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K-BRIN

Kansas Biomedical Research Infrastructure Network

Training and Mentoring Newsletter

Winter 2004 Volume 2 Issue 3

Second Annual Student Symposium



Special Edition

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Symposium held on KSU campus

Staff Report

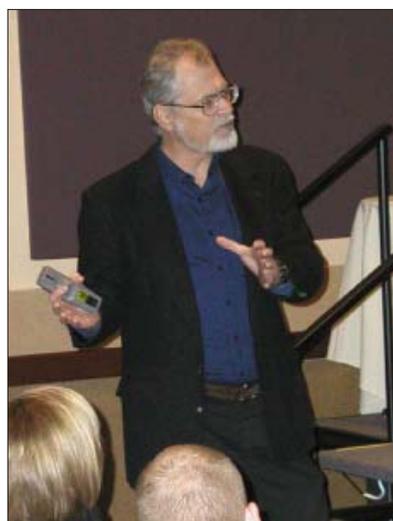
On Jan. 17 and 18, 2004, K-BRIN held its second annual Student Symposium at the Alumni Center on the Kansas State University campus. More than 120 people attended the two day event.

Planning for this symposium started at last year's symposium at the KU Medical Center. It was decided that this year's event would be held at KSU.



Sydney Carlin

“Dr. Chapes graciously agreed to do that (host the symposium) for us. Changing the location every year allows the



James Guikema

participants to visit the other K-BRIN institutions and offers the host institution an opportunity to showcase their campus,” K-BRIN Administrative Officer and Symposium Organizer Heiata Chapman said. “I think Manhattan was an excellent place to hold the symposium. Hotel accommodations were close to the campus and the beautiful Alumni Center held our group very well.”

The symposium began with opening remarks by K-BRIN Director Dr. Joan Hunt. Her observations were

followed by comments by District 66 Kansas House Representative Sydney Carlin and KSU Associate Dean of the Graduate School Dr. James Guikema.

Moderator Dr. Stephen K. Chapes introduced the four students who presented their K-BRIN sponsored projects. The students were KSU students Amber Bledsoe and Joseph Coolon, KU student Madelaine Marchin and WSU student Benjamin Weaver.

After a short refreshment break, Dr. Paul Terranova introduced the speakers for the Plenary Session. Dr. Jan E. Leach from KSU presented a talk entitled, “Common Themes in Plant and Animal Disease and Defense.” Next, Stowers Institute for Medical Research speaker Dr. R. Scott Hawley discussed



Jan E. Leach

“The Molecular Genetics of Meiosis.”

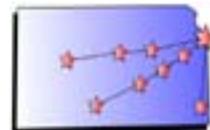
Chapman believes that all of the speakers were informative and enjoyable.



R. Scott Hawley

“I hope that the students were able to get some helpful information from the speakers. I think that it is a great opportunity for the students to be able to present orally to a group of their

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Eric Munson

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peers,” Chapman said.

The day ended with a student poster session, dinner for attendees and bowling at the KSU Student Union.

The events on Jan. 18 opened with a review of graduate programs in Kansas. KU campus Coordinator Eric Munson spoke about opportunities for students at the KU Lawrence campus.

Hunt related information about the KU Medical Center in Kansas City and Dr. Pawan K. Kahol did the same about opportunities at WSU. Guikema finished with a description of KSU graduate student options.

Following a final break, KSU Associate Professor Ruth Welti spoke about “Lipidomics.” Hunt brought the meeting to an end with some closing comments and everyone was offered box lunches for their trip home.

Chapman expects that the students who attended the event gained something from the symposium.

“I hope that the participants were able to meet some new people and make good connections, and perhaps find someone on another campus to collaborate with,” Chapman said.

Next year’s symposium will be held on the KU Lawrence campus.



Ruth Welti



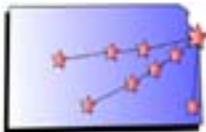
Pawan K. Kahol



Posters were viewed during breaks and the poster session on Jan. 17.



