This is the last “BCMB Buzzzzzz” that I will write. In July 2012 I moved out of the role of Department Head into an Associate Dean position in the College of Arts and Sciences. I find myself reminiscing and reflecting on the privilege I had to serve as Head of an outstanding unit, the Department of Biochemistry and Cellular and Molecular Biology at the University of Tennessee. This is a bittersweet moment for me….writing a “good-bye” letter to our readers and supporters at the same time that I continue to broadcast the great things going on in the BCMB Department.

BCMB is a community that supports achievement. All of our faculty and students have high standards and are fully engaged with their studies and research. Serving as the Department Head in such a mix gave me many chances to brag. Highlights from these past four years include celebrations, opportunities and outcomes that have shaped my three guiding principals as a leader:

1. “Recognizing Excellence.”
   This has come easy. We have outstanding undergraduate majors at UT today. BCMB majors account for the majority of B.S. degrees awarded in the College of Arts and Sciences, and we boast some of the highest grade point averages at the University. Each year we have over 100 of our majors involved in independent research, gaining hands-on experiences with science that will last a lifetime and that will open new doors to students’ futures. With the help of generous donations, BCMB has established scholarships for our best and brightest students. We recognize these accomplishments and scholarships each year at our awards reception. In the last few years, we have had BCMB graduate students win prestigious fellowships from the National Science Foundation. Graduate students in our program have been able to travel worldwide to give presentations about their research. Our alumni now find themselves in a variety of positions at some of the best institutions across the country. We do our best to get these alumni back to keep them apprised of the excellent work that is ongoing in the department. Our faculty continue with a very strong research portfolio supported by substantial federal grants. They are world-renowned and have earned several high profile awards in recent years. Across the board, we can celebrate excellence.

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Hello colleagues and friends of the BCMB. As most of you know by now, I became the Interim head in July 2012. In this message, I wanted to share a few thoughts with you. One of my priorities is to make sure that the positive things started by the previous head, Cynthia Peterson, continue without interruption. While following up these issues, we needed to deal with several changes. One of the most significant changes is the requirement of a two-year budget and teaching plans to the College. These plans need to be aligned with Vol Vision and Top 25 effort.

We have experienced a significant increase in the number of BCMB majors. While this is a good sign pointing to the significance of our department in undergraduate education, it will bring necessity for modifications in schedules of some courses and how we teach them. We will be continuously adjusting our plans. On the graduate education side, we recruited a very good graduate class this year.

We have one new faculty, Josh Bembenek, who joined our department in August 2012, and another new faculty member, Maitreyi Das, will be joining us in January 2013. We also have an ongoing search for another faculty member. These new faculty members will bring significant contributions to our research endeavors and increase our strengths. Despite these financially “tight” times, I am still quite excited about our future prospects and overall, I am looking forward to a productive year for BCMB and making our department a strong contributor to the Top 25 efforts.

Congratulations Kristen Holbrook! On Nov. 11, 2012, Kristen won best graduate student talk at the 38th Midwestern/Southeastern Photosynthesis Meeting at Turkey Run State Park in Indiana.
First of all, where are you from?

I was born in Saint Lucia, which is a small island in the Caribbean. I lived there until I left to complete my undergraduate degree. I went to University of the West Indies in Barbados. After I finished my degree, I came to the U.S. to do my graduate work. So, I’m from a small island.

What was your major, when you went to the university?

Biology and Chemistry, I had a joint-major. I couldn’t decide, so I did both.

What do you think prompted you to want to major in the sciences, in Biology and Chemistry?

I have always wanted to be a scientist. As long as I can remember, I knew even before I knew what a scientist was, I would hear the word, and I’d say, “I want to be a scientist!”

With this interest in science, before you went to college did you realize this possibility of going to graduate school and of being a college professor? Had that ever entered your mind, or was it an outgrowth of being in college?

I come from a very small place, with no university there. I guess I was never really directly thinking about these things. I always knew I was going to a university, and I wanted to be a scientist, whatever that entailed. So I just sort of went along, and did the next step that followed, and here I am. I taught for a while in between finishing my A-levels, and going to university, so I was a high school teacher for two years. That really developed my love of teaching, so that’s when I decided, “Okay, so I want to teach, and I want to continue my education.” Somewhere along the line, I decided being a university professor would be fun. That’s how I came upon it. I didn’t know any university professors at the time, I didn’t know what it was like, but yes, overall it was painless!

