Dear Students, Alumni, and Friends,

Welcome to the 2015 Biochemistry newsletter! This is the 10th year of the newsletter, which is written and edited entirely by undergraduate students in the Biochemistry Club.

The biochemistry major continues to grow and thrive - in spite of its continued reputation as one of the more difficult majors in Harpur. The number of majors has increased by 30% over the last decade – we have almost 200 majors now! Enrollment in the core biochemistry class (BCHM 403, formerly known as BCHM 302) has increased by 65% in just the past 2 years. Multiple factors could play into this development, such as the growing interdisciplinary nature of the research arena as well as a new emphasis on biochemistry in medical training as fittingly described in “The Biochemistry Boom” article (p. 5) of this newsletter.

To accommodate this rising demand in biochemistry, we have recently recruited two biochemistry faculty members, Dr. Sozanne Solmaz of the Department of Chemistry and Dr. Laura Musselman of the Department of Biological Sciences, both of whom have come to be the faces of the biochemistry course this past year. You can read more about them and their research in the “Faculty Feature” (p.11 & 12) of this newsletter.

In addition to reports of new developments and faculty features, this issue of the Biochemistry newsletter also contains several motivational stories from current students (p. 9 & 10) and alumni (p. 15-17). I encourage you to check them out as they provide invaluable academic and personal advice.

Finally, I would like to thank the Biochemistry Club for their efforts in composing and assembling this newsletter. I would also like to acknowledge the club’s dedicated service to fellow students as well as to the Binghamton community by holding assorted advising events (p. 6-8) and outreach programs. I encourage current students to monitor the club’s activities by visiting their “Binghamton Biochemistry Club” page on Facebook. You may also contact the club at biochemistry@binghamtonsa.org for more information.

Enjoy the newsletter!

Best wishes,

Dr. Susan Bane
Welcome, New Professors!

By Jia Hui Zhuo

This past year, we were fortunate to have two incredibly innovative professors join our Biology and Chemistry Departments.

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**Professor Sozanne Solmaz**

Dr. Sozanne Solmaz, Assistant Professor of Biological Chemistry, brought her work to Binghamton in Fall 2014. Dr. Solmaz’s research interests involve understanding cancer formation, cell division, and cell differentiation. Her lab investigates the mitotic functions of nucleoproteins to understand how they contribute to cancer generation. Over the 2014-2015 academic year, Dr. Solmaz instructed Biochemistry and Organic Topic: Protein Biochemistry.

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**Professor Laura Musselman**

Dr. Laura Musselman, Assistant Professor of Biological Science, joined Binghamton University in Fall 2014. Her research interests encompass diet, aging, obesity, sugar, and lipid metabolism. Dr. Musselman’s lab aims to understand the mechanism underlying stress due to caloric excess in *Drosophila melanogaster*. The lab examines the basic mechanisms governing the distribution of stored nutrients in different tissues, focusing on how altering this distribution affects physiology. During the 2014-2015 academic year, Dr. Musselman taught Biochemistry and Senior Seminar in Biochemistry.
Emerging in 1976 through the ardent efforts of Dr. Anna Tan-Wilson and Dr. Karl Wilson, today the biochemistry major has blossomed into one of the most reputable and innovative fields of study on the Binghamton University campus. An interdisciplinary endeavor, biochemistry dovetails the biological and chemical sciences in an ambitious effort to understand life processes. Biochemical lab research evokes broad applications which actualize on both the dinner table and operation table. Here at Binghamton, biochemistry students delve into the nuances of biological matter, life processes, and cell metabolism.

At the helm of the present-day biochemistry program stands the accomplished Dr. Susan Bane. Beyond advising undergraduate students, Dr. Bane studies Chemical Biology, specifically investigating the dynamics and clinical application of microtubules. Recently the unprecedented amount of students interested in enrolling in the biochemistry class has forced administration to raise the class cap to 202 for the fall 2015 semester. The prerequisites to simply enroll in the biochemistry class are the completion of introductory biology, introductory chemistry, and organic chemistry courses. Biochemical lab work itself is devoted to another course, owing to the enormous breadth of the material.