Attendees had the opportunity to bowl in the KSU Student Union after Jan. 17’s events.



Four students present projects

Joseph Chapes
Editor

At the 2004 Student Symposium, four students were given the chance to present their project to the attendees of the event.

The students who presented found the opportunity was rewarding and an important experience.

The first speaker was KSU Student Amber Bledsoe. She presented her project entitled, "Transplantation of Human Umbilical Cord Matrix Stem Cells Alleviates Apomorphine-Induced Rotations in Parkinsonian Rats."

"This presentation just gave me an idea of what it was like to prepare a scientific presentation and then present it to other scientists. I tried to learn my research inside and out so I could explain it to others and so I wouldn't get stumped in the question and answer session," Bledsoe said.

Bledsoe felt that this event was very important.

"I think it was a very valuable experience for me to present in front of my peers and even more so, to present in front of my professors. It challenged me to understand my project better and it gave me more confidence when



Amber Bledsoe

I was able to complete the presentation successfully," Bledsoe said.

KSU student Joseph Coolon was the next to present with his project, "Going Back Home: Development of a C. Elegans Soil Culture System for Functional Genomic Studies."

Coolon, a K-BRIN Star Trainee, enjoyed presenting his work of applying his research to native nematodes at the Konza Prairie.

"The experience was excellent. I really enjoyed telling others about what I am doing," Coolon said.

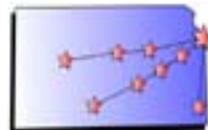
With her project, "Overview of a Web Based Application Developed for the KU Bioinformatics Program," KU student Madeleine Marchin spoke about creating a search tracking web system which is intended to make it easier for biologists to keep track of research.

"This was my first experience speaking to a large audience about my project," Marchin



Joseph Coolon

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Madelaine Marchin

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said. "It was valuable to me because of the positive responses I got from people afterwards! I guess I hadn't realized that people were really eager for an application like this. I thought it would be convenient, but didn't expect the level of enthusiasm some people seemed to have about it."

Marchin sees that she will need experience like this in public speaking in her future career.

"I believe public speaking is always helpful. Especially in the technical fields, there is often a lack of proper explanation and communication. Being able to communicate information about technical subjects to an audience that may not be familiar with the subject is truly an art, and any amount of practice here will help me," Marchin said. "I am currently planning on attending graduate school in Bioinformatics, and especially in such an interdisciplinary field, communication skills will be very helpful."

The final student speaker was WSU student Benjamin Weaver. He presented his project "Analysis of Neonatal Diethylstilbestrol-Induced Disruption of Hamster Testis and

Seminal Vesicle."

"I want to help bring science to the public and advance science literacy. I also want to help research growth by 'selling' the importance of science to lawmakers and the public. In my opinion, in addition to advancing the human condition with new generation pharmaceuticals and the potential to dramatically advance agriculture, conducting basic research is essential to the growth of our and the global economies," Weaver argued. "Basic research drives technology by uncovering knowledge and by forcing us to solve problems with new analytical techniques, new materials, efficient energy/resource utilization, etc. So I think that it's our charge as scientists to communicate that with non-scientists. So in a real sense, public speaking is integral to our professional training as scientists."

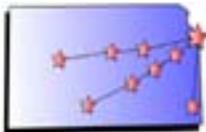
While the student speakers enjoyed their experience at the Student Symposium, some had suggestions for future events.

"I attended the Society of Women Engineers' national convention this year and one presentation I really enjoyed was entitled 'How to find a Job in Academia.' It went through and detailed how one would go from grad school to professor and I thought it was helpful. I also think some kind of introductory activity could be nice," Marchin said.

