

SCHOOL OF INTEGRATIVE BIOLOGY



College of Liberal Arts & Sciences | UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN



Integrative Biology Honors

Newsletter | Fall 2022



Director's Note

This year we are celebrating 60 years of Honors Biology at Illinois! Over that time there have been some unit reorganizations of biology at Illinois, more than a few discoveries that have revolutionized the scope and approaches used to study biological systems, but one commonality: a commitment to providing outstanding teaching and mentorship to our most academically gifted students in the Honors program. Our program is vibrant, with a strong commitment of support from our School, and with an outstanding reputation among our students and peer institutions.

In this brief newsletter we hope to encourage you to re-engage with our program and with our students. As our understanding of biological systems has deepened and diversified so too have the research and career opportunities available to our students.

The Integrative Biology Honors (IBH) program is uniquely placed to provide sophomore biology students the opportunity to pursue any branch of biology wherever it occurs on campus while offering a broad foundation of coursework dedicated to a small cohort of students.

The increasing diversity of summer research and post-graduation career choices has also led to a recognition that students can benefit greatly from the experiences of our alumni. We hope that you will consider beginning a conversation with us to explore how you can help support IBH, either directly, or through the IB Alumni Mentoring Program (sib.illinois.edu/undergraduate/mentor).

With best wishes,
Professor Jim Dalling
Director, Integrative Biology Honors

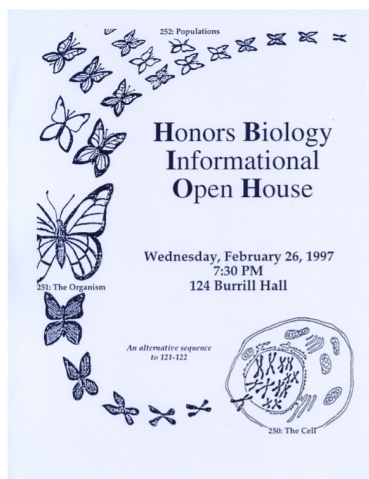
A Brief History of IB Honors

Aside from one very brief interruption, Biology Honors at Illinois has been in operation since January 1962! The program was started by Profs. Dave Nanney and Herbert Stern with the cells course. At that time there was no-one to teach the organism course so despite existing regulations against 'spousal hires' Dr. Judy Willis was drafted in as a temporary instructor to teach and develop labs for Bio 251.

At that time, Judy was instructed by her male colleagues to not overwork the students. However, a question on the student evaluation "Did this challenge you to do your best work?" did not elicit high ratings. Armed with this feedback, Judy worked to make labs more rigorous and thus established the honors philosophy of a demanding program of study providing opportunities for open-ended, independent learning.

Judy served as Director of Biology Honors from 1970 to 1974 and from 1980 to 1982 and taught Cell lab from 1963 to 1968 and Organism lab from 1980-1982. Additional faculty who taught in the program included Profs. Ellis McCleod, Arthur DeVries, John Cheeseman, Ray Zelinski, Dave Slocum, Arthur Ghent and Richard Selander. In 1983 Prof. Stewart Berlocher joined the program along with Prof. Mike Lynch and Shozo Yokoyama. Through the 1990s students in Biology Honors took three classes: Bio 151: The Cell; Bio 251: The Organism; Bio 252: Population Biology (note: course numbers changed over the years).

A Brief History of IB Honors



In 1987, Prof. Carol Muster took over the running of the program, which ran uninterrupted until a reorganization of teaching in the school in 2006. In 2007 the School of Integrative Biology (IB) began a new IB Honors program that continued many of the traditions of Biology Honors with Prof. John Cheeseman as the program director.

IBH occupied space on the 4th floor of the Natural History Building (NHB) before the rushed evacuation of NHB in 2010 due to 'structural deficiencies' (i.e., the floors were about to collapse). After temporarily moving to Morrill Hall IBH relocated to the reopened NHB in 2017 with superb wet and dry lab facilities, prep rooms and a student lounge/study space dedicated to the program.