While a contributing factor to the rise in interest of biochemistry, the increasing overlap of scientific branches does not account for the bulk of this growth. From an outside perspective, one might wonder why students are scrambling to register for this class in particular. Students on the pre-health track are all too aware of the answer, composing the majority of non-biochemistry majors inflating registration in the biochemistry class. Recently, biochemistry and biology have been losing traction as the primary majors of medical school applicants, as medical schools seek diversification.

Biochemistry gained a new level of importance in medical school admissions as a result of the MCAT2015. The Association of American Medical Colleges, also known at the AAMC, hopes that the addition of biochemistry, sociology, and psychology to the MCAT roster will cultivate a more empathetic and well-rounded breed of doctors. Up until January 2015, the MCAT had excluded biochemistry explicitly from its covered subjects, instead covering an indeterminate amount of questions partially related to biochemistry. Beginning on April 17, 2015, 30 out of the 230 questions on the exam will be definitive biochemical questions. Moreover, the number of medical schools that require biochemistry as a prerequisite class is expected to rise in the next few years. Consequently, it comes as no surprise that prospective doctors are scrambling to register for the class in their undergraduate years. Nonetheless, one can certainly take a biochemistry class without feeling a crushing obligation to pursue a medical degree. Biochemists enjoy challenging careers from toxicology to clinical research to biochemical engineering. Through integrating countless facets of life and fostering communication and problem solving, the permanence of biochemistry is uncontested. Having withstood the test of time, biochemistry at Binghamton is anticipated to entertain even more curiosity, thanks to a little help from the AAMC.
Alumni Advice for Pursuing a MD/PhD

By Pui Yi Sit

Dr. Ed Lee, Biochemistry alumni of Harpur College, has been a constant resource and mentor to students at Binghamton University for the past couple years. He was eager to speak with students again this spring at the Biochemistry Club’s MD/PhD event.

As an undergraduate, he chose biochemistry as his major because he struggled to pick between biology and chemistry. His coursework, including biophysical, advanced organic and analytical chemistries, were unfamiliar subjects to his fellow pre-medical classmates and were notorious for lowering GPAs due to difficulty. It was a pleasant surprise when he found out that this choice would make him an impressive candidate for admissions. Dr. Lee remarked that when pursuing an M.D./PhD, one assumes the persona of two applicants.

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As a M.D. candidate, one must demonstrate a passion for working with people. Many prospective physicians automatically gravitate towards a hospital or clinic. While these environments allow invaluable experience and relevant knowledge for careers in the medical field, soup kitchens or elderly homes are just a few more places that offer you the opportunity to improve your communication skills and set your resume apart from every other qualified applicant. Instead of doing undergraduate research at Binghamton, Dr. Lee opted to work the night shifts for the Off Campus College Transport System on campus. He asserted that one must make sure that he/she is able to account for his/her time with something meaningful. Ultimately, do not be discouraged by a couple of low test grades or a lack of research experience because the most important thing is what one learns from his/her experiences. If one discusses his/her research experience in terms of the laboratory techniques as opposed to the social aspect of working as a team, then he/she is probably not getting the full experience.

As a PhD applicant, being inquisitive and persistent are essential qualities. Dr. Lee studied signal transduction because he wanted to help people understand how cancer cells work. He recalled that his advisor from Binghamton, Fred Kull, had encouraged him to “Aim high, because if you never try, you’ll never know”. Moving forward with this advice, Dr. Lee eventually received his PhD in Toxicology and Pharmacology from Rutgers in 1987. The decision to pursue this degree translated to committing to a life of science, but it is also largely a personal journey. Dr. Lee encourages students to apply to programs based on interest rather than a school’s reputation. In the research scene, a breakthrough discovery is not an everyday occurrence so patience and love of research are basic necessities.

Dr. Lee not only loved how research challenged him, but he also craved the satisfaction of being able to personally help patients. After his post-doctoral fellowship at the National Institute of Health - National Cancer Institute and after working as a clinical scholar at Rockefeller, a renowned university with the highest number of Nobel Prize winners, he went to Harvard Medical School for his MD. He has since been in private practice as a dermatologist.

For those either applying or waiting for medical school results, Dr. Lee speaks from his experience on the Harvard admissions committee. He said that if one does not get the acceptance letter from medical school the first time, be sure to occupy time in a significant way before the next application. Know your deficiencies. In particular, the personal statement on an application is extremely important because excellent grades are all too common.