And then graduate school. How did you select graduate schools?

Well, that’s another thing. Talk about someone who was ignorant! Like I said, I went to school in Barbados, and I knew if I were to seek a higher degree, I would go someplace where there was more opportunity with better, bigger programs. My first inclination was to go to England, but I couldn’t quite break into that system from outside. It was very daunting. Then I had just gotten back from doing my teaching, and had a new computer, so I went online and applied to some schools here in the US. I knew some schools by name, the big ones, Yale and Harvard, not knowing that I was applying to schools that most people would never dare apply to! And I took the GRE. I had to go back to Barbados to do all the GRE tests, flying back and forth for all the exams. And then I got into Yale, and the rest is history! Yes, that’s how I did it.

I told my grad school advisor basically, “I know these schools, I know where they are.”

How did you select a mentor in graduate school? And now that you’ve been through that experience, has that influenced the way you might advise a graduate student in terms of that selection?

Most definitely. When I went to grad school, I admit that I wasn’t into plant biology. It was the only thing I was not interested in. I was open to everything else. And then I was planning the beginning of my year, and I met this young professor, he had just started, and he was talking about his research system in plants. I didn’t really want to work on plants, but this problem sounded really interesting. So I did my rotations in his lab, an immunology lab and then in microbiology, and ending up choosing the lab where the problem was interesting, even if it was in a system I didn’t like. Somehow, from then on I ended up working on plants. My advice to the new students will always be, “Do something beyond what you think you are interested in, just to broaden your interests and your scope.” You never know, you might find something that you thought you weren’t interested in is actually what captures your imagination, and that may be where you best talents lie, too. Just go find something to be enthusiastic about, and that will see you through the long road.

And then, post-doctoral positions. You finished your degree, at the same time you’re thinking about how to advance your career. Are you thinking about post-doctoral positions?

Yes, I actually did do that, I looked around, I looked beyond plants, I looked into many different systems, I considered C. elegans, even stem cell work.

Continued on page 6
The BCMB Department once again offered a special summer program for undergraduates interested in research. Twelve students participated this year, and they came from schools such as: University of Tennessee-Knoxville, Louisiana State University, University of Kentucky, Berry College, Lincoln Memorial University, Rensselaer Polytechnic Institute, Indiana University, Vassar College, Emory University, Missouri University of Science & Technology, and Westminster College.

The aim of this Research Experience for Undergraduates (REU) is to provide hands-on research opportunities for undergraduate students majoring in the sciences, with an introduction to cutting-edge research in the broad area of “Sensing and Signaling.” The team of REU investigators represents a multidisciplinary ensemble of Cell Biologists, Geneticists, Biochemists, and Biophysicists who are taking modern approaches to the analysis of how signals are perceived and transduced in myriad biological systems.

This year, the REU summer program was funded by an NSF REU site grant. Students worked in a specific lab for 10 weeks, learning how to carry out independent research. In addition, they had lectures and workshops covering topics such as: basics of cell signaling, how to give oral presentations, improved scientific writing, and networking. Some of these activities involved other REU programs on campus. Additionally, they had a graduate student panel to find out what graduate school is like and a career panel to explore various options for after getting a degree. They also got to visit ORNL and had several fun activities such as a hike and picnic at Big Creek Park. At the end of the program, each student presented his or her work at a final symposium.

My time as an REU student at UT was extremely rewarding. I was part of a wonderful group of ten brilliant students from diverse backgrounds. I worked pretty hard, on average I was in the lab fifty hours per week. However, working on interesting problems with lab mates who kept me both challenged and entertained made the work enjoyable. I was working in the lab of Dr. Mariano Labrador. I worked more closely with Mr. Todd Schoborg, a graduate student in the lab with whose project I was helping. In addition to working on part of Todd’s project I was also given the opportunity to propose my own experiments with the help of Todd and Dr. Labrador. One of the experiments I proposed yielded some interesting results and that project is now being continued by another graduate student in the lab, which is of course very exciting to me.