Left: This flyer is from the 1997 Honors Recruitment Event – showing the progression from the cell at metaphase (Bio 250), morphing into a butterfly (Bio 251) before dividing into a population with two phenotypes (Bio 252).



Our current space allows us to recruit 24 honors students each year. Prof. Cheeseman continued as program director until 2012 when Prof. Jim Dalling took over. Over the last few years both Prof. Dalling and Prof. Chris Cheng have served as director. Jim is the current IBH Director.

One of the more important recent events in IB Honors has been the retirement of Prof. Stewart Berlocher in 2021. For many years Stewart set the tone (musically and academically) for the program. His teaching of evolution inspired and challenged students and his guitar playing by the campfire at Dixon Springs are a cherished memory for many of us.

The future of IB Honors looks good. The program has strong support from the School of Integrative Biology, a growing community of alumni are contributing to supporting our students, and we have outstanding faculty that teach our three core courses: Prof. Eva Fischer (IB270 Evolution of Cells and Molecules); Profs. LiQing Chen and Chris Cheng (IB271 Organismal Biology); Profs. Jim Dalling and Katy Heath (IB372 Ecology and Evolution).

Left, above: The 1988 Honors Bio 252 class at Dixon Springs Research Station in Southern Illinois. Photo by Nathan Schiff. Stewart Berlocher remembers that this was a 'great class'!



Left, below: And Stewart with the 1992 Biology Honors Class in 1992 at Dixon Springs. Stewart even remembers what he was playing – "Blowing in the Wind" (Bob Dylan).

IB Honors Q&A

Biology Honors at Illinois has evolved a bit over the last 60 years, but the philosophy of the program remains unchanged – to provide students with opportunities to learn from faculty and each other, the resources to do cutting-edge science, and the independence and flexibility to pursue their interests in biology wherever that might lead. Here's a brief overview:

What facilities are available to IBH students?

With the renovation of the Natural History Building in 2017 we moved into a spectacular new dedicated space. The IBH suite consists of a student lounge, wet lab, prep rooms, and classroom/dry lab.

How are students recruited into IB Honors?

Each fall and spring, our current IBH students hold a recruitment event to introduce new students to the program. In March each year IBH faculty and students interview up to 60 students and select 24 students to enter the program the fall semester of sophomore year. We pick students that have excelled academically, are eager to gain research experience, and show a curiosity for all aspects of biology. Admitted students have a diversity of backgrounds, and interests that range from ecology and conservation to genetics and neurobiology. Typically, about half of each incoming class is interested in a career in healthcare.



What academic preparation does IBH provide?

Students in IBH take three dedicated classes – evolution of cells and molecules (IB 270), organismal biology (covering plant and animal physiology; IB 271) and ecology and evolution (IB 372). These classes provide a strong foundation across the biology curriculum, equip students in a range of wet lab skills, and train students in hypothesis testing and data science skills. We profile IB 372 ecology in this newsletter and other classes in coming newsletters. Our core curriculum also prepares students to take specialist upper-level classes offered in either Integrative Biology or Molecular and Cellular Biology (MCB). Students also graduate with a minor in chemistry.

What research experiences can IBH students obtain?

IBH students can earn research credit and complete distinction projects in any biology lab on campus. While many students work with faculty in IB, our students are also found in labs in MCB, Veterinary Medicine, the Illinois Natural History Survey and other units.

What funding support is available to IBH?

We support IBH from unrestricted donor funds that help to cover the costs of purchasing equipment and supplies, and from gifts used to support students directly. Currently we have funds to cover scholarships to four IBH students each year: The Oliver J Bell Merit and IBH Achievement Scholarship for Sophomores and the Judy Willis Scholarship and IBH Achievement Scholarship for Juniors. These scholarships are offered to IBH students based on academic achievement and engagement in leadership activities. Awards are most often used to support students to carry out research or attend workshops and conferences over the summer.