All in all, his advice would be to “Be serious, aim high, but have fun”. 
Do You Want to be a Graduate Student?

By Jia Hui Zhuo

On Monday March 9, the Biochemistry Club hosted a Graduate Student Panel, where five graduate students from the biology, chemistry and biochemistry fields attended to share their experiences and opinions through a series of questions. Students often find themselves unsure of whether or not to attend graduate school. At the Graduate Student Panel, students had a chance to discover what it’s like to be a graduate student in various fields of biological science.

“You don’t always get what you wish for; you get what you work for.”

John Wolters, a third year PhD biology student, is currently in a genetics lab working with yeast, specifically with high thermal sequencing and genomics. He knew since his undergraduate years at Binghamton that he was interested in basic biology questions, like what mechanisms in cells make life happen. Graduate school became the place to pursue his answer. He noticed that graduate education differs from undergraduate education in many ways. Wolters stated The most important distinction is that an undergraduate education largely teaches what is known, while graduate education teaches students to identify the unknown and make it known. He noted that graduate school has the potential to boost knowledge and skills in his field of interest.

Kathryn Cherny is a third year PhD student in Dr. Karin Sauer’s lab, working in biofilm development and biofilm dispersion. She chose to go to graduate school to pursue more academic research as well as to spend more time in the lab setting. Being a graduate student allowed her to become more independent and gain unique self-motivation and time management skills. She views time management as one of the most important skills to learn transitioning from undergraduate to graduate school.

CONTINUED ON PAGE 8
Bernard Lanter is a fourth year PhD candidate. His current research is on bacterial presence in heart disease and its progression. His undergraduate research in organic chemistry, including synthesizing and identifying carbohydrate, was not his ideal research topic. In his senior undergraduate year he transferred into a microbiology lab and found rewarding research combining his love for chemistry and applying it to the human body. The microbiology lab helped him rediscover his interest for research. He advises students to make sure to have positive thoughts and great passion for their graduate research.

Steven Boyer is a third year chemistry PhD student researching solar cells. He knew that graduate school was an essential part of fulfilling his dream to become a teacher for higher education. He explains that as a graduate student, there is more work to handle; graduate life is essentially dealing with three full time jobs: coursework, teaching assistant, and research. He emphasized the importance of keeping his advisor informed.

Dr. Kamalika Mukherjee is a postdoctoral researcher working with Dr. Susan Bane. Her field of research spans from cell biology to molecular biology, and molecular synthesis. She obtained her undergraduate degree in biochemistry, masters in microbiology, and decided to pursue an education in chemistry to further understand biological systems. Having received her masters degree in India and working for a pharmaceutical company afterwards made her realize that obtaining a PhD would help her career more. She adds, “Only go to graduate school if you can handle the frustration of failing an experiment.” She advises students to take advantage of as many opportunities as possible during undergraduate years to explore different types of research.

The Graduate Panel provides undergraduate students firsthand experience and knowledge about graduate school. The five graduate students all agreed that going to graduate school is an excellent experience to gain more flexibility and stability in future careers. Overall, graduate school offers more experiences and opportunities, more skill sets, and more networking possibilities. The Graduate School at Binghamton University offers a competitive breadth of knowledge while remaining sensitive to the needs of individual student. The department delivers a diverse academic experience that includes extensive faculty-student interactions and freedom to undertake interdisciplinary studies. Students will find themselves surrounded by a variety of opportunities that enrich their studies such as weekly seminars, research symposia, and individual and team research options.

"Just know, when you truly want success, you’ll never give up on it. No matter how bad the situation may get."
Alongside meetings in teahouses and heated debates in parking lots, one of my favorite “experiences” in research came from a simple question in BIOL425. **How many ribosomal RNA’s are present in one cell?** The assignment was to design an experiment to answer this within two lab periods. Yet, due to the two internships and semesters I had in research beforehand, the rush of experience it let me bring to the table reveals an amazing reason to pursue research.