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Benjamin Weaver



Genomics and Undergraduate Education Do Mix

Dr. Brad Goodner
Contributing Writer

As K-BRIN participants already know, undergraduate involvement in research can and should be a transforming experience for students. Over the past 10 years as a faculty member at two primarily-undergraduate institutions in Virginia and Ohio, I have seen my research students move on to careers in research, all aspects of human health care, veterinary medicine, law, business, and education. When I hear back from my “academic offspring”, they tell me how their undergraduate research experience gave them the confidence, inspiration, and problem-solving skills to succeed at the next level. I would argue that undergraduate involvement can and should also transform the research itself. In a recent article, my colleagues and I made a case for transforming biology education through the incorporation of genomics

Another View

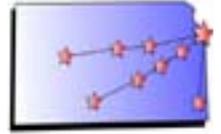
research into several undergraduate courses as well as in independent projects (1). Here, I would like to expand on this proposal by detailing one of several efforts currently underway at my home institution.

In the lab portion of a typical molecular and cellular biology course, students get hands-on experience working with cells, proteins, and DNA: microscopy, protein isolation, enzyme assays, PCR, basic DNA cloning, and bacterial transformation to name a few. At Hiram College, we have maintained those experiences but worked to merge several of them into a multi-week project connected to a larger research effort. Building on the sequenced *Agrobacterium tumefaciens* C58 genome (2, 3), we are testing the predicted function of 5-10 genes each semester. My faculty colleagues and I choose the genes based on our own research interests and design the appropriate PCR primers for cloning out an internal portion of each gene of interest (it is certainly possible that students could learn to design the PCR primers if time allows). Working in pairs over three weeks, students use the PCR primers to amplify their gene fragments, clone them into a plasmid vector, verify their constructions through restriction mapping, and transform their constructions into competent *A. tumefaciens* cells and select for single-crossover gene disruptions. Over the next few weeks, while their mutant strains are being selected and they focus on other labs, students are expected to hit the primary literature to get some ideas of how they might test the function of their gene of interest. Such tests usually involve some type of enzymatic, metabolic, or growth assay. Student pairs must submit a materials list for approval and if possible are involved in the preparation of those materials. The students then have two weeks to conduct one or more experiments. The project comes to a close with poster presentations, but the strains and the initial experiments pave the way for future work in courses, in independent

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Brad Goodner was born and raised in Wichita Falls, Texas. His academic training include a B.S. in biochemistry from Texas A&M University, a Ph.D. in biology from Purdue University, and a postdoctoral/visiting lecturer position at University of North Carolina. He was an assistant professor of biology at University of Richmond for 7 years prior to joining the faculty at Hiram College in 2001. He currently teaches courses in molecular and cellular biology, genetics, microbiology, immunology, and bioinformatics. His research interests are in host-pathogen interactions, evolution of bacterial genomes, and novel ways to involve students in genome projects. Contact by phone, (330)569-5260, or e-mail, goodnerbw@hiram.edu. (Photo submitted)



Video conferencing network used to teach six students at KSU, ESU and PSU

Staff Report

For the first time the K-BRIN video conferencing network was used to teach a class with students on several K-BRIN campuses.

The class, BIOL850, Inflammatory Cells has been offered by Dr. Stephen Chapes several times before for students at KSU. Fall semester, students from Emporia State University and Pittsburg State University were able to take the class at their own university.

The class was offered through the video conferencing network set up as part of the K-BRIN. The class took place on Tuesdays at 11:00 a.m. during August through December of 2003.

Faculty members Dave Saunders (ESU), Virginia Rider (PSU) and Chapes came together at a K-BRIN workshop in January, 2002. There, the issue of graduate student education and participation in graduate level courses was discussed. At that time, Chapes offered to teach his Inflammatory Cells class via the network.

The students in the class from KSU were Susan Moore, Kristin Monser and Linglin Xie. The student from ESU was Tina Stifter and Greg Peterson and Tamara Potapova were from PSU.

Saunders sees this course as a good use of the video conferencing network.

"This allowed our ESU student to have an introduction to a topic that she would not have received at Emporia State University. Further, she received this information first hand from an expert in the field. This class also exposed our student to course work at KSU and allowed her to get to know Dr. Chapes," Saunders said. "If more of these types of courses could be offered, students at the non-Ph.D. granting institutions might get to know more about the faculty at the Ph.D. granting institutions and be more apt to think about attending these institutions for graduate work."