What do IBH students do after graduation?

The vast majority of IBH students continue to graduate school or a health-related program (about a third of each class enter medical/dental/vet school). IBH students have also had great success earning Fulbright awards and other prestigious fellowships to study or teach abroad.

2022 SIB Distinction Symposium

IB Honors students complete at least one year of independent lab research. This can be conducted in any biology-related lab on campus. In addition to obtaining research credit towards graduation students may also elect to present their research for consideration for graduation with Distinction, High Distinction or Highest Distinction.

Learn more: sib.illinois.edu/undergraduate/distinction

For consideration for Distinction, students must provide a formal write-up their research in scientific journal format and present either a poster (Distinction) or research talk (High or Highest Distinction) at the University or School's undergraduate research symposium.

We congratulate the 2022 IB Honors Distinction winners!

Name	Advisor	Distinction Earned	Project Title
Rebecca Duca	Mark Hauber	Highest Distinction	Multicomponent shell traits are consistent with an individual recognition function of the appearance of common murre (<i>Uria aalge</i>) eggs: A biological replication study
James Kosmopoulos	Katy Heath	Highest Distinction	Novel Soil Bacteria that Reduce the Benefits of Legume-Rhizobium Symbiosis
Grace Westphal	Carla Cáceres	Highest Distinction	The genetic basis of susceptibility to disease in a zooplankton parasite system
Joanna Droppo	Chris Brook	High Distinction	Differential Type III Interferon Induction Upon Infection by Laboratory Adapted H1N1 Influenza Strains
Jonathan Chan	Becky Fuller	Distinction	Costs of Delayed Mating Opportunities and its Effect on Mate Choice in Bluefin Killifish
Anna Dec	Sarah Douglass	Distinction	Evaluating environmental DNA quantity after simulated exposure of pesticide runoff in aquatic freshwater environments
Evi Malone	Becky Fuller	Distinction	Bluefin Killifish Polymorphism Effects on Behavior, Growth, and Survival
Mariam Ouzidane	Naiman Khan	Distinction	Effectiveness of a Youth Summer Physical Activity Program for Children from Low Income Households in Champaign County
Armit Subbarao	Marcia Monaco Siegel	Distinction	Encapsulated γ -Cyclodextrin/Tributyryn (CDTB) Does Not Ameliorate the Severity of Dextran-sodium Sulfate (DSS)-induced Colitis in Neonatal Piglets



From left: Rebecca Duca, James Kosmopoulos, and Grace Westphal received highest distinctions for their work.

Focus on IB372 – Ecology

IB Honors students take three classes together as a cohort. The last of these classes is Ecology and Evolution, which they take in the fall semester of Junior year. The first half the semester is dedicated to Ecology, covering the full range of sub-disciplines from population biology to ecosystem ecology, conservation biology, microbial ecology and paleoecology. As a complement to lectures and discussions students spend every Tuesday afternoon and a weekend in southern Illinois collecting field data.

Our first stop is the Salt Fork river for Stream Lab. We use kick-nets to capture stream invertebrates, dig with our hands to find freshwater mussels, and corral fish into seine nets. We learn a lot of natural history from our guest instructors (ichthyologists from the Natural History survey) and build our data year-on-year on stream communities. Back in the lab students use fish data to estimate stream diversity, insect captures to classify stream quality, and quantify turnover in community composition across the different stream habitats they have sampled.

The following week we travel to the Dixon Spring Agriculture Research Station in southern Illinois. We arrive late on Friday night at the Dixon Springs dorm, and head out on Saturday morning to Heron Pond, spectacular cypress swamp on the cache river.

After exploring the board walk (and watching out for snakes) we collect data on a transect perpendicular to the swamp edge and record how plant communities and environmental features change as we move into the upland forest. In the afternoon we explore some more with a guest TA.