While I enjoyed my work thoroughly, I have to say my favorite part of the program was getting to know so many people who share my love for science. I made dozens of new friends, most of whom I am still in touch with, and all of whom were motivated, passionate and fascinating people. Sharing the stress and the fun of living and working in Knoxville with them was an awesome experience.

My experience at UTK was a game changer for me. It allowed me to experience life as a full-time scientist, something I could never have gotten out of a part-time research job between classes. I was given the opportunity to figure out that I can handle life as a grad student before even applying to grad school. I believe that confidence has given me a huge advantage in the grad school application process. Dr. Labrador’s lab was a great choice because they use a broad range of experimental techniques in their approach, addressing problems in vitro and in vivo. I was able to learn many techniques, from basic cell culture to qRT-PCR. In that one lab, I was exposed to most of the basic tools of molecular biology. So I now feel totally confident applying to any lab with a molecular biological focus. At LSU, we have many Biology majors and not as many research laboratories, so getting a research position is competitive. I had tried before to get lab experience, but had no luck. However, after I was able to talk about my research experience at UTK, professors were much more willing to offer me laboratory positions, and I am now working in a Neuroscience lab here at LSU. I have no doubts that the UTK REU experience opened that door for me.

Joshua plans to pursue a Ph.D. in the field of Neuroscience after he graduates in the Spring.
Going in This Direction

The BCMB Department has many students headed in different directions with their degree after graduation such as, graduate school, medical school and various jobs related to their degree. Sarah Stump, a recent alumnus of the BCMB Department, chose to attend Pharmacy school. We asked her four questions, and this is what she had to say…

1. What is your position now and what is your daily life like at the University of Kentucky?

I am currently a PY1 at the University of Kentucky College of Pharmacy in Lexington, KY. The first semester academic load consists of 19 credit hours (7 courses) including courses in physiological chemistry, antibiotics, biopharmaceutics/pharmacokinetics and others. In addition to academics, I am gaining experience as a registered pharmacy intern in the community pharmacy setting and have recently joined several national pharmacy organizations including KAPS (Kentucky Alliance of Pharmacy Students), APhA (American Pharmacists Association), and CPFI (Christian Pharmacists Fellowship International).

2. How has your undergraduate experience at BCMB helped you in pharmacy school?

My experience in the BCMB Department at The University of Tennessee has made my transition to professional school very easy. The courses I took at UT built a strong knowledge base in the areas of biochemistry, structural biology, and microbiology that have given me confidence in my first semester courses and an advantage over some students that came from other universities or academic programs. Alpha Epsilon Delta (AED) and the pre-pharmacy interest group associated with the American Pharmacists Association - Academy of Student Pharmacists (APhA-ASP) were also extremely helpful in preparing me for pharmacy school. These organizations gave me an opportunity to learn about the different areas of pharmacy practice and prepare for the professional school application/interview process. I am incredibly thankful for the challenges that my BCMB professors and mentors presented to me during my undergraduate career and feel very prepared for pharmacy school as a result of my experience in the BCMB Department at UT.

3. What was your most memorable experience at BCMB?

My most memorable experience in BCMB was the time I spent in the lab for BCMB courses, and in particular BCMB 419 (Cellular and Comparative Biochemistry Laboratory). As a part of this course and others, I was able to develop laboratory skills that are needed when conducting scientific research. These skills include genetic transformation and cloning, enzyme/protein/immunological assays, cultivation and identification of an unknown microorganism, protein purification and many others. This time in the laboratory helps supplement the material learned in the classroom and prepares students for their careers beyond the University of Tennessee.

4. What/who was your favorite class/professor at the BCMB? Why?

My favorite class I took in the BCMB Department was BCMB 420: Advanced Topics. My last semester at UT, this course was taught by Dr. Jerome Baudry and was focused on the topic of structural biology and drug discovery. I enjoyed learning about a very applicable area of biochemistry and the methods that make up the intricate, lengthy drug discovery process. Advanced Topics courses offered by the BCMB Department are great opportunities for students to gain insight in different aspects of biochemistry, learn about a professor’s specific area of research or expertise, and perhaps broaden their interests before heading out into the professional world.