After receiving the question, I immediately went: “Okay, I’ll do viable colony counts to relate my data to one cell, then I can qPCR for 16S with the RNA we isolated from that other lab. The PCR will relate to the counts if I compare it to a 16S qPCR of my gDNA. Easy!” Despite the jargon, it was exciting because some of these ideas came from my first semester, second, and “hindsight is 20/20” moments in research. It showed that each time I meet a scientific problem, I’ll be using a pool of experience that can only grow with time. On the other hand, because my guess was very rough and very, very incorrect, the path to designing this experiment became better as it put my concentration and joy for complexity to good use. To describe my assignment with ribosomal RNA in Molecular Genetics Lab, the limited bench-time and range of projects for each student encouraged using reagents and materials already present from our previous labs. While this seemed to limit options to simplify the process, we were still considering an expanse of choices as we could order “anything that may be needed.” I had practically formed a drop-down menu of questions by the time I re-assessed my procedure. I asked “What primers? Which bacterial strains? Would it take too long? Has another group done this? Will it be accurate?” Yet once I hit each blunder, the focus it required and the complexity it revealed motivated me as I saw myself steadily reaching an answer.

Since the parameters of this assignment matched the parameters of any independent experiment, this exercise also let me appreciate the social abilities I needed to utilize in research. I associate this with the ability and perseverance to communicate with those around you. Despite the usefulness of technical skills, I could not have advanced the project without questioning graduate students, coordinating with my partners, and setting a meeting with my professors. Although scientists are often individualists, our knowledge is only built on the research before us; we constantly need to share information with each other to succeed. After a series of e-mails and a push to fit a meeting in my schedule, my professor and TA’s improved my project immensely and even sent experimental data to point me in the right direction. In the end, once the procedure was modified several times and my partners ran the experiment, our final calculations differed greatly from expected values. Yet, by knowing what to do if I tried again and how this time reflects my interest for research simply proves how every side of oneself can come forth in the field. I look forward to growing as a scientist and person each time a new question crosses my path.
The Opportunities in Undergraduate Research

By David Vernik

Coming in as a freshman I knew I wanted to join a laboratory group and participate in some sort of medically related research. During my first semester of freshman year, I went to the Biochemistry Club Faculty Mixer where I heard various professors speak about the research they do at Binghamton University. One professor’s research that struck me as exceptionally interesting was Dr. Brian Callahan’s presentation on Sonic the Hedgehog Protein.

After staying in touch with Dr. Callahan through the fall and spring semester, I secured myself a position in his lab for the fall of sophomore year. When I initially started, Dr. Callahan described my first week of work as “baptism by fire”, kind of like being thrown in the deep end when you’re first taught to swim. The amount of new terminology, laboratory techniques, and information was overwhelming but I slowly and steadily began learning. Though it was hard to grasp everything at first, being paired with a more experienced undergraduate student in the lab helped me get adjusted and as the semester progressed so too did my understanding of the research.

Gradually, I grew comfortable enough with the various techniques and terminology of the laboratory to be awarded with my own project for the following semester. My project this semester focuses on a way to create a cholesterol modified version of the fluorescent protein mCherry. This experience has been very beneficial to me and has given me the opportunity to see how the material I learned in general chemistry and organic chemistry can be put to practical use in a laboratory setting. For example, from the beginning of college, in classes I learned about protein expression in E.coli, but never got to see it firsthand. Laboratory research exposed me to this and taught me how to manipulate E.coli to express mCherry and ultimately purify and modify it with cholesterol.

The brilliance of laboratory research is that essentially there is no end to it. There are always new things to learn and there is always room for improving results. A major aspect that has drawn me to research is the ability to approach a problem in multiple directions. In regular lecture classes, a lot of the time you just learn material, study and simply regurgitate what you’ve learned for a test. In the lab, you learn information and techniques that you can later utilize in many ways to solve a problem.

After completing my undergraduate degree in biochemistry, I plan on attending medical school and pursuing a career in the medical field. I feel that my participation in Dr. Callahan’s research will be very advantageous to me as I pursue these goals. However, whether it is clinical medicine, laboratory research, or any other field, I feel this type of work can be an asset to any individual because is that it teaches you to think outside the box. It is clear to me, that this new way of thinking would benefit a person regardless of what field they choose to pursue. As a result, I HIGHLY recommend getting involved with research to anyone who wishes to acquire and refine a very essential set of skills.
A new addition to the Chemistry faculty here at Binghamton University, Dr. Sozanne Solmaz has been here a short time but has already made quite an impression. She is an assistant professor of biological chemistry and has taught a senior seminar as well as the increasingly popular Biochemistry class, making her a friendly, familiar face to many students. Her research focus is on nuclear pore complexes, requiring a multi-faceted approach to answer questions related to protein structure, cell division, and cell differentiation.