The class gave students several opportunities.

"It offers students an opportunity to interact with students at other campuses. It expands the expertise that students can tap for areas that are of interest to them. It

allows students at undergraduate campuses to interact with faculty at Ph.D. institutions," Rider said. "This lessens intimidation that students feel about contacting faculty for help with research problems and/or potential further studies. It was a great opportunity for graduate students on our campus and they enjoyed the class immensely!"

The video conferencing network has the ability to allow students at one institution to benefit from classes he/she would not normally be able to take.

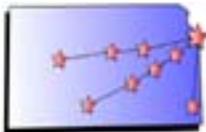
"This would provide additional resources to students at the non-Ph.D. granting institutions. At ESU, faculty provide a few courses that are specialized in their discipline, but we only have twelve faculty, thus a limited number of specialized courses. By allowing students to take courses from KSU, KU and KU Med, our students would obtain additional specialized courses," Saunders said. "This also exposes our students to different teaching styles and allows them to make contacts with faculty at other campuses. This might provide the stimulus for these students to attend one of the Ph.D. granting institutions for graduate work."

Students in the class also saw the advantages of the course.

"I think it's a good way for those who can not normally take the course to have such technology. It's fast and very clear, and we did not have any technical problem during the class, but we may have less communication with those students off campus compared to on-campus students," Xie said.

Since the class is offered over the video conferencing network, it can have advantages and disadvantages.

"The advantage was having more students with different perspectives and interests, hence more variety of questions. The disadvantage was being more restricted in terms of visual explanations, such as blackboard diagrams," Moore said. "The disadvantage that I perceived can be corrected with more use of the technology, and the advantage of having additional students in the course is a definite plus."



Goodner

(Continued from Page 6)

projects (several students have said "I want to keep working on my mutant), and in work by colleagues elsewhere.

We have similar efforts ongoing in our genetics (generating genetic and physical maps of other bacterial genomes), bioinformatics (annotating large chunks of other bacterial genomes), and microbiology (sampling environmental samples for specific genes) courses. Maybe one of the points mentioned here lights a spark for an analogous project based on your favorite organism or pathway. I would be happy to help members of K-BRIN explore these ideas further. You have already taken the biggest steps by your commitment to great undergraduate education.

A Note to K-BRIN Faculty Participants:

Maybe one of the specific projects I've mentioned interests you. If so, please let me know as we will soon be seeking funds for a pilot program where a consortium of small schools finishes a draft genome.

- 1) Goodner et al., 2003. ASM News 69:584-585. Massively parallel undergraduates for bacterial genome finishing.
- 2) Goodner et al., 2001. Science 294:2323-2328. Genome sequence of the plant pathogen and biotechnology agent *Agrobacterium tumefaciens* C58.
- 3) Wood et al., 2001. Science 294:2317-2323. The genome of the natural genetic engineer *Agrobacterium tumefaciens* C58.

EDITOR'S NOTE:

We have a special issue for Winter 2004! This issue is our 2004 Student Symposium Issue and much happened at the excellent event. If you didn't go, hurry, turn to pages 2 and 4 for special stories covering the event.

Also in this issue is a special article written by contributing writer Dr. Brad Goodner in our new "Another View" section. This section allows different writers to present their views on involving students in research.

I hope you enjoy this issue as much as I did putting it together for you!

Joseph Chapes
jchapes@ksu.edu

Student Speakers

(Continued from Page 5)

Weaver also suggested an activity.

"I would suggest some mentor-lead discussion groups with students regarding potential fields of interest in biomedical research and the kind of job opportunities available to biomedical researchers. The problem with students trying to figure out what they want to do is that they've never done anything before; except maybe pack some groceries or ask if you'd 'like fries with that?'" Weaver said. "The undergraduate research experiences help with this regard. However, the path to being a successful academician, for example, can look quite daunting to someone at the beginning of the road and students wonder if they want to invest that much time and effort."

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