The Biolog

Volume 3, Issue 2 March 2, 2012

Of note in March's Biolog:

- Recruitment rocks!
- Biology of note in Washington Post

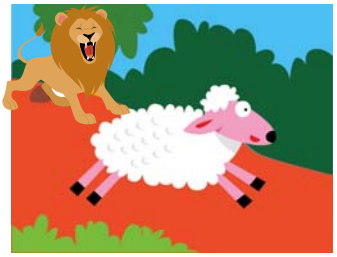
Inside this issue:

Notes from the Chair: Coming in like a lion

By Beverly Wendland

Welcome to the March issue of the Biolog! It is hard to believe winter is almost over, especially since it never really felt like winter ever arrived…

I want to thank all of you for your tremendous efforts in all of the important activities that have been keeping us so busy over the past few weeks, including the Administration in the Biology Office who worked very hard to coordinate all of these things. It seems our CMDB Interview Weekend for prospective Ph.D. graduate students was a big success – we've already got nine students committed to joining our program, and there are many other great candidates who remain interested but have yet to decide. If you met any students you particularly liked, I encourage you to contact them to let them know how much you'd like them to be your colleagues.



Also, we have all been very preoccupied with interviewing many faculty candidates for the open positions in the Department of Biology. I am grateful to all of the students and faculty who joined these candidates for lunches twice per week for the past several weeks, along with attending the job seminars and other meetings and meals. We will be concluding the process soon – I hope I will be able to announce the names of our new faculty members within a few weeks.

The process of interviewing and recruiting our future student and faculty colleagues is incredibly important for steering the direction of our department and graduate program – few decisions are as critical, and they all have lasting effects. Who knows where the next great ideas will come from, or what serendipitous connections between disparate fields will give birth to a new discipline? These are the potential consequences of the work that has so consumed us over the past few weeks, and I feel like the future has never been more electric with possibility!

Recruitment weekend hosts curious candidates

On February 10, the CMDB program hosted 48 prospective graduate students from the US and overseas for interviews by our training faculty and an introduction to the curriculum of the program.

Chris Stefan from Kyle Cunningham's lab was our featured speaker for the student symposium on Friday followed by a poster session and a happy hour. The day culminated with dinners at several of our training faculty members' homes.

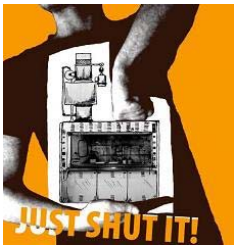
Saturday was dedicated to a question and answer session regarding the program and graduate student life. During the afternoon, our visitors toured Carnegie where they were treated to some demonstrations representing current research projects.

After a luncheon at Gertrude's, applicants were able to view several of our graduate students' apartments. Finally, we hosted a dinner at Camden Yards to complete the interview weekend.

In the end, we accepted 49 students for Fall 2012. The pool of accepted students was drawn from our weekend attendees, phone interviews to students located abroad, individual interviews, and interviews conducted in China by Yixian Zheng.

We hope that everyone's hard work and effort results in at least 18-20 new students.

A message from Green Campus Reps and Green Lab Champions



From U. Toronto's Sustainability program

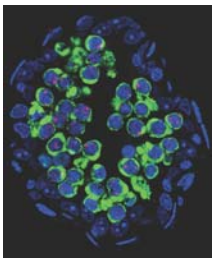
Chemical fume hoods and biological safety cabinets are essential pieces of safety equipment in labs and typically the most energy intensive. In fact a fume hood consumes 3.5 times the amount of energy consumed by the average house [Mills, E.; Sartor, D. Energy use and savings potential for laboratory fume hoods. Energy 2004, 30, 1859–1864.]

Because the main function of the fume hood is to keep the building occupants safe by removing contaminants that may be released into the air during an experiment it is an energy use that is unavoidable. However, that does not mean this device is an environmental lost cause.

One simple action can make the difference between a wasteful lab and a responsible lab: CLOSE THE SASH!

This Month's Colloquium

"Hops and Fears: Transposons in the Germline"



Retrotransposon LINE-1 in male germ cells of Maelstrom mutant mice

Alex Bortvin, Ph.D., from the Carnegie Institution will be this month's Colloquium presenter, March 7.

From his abstract: "Piwi-interacting RNAs (piRNAs) are a relatively new class of small RNAs expressed in almost exclusively in germ cells of metazoans. Sequencing and genetic studies provided abundant evidence implicating piRNAs in transcriptional and post-transcriptional silencing of transposable elements.