Some years we learn about ants, other years birds or salamanders or fungi. After cooking dinner at the station, we hunt for insects under the lights, and in the past, Prof. Berlocher has entertained us on the guitar.

On Sunday morning we head to the sandstone canyons of Bell Smith Springs. We notice how the vegetation changes from the cool humid canyon bottom to the harsh dryness of sandstone ridges and glades. We catch camouflaged grasshoppers and ant lions and admire cacti and parasitic ghost pipes.

The major assignment for ecology is the student independent project. Working in small groups, students have three weeks to conceptualize, plan and collect field data at Phillips Tract and Trelease Woods – two university properties close to campus. It's hot in the late summer and most students elect to work in the cooler woods. In 2022, teams of undergrad students from Integrative Biology completed a full census mapping all 31,948 trees in the 60-acre Trelease Woods.

Read more about Trelease Woods:
publish.illinois.edu/treleasewoods

Right: IB students mapping trees in Trelease Woods. It took 70 students two years to generate maps of all 31,948 trees in Trelease.



Members of the 2018 IBH class collecting invertebrates in the Salt Fork River



Students from the 2009 IBH class at the Heron Pond cypress swamp, southern Illinois



This fantastic new resource will be used for the first time this year as IBH students design their field projects. After two weeks of data collection, many hours of data analysis, writing and draft revisions, students present their project results at the end of the ecology class.

Our last field lab of the semester involves a trip to a rock outcrop along the Salt Fork River. After scrambling down the bank, groups of students spread out along the river and map out the vertical profile of rocks that they observe. They learn to identify mudstones, shales, limestone and sandstone, and collect fossils they find embedded in the rock. Back in the lab they identify their fossils, use stratigraphy to figure out their place in geological time, and debate the processes that led to the landscape change. It's a great place to handover the class to evolution.

"We hiked two days. Every bizarre fungus we spotted, we presented for commentary to Jason, the mycologist grad student who hiked with us. We students brought forth the materials we cared to hear about.

Our class materials we discovered in the wild and held in our hands. The ecological theory you learn in a classroom is clothes that look good on you; the familiarity you develop with the wildlife you encounter hiking through Shawnee is knowledge you embody.

Jason taught me what mushrooms were edible. I cooked a mushroom he found for me when I got home. We spent time together on the trip. At night we whispered outrageous things into each other's ears, sitting in a circle on asphalt. We seasoned our dinner properly. We shared the things we brought, we talked about private things, and we trusted each other for it.

Nothing else you get out of academia is more important."

*Vi Aldunate (Class of '22)
on the Southern Illinois field trip*



Students mapping an outcrop and collecting fossils on the Salt Fork River to generate a hypothesis for landscape evolution during the Pennsylvanian.



Far left: A student drawing the geological sequence from Fithian in the lab.



Left: Juniors in IB271 Organismal Biology monitoring osmoregulation live crabs. Some students enjoyed their experiment for dinner.

School of Integrative Biology

University of Illinois
286 Morrill Hall, MC-120
505 S. Goodwin Ave.
Urbana, IL 61801

Get involved with IB Honors!

We would love to hear from you! If you'd like to chat about IBH or learn more about program needs please get in touch with IBH Director, Jim Dalling. Email: dalling@illinois.edu

You can also join the IBH community on Facebook. This includes most of our current students and many of our more recent alumni. Learn more: go.illinois.edu/IBHonors-FB

We would also love to involve alumni in our IB mentoring program which matches student interests with IB alumni. Learn more: sib.illinois.edu/undergraduate/mentor

The IB mentoring program recently started a Discord channel which has grown into a fantastic community space for students. Learn more: go.illinois.edu/IBDiscord

For more information on how to give to the IBH program, please visit sib.illinois.edu/alumni/giving or contact Paul Winterbotham, Associate Director of Development, LAS Office of Advancement, at paulw2@illinois.edu or (217) 300 9993.