Thank you Sarah, and good luck in Pharmacy school!
From St. Lucia to Knoxville Cont..

But in the end, I ended up going with something that has always fascinated me, and that’s how I chose to go to Dr. Zambrski’s lab working on plasmodesmata. The project was so challenging. It’s a hard problem, with few labs working on it, but I think it’s still inspiring. Again, I can keep my interest. That’s why I decided to go there.

Of course. And you moved to a different part of the country.

Yes, all the way across the country. Again, I did not want to go to California, but that’s where I ended up going.

When we think about this, you’ve got to be wondering, “What’s my next big change?!”

There have been a lot of big changes. It’s fun. I’m okay with big changes when I’m learning all the new things. But it gave me a better perspective of America, than just a small geographical area. I’ve been lucky. I’ve seen the Northeast, the West, and now the South.

I’m curious, in the context of coming to Tennessee. In some ways, location is a bit irrelevant in context of the part of the country it’s in, because all universities, certainly all universities that are research-extensive like this, are pretty cosmopolitan. So the campus itself is an oasis. It’s not the campus that’s the cultural change, is it?

Yes, it’s an oasis. But there are some differences. The students are different, and the staff is very different, but you’re right, the cosmopolitan feel is still there.

What are the biggest challenges you face now, being a new faculty member? How do you prioritize? Because there are a lot of challenges. How do you prioritize them?

I think my biggest challenge has been switching from a scientist, hands-on at the bench, to being a manager. That’s been a big change. Nobody has expressly taught me the rules of good management, so that’s something that I have to learn or make the effort by myself. Make sure I am being a good manager, watching the budget, watching personnel issues, keeping everybody motivated and doing the right thing. That has been a challenge for me, I haven’t had any immediate difficulties with people, but I think it’s very challenging to be a good manager, and run a lab, basically keep a nice even keel. I know I’ve moved on, and I have a lot more learning to do, it’s just that as a post-doc, you have very little experience with these responsibilities. You think of supervising two graduate students, and now my agenda of graduate students and undergrads is a lot. As you go along, you just realize there are so many other things to take you away from the actual venture of science.

So what are you teaching, now?

The science communication courses appear to be my niche area. I enjoyed that and did that last semester. I’ll be teaching it in the spring, and I’m also doing one of the graduate level journal clubs this semester, Genetics and Development. I think next year I will contribute to the core teaching course load.

Do you think there’s anything you wish you’d done differently?

Well, in my moments of time when things aren’t going well in the lab, I sometimes think I should have been a nurse instead! But, no, I think I’ve been pretty happy with the choices that I’ve made so far. There was always, “Do I really want to do this?” before I take those steps. So I know it sounded like I just fell into things, but there were always places where I had to make choices, and I put a lot of time and deliberation into it before I made the choice. So I’m happy with where I’ve been, and that sort of thing. I’m happy. When I was younger, I also had to choose. Our system was to choose which “stream” you wanted to go to: Languages, Sciences, Business, or General Studies. I picked Sciences, but I also wanted to do Languages, so I did some of the languages outside of my own. That was how I kept those options open.

It sounds to me, like the system you were in helped you. Helped you in the sense that it forced you to set goals.

Oh, yes. People called the system very harsh. At eleven, you take your first big exam to determine which secondary school you can go to. All secondary schools are not created equal. So at eleven you take the exam. From the time we are nine, we know that this exam coming up is going to determine the rest of our future. You sit your exam at eleven. And you know there’s another exam at sixteen that will determine the same thing. So from that age, we prepare for the next set of big exams at sixteen. Then, at sixteen, you know there’s another one set at eighteen. So all of that . . .

So who was your inspiration in all this? Did you have any specific people who sort of kept you going? Or was it internal?