I will describe our work in mouse male and female germ cells aimed at the elucidation of molecular mechanisms that attempt to maintain the balance between genomic innovation and preservation of the germline genome. Specifically, I will talk about a mouse protein Maelstrom, its biochemical and cellular functions in the defense against transposons, and important insights into fundamental aspects of mammalian oogenesis uncovered in our work."

Washington Post features Phage Hunters Lab

In his article, "Colleges looking beyond the lecture," published February 15, 2012, Daniel de Vise investigates the value of active learning in undergraduate and graduate education.

From the article: "'You can't hang back,' [Joel Schildbach] told the class, during a lull. 'You've got to talk. You've got to argue. You've got to contribute.' Active learning is hard work. Students say the interactive classes are more taxing than any lecture."

This Month's Astrobiology Lecture Series

Eric Agol, Ph.D.

On March 2, Eric Agol, Ph.D., of the University of Washington presented the Astrobiology Lecture. The name of the Lecture is "Planets in the 'Habitable Zones' of White Dwarfs," his abstract follows.

If planets could re-form or migrate inwards to just outside the Roche limit of white dwarf stars, they would be warmed to Earth-like temperature for billions of years. These planets would be easy to detect in edge-on orbit via a large depth transit lasting a couple of minutes and repeating every 12 hours; thus, a ground-based transit survey of cool white dwarfs would be sensitive to Earth-sized planets in their habitable zones, should they exist in sufficient abundance.

I will discuss the prospects for detection and characterization of Earth-like planets in the habitable zones of white dwarfs, as well as scenarios for planet formation and potential constraints on habitability.

Papers Published

♦Brar GA, Yassour M, Friedman N, Regev A, Ingolia NT, Weissman JS. High-resolution view of the yeast meiotic program revealed by ribosome profiling. Science. 2012 Feb 3;335 (6068):552-7. PMID22194413. "Monitoring of protein production timing revealed uncharacterized recombination factors and extensive organellar remodeling."

♦Ho HY, Susman MW, Bikoff JB, Ryu YK, Jonas AM, Hu L, Kuruvilla R, Greenberg ME. Wnt5a-Ror-Dishevelled signaling constitutes a core developmental pathway that controls tissuemorphogenesis. Proc Natl Acad Sci U S A. 2012 Feb 17. PMID22343533. "Through loss-of-function experiments in mice, we provide conclusive evidence that Ror receptors mediate Wnt5a-dependent processes in vivo and identify Dishevelled phosphorylation as a physiological target of Wnt5a-Ror signaling."

♦Wahba L, Amon JD, Koshland D, Vuica-Ross M. RNase H and multiple RNA biogenesis factors cooperate to prevent RNA:DNA hybrids from generating genome instability. Mol Cell. 2011 Dec 23;44(6):978-88. PMC3271842. "Mutants defective in transcriptional repression, RNA export and RNA degradation show increased hybrid formation and associated genome instability. . . . In summary, RNA:DNA hybrids are a potent source for changing genome structure. By preventing their formation and accumulation, multiple RNA biogenesis factors and RNase H act as guardians of the genome."

This Month's Seminar Series

Our Special Seminars continued with Lee Lim, Ph.D., from UCSF on March 1, presenting "Analyzing and engineering microRNA activity." From a 2005 paper: "To investigate the influence of miRNAs on transcript levels, we transfected miRNAs into human cells and used microarrays to examine changes in the messenger RNA profile. ...Our results suggest that metazoan miRNAs can reduce the levels of many of their target transcripts, not just the amount of protein deriving from these transcripts."

On March 6, Xiaoyan Zheng, Ph.D., from Stanford will present a Special Seminar: "Unraveling the mechanism of Hedgehog signal reception." From a 2010 paper: "We demonstrate that Ihog interacts directly with Ptc, is required for presentation of Ptc on the cell surface, and that Ihog and Ptc are both required for high-affinity Hh binding."

Wendy Gilbert, Ph.D., from MIT will end our Seminars for the month on March 29. She will present "Molecular Mechanisms of Translational Reprogramming: Lessons from Hungry Yeast." From her website: "The proteins of a cell are the primary determinants of cellular form and function. Regulation of the proteome is therefore the ultimate goal of signaling pathways that connect cell physiology to internal and external environmental cues. We study the molecular mechanisms and physiological functions of translational control of gene expression using genome-wide translation state profiling, molecular genetics, and biochemistry."