Professor Solmaz’s story is one of persistent scientific passion and exploration. Her interest in science started young and by high-school she already knew she wanted to study biochemistry. Then, as her studies continued she became interested in structural biology and decided to pursue an internship at Columbia University. This experience served as positive reinforcement and so she returned to Germany and pursued a PhD in structural biology of membrane proteins. During this time she studied the structure of complex III, an important piece of the respiratory chain with cytochrome c. She evaluated what she wanted after this experience, and in order to allow her to achieve her dream of having her own lab and an academic career, she would take on a post-doc. Her post-doctoral mentor Dr. Gunter Blobel at Rockefeller University immensely impacted her career and is who she considers the most important mentor of her career. His lab had recently been redesigned to study nuclear pore complexes through structural biology and caught her attention as she found nuclear pore complexes to be fascinating transport machinery. It was under his guidance that she truly learned how to formulate scientific hypotheses to figure out the big picture, not just the smaller aspects, of a problem.

Now, Dr. Solmaz has finished setting up her lab on campus and is obtaining her first results. The process of setting up the lab was quite time consuming, as she had to quite literally start from scratch, doing tasks like painting shelves before any scientific activities could take place. But, she looks forward to what lies ahead. For now, her goal is to establish her new project and show that the nuclear pore complex is in fact an integral part of mitotic machinery. Additionally, she aims to prove a large scale nuclear pore constriction mechanism and dilation mechanism that explains the selective transport of cargo that range in size.

Throughout her career, Professor Solmaz’s success has stemmed from her immediate delving into her interests. She encourages students to start finding what they like to do early on by gathering experiences and honing in skills so they can discover where their true interest lies. Peers have also been important in her career, so she stresses the importance of comradery among classmates. She says the beauty of biological and chemical research is that it is fast paced and always progressing compared to other fields, and this may be an aspect for some students to consider in choosing their paths – there is always change and growth.
As of Fall 2014, Dr. Laura Musselman is a new addition to the Biology Department at Binghamton University. She is an Assistant Professor of Biological Sciences and has taught two courses: Biochemistry and Senior Seminar in Biochemistry. Her lab researches on the mechanism underlying stress due to caloric excess in the common fruit fly, *Drosophila melanogaster*.

Dr. Musselman earned her Bachelor’s degree in Biology at Cornell University and completed her PhD in Genetics at the University of Utah. After that, she conducted her post-doctoral research at the Washington University School of Medicine in St. Louis, where she first became interested in the field of metabolism. She worked with a specific nuclear hormone receptor, a transcription factor, which played a role in the burning of fat, lipolysis, and beta oxidation to make energy, once the factor was activated. This receptor was linked with the metamorphosis process in the fruit fly, as the receptor provided the means to use energy storage for the formation of the legs, eyes, wings, and every other part of the adult fly body during the pupal stage. Dr. Musselman discovered that flies with a mutation in the nuclear hormone receptor gene would not make it through the metamorphosis process because they were unable to burn sufficient levels of fat. This research piqued her interest in metabolism, obesity, and diabetes.

Currently, Dr. Musselman has finished setting up her lab on campus and is co-teaching the Biochemistry course with Dr. Sozanne Solmaz. Although the material is challenging, her love for Biochemistry is perpetual. She is also interested in developing a FRI stream using *Drosophila* genetics and possibly genomics or metabolomics, in which students can learn data analysis as well as wet lab genetics and animal husbandry. She hopes that this research field, integrating aspects of genetics and biochemistry, will be accessible to freshmen, as it could shape their academic and career interests.

Dr. Musselman has also expressed her desire to mentor students and teach classes, while also aiming to become one of the key researchers of the field of *Drosophila* metabolism. She hopes to build a reputation for her lab, its students, and Binghamton University as a whole. In the future, Dr. Musselman wants to leave a legacy of students who understand complex scientific matters and have been trained to become professors, doctors, researchers, or just scientific thinkers. On a final note, she shares this piece of advice with undergraduates: Hide your social media profile, and don’t post foolish pictures on it. Maintain a professional online presence; it’s never too early to be professional in the online world.
Dr. Wayne Jones: Professor and Department Chairman of Chemistry

Interview by: Jin Yao Li    Written by: Jason Anesini

Any student majoring in chemistry or biochemistry has probably met Dr. Wayne Jones. His research specialty is the design and study of molecular wires and devices such as molecular wire sensors, photovoltaic devices, and nano-fiber catalysts.