Well, I think there was a mixture. I can’t point to a specific person, but I was in a supportive environment, and I guess, it’s interesting now, coming from such a small place, people would think, “This is what I’m going to do.” But again, people there see that there’s a big world out there, and that world is yours for the taking. That’s the sort of attitude that we have. Being from a small place doesn’t mean that we should dream small. I never felt small. I also had an aunt who was extremely supportive and encouraging of me. When I started to play around, she said, “You can do better than this!” She was very serious. She was a lifelong school teacher. “Tessa, you can do better than this!” I’d say, small voiced, “I know . . .”
2. “Supporting new Ideas.” Science moves quickly, and it is important for a modern BCMB department to be nimble and responsive to new research areas. I believe the role of a department head is to play a supportive role to help individuals on their way to innovation. We make a big investment in recruiting new faculty to campus. Within the last year, we have added three new faculty members, Dr. Tessa Burch-Smith from the University of California at Berkeley, Dr. Josh Bembenek from the University of Michigan, and Dr. Maitreyi Das who is soon to arrive from the University of Miami. These new colleagues bring original ideas and fresh approaches to important problems in cell and developmental biology. In addition to adding faculty, we have increased research support by establishing our Bioanalytical Resources Facility, with over $1,000,000 in top-notch equipment that is run by Dr. Ed Wright to provide the technical capacity to tackle experimental problems in novel ways. This facility is a resource that serves researchers beyond the BCMB Department, and it routinely impresses our visitors. In recent months, we also have worked to build added capabilities with high-end electron and fluorescence microscopy. The support we have received from donors has helped launch new research in the department, by funding pilot programs and supporting faculty with excellent records in scholarship. For example, our Hunsicker Research Incentive program has over a 50% success rate in funding start-up projects that have been leveraged into federal grant support. We also have celebrated a FIRST recently. We are proud to have established an endowed chair in BCMB, the Charles P. Postelle Professorship, which was awarded in its inaugural year (2012) to Professor Bruce McKee.

3. “Making Connections.” An area in which BCMB made great strides during my time as head was in outreach and connection with the broader community. Two years ago we launched our “From the Top: Trends in Biosciences” symposium, which brings high-profile scholars to deliver keynote addresses giving their perspectives on the professional landscape in biochemistry, cell biology and molecular biology across the globe. Our interactions beyond the department have been bolstered with the re-establishment of an External Advisory Board. This board is comprised of 12 individuals from research institutions, universities, biopharmaceutical and biotechnology companies and health professions. The board members have helped keep us focused on the needs of these various sectors as we improve our education at the undergraduate and graduate levels. Our BCMB undergraduate club has taken the initiative with “oUTreach” to our local high schools, giving presentations about their research projects at the University. Finally, Dr. Jae Park has organized a weeklong summer experience for public school teachers in the region, giving them an opportunity to come to campus and do hands-on experiments.

I recently had the pleasure of working with the first Head of the Department of Biochemistry at UTK as he organized a reunion of folks from the “early years.” These three guiding principals and the many accomplishments of the department were highlighted for these visitors during their time on campus. They were pleased to see the way our science and education has evolved and were invigorated by recognizing their thriving legacy. This was one of my proudest moments as Head of BCMB. Such accomplishments have been made possible because of the investment in the department, both by the University administration and from endowments and individual donations. We need continued support to maintain our positive trajectory, as we enter some of the most challenging times in recent history regarding federal support for research at UTK and other public institutions. This week I have made personal visits to our Congressman and Senators to request that they keep basic science as a high priority. My hope is that we can continue with the great strides that we are making in educating our next generation of scientists, physicians, pharmacists, veterinarians, dentists, educators and biotechnology work force. Thanks for your support!

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**From The Top**

The BCMB Department recently celebrated research achievements by hosting “From the Top”-Trends in Biosciences Symposium and Seminar on September 4-5. The symposium was held at the UT Conference Center where guests munched on hors d’oeuvres and viewed research from the students and their respective labs. Following the poster presentations, guests enjoyed a buffet dinner. Dr. Martha J. Fedor, editor-in-chief for the Journal of Biological Chemistry, and a professor in the Department of Chemical Physiology of the Scripps Research Institute in California, was the guest of honor and the featured speaker for the seminar that was held on Wednesday, Sept. 5. Dr. Fedor’s topic was “RNA sensors and global metabolic regulation.” Dr. Elias Fernandez said, “The symposium went moderately well, and the students who attended were very enthusiastic about their work.”
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