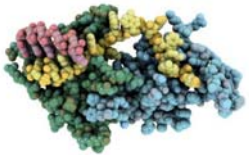
"...metazoan miRNAs can reduce the levels of many of their target transcripts..."

February's Progress Reports Recap

On February 14, Rachel Niederer (Zappulla Lab) presented her progress report. "The aim is to eventually characterize structural changes within the RNA induced by protein binding."

Shekerah Primus (Van Doren Lab) and Ami Patel (Kuruvilla Lab) presented progress reports February 21. From Primus, "Using RNA-Seq data generated from male and female gonads, we are searching for genes that exhibit sex-specific patterns of alternative splicing." And from Patel, "Based on our preliminary results, we will test the hypothesis that RCaN1 overexpression in Down Syndrome inhibits calcineurin-dependent NGF-TrkA trafficking in both sympathetic and basal forebrain cholinergic neurons."

On February 28, Cara Marie Manlandro (Hill Lab) presented her progress report, "A Novel Screen for Simultaneous Mapping of Multiple Protein-Protein Interfaces Involved in Yeast Mitochondrial Fission." From the abstract, "Generally, we anticipate that this approach will gain widespread use to define critical residues in other signaling hub proteins, as it can be used to identify single disruptions with multiple binding partners simultaneously.



DEPARTMENT OF BIOLOGY

Office of the Chair
The Johns Hopkins University
3400 N. Charles St.
Mudd Hall, Rm 122
Baltimore, MD 21218

Phone: 410-516-4693
Fax: 410-516-5213
E-mail: jennifercwohl@jhu.edu

www.bio.jhu.edu

Calendar of Events

Day	Event
Mar 1 **THURS**	Seminar: "Analyzing and engineering microRNA activity" Presented by Lee Lim, Ph.D., UCSF Mudd Rm 100, 4:00pm
2 **FRI**	Astrobiology Lecture "Planets in the 'Habitable Zones' of White Dwarfs" Eric Agol, Ph.D., University of Washington Bahcall Auditorium, STScI, 12:00pm
6 **TUES**	Progress Reports: Melissa Mefford (Zappulla Lab) Alan Rupp (Hattar Lab) Mudd Rm 100, 12:00pm
6 **TUES**	Seminar: "Unraveling the mechanism of Hedgehog signal reception" Xiaoyan Zheng, Ph.D., Stanford Mudd Rm 100, 4:00pm
7 **WED**	Colloquium: "Hops and Fears: Transposons in the Germline" Presented by Alex Bortvin, Ph.D., Carnegie Institution Mudd Auditorium, 4:30pm
13 **TUES**	Progress Reports: Lamia Wahba (Koshland Lab) Aaron Welch (Koshland Lab) Mudd Rm 100, 12:00pm
20 **TUES**	Progress Reports: Melissa Simmonds (Hattar Lab) Abhignya Subedi (Halpern Lab) Mudd Rm 100, 12:00pm
22 **THURS**	Rotation Talks Mudd Rm 100, 12:00pm
23 **FRI**	Rotation Talks Mudd Rm 100, 12:00pm
27 **TUES**	Progress Reports: Anna Talaga (Zhao Lab) Hangyi Yan (Yang Lab) Mudd Rm 100, 12:00pm
29 **THURS**	Seminar: "Molecular Mechanisms of Translational Reprogramming: Lessons from Hungry Yeast" Presented by: Wendy Gilbert, Ph.D., MIT Mudd Rm 100, 4:00pm
30 **FRI**	RNA Club Presenters: Nicholas Ingolia and David Zappulla Mudd Rm 23, 4:00pm

Coming up: Tri-beta Poster Session

April 24th

4:00 to 6:00pm in Mudd Hall Lobby

Contact the BioReps

www.jhu.edu/cmdbgradrepcouncil/ BIO-GradRepCouncil@listproc.jhu.edu

If you have a question, concern, problem, or you'd like to see some changes, contact your BioReps.

Amanda Reider ◊ Brett Scipioni ◊ Megan Mayerle ◊ Tara Legates ◊ Stephanie Ketcham
Anna Talaga ◊ Maria Kaltcheva ◊ Michelle Rozo