After earning his bachelor of science in chemistry at St. Michaels College, he went on to receive his Ph. D at the University of North Carolina- Chapel Hill. He then completed his Postdoctoral Fellowship at the University of Texas at Austin.

What inspired Dr. Jones to study chemistry? It started when he was in high school. Since his basketball coach was a chemistry teacher, Dr. Jones sought to impress his coach both on and off the court and began to focus on chemistry.

In his undergraduate studies, he learned about the different disciplines of chemistry and discovered that he enjoyed physical and inorganic chemistry the most. As a way to explore further these fields in chemistry, he went on to conduct research on inorganic photochemistry at UNC-Chapel Hill where his research mentor was an inorganic photochemist. When asked why he focused on inorganic photochemistry he remarked, “Photochemistry was fun with lots of colors and I wanted to learn more about where the colors came from.”

Aside from research, Dr. Jones’ teaching reflects his unique character. Compared to lecturers or professors in other large science classes, Dr. Jones’ teaching style focuses on making a curriculum that provides students with an interactive learning environment – not the standard lecture and note-taking most students come to expect. In this kind of environment, students develop critical thinking and problem solving skills. Both the faculty in his undergraduate years and his father inspired his teaching philosophy. The undergraduate faculty taught him that teaching is a conversation and that he should not constantly lecture, but instead engage the student audience. Similarly, Dr. Jones’ father – a preacher – demonstrated the importance of creating a lecture discussion to fit the needs and interests of the audience while simultaneously conveying the necessary information.

In addition to teaching, he is also an advisor for students interested in chemistry and biochemistry majors. He loves talking to students about the different career paths science majors can offer and helping students discover a career focus (e.g. academia, industrial, government, medical practice). To supplement this, Dr. Jones has worked with alumni to develop the chemistry alumni board as a forum for alumni to share their career paths and experience to assist current students in discovering their own futures. In the past years, he has hosted a Chemistry/Biochemistry Alumni panel for current Binghamton undergraduates.

Going forward, Dr. Jones aspires to continue developing the alumni board in the hopes of creating more summer opportunities for students. His plan is to use funding from the National Science Foundation to support new undergraduate programs similar to Freshman Research Immersion (FRI) and Summer Research Immersion (SRI). When asked how he manages to balance his intense work life with his personal life, Dr. Jones simply states, “It’s a never ending challenge, but when you love what you do it makes for a fulfilling life.”
Graduates of the Class of 2015 with Honors in Biochemistry

Brandon Bordeau
Thesis Title: Conjugation of Sonic-Hedgehog's signaling domain with the chemotherapeutic agents Doxorubicin, Galeterone and Abiraterone
Research Advisor: Dr. Brian P. Callahan

Graduates of the Class of 2015 in Biochemistry

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Binghamton Biochemistry Club Eboard 2014-2015

Back row (left to right): Steve Kwon, Rachel Bright, Freddie Hance, Gavriella Hecht, David Vernik, Andrew Fontes, Pui Yi Sit, Winman Lei

Front row (left to right): Heather Sherman, Stephanie Jiang, Betty Chu, Jia Hui Zhuo, Johnny Wong
Jenny Tse, Graduate of 2014

Since my first elementary school science fair, my favorite part of the scientific method has been communicating the results. Above all else, I aimed to make my findings seem as fascinating to my classmates as they seemed to me, like the number of water droplets that could fit on the surface of a penny. I no longer employ colorful tri-fold poster boards as my visual aids, but my goal to leave an enduring impact on the audience has remained the same. This longtime eagerness for sharing information, combined with my various public health and research experiences, has helped me clarify my career objectives. I am excited to say that I will begin pursuing an MS in Epidemiology this fall at the Harvard T.H. Chan School of Public Health.

