

DEPARTMENT OF BIOLOGY  
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## 2016-2017

### 2017-2018

**September 9, 2016** - Norm Bell, Safety talk for all students working in labs. This is mandatory!!

**September 15, 2016 @ 6:00 PM - "Strategies for designing and delivering a scientific presentation"** (by Luana Maroja, Associate Professor of Biology and Tim Lebestky, Assistant Professor of Biology)

It takes time, effort and skill to design and deliver an engaging scientific talk that audiences understand and remember. In this one-hour presentation, we will discuss three aspects of designing an outstanding scientific talk: (1) organizing complex scientific information into a clear narrative; (2) using PowerPoint or Keynote software to visually communicate scientific concepts; and (3) improving verbal and nonverbal delivery during a presentation. This seminar is open to anyone and is especially applicable to senior thesis students.

**September 16, 2016** - [Bruce Beehler](#), '74

"North with the Songbirds: The Future of Neotropical Migration in North America"  
Bruce Beehler followed the northward spring migration of songbirds from the coast of Texas up the Mississippi valley and then into the vast boreal forests of northern Ontario – the heartland of the breeding ranges of many of these small and colorful species. The talk, illustrated by many of Beehler's images, will focus on stories about the people and institutions working to better understand and to effectively conserve this globally important migration system. It will highlight the history and culture of the many little-known rural places that he visited along the way, as well as the special places, dedicated government and non-government workers, and insightful university researchers working on songbird migration and on the conservation of these birds and the places they need to prosper.

Beehler has spent much of his scientific career studying and working to conserve birds and their forest habitats. After conducting doctoral fieldwork in Papua New Guinea, Beehler worked at the Smithsonian's National Museum of Natural History, followed by

stints at the Wildlife Conservation Society, U.S. Department of State, Counterpart International, Conservation International, and the National Fish & Wildlife Foundation.

**September 23, 2016** (BIMO 60s Scholar) - [Bradley Maron, M.D.](#), Brigham & Women's Hospital

"Redox switches in health and human disease"

Brad's research focuses on understanding novel molecular mechanisms involved in the pathobiology of pulmonary arterial hypertension

**September 30, 2016** - [Elinor Karlsson](#), UMass Medical, Broad, MIT

"Natural selection, disease, and genome function in humans and dogs"

Ancient natural selection can give new insights into the function – and dysfunction – of human biology, with important implications for medical genomics. We combine evolutionary history with trait association and functional tests to study a range of diseases, from pathogen susceptibility to psychiatric diseases, in diverse species. In humans, infectious diseases are among the strongest selective forces driving recent evolution. One such disease is cholera, which is ancient and endemic in the Ganges River Delta. Using signals of natural selection, we identified genes and pathways implicated in cholera susceptibility in Bangladesh, and developed a model of the innate immune signaling pathways that respond to this infection. We are using the same approach to study psychiatric diseases in dogs, which have been strongly selected for behavioral traits, through our new citizen science dog genetics project Darwin's Dogs.

**October 14, 21, 28, 2016** - Thesis talks

**November 4, 2016** (BIOL 60s Scholar) - [Josh Obar](#), Dartmouth Medical School

"*Aspergillus fumigatus* strain-specific virulence and inflammation in the respiratory tract"

*Aspergillus fumigatus* is a ubiquitous environmental mold, and even though most individuals are regularly exposed to fungal spores, clinical invasive disease is a rare manifestation. However, in the growing population of individuals with weakened immune systems, for example due to prolonged corticosteroid treatment or chemotherapeutic interventions, *A. fumigatus* exposure can cause severe invasive disease. It is critical to better understand the host-pathogen interactions after *A. fumigatus* exposure in order to develop novel treatment options which harness the power of the host's immune response. We have recently found that different environmental and clinical strains of *A. fumigatus* lead to different inflammatory profiles as well as different disease pathology. Specifically, strains that are able to germinate more readily within the lung environment are more virulent, and lead to enhanced lung damage, vascular leakage and inflammation. These findings will allow researchers to better understand what fungal component(s) are important in virulence determination, which immune pathways are contributing to the different disease pathologies observed, as well as understand the mechanism through which a healthy immune system can resist *A. fumigatus* exposure on a daily basis.

**February 24, 2017** (BIOL 60s Scholar) - Alumni Retreat with Daniela Zarate '15, Gregory McElroy '12, Kimberley Davis '08, Galen Holt '04 and Jason Fan '08  
*There will be a panel discussion in TBL 112 from 2pm-3pm followed by a poster presentation in TBL Lobby from 3pm-4:15pm.*

Daniela Zarate "Mapping ancestral admixture across the genomes of hybrid Africanized honeybees"

Gregory McElroy "The role of mitochondrial electron transport chain complex 1 function in neurodegeneration, diabetes, and cancer"

Kimberley Davis "Patterns, impacts, and feedbacks of global *Pinus contorta* (lodgepole pine) invasions"

Galen Holt "Branching patterns, environmental variation, and diversity in river networks"

Jason Fan "Progenitor Cell Marker Aldehyde Dehydrogenase 1a3 Defines a Subset of Failing Pancreatic  $\beta$  Cells in Diabetic Mice"

**March 10, 2017** - [Elena Vazey](#), UMass Amherst

"Focus on the locus: Noradrenergic roles in attention and inattention"

The locus coeruleus (LC) projects widely throughout the central nervous system and is the near exclusive source of norepinephrine (NE) to cortex. LC has been implicated in a range of core neural processes including arousal, mood and cognition. Dr Vazey uses a combination of traditional and cutting edge techniques to generate novel insights that enhance our understanding of the role of LC-NE in normative function and disease states. In this presentation she will discuss some of her recent findings using selective manipulations of LC-NE to modify cortical physiology and behavioral functions. She will highlight empirical evidence that demonstrates a causal role for LC in cortical state transitions at cellular, local and global levels.

**April 14, 2017** - Jeremy Fox, University of Calgary

"The spatial hydra effect: that which does not kill metapopulations makes them stronger"

Many species occupying patchy habitats comprise metapopulations: local populations connected by dispersal, allowing recolonization of extinct populations. Metapopulation persistence requires asynchrony; simultaneous crashes of all populations would leave no source of recolonization. Anything that prevents spatial synchrony therefore should promote metapopulation persistence. I will show theoretically and experimentally that population extinctions themselves can promote metapopulation persistence, by inhibiting spatial synchrony and thus enhancing recolonization. A population that goes extinct and subsequently gets recolonized requires time to resynchronize with other populations. Local extinctions thus both create the need for recolonization, and ensure the availability of an adequate supply of recolonists by preventing synchrony. I refer to this behavior as the 'spatial hydra effect': as with the mythical hydra that grows two new heads when one is cut off, that which does not kill metapopulations makes them stronger.

**April 21, 2017** - [Paul Yancey](#), Whitman College

"Life in the Trenches: How do Animals Cope with Pressure in the Ocean's Greatest

Depths?"

The HADES (Hadal Ecosystem Study) Project has initiated the first ecological video transects of the deep ocean trenches (the biological hadal zone, 6000 - 11,000 m), starting with the Kermadec and Mariana Trenches. This talk focuses on hydrostatic pressure as a major limiting factor and how some animals adapt through a combination of protein evolution and piezolytes (pressure-counteracting osmolytes).

**April 28, 2017** - Poster Workshop for Thesis Students

**May 5, 2017** - Thesis Poster Presentations