:

John S. Peters (MS – College of Charleston - Marine Biology; Ph.D. – University of Northern Colorado – Biological Education) and **Brian G. Scholtens** (MS/Ph.D. – University of Michigan - Entomology) currently teach in the Department of Biology at the College of Charleston. There they coordinate the introductory biology labs and teach undergraduate and graduate courses in biology.

Visit [Macmillan Learning](#) to preview labs and instructional resources, request an exam copy and contact your local Macmillan representative.