After graduating from Binghamton University last year, I set out to solidify my decision to apply for graduate school in public health. I set two broad goals for my gap year: 1) obtain significant clinical experience and 2) volunteer. Last June, I started working on my first goal by becoming a medical scribe at a neurology office. Since many of the patients presented complaints secondary to long histories of chronic disease I became increasingly interested in chronic disease prevention through improved health literacy. This influenced my search for volunteer positions a few months later and I was immediately drawn to the Bubble Foundation, an organization that creates nutrition education programs and cooking demonstrations for elementary school students. After seeing the enthusiasm of the students and hearing from their parents about how the program has positively impacted their eating habits, I am looking forward to working with similar organizations in the future.

One of the most important lessons I learned during my time in Binghamton was to surround yourself with supportive friends who encourage you to explore your strengths. Without a doubt, I found this support as a member and as a part of the executive board of the Biochemistry Club. It is easy for freshman or sophomore science majors to feel as though they are funneled into either medical or doctorate degrees. However, events the club hosted such as the research and volunteer seminars, miniBridge, graduate student panels, and presentations from alumni encourage students to explore all of the opportunities available to them.

Based on my experiences since graduation, the advice I would offer to recent graduates would be to view life as a series of steps, rather than a linear path. Although I gathered excellent advice through the Biochemistry Club’s seminars, I still dreaded the standard “What are your plans after graduation?” during my senior year and this mindset significantly decrease my worries about the future. Unfortunately, life is not as straightforward as a simple staircase, but we should aim for it to look like one from afar, steadily leading upwards. In order to achieve this, make deliberate steps to enhance your personal lives, health, or careers by actively seeking to acquire new skills. It may be tempting to compare your progress to your peers’, but remind yourself to go at your own pace and do not lose sight of your own goals.
Lance Kong, Graduate of 2013

A Little Motivational Piece

Dear Current Students of Binghamton University,

To briefly introduce myself, my name is Lance and I started my undergraduate career in August 2010 and graduated in December 2013. Since my graduation, not a day has gone by where I have not thought about my time in Binghamton. I think about the good moments that bring me to a small spontaneous grin and the bad ones that make me realize how much I have gone through and how much I have matured. I will be honest, it was surreal wearing a cap and gown and walking across the stage to shake President Stenger’s hand. This moment signified my first step into “real life”. However, real life at times can have a harsh learning curve, which is why I wish to share with you a little of what I have experienced and felt after graduation.

Life after college can be quite interesting. It is at this point that you may start seeing the people you befriended throughout your college years scattering to their own paths. You may find yourself immediately joining the workforce, proceeding to graduate or professional education, doing an activity to amp up your credentials, or simply spending some time to relax. You may find yourself still not knowing what the heck to do with your life and that is okay. To put it in the grand scheme of things, I have come across people who are in their late 20s and even 30s still trying to find their way. Trust me when I say that you have time and lots of it too!

Those of you who have your minds dead set on a particular track such as medical school, graduate school, or law school, you must work hard to achieve your goals but also understand that things may not end up the way you want them to. Not everyone gains admission into these places right away. Learn to accept that and work to improve yourself so that you will acquire what you set out for. Take me for example: After graduation, I spent some time to prepare for my MCAT and my application to medical school while tutoring for a community college learning center, volunteering in the hospital and taking additional courses that fulfilled my academic interests. I did not go straight into a professional school. In fact many people nowadays choose not to.

The last thing I wish to stress is for you not to feel discouraged should you find yourself caught in the situation where everyone else seems to be moving on but you. It is very easy to feel this way and the truth is that I felt this way many times. It was a humbling experience to say the least, but I realized that this time could be more productively spent on improving myself.

Whether this article pertains to you now or in the future, I hope that you remember some of these words and use me as an example to understand that you are not and will not be the only one out there struggling to adjust to real life. You will eventually find your way; I guarantee it.

Best Regards,
Lance Kong
BS Biochemistry, Fall 2013
Fall 2013 Biochemistry Club President
Stephen Collins, Graduate of 2012

In 2008, I entered Binghamton University with the goal of graduating from the Biochemistry program. Any other ambitions I had were dwarfed by this. Like many undergraduates, I did not have a clear idea of my career plans after graduation. Although I was unsure of what I wanted to do, I was certain that I did not want to become a medical doctor. Contrary to what many students enter college thinking, I knew that being a doctor was not the right fit for me. When I took Organic Chemistry with Dr. Kissling, I was encouraged to seek out research opportunities in the field of organic chemistry. This was a defining moment in my undergraduate career. I knew that my interests included biology and chemistry, but it was not until I started to work in Professor Rozners’s laboratory that I realized that research was going to be a part of my life after graduating from Binghamton.

After graduating from Binghamton University, I wanted to dive right back into research, but I found the 2012 economy limiting. It became clear to me that even though my experiences at Binghamton were valuable, they would not be enough to get me where I wanted to be. This led me to volunteer, and eventually, work full-time as a research technician at The Commonwealth Medical College in Scranton, Pennsylvania. As a technician, I worked on an actin filament associated protein 1 (AFAP1) knockout mouse model. AFAP1 is a Src binding partner that is involved in the metastasis of breast cancer and invadopodia formation.

Working at The Commonwealth Medical College was a completely different experience compared to my undergraduate research career. Working with proteins was new, exciting, and somewhat foreign to me and posed many challenges. Even with my undergraduate training, there was much to learn as I transitioned into a molecular biology lab. Motivated by the thought of contributing to the understanding of signaling proteins and improving myself as a scientist, I accepted a project that required me to train several undergraduate students and to perform time-consuming experiments. My dedication to the project eventually paid off; I was able to obtain data that will be presented by one of the students with whom I worked at the American Diabetes Association 75th Scientific Session under the title: Actin Filament-associated Protein 1 is a Novel Regulator of Glucose and Lipid Metabolism.

My time at The Commonwealth Medical College came to an end in the summer of 2014, when I left for graduate study in the Biochemistry and Structural Biology (BSB) Program at Stony Brook University last fall. When I entered Binghamton, I never thought that this would be where I would end up. At Stony Brook, I have had the opportunity to work on several interesting projects, which involve the understanding of cancer metastasis and matrix metalloproteinases, lipid metabolism drug design in cancer, and breast cancer receptor tyrosine kinase drug design. A final take-home message for students in the Biochemistry program: your experiences as a Biochemistry student will serve as an excellent foundation for you to build upon. Remember that no matter what career interests you may have, take the time to explore them at Binghamton. Realize that graduation will only mark the beginning of your career and that the more you learn, the more you will realize how much more you have yet to learn.
Dear Fellow Students, Faculty, and Alumni,

It has been a great privilege to serve as the President of the Binghamton Biochemistry Club for the 2014-2015 year. This academic year proved to be quite eventful and remarkable, as we set our sights to execute new and exciting events to further engage the Binghamton campus and community, while maintaining our regular events.

With the success of our programs and events, such as the Faculty Mixer, Mentorship Program, Volunteer, Research, and Internship Seminar, Graduate Student Panel, and Advising Seminar, the Biochemistry Club is becoming more widely known throughout campus. During the Spring semester, we launched a new event to engage our members in a discussion about vaccines and autism. This discussion on such a popular scientific topic drew the interest of many members and was very successful. We look forward to expanding this event!

As the club continues to grow, we look toward the direction of establishing greater interaction with the Binghamton community. We have taken an initiative through our miniBridge Program collaboration with the Johnson City Elementary and Middle Schools, which began two years ago under the leadership of former president Lance Kong. This semester, we took an initiative to volunteer with a local church, which was a fantastic way to start building a connection with our community.

The success of all these events could not have been possible without the commitment and dedication of our many members! As one who has been with the club through and since its revival under former president Michael Chung, I am greatly honored to see the club reach its current stage. With the great progress that the club has made in just four years, I truly believe that the Biochemistry Club will continue to successfully carry out the mission to serve the Binghamton campus and community in the upcoming years!

Best wishes to you all!

Sincerely,
Betty Chu

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Dear Fellow Students, Faculty, and Alumni,

It has been an honor to serve as the Newsletter Coordinator for the Binghamton Biochemistry Club for the 2014-2015 academic year. I would like to thank Dr. Bane for her administrative and academic support, and the Binghamton Alumni Office for administrative help. Thank you: Susan Erickson for the cover; the writers, the interviewees, and all the members of the Biochemistry Club! I hope you all enjoyed the newsletter!

Sincerely,
Jia Hui Zhuo
ADDRESS